Agenda Item E.1
Situation Summary
March 2007

# GROUNDFISH HARVEST POLICY EVALUATION WORKSHOP REPORT

The Council's Scientific and Statistical Committee (SSC) sponsored a December 18-20, 2006 workshop in La Jolla, California to evaluate current West Coast groundfish harvest policies and the science informing these harvest policies. In previous planning materials this workshop was referred to as the $B_0$ workshop, reflecting the original emphasis on methods to assess initial, unfished biomass ($B_0$) as the benchmark from which overfished designations are made. The report of this workshop is provided as Agenda Item E.1.a, Attachment 1.

The workshop agenda included a review of harvest control rules employed by other Councils, an evaluation of the 40-10 harvest policy for stocks with variant life history and recruitment patterns, an evaluation of alternative methods for estimating initial biomass ($B_0$) and $B_{MSY}$ proxies, and a discussion of the use of priors (i.e., constraints on estimated parameter values in assessment models that use information from other sources) for key parameters in groundfish stock assessments. These discussions may prove quite useful in eventually revising the groundfish harvest policy framework and in providing technical guidance to stock assessment authors. Workshop participants identified several potential problems with current policies, but made no explicit recommendations for immediate changes. Instead, new avenues of further evaluation were outlined and a follow-up workshop on estimating $B_{MSY}$ was recommended to finalize analyses presented in draft form at the workshop.

The Council should consider the results and recommendations from the Groundfish Harvest Policy Evaluation Workshop and the recommendations from the Scientific and Statistical Committee and other advisors before recommending the next steps in exploring changes to current groundfish harvest policies.

**<u>Council Action</u>:**

1. **Discuss the results and recommendations of the Groundfish Harvest Policy Evaluation Workshop.**

<u>Reference Materials</u>:

1. Agenda Item E.1.a, Attachment 1: Report of the Groundfish Harvest Policy Evaluation Workshop.

<u>Agenda Order</u>:

a. Agenda Item Overview — John DeVore
b. Reports and Comments of Advisory Bodies
c. Public Comment
d. Council Discussion

PFMC
02/14/07

Agenda Item E.1.a
Attachment 1
March 2007

# DRAFT
# Report of the Groundfish Harvest Policy Evaluation Workshop

**Southwest Fisheries Science Center, La Jolla, California**
**December 18-20, 2006**

**A Workshop Sponsored by the Scientific and Statistical Committee of the Pacific Fishery Management Council**

The Pacific Fishery Management Council's (Council) Scientific and Statistical Committee hosted a workshop on Dec 18-20, 2006, to evaluate aspects of the Council's groundfish harvest policies. The workshop was held at the Southwest Fisheries Science Center in La Jolla, California.

The goals of the workshop were to address following three issues:

1. Evaluate the performance of the Pacific Council's 40-10 harvest policy for stocks with different life history and stock-recruit patterns.

2. Evaluate alternative methods to estimate $B_0$ and $B_{MSY}$ proxies and provide recommendations on their use.

3. Provide recommendations on the use of priors for key assessment parameters in stock assessment models. Parameters for which priors could potentially be useful include natural mortality, stock-recruit steepness, survey catchability, and recruitment variability.

This report summarizes the results of the workshop. It is intended to provide recommendations for consideration by the Council and its advisory bodies and also to give guidance to authors preparing stock assessments for the Pacific Council.

## Workshop Background

The Pacific Council's current harvest policy for groundfish was established by Amendment 11 of the Groundfish Fisheries Management Plan (FMP) in 1998 in response to new requirements in the 1996 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act. Amendment 11 included proxies for FMSY, a schedule for reducing fishing mortality at low stock size (40-10 policy), and a default minimum stock size threshold (MSST) of 25% of unfished biomass.

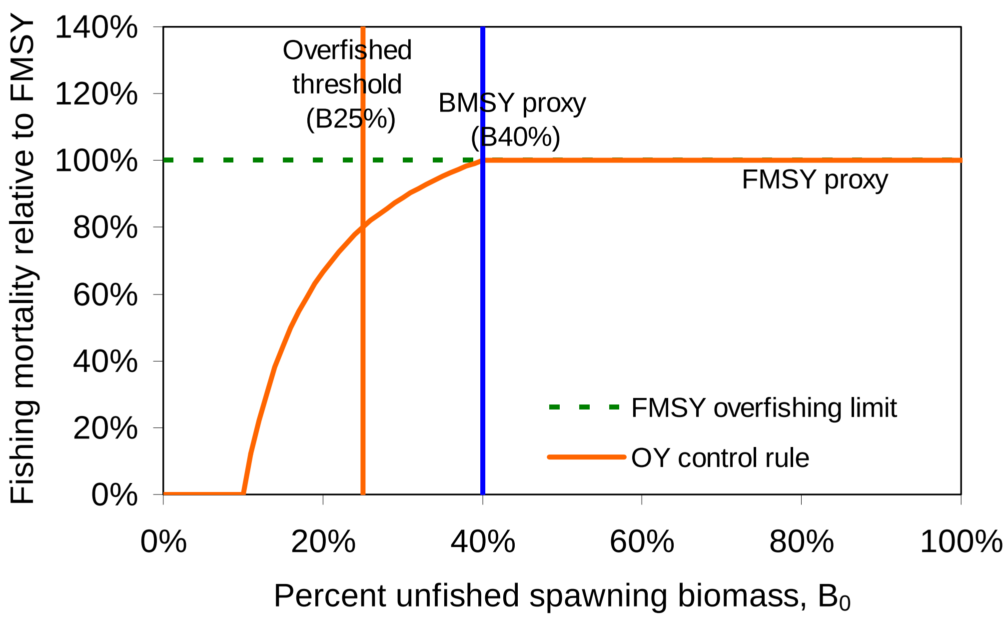


Figure 1. Pacific Council's harvest policy for groundfish.

Proxies for FMSY were revised in 2000 to reflect new estimates of groundfish productivity. A series of workshops in 1999 and 2000 led to a scientific recommendation that different FMSY proxies be adopted for rockfish ($F_{50\%}$), flatfish and Pacific whiting ($F_{40\%}$), and for other species ($F_{45\%}$). Harvest policies should be expected to evolve over time as experience is gained in their application and as new scientific findings are taken into account. A single workshop will not be able to address definitively all issues, and evaluation and refinement of harvest policies should be regarded as an ongoing process. The modeling and analyses needed to support a change in harvest policy is complex and time-consuming, and aligning the necessary resources (i.e., skilled modelers) to address these issues can be difficult given competing demands.

The first objective of the workshop was to evaluate the overall performance of the Pacific Council's OY control rule for groundfish. In an ideal situation, the OY control rule should maintain stock size close to BMSY and produce mean annual catches close to MSY. A stock exploited according to the OY control rule should not decline below the overfished limit except on rare occasions. Species managed under the groundfish FMP have diverse biology and stock dynamics. The performance of the Pacific Council's harvest policy across this biological diversity has not been evaluated.

A second objective of the workshop was to evaluate whether improvements are possible in the methods used to obtain the biomass reference points used in the harvest policy. The Pacific Council's Groundfish FMP establishes default proxies for FMSY, BMSY and the overfished threshold, but allows alternatives to be used if there is scientific justification: "The Council will consider any new scientific information relating to calculation of MSY or MSY proxies and may adopt new values based on improved understanding of the population dynamics and harvest of any species or group of species." Under the existing Groundfish FMP, the scope for changes in biomass reference point includes the following:

1. Using alternative methods of estimating $B_0$ and derived quantities such as $B_{40\%}$ and $B_{25\%}$.

2. Replacing current $B_{MSY}$ proxies with more suitable proxies or stock-specific estimates of BMSY.

3. Using alternative minimum stock size thresholds (MSST) based on stock-specific characteristics rather than the $B_{25\%}$ default. The FMP stipulates that the default MSST when $B_{MSY}$ is known is 50% of BMSY, although other alternatives could be used if justified by scientific analysis.

The method currently recommended in the FMP for estimating $B_0$ is to multiply unfished spawning biomass per recruit by average recruitment during a period when the stock was at high biomass. An alternative method is to use the estimate of $B_0$ derived from a stock-recruit relationship, either fit within assessment model or externally. Estimating $B_0$ within the assessment model became the standard approach in 2005 stock assessments, partially due to the ease with which it could be applied in the new modeling software. A third method is a dynamic estimate of $B_0$ obtained by replaying stock dynamics in the absence of fishing. At present it is unclear which of these methods performs best for the data available for West Coast groundfish, and under decadal-scale environmental variability characteristic of the California Current ecosystem.

A final objective for the workshop was to develop recommendations on the use of priors in groundfish stock assessments. At the Groundfish Stock Assessment Process Review Workshop following the 2005 stock assessments, it was noted that a variety of approaches had taken by STAR panels and STAT teams for parameters that are difficult to estimate freely in stock assessment models. Explicit guidelines might ensure consistency of approach while acknowledging scientific uncertainty. The workshop developed recommendations for estimating natural mortality ($M$). A more quantitative approach, using priors generated from Bayesian meta-analysis, was evaluated for stock-recruit steepness ($h$).

## Context in which the Council's groundfish harvest policy was developed

The Pacific Council's harvest policy was developed to satisfy requirements of fisheries legislation and regulations promulgated by the National Marine Fisheries Service, specifically the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and a guidance document by NMFS instructing Councils about how to comply with the Act. The Act contains a set of ten national standards for fishery conservation and management. National Standard 1 states "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry." The Act clarifies that “the term “optimum”, with respect to the yield from a fishery, means the amount of fish which--(A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.”

The MSFCMA also requires the Secretary of Commerce to “establish advisory guidelines (which shall not have the force and effect of law), based on the national standards, to assist in the development of fishery management plans.” The National Standard Guidelines define maximum sustainable yield (MSY): “MSY is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions. MSY stock size means the long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate units, that would be achieved under an MSY control rule in which the fishing mortality rate is constant.” “MSY control rule” means a harvest strategy which, if implemented, would be expected to result in a long-term average catch approximating MSY.

The National Standard Guidelines also establish status determination criteria as follows: “Each FMP must specify, to the extent possible, objective and measurable status determination criteria for each stock or stock complex covered by that FMP. In all cases, status determination criteria must specify both of the following: a maximum fishing mortality threshold or reasonable proxy thereof, and a minimum stock size threshold or reasonable proxy thereof. The stock size threshold should equal whichever of the following is greater: One-half the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock were exploited at FMSY.”

**Performance of the Pacific Council’s 40-10 harvest policy**

*Andre Punt, Martin Dorn and Melissa Haltuch: “Simulation Evaluation of Threshold Management Strategies for Groundfish off the U.S. West Coast.”* A Monte Carlo simulation approach was used to explore the implications of applying the Pacific Council’s 40-10 harvest policy and two alternative harvest policies (60-20 and constant fishing mortality). The 40-10 and 60-20 harvest policies are simply a schedule for reducing target mortality at low stock sizes, so this evaluation should be understood to include both the schedule for reducing fishing mortality and the $F_{MSY}$ proxies currently being used. The analysis was not a comprehensive evaluation of the Council’s management strategy because no attempt was made to model the development and implementation of rebuilding plans for stocks assessed to have dropped below the overfished threshold. Simulations of stock dynamics were performed for several representative species with contrasting life history characteristics, including a representative rockfish, a representative flatfish, and Pacific whiting. The simulations explored the medium- to long-term implications of uncertainty in steepness, recruitment variation and its possible temporal auto-correlation, the state of the resource when the management strategy is first applied, as well as implementation and estimation uncertainty.

Performance statistics were chosen to capture the intent of the harvest control rules selected for west coast groundfish resources, i.e. high stable catches and a low probability of dropping the resource below the overfished threshold. The results identified uncertainty regarding steepness as the major source of variation in the final size of the resource and whether it is below the overfished threshold, although extent of recruitment variation was also found to impact these quantities. The extent of inter-annual variation in catches was determined primarily by the extent of implementation and estimation error. The analyses also highlighted the implications of a single fixed choice for the overfished threshold given among-species variation in biological characteristics such as the rate of natural mortality and the extent of variation in recruitment.

In general, the performance of the 40-10 harvest control rule with the current $F_{MSY}$ proxies appeared to be adequate for most species. However, the results of the simulations highlighted a potential problem for short-lived species with high recruitment variability, such as Pacific whiting. Application of the Council's harvest control rule was predicted to lead to frequent cases in which the stock drops below the overfished threshold of $B_{25\%}$ even if $F_{40\%}$ is the appropriate harvest rate on average (i.e., $F_{40\%}$ equals the true $F_{MSY}$). The workshop was not able to determine how best the current harvest policy could be revised to address this problem. One approach would be case-specific, such as developing a unique harvest policy for species with high recruitment variability; another would be to develop a generic approach that would deal comprehensively with the problem by, for example, making the MSST a function of the estimated extent of recruitment variability (analogously to how productivity is currently treated).

A second concern is the apparent low productivity of some rockfish species. If current estimates of productivity are correct, applying the 40-10 harvest policy with the current $F_{MSY}$ proxy will not maintain stock size close to the $B_{MSY}$ proxy for some species. However, all of the West Coast rockfish species for which productivity is estimated to be low are currently under rebuilding plans. Since the 40-10 harvest policy will not be applied to these stocks until after they are rebuilt, there will be an opportunity to monitor stock response while rebuilding and perhaps adjust proxies for $F_{MSY}$. Recent sablefish assessments have also resulted in estimates of very low productivity, raising similar concerns for rockfish. It is also important to note that the Monte Carlo simulations considered only a relatively simple pattern of environmental forcing, i.e. correlated recruitment. More complex patterns of forcing, such as climatic regime shifts or directional climate change were not evaluated, and would likely significantly impact harvest control rule performance. The Workshop recommended that the impact of estimation error on the performance of the 40-10 and alternative harvest rules be explored further as the current simulations only examine one way in which estimation error might impact the implementation of possible harvest control rules.

## Alternative methods to estimate $B_0$ and $B_{MSY}$ proxies

*Comparisons with other fishery management councils.* Each of the eight Fishery Management Councils has implemented the requirements of the Magnuson-Stevens Act and the National Standard Guidelines somewhat differently. This review focuses primarily on the Pacific

Council, the North Pacific Council and the New England Council. Each Council is dealing with a set of stocks with unique biology and exploitation history and, potentially, a distinctive pattern of environmental forcing. In many cases, differences between management systems reflect these unique characteristics.

North Pacific Council harvest policies are specified by a tier system, which defines how ABC (acceptable biological catch) and OFL (overfishing level) are calculated based on the information available from stock assessments. At the lowest tier, only a time-series of catches is available, while at the highest tier a quantitative stock assessment allows estimation of both point estimates of $F_{MSY}$ and $B_{MSY}$ and the uncertainty associated with them. Tier 3 is most analogous to the Pacific Council's groundfish harvest policy, and is the tier in which most North Pacific stocks with assessment models are placed. Tier 3 uses a target fishing mortality rate of $F_{40\%}$ for all stocks, and provides for reductions in the fishing rate at low stock size. Rather than reducing catches linearly, as in the Pacific Council harvest policy, the North Pacific Council harvest policy reduces fishing mortality linearly once the stock size drops below $B_{40\%}$. Reducing fishing mortality rather than catch is a more aggressive response to declining stock size when the stock is between the target biomass and the overfished threshold, but becomes less aggressive at lower stock sizes.

$B_{40\%}$ is the biomass at which fishing mortality begins to ramp down for both the North Pacific and the Pacific Council harvest policies. However, $B_{40\%}$ is defined and calculated differently by the two Councils. The Pacific Council's groundfish FMP defines $B_{40\%}$ as 40% of unfished stock size whereas the North Pacific Council defines $B_{40\%}$ as the mean spawning biomass when fishing at $F_{40\%}$. In the North Pacific, an estimate of $B_{40\%}$ is obtained using mean post-1977 recruitment. Use of post-1977 recruitment recognizes the climatic regime shift that occurred in 1977 in the North Pacific. Many stocks in Alaska experienced higher recruitment after the 1977 regime shift, so the use of recent recruitment when estimating $B_{40\%}$ leads to higher estimates than would have been the case had the entire time-series of recruitment been used.

The North Pacific management system emphasizes control of fishing mortality rather than using biomass thresholds to identify overfished status. The North Pacific Council has declined to establish an overfished threshold for groundfish, arguing that their harvest policy provides for automatic rebuilding. A projection model is used to show that stocks can rebuild from current status to a $B_{MSY}$ proxy of $B_{35\%}$ within 10 years. NMFS scientists perform the required status determination using one-half of $B_{35\%}$ as the default threshold. What would happen if a stock dropped below this level has not been resolved?

In New England, where fishing mortality has been significant for over the last 100 yrs, estimation of the properties of an unexploited ecosystem is a dubious undertaking. Since nearly all New England groundfish stocks have been declared overfished, analyses have focused on estimating $B_{MSY}$ to establish a rebuilding target for these stocks, rather than harvest control rules for stocks that are not overfished.

A major re-evaluation of biological reference points was completed in 2002 (Anon 2002). The objective of this re-evaluation was to revise estimates of $F_{MSY}$ and $B_{MSY}$ for the New England Multispecies FMP (19 groundfish stocks). A suite of estimation methods was applied to estimate spawning stock biomass and recruitment from assessment models and hence fishing mortality and biomass reference points. Methods included a non-parametric approach of estimating $B_{MSY}$ by multiplying average recruitment by the spawning biomass per at $F_{40\%}$. This is analogous to the Pacific Council's to the approach to estimate $B_{40\%}$, but differs in the range of years to calculate average recruitment. The range was generally intended to represent an earlier period when the stock was at higher abundance and stable (i.e., potentially close to $B_{MSY}$ rather than $B_0$). Parametric approaches using Beverton-Holt and Ricker SR relationships were also used, with and without Bayesian priors. Explicit model selection criteria were use to select the best model, with the philosophy being that parametric approaches would be used when they were "reasonable" and did not differ greatly from the non-parametric approach.

Only the Pacific Council uses $B_0$ in its harvest policy to calculate proxies for $B_{MSY}$ and the overfished threshold. Other Councils use proxies for $B_{MSY}$ that are estimated directly, but there may be legitimate reasons for these differences. In New England, the long history of exploitation precludes the use of $B_0$ as a useful concept. In the North Pacific, dramatic increases in recruitment following the 1977 regime shift made it necessary to develop biomass reference levels using recruitment during a more recent time period. Neither of these approaches would be applicable to West Coast groundfish. An issue that remains problematic for the Pacific Council's use of $B_0$ is whether biomass estimated at the start of the assessment period is representative of the long-term average unfished biomass.

There are differences in how the Councils have defined and applied the overfished threshold (or minimum stock size threshold). Some Councils, such as the New England Council, use the default of one-half of $B_{MSY}$ as the overfished threshold. The North Pacific has declined to establish an overfished threshold, but NMFS makes its own status determinations of North Pacific stocks using a threshold of one-half of $B_{MSY}$. The Pacific Council's overfished threshold is $B_{25\%}$, which is higher than the default in the National Standard Guidelines (since the $B_{MSY}$ proxy is $B_{40\%}$), but lower than the $(1\text{-}M)*B_{MSY}$ used by the South Atlantic Council. The overfished threshold acts as safety net if the primary harvest policy fails. An advantage of using a relatively high overfished threshold is that it is quicker to protect stocks that are in decline for any reason, including a harvest policy that is potentially too aggressive. The disadvantages are, of course, is that rebuilding plans tend be disruptive of the management system and cause adverse economic impacts on the fishery. There are benefits to adopting a standard approach across Councils for national status reviews. The use of different overfished thresholds could result in stocks with similar status being categorized differently depending on the Council that is managing them.

*Melissa Haltuch, Andre Punt and Martin Dorn: "Evaluating Alternative Estimators for Fisheries Biomass Reference Points."* The control rules used to determine fishery harvest levels depend on estimates of 'biological reference points'. Commonly-used biological reference points include the level of unfished spawning biomass ($B_0$), the spawning biomass corresponding to maximum sustainable yield ($B_{MSY}$), and the current size of the stock in relation to $B_0$ and $B_{MSY}$. Although several methods exist for estimating these quantities, it is unclear which methods perform best. Simulation was therefore used to evaluate alternative estimators for $B_0$, $B_{MSY}$, current biomass relative to $B_{MSY}$, and current biomass relative to $B_0$. These estimators differed in terms of whether a stock-recruitment relationship was used when estimating $B_{0,}$ and whether a prior was placed on the steepness of the stock-recruitment model. The simulations involved first simulating the dynamics of a population for several decades, then simulating sampling from that population to generate assessment data, and finally fitting a simplified stock assessment model to those data. This simulation-estimation scheme was repeated multiple times to determinate the statistical properties of the various estimators, for example, how precise they are, and whether or not they are biased.

The simulations considered three life histories (a long-lived unproductive rockfish, a moderately long-lived and productive flatfish, and a moderately long-lived and highly variable but productive hake) since life history characteristics may impact estimator performance. Initial results suggested that estimator performance varies among both reference points and species. The performance of the estimators was better for the rockfish and flatfish life histories than for the hake life history. A draft version of this analysis was presented at the workshop, and a number of recommendations were made for improvement. It was not possible to identify the best estimators of $B_0$ and $B_{MSY}$ at the workshop due to the preliminary nature of the simulations, but a revised paper should provide some basis for developing recommendations.

*Michael Schirripa: "The potential effects of including/excluding environmental factors into stock assessments"* A simulation-estimation framework was developed specifically for sablefish using FSIM, a population and fishery simulator (Goodyear 2004). The estimation model used is the SS2 model used in the sablefish assessment. Environmental forcing on recruitment was modelled using an actual time series of sea surface height data to drive recruitment variability around the mean stock- recruitment relationship. A random component was also included to model residual variability not associated with sea surface height. A number of scenarios were considered, including those with and without environmental forcing on recruitment, and assessment models that attempted to estimate the environmental forcing and those that did not. All results are for scenarios in which the data using in the assessment is nearly perfect, i.e., there is minimal sampling error. To develop recommendations based on this work, the analyses need to be repeated for more realistic data-moderate and/or data-poor situation.

The workshop identified several issues related to how the bias-correction factor associated with the stock-recruitment should be calculated when modelling environmental forcing on recruitment deviations. These issues need to be resolved before this approach can be recommended. In addition, misleading results for sablefish could be occurring due to the timing of the environmental signal (sea surface height) and the draw-down from the fishery. Workshop participants concluded that a high standard was needed when deciding whether to include environmental forcing on recruitment. This is because process error is being modelled by the environmental data, rather than sampling error as for all other data inputs. A further concern is that modelling environmental forcing on recruitment has direct implications on stock productivity, which in turn effects how stocks are expected to respond to fishing.

An alternative approach of using environmental data as a survey-like data input was discussed briefly at the workshop. While this approach appears promising, there was no opportunity to compare approaches or review results at the workshop. Further evaluation of this and other methods of incorporating environmental data in assessment models is encouraged. The workshop considered it important to conduct simulation testing of estimators before including environmental data in assessment models used for management advice.

*Alec MacCall and John Field: "Comparison of dynamic and static estimates of B0 and stock depletion."* Current practice is to compare current spawning biomass to a reference point that represents the average abundance of an unfished resource (treated as a constant). It is unlikely that an unfished resource would be of constant abundance, as ecosystem processes are dynamic across both space and time. An alternative is to use the information generated by stock assessments to consider how an unfished resource would change over time, based on recruitment deviations and the shape of the spawner-recruit relationship. This provides an opportunity to consider alternative reference points that explicitly recognize that stocks would have varied across time in the absence of fishing.

Two approaches were evaluated: DSPR (Dynamic Spawner per Recruit) is the time series of ratios of the estimated spawning biomass to the spawning biomass that would have resulted had the same sequence of recruitments not been fished. DB0 (Dynamic B0) is the time series of spawning potentials that would have resulted if the estimated recruitment deviations in the assessment model were fixed, but the absolute recruitment values themselves are modified by the stock-recruitment relationship. Based on this, DRS (Dynamic Reference Spawning Status) is the time series of ratios of estimated spawning potential to corresponding estimates of dynamic $B_0$. DSPR and DRS, as defined here, are fully analogous to the current practice of defining spawning biomass potential to static $B_0$.

Estimates of DSPR, DBO and DRS were calculated for most of the existing West Coast groundfish stocks and compared to the current approach of using a static definition of $B_0$ and stock depletion. In many cases estimates of stock status were similar. A common difference was that DRS tended to show less extreme behavior than stock depletion estimates based on a static $B_0$. Pacific whiting, currently approaching an overfished condition, would be close to target biomass levels with this approach. However, the stock status of sablefish would be more pessimistic, as "all else equal" the spawning biomass would have been higher in recent years.

There were several proposals for incorporating these dynamic estimators into the current groundfish harvest policy. One proposal was to use a DRS of 25% as an overfished threshold to screen out stocks that have declined due to environmental changes from those that have declined due to overfishing. A second proposal was to use the existing static $B_0$ and the dynamic DRS and DSPR to determine whether a stock will be declared rebuilt. Again the purpose of using the dynamic estimates is to recognize that stocks may fail to rebuild due to ecological change even after fishing mortality has been restricted.

This Workshop welcomed these proposals, but the ideas are not sufficiently well-tested and developed yet so as to form the basis for recommendations for changes to how harvest control rules for West Coast Groundfish are applied. This is because, for example, the dynamic approach implicitly assumes that the same recruitment deviation would have occurred had there been no fishing, an untested and potentially untestable assumption. Furthermore, the imprecision and statistical properties of recruitment deviations also need to be explored. The approach may be conditioned on the deviations being calculated relative to a well-estimated spawner-recruitment relationship that captures the central tendency of recruitment. Simulation testing of dynamic $B_0$ estimators is currently underway, and the results of this work need to be reviewed. The Workshop also recommended that stock assessments report dynamic biomass time-series such as DSPR, DB0 and DRS so that more can be learned about how these status indicators perform in practice.

## Advice to assessment authors

*Natural mortality*. This section provides recommendations for selecting an appropriate value for natural mortality, *M*. It is intended to guide the development of new assessments or assessments where a change in *M* is contemplated. At this point it is not possible to be prescriptive about how to choose a value of *M* for stock assessment, and these guidelines are intended to describe a default approach, with the understanding that other methods and approaches can be considered if accompanied by a reasoned argument. Analysts are expected to consider the value of *M* used in previous assessments, and values of *M* used for similar stocks. Continuity in advice is an important consideration in stock assessment and proposed changes in M should represent a genuine scientific advance and not the preference of the assessment author.

A number of papers have dealt with obtaining suitable values of *M* for stock assessment modeling. These methods depend on deriving a relationship between *M* and a more easily measured life history characteristic. Many (if not all) of these methods have significant limitations that restrict their applicability. Experience has shown that empirical methods of Hoenig (1983), Gunderson (1992), and Beverton (1992) tend to be the most reliable. However, it is still necessary to be judicious in even using these methods, as each is capable of producing nonsensical results. Other empirical methods for estimating *M* are not recommended.

In addition to evaluating these empirical methods, a likelihood profile on M should be produced. Analysts should consider generating the full likelihood surface of M versus steepness, although it is recognized that this represents a significant computational undertaking. Analysts should also be aware of the potential for unrealistic selectivity patterns to be generated when doing such a likelihood profile due to the interaction between M and selectivity. These potential pathologies should be investigated to the extent possible, for example both tracking the values of other key parameters while stepping through the likelihood profile.

One potential advance in stock assessment practice is to use a Bayesian prior for M that reflects both the estimate and the uncertainty from the empirical relationship (such as the relationship between GSI and M). Prediction intervals around such relationships are much wider than confidence intervals (which are already quite large). At present it is unclear which expression of uncertainty is more appropriate to use in a Bayesian prior, but these two alternatives may be suitable endpoints for sensitivity analysis. Confidence intervals are appropriate only if the scatter around the mean relationship between the other life history parameter and M is due purely to observation error. In contrast, prediction intervals should be used if the scatter is due purely to true variation about the mean relationship. The truth is undoubtedly somewhere in the middle, and is complicated by probable bias introduced by the methods for estimating M values used in the meta-analyses.

The use of an arbitrary prior to constrain the estimate of M to a previously-used value is not recommended, particularly if the prior variance was chosen by iterating until "satisfactory" results are obtained. Instead, a likelihood profile should be provided, and (if uncertainty in M is considered a major component of assessment uncertainty) alternative model runs should be produced using alternative values of M. Estimation of M within a model (with or without an informative prior) is complicated by the reality of dome-shaped selectivity, since the value of M and the rate of decrease in selection with age (or size) are correlated. Only if at least one selectivity curve can reasonably be assumed to be asymptotic should an attempt be made to estimate M within the model.

Application of these methods collectively should allow the analyst to focus in on a value of M or a range of values to use in the stock assessment. Of course, the true natural mortality is likely to vary between ages and from one year to the next, but estimating this variation is not possible using data currently available for stock assessment, and may not be all that important. Stock assessments do not require a highly precise estimate of natural mortality to serve their purpose in managing fish stocks.

*Stock recruit steepness.* The latest version of the assessment model used for most West Coast groundfish species, SS2, includes a stock-recruit relationship as an intrinsic part of the population dynamics. Stock-recruit parameters, such as steepness, must therefore be either assumed or estimated in the model. Other assessment models, such as VPA and its more advanced variants, do not include a stock recruit relationship. Including a stock recruit relationship adds additional structure to model, which can help the estimation in data-poor situations. However, it is not a necessary feature of assessment models, and most assessment models used in North Pacific do not include a stock-recruit relationship. In the previous assessment cycle, about 40% of the assessments estimated stock-recruit steepness, while the remainder assumed a fixed value for steepness. Fixed values of steepness were obtained using a variety of rationales, including the results of meta-analysis, expert judgement, or on the basis of preliminary runs which indicated a need to constrain steepness to avoid hitting a bound (i.e., a steepness of 0..2 or 1.0).

One possibility for more rigorous and consistent treatment of this important assessment parameter is to incorporate a Bayesian prior for steepness in the assessment model. Workshop participants reviewed results presented by Dorn of a meta-analysis of steepness for Pacific Coast rockfish and flatfish. This analysis was an update of earlier work (Dorn 2002) that jointly estimated steepness for a group of stocks with age structured assessments. Results indicated a mean steepness for rockfish of 0.55 (range 0.41-0.85). The mean is lower than the mean of 0.65 from the previous meta-analysis. For flatfish, the mean steepness was 0.89 (range 0.74-0.92).

For rockfish and flatfish assessed during the next assessment cycle, analysts are requested to consider the appropriate prior for steepness derived from the Dorn meta-analysis. A comparison of the final model with and without this prior is requested (if the final model doesn't include the prior). Rockfish stocks being assessed in 2007 that were included in the meta-analysis are black rockfish, bocaccio, chillipepper rockfish, darkblotched rockfish, and canary rockfish. For these species, the prior should be based on a meta-analysis with the stock in question omitted to avoid double use of data (Minte-Vera et al 2006). Blue rockfish, which has not been assessed previously, would use a prior derived from data for all stocks. Stock assessment updates would not be able to use meta-analysis results and still be considered updates. Dorn will complete the paper on the undated meta-analysis and provide the appropriate priors for consideration by assessment authors. Assessment authors are also requested to do a likelihood profile on steepness (with the prior removed) to enable routine updates of the meta-analysis to be done.

**The next steps**

There is an on-going need to hold methods workshops that focus directly on the Council's harvest policies and stock assessment methods. This need is not limited to groundfish, but extends to CPS species for which management policies and assessment methods are comparable. There is also broad interest in management strategy evaluations in the North Pacific Council, and collaborations should be pursued on topics of mutual interest. The SSC would like to be involved in an active and on-going research program related to the practical matters associated with implementation of Council policies to improve its advisory role to the Council. However, it is recognized that methods are complex and require a significant time commitment that may prevent SSC from doing more than guiding and reviewing the research. How to align resources is an unanswered question and was a challenge for the present workshop. Future methods workshops might deal with:

- A follow-up workshop is needed to develop recommendations on estimating $B_0$ and $B_{MSY}$ if the suggestions made due the workshop to the analysts working on comparing alternative estimators are implemented.

- A harvest policy evaluation should be undertaken for Pacific whiting due to the apparent poor performance of the current policy for this species as a result of high recruitment variability.

- Management policies for data-limited stocks should be developed and evaluated. This is because Council harvest policies for species without full age-structured assessments are not fully developed.

- The harvest policies for the CPS species should be reviewed and perhaps modified given the results of research since the current harvest policies were selected.

- Harvest policies that perform robustly in the face of climatic regime shifts should be developed and evaluated.

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**Appendix A: Workshop agenda**

# Groundfish Harvest Policy Evaluation Workshop

## Pacific Fishery Management Council

## Scientific and Statistical Committee

**Southwest Fisheries Science Center**
**8604 La Jolla Shores Drive**
**La Jolla, CA 92037**

**December 18-20, 2006**

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**<u>Monday, December 18, 2006</u>**

| | |
|---|---|
| 9:00 a.m. | Welcome (Bill Fox, SWFSC Center Director) and Introductions |
| 9:15 a.m. | Review Goals and Objectives of the Workshop |

***Session 1. Workshop Background***

| | |
|---|---|
| 9:30 a.m. | Martin Dorn: "Review of methods of estimating biomass reference points used in harvest control rules employed by US Fisheries Management Councils." |
| 10:30 a.m. | Break |
| 10:45 a.m. | Neil Klaer: "Recent experience with implementation of a 40-20 harvest rule in a SE Australian multispecies demersal fishery." |
| 11:45 a.m. | Discussion |
| 12:00 p.m. | Lunch |

***Session 2: Evaluate the performance of the 40-10 harvest policy for stocks with different life history and stock-recruit patterns***

| | |
|---|---|
| 1:00 p.m. | Andre Punt, Martin Dorn and Melissa Haltuch: "Simulation evaluation of the 40-10 and 60-20 control rules under semi-ideal conditions." |
| 2:00 p.m. | Discussion and requests to analysts. |
| 3:00 p.m. | Break |

***Session 3: Evaluate alternative methods to estimate B0 and BMSY proxies and provide recommendations on their use***

| | |
|---|---|
| 3:30 p.m. | Melissa Haltuch, Andre Punt, Martin Dorn: "Simulation testing alternative estimators of unfished stock size." |
| 4:30 p.m. | Discussion and requests to analysts |

**Tuesday, December 19, 2006**

9:00 a.m. Michael Schirripa: "Simulation testing estimators of sablefish biomass reference levels under decadal environmental variability."

10:00 a.m. Alec Maccall and John Field: "Comparison of dynamic and static estimates of B0 and stock depletion."

11:00 a.m. Break

11:15 a.m. Discussion and requests to analysts

12:00 p.m. Lunch

***Session 4: Provide recommendations on the use of priors for key assessment parameters in stock assessment models***

1:00 p.m. Martin Dorn: "Advice on priors for stock-recruit steepness for use in West Coast stock assessments."

2:00 p.m. Owen Hamel: "Advice on priors for natural mortality."

3:00 p.m. Break

3:30 p.m. Discussion and analysts report on progress.

**Wednesday, December 20, 2006**

***Session 5. Workshop Discussion***

9:00 a.m. Analysts report on progress.

10:00 a.m. Begin drafting workshop report

11:30 a.m. Wrap-Up—workshop recommendations

12:00 p.m. Workshop Adjourns

## Appendix B:  Workshop participants

Martin Dorn, National Marine Fisheries Service Alaska Fisheries Science Center, SSC Groundfish Subcommittee and workshop chair
Jim Ianelli, National Marine Fisheries Service Alaska Fisheries Science Center
Andre Punt, University of Washington
Dan Waldeck, Pacific Whiting Conservation Cooperative
Michael Schirripa, National Marine Fisheries Service Northwest Fisheries Science Center
Owen Hamel, National Marine Fisheries Service Northwest Fisheries Science Center
Tom Jagielo, Washington Department of Fish and Wildlife
Melissa Haltuch, University of Washington
Ray Conser, National Marine Fisheries Service Southwest Fisheries Science Center
Rick Methot, National Marine Fisheries Service Northwest Fisheries Science Center
David Sampson, Oregon State University
Theresa Tsou, Washington Department of Fish and Wildlife
Steve Ralston, National Marine Fisheries Service Southwest Fisheries Science Center
John Field, National Marine Fisheries Service Southwest Fisheries Science Center
Meisha Key, California Department of Fish and Game
Debbie Aseltine-Neilson, California Department of Fish and Game
Pete Leipzig, Fishermen's Marketing Association
Mark Maunder, IATTC
Roger Hewitt, National Marine Fisheries Service Northwest Fisheries Science Center
Neil Klaer, CSIRO Australia
Gway Kirchner, Oregon Department of Fish and Wildlife
Bill Herberer, Oregon Department of Fish and Wildlife
Brad Pettinger, Oregon Trawl Commission
Emmanis Dorval, National Marine Fisheries Service Southwest Fisheries Science Center
William Fox, National Marine Fisheries Service Southwest Fisheries Science Center
Paul Krone, National Marine Fisheries Service Southwest Fisheries Science Center
Don McIsaac, Pacific Fishery Management Council
John DeVore, Pacific Fishery Management Council

# NATIONAL MARINE FISHERIES SERVICE REPORT

National Marine Fisheries Service (NMFS) Northwest Region will briefly report on recent regulatory developments relevant to groundfish fisheries and issues of interest to the Pacific Fishery Management Council (Council).

NMFS Northwest Fisheries Science Center (NWFSC) will also briefly report on groundfish-related science and research activities.

**Council Task:**

**Discussion.**

Reference Materials:

1. Agenda Item E.2.a, Attachment 1: List of Groundfish and Halibut Federal Register Notices Published from October 26, 2006 through February 18, 2007.
2. Agenda Item E.2.a, Attachment 2: Notification to PFMC of 2005 petrale sole overfishing.
3. Agenda Item E.2.b, Attachment 1: Estimated 2005 Discard and Total Catch of Selected Groundfish Species.
4. Agenda Item E.2.b, Attachment 2: Geographic distribution of canary bycatch in northern shelf groundfish trawl fisheries observed between January 2005 and April 2006.
5. Agenda Item E.2.b, Attachment 3: Summary of bronzespotted rockfish (*Sebastes gilli*) conservation concerns.

Agenda Order:

a. Regulatory Activities — Frank Lockhart
b. Science Center Activities — Elizabeth Clarke
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. Council Discussion

Agenda Item E.2.a
Attachment 1
March 2007

# FEDERAL REGISTER NOTICES

## Groundfish and Halibut Notices
## October 26, 2006 through February 18, 2007

**Documents available at NMFS Sustainable Fisheries Groundfish Web Site**
**http://www.nwr.noaa.gov/1sustfsh/gdfsh01.htm**

71 FR 64216. Pacific Coast Groundfish Fishery; Advance Notice of Proposed Rulemaking to Establish a Control Date. NMFS and PFMC are beginning to develop a groundfish fishery management plan amendment and management measures to reduce harvest capacity in the open access fishery - 11/1/06

71 FR 66122. Pacific Coast Groundfish Fishery; Amendment 18. NMFS issues this final rule to implement Amendment 18 to the Pacific Coast Groundfish Fishery Management Plan - 11/13/06

71 FR 66693. Pacific Coast Groundfish Fishery; End of the Pacific Whiting Primary Season for the Catcher-Processor Sector. - 11/16/06

71 FR 69076. Pacific Coast Groundfish Fishery; Specifications and Management Measures; Inseason Adjustments. NMFS announces changes to management measures in the commercial and recreational Pacific Coast Groundfish Fisheries - 11/29/06

71 FR 78638. Pacific Coast Groundfish Fishery; Biennial Specifications and Management Measures for 2007-2008; Amendment 16-4. Action: Final Rule - 12/29/06

72 FR 1690. Pacific Halibut Fishery; Proposed Rule to Implement 2007 Change to the Catch Sharing Plan and Domestic Regulations for Pacific Halibut in Area 2A - 1/16/07

72 FR 1706. Notice of availability of updated observer coverage plan for the Pacific Coast Groundfish Fishery; notice of an exemption to the at-sea processing prohibition for sablefish taken in the limited entry primary sablefish fishery - 1/16/07

**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

FEB 13 2007

Donald Hansen
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Mr. Hansen: Don

NOAA's National Marine Fisheries Service (NMFS), on behalf of the Secretary of Commerce, is required to notify the Pacific Fishery Management Council (Council) by letter that petrale sole was subject to overfishing in 2005. NMFS has made this determination under section 304(e)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) combined with our National Standard 1 guidelines at section 600.310(e)(3)(i) of the Code of Federal Regulations.

NMFS's Northwest Fisheries Science Center recently completed its report "Estimated 2005 Discard and Total Catch of Selected Groundfish Species," which is provided as an attachment to agenda item E.2. for your March 2007 meeting. In that report, we estimated that the catch of petrale sole in 2005 was 2,766 mt, 0.14% above the 2005 petrale sole Acceptable Biological Catch (ABC) of 2,762 mt. We are required to announce this notification of overfishing in the *Federal Register* for interested members of the public; we intend to include that announcement in the next *Federal Register* notice that we publish for an inseason groundfish action.

The Council is required under section 304(e)(3)(A) of the Magnuson-Stevens Act to prepare a fishery management plan (FMP), FMP amendment, or proposed regulations within one year of this notification to address petrale sole overfishing. However, preliminary estimates from 2006 indicate that the 2006 petrale catch was below that species' ABC. This lower catch was likely due to the Council having introduced winter trip limits for petrale sole via inseason recommendations from its November 2005 meeting (70 FR 72385, December 5, 2005.) We note that the 2007-2008 groundfish trip limits, established through notice and comment rulemaking, also include limits for petrale sole that were designed to keep catch within the appropriate level. Thus, we believe that the Council has taken the necessary steps under section 304(e)(3)(A) and we anticipate that it will continue to recommend any necessary adjustments through its standard management process.

Thank you for your time and attention in this matter.

Sincerely,

Bob Lohn

D. Robert Lohn
Regional Administrator

Agenda Item E.2.b
Attachment 1
March 2007

# Estimated 2005 Discard and Total Catch of Selected Groundfish Species

Dr. James Hastie
Fishery Resource Analysis and Monitoring Division
Northwest Fisheries Science Center

Marlene Bellman
Pacific States Marine Fisheries Commission

December 29, 2006

## INTRODUCTION

This report summarizes estimates of 2005 discard and total fishing mortality for selected groundfish species. The report includes an inventory of fishing mortality from all sources, however, analysis conducted for this report focuses on commercial fisheries where NOAA Fisheries has conducted scientific observation of discards. Observations from limited-entry groundfish trawl fisheries, fixed-gear sablefish fisheries, and nearshore fixed-gear groundfish fisheries are used in conjunction with landings records and mortality information obtained from additional sources in developing mortality estimates for this report. Data sources for these analyses include onboard observer program data, landing receipt data (referred to as fish tickets), trawl logbook data, and information from the Pacific Fishery Management Council's (PFMC) Groundfish Management Team (GMT).

The West Coast Groundfish Observer Program (WCGOP) was established in 2001 by NOAA Fisheries (National Marine Fisheries Service, NMFS) (66 FR 20609). All vessels that catch groundfish in the United States Exclusive Economic Zone (EEZ) from 3-200 miles offshore are required to carry an observer when notified to do so by NMFS or its designated agent. Subsequent state rule-making has extended NMFS's ability to require that California and Oregon vessels which only fish in the 0-3 mile state territorial zone also carry observers. The WCGOP coverage plan, which details program goals, vessel selection, observer coverage, and basic data collection, is available at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/observersamplingplan.pdf. Observation of the at-sea hake/whiting fishery had been conducted by the North Pacific Observer Program since the 1970s. In 2001, the Northwest Fisheries Science Center assumed management of west coast hake fleet observations through the At-Sea Hake Observer Program.

Logbook record-keeping for the LE groundfish trawl fishery is a state-mandated requirement in Washington, Oregon, and California. A common-format logbook is used by all three states and completed logbook information is entered into state agency databases. The electronic logbook data are then uploaded to a regional database clearinghouse, the Pacific Coast Fisheries Information Network (PacFIN), maintained by the Pacific States Marine Fisheries Commission (PSMFC).

Landing receipts, known as fish tickets, are completed by fish-buyers in each port upon vessel delivery of fish. Fish tickets are issued to fish-buyers by a state agency and must be returned to the agency for processing. Washington, Oregon, and California each have a slightly different format of fish ticket receipt. Each state also conducts species-composition sampling for numerous "market" categories reported on fish tickets. Market categories may include several species (e.g. minor shelf rockfish), or may represent individual species where verification of correct species identification is deemed desirable. The fish ticket and species-composition data are also uploaded to the PacFIN database.

The Groundfish Management Team (GMT) is an advisory body to the Pacific Fishery Management Council. The GMT monitors catch-related information from all sectors of the groundfish fishery, which is provided as needed for this analysis. The assumptions regarding the survival of discards, as well as the modeling of nearshore groundfish fisheries used in this analysis are based on a model developed by the GMT and first presented to the PFMC at their June 2005 meeting.

## METHODS

Discard estimates for each fleet begin with summarizing WCGOP observer data according to strata. Based on the amount of available observer data and the distribution of observed and fleet fishing effort, observer data are stratified by depth, area, and/or season. Methods used to expand the observer data to the entire fishing fleet vary somewhat between fisheries since trawl logbook data, which provide fishing location and depth information, are not available for the fixed-gear fleets.

### Limited-Entry Trawl Fishery

Fleet-wide discard estimates in the LE trawl fishery are derived from WCGOP observer data, fish ticket landings data, and trawl logbook data. Fish ticket and logbook data are obtained from the Pacific Coast Fisheries Information Network (PacFIN) database. The observer data used in this report are included in the WCGOP Data Report and Summary Analyses of Limited-Entry Trawl Permits published in September 2006, available at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/datareport/trawl/datareportsep2006.cfm.

First, WCGOP observer data is stratified by area, season, and depth. Trawl logbook data are then stratified in the same manner as the WCGOP observer data. Area strata are defined as north and south of the management line at 40° 10' N. latitude. The northern area is divided into six depth strata (0-50, 51-75, 76-100, 151-200, 201-300, >300 fathoms) and the southern area is divided into six depth strata (0-50, 51-75, 76-100, 151-225, 226-300, >300 fathoms). It should be noted that in 2005, depth-based spatial closures in the LE trawl fishery incorporated depths from 100 to 150 fathoms coast-wide for the entire year. In the northern area and for depths greater than 150 fathoms in the southern area, two seasons are defined by combining two-month cumulative trip limit periods representing winter (January-April and November-December; periods 1+2+6) and summer (May-October; periods 3+4+5). Due to the limited numbers of observations, data are aggregated to an annual level in the three southern depth strata less than 100 fathoms.

The catch of many groundfish species is characterized by a mix of retention and discard throughout most of the strata where they are encountered. For these species, the approach used in this analysis is to estimate discards as a function of retained catch of the individual species or species groups. For other species ("bycatch" species), where a large percentage of catch is discarded in many strata, discard is estimated as a function of the retained catch of a group of "target" species. This group includes all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish, in both the northern and southern areas, with the addition of slope rockfish in the southern area. The retained catch of these target species is used as a measure of trawl effort for expanding discard from observed trips to the entire fleet. Spiny dogfish and unspecified skates are included in the calculation of target tonnage, but are not treated as target species in expanding observed discard. The rationale for this is that while they are targeted in some areas, they are discarded at a very high rate in most strata. The number of tows and retained catch of target species within each stratum from the observer program and trawl logbooks are reported in Table 1.

Discard ratios are calculated for three sets of species: rebuilding species, which are under rebuilding plans and a critical component of bycatch in the context of groundfish fishery management, target species, and other "bycatch" species. Stratum discard ratios for rebuilding species are calculated by dividing a rebuilding species' discarded pounds by the aggregate poundage of target species retained in the stratum (Table 2a). Stratum discard ratios for target species are calculated by dividing each target species' (or group's) discarded pounds by its retained pounds (Table 2b). For other species that are treated as bycatch, for the purpose of analysis, discard ratios are calculated in the same manner as for rebuilding species (Table 2c). Overall ratios of bycatch (retained + discarded weight) for rebuilding species relative to retained target species are also presented in Table 3. A complete listing of groundfish species included in the Fishery Management Plan is provided in Appendix A.

Stratum estimates of discard are calculated for each target species by multiplying the logbook retained species catch (metric tons) (Table 1) by the appropriate discard ratio (Table 2b). Stratum estimates of discard for individual rebuilding species and other bycatch species are calculated by multiplying the aggregate logbook target species catch (metric tons) in each stratum (Table 1) by the appropriate discard ratio (Table 2a and Table 2c). These amounts are then summed for each state and 2-month period.

Logbook data do not provide a complete synopsis of all trawl trips, as logbooks are not submitted for 100% of trips taken. Additionally, for analysis purposes, only logbook records which have a depth or latitude-longitude coordinates recorded are included in the stratum-specific expansions of observed discard. As a result, discard estimates must be expanded to reflect the difference in landed catch reported on fish tickets and that reported in logbooks. The expansion ratio for target species is equal to fish ticket pounds divided by logbook pounds for each state and two-month period. The expansion ratio for rebuilding and other bycatch species is equal to fish ticket pounds of the combined target species divided by logbook pounds for the combined target species. Landings and estimates of discard and total catch are reported in Table 4.

Fixed-Gear Sablefish Fishery

Fleet-wide discard estimates for the fixed-gear fishery are derived from WCGOP observer data and fish ticket landings data. The observer data used in analysis of this fishery were collected mainly from observations of the LE primary fixed-gear season for sablefish. Fish ticket data are obtained from the Pacific Coast Fisheries Information Network (PacFIN) database. The observer data used in this report are included in the WCGOP Data Report and Summary Analyses of Sablefish-Endorsed Fixed-Gear Permits published in September 2006, available at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/datareport/fixedgear/fixedgearreportsep2006.cfm and the WCGOP Data Report and Summary Analyses of Non Sablefish-endorsed

Fixed Gear Permits published in October 2006, available at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/datareport/fixedgear/fixedgearreport_oct2006.cfm. The observer program has focused on the primary LE sablefish fishery which takes place from April to the end of October and operates under a tier limit program. In contrast, few vessels (limited-entry or open access) in 2005 were observed under the alternative daily trip limit provisions. Thus, observations of the primary fishery are assumed to be representative of bycatch and discard associated with all fixed-gear sablefish fishing effort.

Stratification of the sablefish fishery is applied for area, gear type, and the area-specific depth zones dictated by fishery management. The sablefish fishery is divided into area strata north and south of the management line at 40° 10' N. latitude. Gear type is divided into longline or pot/trap strata. Because logbooks are not mandatory in this fishery, data associated with the depth of fishing for the entire fleet are not available. However, 2005 fishery management restrained fishing to depths greater than 100 fathoms in the area north of 40° 10' N. latitude and to depths greater than 150 fathoms in the area south of 40° 10' N. latitude. These two depth zones are therefore tied to area strata, but no further depth stratification of fishing effort is possible. Due to the limited number of observations of pot vessels in the southern area, data for the pot sector are combined on a coast-wide basis, for the appropriate depth range in each area.

Sablefish landings and discard estimates are calculated by gear type and area and are summarized in Table 5. Estimated discard for sablefish is calculated by multiplying the landed catch (from fish tickets) by the corresponding observed discard ratio. Since only a fraction of discarded sablefish die after being released, a discard mortality estimate is then calculated. The analysis employs a sablefish release mortality rate of 20%, which is also used by the GMT. Estimated total sablefish mortality in this fishery is then calculated by adding the estimated discard mortality to the total landed catch.

Discard ratios for rebuilding and other groundfish species in this fishery are calculated by dividing the stratum discard weight of each species by the retained catch weight of sablefish (Table 5). Estimated discard of rebuilding and other groundfish species associated with coast-wide fixed-gear sablefish landings are summarized in Table 6.

Nearshore Fixed-Gear Groundfish Fishery

Fleet-wide discard estimates in the nearshore (depths < 50 fathoms) fixed-gear fishery are derived from WCGOP observer data, fish ticket landings data, and other parameters developed through GMT modeling efforts. Fish ticket data are obtained from the Pacific Coast Fisheries Information Network (PacFIN) database. The observer data used in this report were collected aboard open-access vessels in waters less than 50 fathoms The WCGOP conducted pilot coverage of the nearshore open access fisheries in California and Oregon from August through October 2002. In 2003, California licensed their nearshore state fishery. In 2004, Oregon licensed their nearshore state fishery, with additional licensing for black and blue rockfish. State regulations have extended the authority of the WCGOP to place observers on vessels participating in these state nearshore fisheries. Observer coverage (non-pilot) began in January 2003 for the California nearshore fishery and in May 2004 for the Oregon nearshore/rockfish fisheries. Coverage of observed trips and catch is lower in these fisheries and therefore greater uncertainty in discard estimation should be noted.

The number of observed nearshore open access fixed-gear trips, sets, and associated landed catch in 2005 are summarized by WCGOP port group and gear type in Table 7. Port groups used by the WCGOP for the nearshore open access fixed-gear fisheries are reported in Appendix B. It should be noted that both gear types can be used during a single trip. Table 8 reports the total catch weight of nearshore species or species groups observed on fixed-gear sets in depths shallower than 50 fathoms, stratified by area and depth. The percentage of total species (or group) catch that was discarded is also shown for each stratum.

Table 9 summarizes the calculation of discard mortality for nearshore target species. Landed weights for each species/species group are expanded to total catch estimates, using the retention rate for all depths less than 50 fathoms. Total catch is then distributed among 3 depth intervals (0-10, 11-20, 21-50 fathoms), based on GMT estimates. Within each depth stratum, estimated discard and mortality estimates are calculated by applying observed discard ratios and GMT-assumed rates of discard mortality in sequence. The GMT's assumptions were based on consideration of nearshore rockfish biological attributes and available tagging and mortality studies. Depth-specific discard survival rates are based on GMT review of available data. Amounts of mortality from discard are then summed with estimated retained weights to produce stratum amounts of total mortality. Amounts of retained, discarded, and total catch are summarized over the entire 0-50 fathom depth range, along with estimates of the percentage of total catch that was discarded.

The calculation of discard amounts for rebuilding species is presented in Table 10. Stratum-specific retained amounts of combined target species are summed from Table 9. For purposes of estimating discard of rebuilding species, the target species group includes all nearshore rockfishes, cabezon, and kelp greenling in both areas, with the addition of California sheephead in the southern area. Target species tonnages are multiplied by discard ratios for each rebuilding species. Depth-specific discard survival rates, based on GMT review of available data, are used to calculate amounts of mortality attributable to discards.

Other Commercial Data

Fixed-gear landings of groundfish are summarized in Table 11. Limited-entry and open-access totals are provided by area, along with combined-fleet area and coast-wide totals. In Table 12, these landed catches are combined with discard mortality estimates from Tables 10 and 6, providing both area-specific and coast-wide summaries of fixed-gear catch.

The trawl fishery for Pacific hake/whiting is comprised of several fleets. The at-sea processing sector is comprised of three fleets: non-tribal catcher-processors and motherships (with catcher boats) and a tribal fishery. Each of these fleets is observed by the At-Sea Hake Observer Program. Observer-based estimates of retained and discarded groundfish catch, obtained from NOAA Fisheries NW Regional Office, are presented in Table 13. There are also tribal and non-tribal fisheries which deliver to shoreside processors. The non-tribal shoreside fishery has been conducted under an Exempted Fishing Permit. This permit allows participants to retard fish degradation, through unloading codends directly into refrigerated tanks, while avoiding penalties for trip-limit overages at the time of landing. This may be described as a "maximum" retention fishery, with a low percentage of at-sea discards. However, a portion of these deliveries may be discarded upon landing, for quality reasons, or may be surrendered without payment if trip limits have been exceeded. Fish falling into either of these categories are summarized as discard for the shoreside fleet in Table 13. PacFIN fish ticket records are used to document landings in this fishery.

Fishing Mortality Summary

A summary of discarded and retained catches by all commercial fleets targeting groundfish is presented in Table 14. Because the tribal hake fishery is observed in the same manner as the commercial at-sea fishery, data from it are included in the "combined hake fisheries" summary. Table 15 summarizes fishing mortality from all sources. Sources not covered by previous tables include: the shoreside tribal hake fishery, recreational fisheries, research, and other commercial fishing where groundfish is not the target. Shoreside tribal amounts were summarized from fish ticket records submitted to PacFIN. The GMT Bycatch Scorecard was used as the source for recreational fishing mortalities for rebuilding species (Table 17). For California and Oregon, amounts of other species were extracted from the Recreational Fisheries Information Network (RecFIN), and include retained catch (A) plus discarded dead (B1). Washington catch estimates were obtained directly from the Washington Department of Fish and Wildlife. The GMT Bycatch Scorecard was also used as the source for research mortality for rebuilding species. Research amounts for other species reflect the catches of the Northwest Fisheries Science Center's bottom trawl and hake surveys.

## RESULTS

In Table 16, total mortality estimates are presented with harvest specification quantities of Optimum Yield (OY) and Allowable Biological Catch (ABC). OYs represent the harvest targets of fishery managers. ABCs represent the thresholds for determining whether overfishing has occurred. For some species or species groups, such as the minor rockfish categories, where OYs and ABCs are specified for northern and southern areas, amounts reflect coast-wide summation of the harvest specifications. Where applicable, adjoining columns indicate the percentage which each fishing mortality represents of the corresponding OY or ABC.

In three instances, estimated 2005 fishing mortality exceeded the specified OY. Canary rockfish mortality was roughly 2 mt (4%) higher than its rebuilding OY. Dover sole and petrale sole mortalities exceeded their OYs by larger amounts (31 mt and 4 mt, respectively), but much smaller percentages (0.4% and 0.1%, respectively). Because the petrale sole OY was equal to its ABC, fishing mortality also exceeded the ABC by 0.1%. In no other instance did fishing mortality exceed an ABC. With the exception of canary rockfish, fishing mortalities for other rebuilding species did not represent more than 70% of their rebuilding OYs, with an average of 43%.

## CONCLUSIONS

WCGOP observer data are used in conjunction with information from additional sources to estimate total levels of fishing mortality for major groundfish species. Estimated 2005 fishing mortalities for the species or species groups analyzed were less than their specified ABCs in all cases except that of petrale sole, where fishing mortality exceeded the 2,762 mt ABC (and OY) by 4 mt (0.1%). When comparing mortality estimates to management targets such as OY or ABC, it should be recognized that considerable uncertainty may be associated with discard estimates and assumptions from fisheries with partial or no at-sea observations.

## ACKNOWLEDGMENTS

The authors gratefully acknowledge contributions from Jonathon Cusick, Nancy Gove, and Janell Majewski in the development of this report.

Table 1. --Number of 2005 limited-entry trawl tows and retained target species poundage in trawl logbook records and observed by the West Coast Groundfish Observer Program, by depth interval, area and season.

| Depth intervals [3] (fathoms) | North of 40°10' N. Lat. Number of tows Winter [1] | North Number of tows Summer [1] | North Retained mts of target species [2] Winter [1] | North Retained mts of target species [2] Summer [1] | Depth intervals [3] (fathoms) | South of 40°10' N. Lat. Number of tows Winter [1] | South Number of tows Summer [1] | South Retained mts of target species [2] Winter [1] | South Retained mts of target species [2] Summer [1] |
|---|---|---|---|---|---|---|---|---|---|
| **Observed fleet** | | | | | | | | | |
| 0-50 | 22 | 367 | 10.6 | 237.0 | 0-50 | 123 | | 36.9 | |
| 51-75 | 117 | 670 | 63.9 | 663.3 | 51-75 | 85 | | 38.7 | |
| 76-100 | 114 | 489 | 103.3 | 588.3 | 76-100 | 34 | | 16.6 | |
| 151-200 | 183 | 0 | 341.9 | 0 | 151-225 | 57 | 34 | 66.5 | 50.1 |
| 201-300 | 387 | 303 | 882.9 | 374.5 | 226-300 | 70 | 47 | 153.3 | 73.2 |
| >300 | 138 | 147 | 216.6 | 197.2 | >300 | 73 | 82 | 128.3 | 134.6 |
| **All trawl logbooks** | | | | | | | | | |
| 0-50 | 137 | 1,900 | 59.6 | 1,059.8 | 0-50 | 1,351 | | 84.2 | |
| 51-75 | 491 | 3,327 | 291.6 | 2,993.6 | 51-75 | 329 | | 180.1 | |
| 76-100 | 246 | 2,184 | 224.1 | 2,348.5 | 76-100 | 260 | | 181.1 | |
| 151-200 | 696 | 0 | 1,150.6 | 0 | 151-225 | 189 | 131 | 200.7 | 148.5 |
| 201-300 | 1,621 | 1,162 | 3,473.4 | 1,743.4 | 226-300 | 203 | 255 | 314.5 | 414.0 |
| >300 | 541 | 543 | 888.9 | 684.0 | >300 | 408 | 333 | 622.6 | 468.4 |
| **Observed percentage** | | | | | | | | | |
| 0-50 | 16% | 19% | 18% | 22% | 0-50 | 9% [4] | | 44% | |
| 51-75 | 24% | 20% | 22% | 22% | 51-75 | 26% | | 22% | |
| 76-100 | 46% | 22% | 46% | 25% | 76-100 | 13% | | 9% | |
| 151-200 | 26% | na | 30% | na | 151-225 | 30% | 26% | 33% | 34% |
| 201-300 | 24% | 26% | 25% | 21% | 226-300 | 34% | 18% | 49% | 18% |
| >300 | 26% | 27% | 24% | 29% | >300 | 18% | 25% | 21% | 29% |

[1] Winter season includes bi-monthly periods 1, 2, 6 (January-April; November-December); the Summer season includes bi-monthly periods 3, 4, 5 (May-October). Seasons are combined for depth strata shallower than 100 fm in the area south of 40° 10' N. Lat..

[2] Target species include retained amounts of all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish in both areas, as well as slope rockfish in the southern area.

[3] Depths between 100 and 150 fm were closed coastwide throughout the year.

[4] Coverage of tows is substatially below that of tonnage, due to over 1,000 logbook tows with less than 100 lb of retained groundfish

Table 2a.--Discard ratios for major west coast bycatch and target species, by area, depth interval, and season, based on trawl tows observed during 2005 by the West Coast Groundfish Observer Program.

| | | North of 40°10' N. Lat. | | | | | | South of 40°10' N. Lat. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth intervals[3] (fathoms) | | | | | | Depth intervals[3] (fathoms) | | | | | |
| Species | Season[1] | 0-50 | 51-75 | 76-100 | 151-200 | 201-300 | >300 | 0-50 | 51-75 | 76-100 | 151-225 | 226-300 | >300 |
| **Rebuilding species** | | | | | | | | | | | | | |
| (Ratio of species pounds discarded to total target species[2] pounds retained) | | | | | | | | | | | | | |
| Lingcod | Winter | 0.00324 | 0.01054 | 0.02905 | 0.00718 | 0 | 0 | 0.02106 | 0.05370 | 0.00373 | 0.00015 | 0 | 0 |
| | Summer | 0.02136 | 0.05610 | 0.06484 | 0 | 0.00004 | 0 | | | | 0.03190 | 0 | 0 |
| Canary rockfish | Winter | 0.00055 | 0.00071 | 0.00378 | 0.00003 | 0 | 0 | 0 | 0 | 0.00022 | 0 | 0 | 0 |
| | Summer | 0.00139 | 0.00283 | 0.00440 | 0 | 0.00002 | 0 | | | | 0.00003 | 0 | 0 |
| Widow rockfish | Winter | 0 | 0.00002 | 0 | 0.00209 | 0 | 0 | 0 | 0.00018 | 0 | 0 | 0 | 0 |
| | Summer | 0.00000 | 0.00000 | 0.00011 | 0 | 0.00002 | 0 | | | | 0.00083 | 0 | 0 |
| Yelloweye rockfish | Winter | 0 | 0.00000 | 0.00003 | 0.00007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0.00013 | 0.00005 | 0.00010 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Bocaccio[4] | Winter | na | na | na | na | na | na | 0.00272 | 0.01675 | 0.07413 | 0.00021 | 0 | 0 |
| | Summer | na | na | na | na | na | na | | | | 0.04613 | 0 | 0 |
| Cowcod[4] | Winter | na | na | na | na | na | na | 0.00000 | 0.00076 | 0.00558 | 0 | 0 | 0 |
| | Summer | na | na | na | na | na | na | | | | 0.00045 | 0 | 0 |
| Pacific ocean perch[5] | Winter | 0 | 0 | 0.00000 | 0.00519 | 0.00006 | 0 | na | na | na | na | na | na |
| | Summer | 0 | 0.00001 | 0.00099 | 0 | 0.00065 | 0 | | | | na | na | na |
| Darkblotched rockfish | Winter | 0 | 0.00006 | 0.00238 | 0.01020 | 0.00041 | 0.00011 | 0 | 0 | 0 | 0.00004 | 0 | 0 |
| | Summer | 0.00001 | 0.00059 | 0.00137 | 0 | 0.00100 | 0 | | | | 0.00508 | 0 | 0 |

[1] Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5. Seasons are combined for depth strata shallower than 100 fm in the area south of 40°10'.

[2] Target species include retained amounts of all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish in both areas, as well as slope rockfish in the southern area.

[3] Depths between 100 and 150 fm were closed coastwide throughout the year.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[5] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Slope Rockfish category.

Table 2b.--Discard ratios for major west coast bycatch and target species, by area, depth interval, and season, based on trawl tows observed during 2005 by the West Coast Groundfish Observer Program.

| | | North of 40°10' N. Lat. | | | | | | South of 40°10' N. Lat. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth intervals[2] (fathoms) | | | | | | Depth intervals[2] (fathoms) | | | | | |
| Species | Season[1] | 0-50 | 51-75 | 76-100 | 151-200 | 201-300 | >300 | 0-50 | 51-75 | 76-100 | 151-225 | 226-300 | >300 |
| **Target species** | | | | | | | | | | | | | |
| (Ratio of each species' discarded-to-retained pounds) | | | | | | | | | | | | | |
| Sablefish | Winter | 14.067 | 0.806 | 3.472 | 0.691 | 0.242 | 0.229 | 0.000 | 0.474 | 0.323 | 0.137 | 0.189 | 0.337 |
| | Summer | 4.171 | 0.680 | 0.178 | | 0.057 | 0.191 | | | | 0.026 | 0.226 | 0.164 |
| Shortspine thornyhead | Winter | 0 | 0 | 0.065 | 0.370 | 0.190 | 0.260 | 0.000 | 0.000 | 0.000 | 0.121 | 0.241 | 0.307 |
| | Summer | 0 | 0.009 | 0.052 | | 0.298 | 0.351 | | | | 0.133 | 0.468 | 0.192 |
| Longspine thornyhead | Winter | 0 | 0 | 0 | 0.012 | 0.390 | 0.166 | 0.000 | 0.000 | 0.000 | 0.077 | 0.183 | 0.069 |
| | Summer | 0 | 0.005 | 1.912 | | 1.147 | 0.154 | | | | 0.006 | 0.263 | 0.077 |
| Dover sole | Winter | 6.327 | 0.112 | 0.077 | 0.192 | 0.026 | 0.085 | 0.000 | 0.000 | 0.000 | 0.739 | 0.055 | 0.023 |
| | Summer | 0.282 | 0.165 | 0.097 | | 0.158 | 0.273 | | | | 0.066 | 0.081 | 0.150 |
| Petrale sole | Winter | 0.307 | 0.030 | 0.080 | 0.002 | 0.023 | 0.014 | 0.006 | 0.010 | 0.014 | 0.003 | 0.000 | 0 |
| | Summer | 0.019 | 0.036 | 0.034 | | 0.011 | 0 | | | | 0.014 | 3.317 | 0 |
| English sole | Winter | 0.131 | 0.228 | 0.141 | 0.358 | 0.101 | 0.004 | 0.722 | 0.860 | 1.323 | 0.039 | 0.128 | 0 |
| | Summer | 0.447 | 0.384 | 0.235 | | 0.066 | 0 | | | | 0.178 | 0 | 0 |
| Arrowtooth flounder | Winter | 0.368 | 1.798 | 0.910 | 0.239 | 0.241 | 0.121 | 0.000 | 0.000 | 0.000 | 59.134 | 1.867 | 28.217 |
| | Summer | 0.795 | 1.005 | 1.004 | | 0.151 | 0.246 | | | | 0.424 | 0 | 0 |
| Other flatfish | Winter | 0.077 | 0.344 | 0.733 | 0.203 | 0.242 | 0.366 | 0.520 | 0.882 | 1.228 | 0.309 | 0.034 | 0.548 |
| | Summer | 0.711 | 1.369 | 1.821 | | 0.085 | 0.323 | | | | 0.209 | 0.405 | 3.931 |
| Blackgill rockfish[3] | Winter | na | na | na | na | na | na | 0.000 | 0.000 | 0.000 | 0.421 | 0.006 | 0.008 |
| | Summer | na | na | na | na | na | na | | | | 0 | 0 | 0 |
| Splitnose rockfish[3] | Winter | na | na | na | na | na | na | 0.000 | 0.000 | 0.000 | 1.025 | 0.339 | 0 |
| | Summer | na | na | na | na | na | na | | | | 2.275 | 6.228 | 1.929 |
| Other slope rockfish | Winter | 0 | 0 | 0 | 0.663 | 0.167 | 0.123 | 0.000 | 0.000 | 0.000 | 0.156 | 0.098 | 0.032 |
| | Summer | 0.004 | 1.245 | 0.535 | | 0.070 | 0.018 | | | | 0.013 | 0.043 | 0.200 |
| Yellowtail rockfish[4] | Winter | 0 | 0.243 | 2.247 | 11.083 | 0.682 | 0 | na | na | na | na | na | na |
| | Summer | 0.274 | 1.177 | 0.989 | | 7.080 | 0 | | | | na | na | na |
| Chilipepper rockfish[5] | Winter | na | na | na | na | na | na | 0.125 | 9.414 | 26.539 | 0.327 | 0 | 0 |
| | Summer | na | na | na | na | na | na | | | | 0.021 | 0 | 0 |
| Pacific cod | Winter | 0.002 | 0.000 | 0.003 | 0.027 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0 | 0 | 0 |
| | Summer | 0.007 | 0.009 | 0.005 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Unspecified skate | Winter | 0.122 | 0.193 | 0.055 | 0.043 | 0.128 | 0.716 | 0.705 | 0.161 | 0.332 | 0.051 | 0.034 | 12.151 |
| | Summer | 0.286 | 0.229 | 0.070 | 0 | 0.025 | 1.277 | | | | 0.025 | 0 | 0 |

[1] Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5. Seasons are combined for depth strata shallower than 100 fm in the area south of 40°10'. [2] Depths between 100 and 150 fm were closed coastwide throughout the year.

[3] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[4] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[5] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

Table 2c.--Discard ratios for major west coast bycatch and target species, by area, depth interval, and season, based on trawl tows observed during 2005 by the West Coast Groundfish Observer Program.

| | | North of 40°10' N. Lat. | | | | | | South of 40°10' N. Lat. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth intervals[3] (fathoms) | | | | | | Depth intervals[3] (fathoms) | | | | | |
| Species | Season[1] | 0-50 | 51-75 | 76-100 | 151-200 | 201-300 | >300 | 0-50 | 51-75 | 76-100 | 151-225 | 226-300 | >300 |
| **Other species** | | | | | | | | | | | | | |
| (Ratio of species pounds discarded to total target species[2] pounds retained) | | | | | | | | | | | | | |
| Shortbelly rockfish | Winter | 0 | 0 | 0 | 0 | 0 | 0 | 0.00000 | 0.00137 | 0.00191 | 0.00074 | 0 | 0 |
| | Summer | 0 | 0 | 0.00000 | | 0 | 0 | | | | 0.00139 | 0 | 0 |
| Chilipepper[4] rockfish | Winter | na | na | na | na | na | na | 0.00026 | 0.16524 | 0.40124 | 0.00109 | 0 | 0 |
| | Summer | na | na | na | na | na | na | | | | 0.00210 | 0 | 0 |
| Other shelf rockfish | Winter | 0 | 0.00180 | 0.03252 | 0.00106 | 0.00015 | 0.00003 | 0.00119 | 0.01172 | 0.01416 | 0.00165 | 0.00000 | 0 |
| | Summer | 0.00036 | 0.00732 | 0.01738 | | 0.00093 | 0 | | | | 0.00194 | 0 | 0 |
| Black rockfish | Winter | 0 | 0 | 0 | 0 | 0 | 0 | 0.00000 | 0.00000 | 0.00000 | 0 | 0 | 0 |
| | Summer | 0.00056 | 0 | 0 | | 0 | 0 | | | | 0 | 0 | 0 |
| Other near-shore rockfish | Winter | 0 | 0 | 0 | 0 | 0 | 0 | 0.00000 | 0.00000 | 0.00105 | 0 | 0 | 0 |
| | Summer | 0.00004 | 0.00001 | 0 | | 0 | 0 | | | | 0 | 0 | 0 |
| Pacific hake | Winter | 0.00006 | 0.00073 | 0.00245 | 0.10975 | 0.04118 | 0.02014 | 0.23229 | 0.16169 | 0.18522 | 0.19601 | 0.08916 | 0.00697 |
| | Summer | 0.07532 | 0.03403 | 0.00466 | | 0.04872 | 0.01172 | | | | 0.06644 | 0.03827 | 0.00322 |
| Spiny dogfish | Winter | 0.00682 | 0.03007 | 0.18280 | 0.05617 | 0.00732 | 0.00153 | 0.02184 | 0.02768 | 0.01460 | 0.01495 | 0.00140 | 0.00017 |
| | Summer | 0.09742 | 0.12030 | 0.12603 | | 0.01357 | 0.00009 | | | | 0.58108 | 0.01618 | 0 |
| Big skate | Winter | 0.00155 | 0.01455 | 0.01041 | 0.00006 | 0.00094 | 0.00009 | 0.01405 | 0.01028 | 0.00939 | 0 | 0 | 0.00009 |
| | Summer | 0.03955 | 0.01421 | 0.00203 | | 0.00188 | 0.00062 | | | | 0 | 0 | 0 |
| Longnose skate | Winter | 0.00200 | 0.03501 | 0.04004 | 0.01752 | 0.01455 | 0.00366 | 0.02975 | 0.18286 | 0.22085 | 0.18437 | 0.04004 | 0.01611 |
| | Summer | 0.06336 | 0.04241 | 0.03500 | | 0.02391 | 0.00373 | | | | 0.03500 | 0.08426 | 0.01360 |
| Other groundfish | Winter | 0.03928 | 0.06875 | 0.15695 | 0.04657 | 0.04744 | 0.09879 | 0.17082 | 0.25428 | 0.28769 | 0.13943 | 0.03923 | 0.06144 |
| | Summer | 0.08283 | 0.07337 | 0.08951 | | 0.11187 | 0.15681 | | | | 0.05743 | 0.03608 | 0.07875 |
| Dungeness crab | Winter | 0.05781 | 0.09436 | 0.01357 | 0.00037 | 0.00001 | 0.00005 | 0.08277 | 0.03939 | 0.02259 | 0.00033 | 0 | 0 |
| | Summer | 0.07236 | 0.02548 | 0.01591 | | 0.00030 | 0.00001 | | | | 0.00021 | 0 | 0 |
| Tanner crab | Winter | 0 | 0 | 0 | 0.00019 | 0.00557 | 0.04261 | 0.00000 | 0.00013 | 0.00000 | 0.00618 | 0.01688 | 0.08577 |
| | Summer | 0 | 0.00002 | 0.00000 | | 0.01358 | 0.07649 | | | | 0.00007 | 0.00176 | 0.07518 |

[1] Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5. Seasons are combined for depth strata shallower than 100 fm in the area south of 40°10'.

[2] Target species include retained amounts of all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish in both areas, as well as slope rockfish in the southern area.

[3] Depths between 100 and 150 fm were closed coastwide throughout the year.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

Table 3.--Bycatch ratios for west coast rebuilding species, by area, depth interval, and season, based on trawl tows observed during 2005 by the West Coast Groundfish Observer Program.

| | | North of 40°10' N. Lat. | | | | | | South of 40°10' N. Lat. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth intervals[3] (fathoms) | | | | | | Depth intervals[3] (fathoms) | | | | | |
| Species | Season[1] | 0-50 | 51-75 | 76-100 | 151-200 | 201-300 | >300 | 0-50 | 51-75 | 76-100 | 151-225 | 226-300 | >300 |
| **Rebuilding species** | | | | | | | | | | | | | |
| (Ratio of species pounds retained+discarded to total target species[2] pounds retained) | | | | | | | | | | | | | |
| Lingcod | Winter | 0.00661 | 0.02248 | 0.03384 | 0.01058 | 0 | 0 | 0.02222 | 0.06539 | 0.00894 | 0.00671 | 0 | 0 |
| | Summer | 0.02741 | 0.06525 | 0.06968 | | 0.00015 | 0 | | | | 0.04061 | 0 | 0 |
| Canary rockfish | Winter | 0.00055 | 0.00166 | 0.00459 | 0.00003 | 0 | 0 | 0.00016 | 0.00119 | 0.00022 | 0 | 0 | 0 |
| | Summer | 0.00237 | 0.00361 | 0.00556 | | 0.00002 | 0 | | | | 0.00006 | 0 | 0 |
| Widow rockfish | Winter | 0 | 0.00004 | 0.00001 | 0.00218 | 0 | 0 | 0.00000 | 0.00018 | 0 | 0 | 0 | 0 |
| | Summer | 0.00001 | 0.00000 | 0.00012 | | 0.00004 | 0 | | | | 0.00083 | 0 | 0 |
| Yelloweye rockfish | Winter | 0 | 0.00000 | 0.00003 | 0.00007 | 0 | 0 | 0.00000 | 0.00000 | 0 | 0 | 0 | 0 |
| | Summer | 0.00014 | 0.00012 | 0.00012 | | 0 | 0 | | | | 0 | 0 | 0 |
| Bocaccio[4] | Winter | na | na | na | na | na | na | 0.00272 | 0.01675 | 0.07413 | 0.00021 | 0 | 0 |
| | Summer | na | na | na | na | na | na | | | | 0.04626 | 0 | 0 |
| Cowcod[4] | Winter | na | na | na | na | na | na | 0.00000 | 0.00076 | 0.00558 | 0 | 0 | 0 |
| | Summer | na | na | na | na | na | na | | | | 0.00045 | 0 | 0 |
| Pacific ocean perch[5] | Winter | 0 | 0.00000 | 0.00020 | 0.01511 | 0.00425 | 0.00106 | na | na | na | na | na | na |
| | Summer | 0.00001 | 0.00026 | 0.00398 | | 0.01303 | 0.00091 | | | | na | na | na |
| Darkblotched rockfish | Winter | 0 | 0.00006 | 0.00343 | 0.02303 | 0.00454 | 0.00911 | 0 | 0.00001 | 0 | 0.00233 | 0.00477 | 0.000891 |
| | Summer | 0.00071 | 0.00088 | 0.00478 | | 0.01625 | 0.00281 | | | | 0.02305 | 0.003 | 0.008071 |

[1] Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5. Seasons are combined for depth strata shallower than 100 fm in the area south of 40°10'.

[2] Target species include retained amounts of all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish in both areas, as well as slope rockfish in the southern area.

[3] Depths between 100 and 150 fm were closed coastwide throughout the year.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[5] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Slope Rockfish category.

Table 4.--Landings, estimated discard mortality, and total catch (mt) of major west coast groundfish species from non-whiting[1], commercial groundfish trawls targeting groundfish during 2005.

| | Landed catch (mt) | | | Estimated discard (mt) | | | Estimated total catch (mt) | | |
|---|---|---|---|---|---|---|---|---|---|
| | North of 40°10' | South of 40°10' | Total | North of 40°10' | South of 40°10' | Total | North of 40°10' | South of 40°10' | Total |
| Sablefish | | | | 426 | 98 | 524 | | | |
| mortality [2] | 1,834 | 456 | 2,291 | 213 | 49 | 262 | 2,047 | 505 | 2,553 |
| Shortspine thornyhead | 348 | 146 | 494 | 93 | 40 | 133 | 441 | 186 | 627 |
| Longspine thornyhead | 280 | 351 | 631 | 63 | 29 | 92 | 343 | 380 | 723 |
| Dover sole | 5,493 | 1,177 | 6,671 | 545 | 111 | 656 | 6,039 | 1,288 | 7,327 |
| Petrale sole | 2,303 | 372 | 2,675 | 51 | 4 | 55 | 2,354 | 376 | 2,730 |
| English sole | 780 | 67 | 847 | 249 | 53 | 302 | 1,029 | 120 | 1,149 |
| Arrowtooth flounder | 2,050 | 2 | 2,052 | 1,394 | 4 | 1,397 | 3,443 | 6 | 3,450 |
| Other Flatfish | 854 | 228 | 1,081 | 589 | 142 | 731 | 1,443 | 370 | 1,813 |
| Blackgill rockfish [3] | na | 51 | 51 | na | 2 | 2 | na | 53 | 53 |
| Splitnose rockfish [3] | na | 86 | 86 | na | 144 | 144 | na | 230 | 230 |
| Other slope rockfish | 85 | 59 | 144 | 22 | 5 | 27 | 107 | 64 | 171 |
| Yellowtail rockfish [4] | 27 | na | 27 | 29 | na | 29 | 56 | na | 56 |
| Chilipepper rockfish [5] | na | 24 | 24 | na | 52 | 52 | na | 76 | 76 |
| Other shelf rockfish | 11 | 5 | 16 | 75 | 6 | 81 | 86 | 11 | 97 |
| Black rockfish | 0 | | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| Other nearshore rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Pacific hake/whiting | 4 | 0 | 4 | 613 | 210 | 822 | 617 | 210 | 826 |
| Pacific cod | 722 | 0 | 722 | 4 | 0 | 4 | 726 | 0 | 726 |
| Spiny dogfish | 126 | 0 | 126 | 943 | 125 | 1,067 | 1,069 | 125 | 1,194 |
| Unspecified skate | 840 | 18 | 858 | 134 | 4 | 138 | 975 | 21 | 996 |
| Big skate | 0 | 0 | 0 | 105 | 6 | 111 | 105 | 6 | 111 |
| Longnose skate | 0 | 0 | 0 | 426 | 211 | 637 | 427 | 211 | 637 |
| Big+longnose+Unsp. skate | 840 | 18 | 858 | 666 | 220 | 886 | 1,506 | 238 | 1,744 |
| Shortbelly rockfish | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| Other groundfish | 72 | 36 | 108 | 1,231 | 294 | 1,524 | 1,303 | 329 | 1,632 |
| Dungeness crab | | | | 233 | 21 | 254 | 233 | 21 | 254 |
| Tanner crab | | | | 141 | 111 | 252 | 141 | 111 | 252 |
| Lingcod | | | | 364 | 20 | 383 | | | |
| mortality [2] | 63 | 10 | 73 | 182 | 10 | 192 | 244 | 20 | 264 |
| Canary rockfish | 3.7 | 0.7 | 4.4 | 21.5 | 0.1 | 21.6 | 25.2 | 0.7 | 26.0 |
| Widow rockfish | 0.2 | 2.7 | 3.0 | 3.2 | 0.2 | 3.3 | 3.4 | 2.9 | 6.3 |
| Yelloweye rockfish | 0.2 | 0.0 | 0.2 | 0.6 | 0.0 | 0.6 | 0.8 | 0.0 | 0.8 |
| Bocaccio [5] | na | 1.6 | 1.6 | na | 27.7 | 27.7 | na | 29.3 | 29.3 |
| Cowcod [5] | na | 0.0 | 0.0 | na | 1.4 | 1.4 | na | 1.4 | 1.4 |
| Pacific ocean perch [6] | 56.9 | na | 56.9 | 10.8 | na | 10.8 | 67.7 | na | 67.7 |
| Darkblotched rockfish | 66.9 | 9.8 | 76.7 | 22.8 | 0.9 | 23.7 | 89.7 | 10.7 | 100.4 |

[1] includes only landings with less than 2 mt of Pacific hake/whiting.

[2] As assumed by the PFMC's Groundfish Management Team, the rate of mortality for discarded sablefish and lingcod in the trawl fishery is assumed to be 50%.

[3] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[4] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[5] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[6] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Slope Rockfish category.

Table 5.--Estimated discard and total catch of sablefish and discard ratios for other species associated with all fixed-gear sablefish landings north of 36° N. Lat. during 2005.

| | **36° to 40°10' N. Lat.** (seaward boundary of ) the RCA at 150 fm) | | **North of 40°10' N. Lat.** (seaward boundary of ) the RCA at 100 fm) | | North of 36° N. Lat. |
|---|---|---|---|---|---|
| | Longline | Pot | Longline | Pot | Total |
| **Sablefish** | | | | | |
| Observed sets used for discard ratios in each depth range [1] | | | | | |
| number of sets | 35 | 457 | 618 | 490 | |
| observed sablefish catch (mt) | 30 | 286 | 516 | 326 | |
| Total landings (mt) | **311** | **262** | **1,774** | **723** | **3,069** |
| Area percent, by gear | 54% | 46% | 71% | 29% | |
| Coast-wide percent, by gear/area | 10% | 9% | 58% | 24% | |
| Observed sablefish discard ratio [4] | 9.7% | 17.4% | 12.8% | 16.3% | 13.7% |
| Total estimated discard | 30 | 46 | 228 | 118 | 421 |
| Estimated discard mortality [2] (mt) | 6 | 9 | 46 | 24 | 84 |
| Estimated total mortality | **317** | **271** | **1,819** | **746** | **3,153** |
| **Rebuilding species discard ratios [3]** | | | | | |
| Lingcod | 0.000337 | 0.000295 | 0.005211 | 0.001545 | |
| Canary rockfish | 0 | 0.000009 | 0 | 0.000008 | |
| Widow rockfish | 0 | 0 | 0.000458 | 0 | |
| Yelloweye rockfish | 0 | 0 | 0.000448 | 0.000011 | |
| Bocaccio rockfish | 0 | 0 | 0 | 0 | |
| Cowcod rockfish | 0 | 0 | 0 | 0 | |
| Pacific ocean perch | 0 | 0 | 0.000158 | 0 | |
| Darkblotched rockfish | 0.000085 | 0.000175 | 0.000209 | 0.000152 | |
| **Other species discard ratios [3]** | | | | | |
| Pacific whiting/hake | 0 | 0.000096 | 0.000291 | 0.000084 | |
| Shortspine thornyhead | 0.000283 | 0.000081 | 0.000546 | 0.000070 | |
| Longspine thornyhead | 0.000127 | 0.000014 | 0 | 0.000012 | |
| Dover sole | 0.003206 | 0.000615 | 0.001195 | 0.000580 | |
| Arrowtooth flounder | 0 | 0.002723 | 0.045180 | 0.002455 | |
| Petrale sole | 0 | 0 | 0.000024 | 0 | |
| English sole | 0 | 0 | 0 | 0 | |
| Other flatfish | 0 | 0.000009 | 0.000007 | 0.000008 | |
| Yellowtail rockfish | 0 | 0 | 0.000230 | 0 | |
| Chilipepper rockfish | 0 | 0 | 0 | 0 | |
| Other shelf rockfish | 0.000035 | 0.000086 | 0.007931 | 0.000106 | |
| Blackgill rockfish | 0.001335 | 0 | 0 | 0 | |
| Splitnose rockfish | 0 | 0 | 0 | 0 | |
| Other slope rockfish | 0.000139 | 0.000198 | 0.009848 | 0.000172 | |
| Pacific cod | 0 | 0.000011 | 0.001275 | 0.000010 | |
| Spiny dogfish | 0.067127 | 0.000245 | 0.072411 | 0.000352 | |
| Longnose skate | 0.035468 | 0 | 0.024401 | 0 | |
| Big skate | 0.000209 | 0 | 0.025584 | 0 | |
| Unspecified skate | 0.000758 | 0 | 0.010592 | 0 | |
| Other groundfish | 0.003264 | 0.001821 | 0.003490 | 0.001586 | |
| Dungeness crab | 0.000000 | 0.001009 | 0.000007 | 0.001305 | |
| Tanner crab | 0.000212 | 0.009572 | 0.000050 | 0.008335 | |

[1] Due to the limited number of pot-gear observations south of Cape Mendocino, data for the pot sector have been pooled on a coast-wide basis for the appropriate depth strata. The total number of pot sets observed coastwide was 490, of which 33 were between 100 and 150 fm.

[2] As assumed by the PFMC's Groundfish Management Team, the rate of mortality for discarded sablefish in the fixed-gear fishery is assumed to be 20%.

[3] Discard ratios are calculated by dividing the total discarded weight of each species by the retained catch weight of sablefish, and are dervied from data collected by the West Coast Groundfish Observer Program during 2005 from trips targeting sablefish.

[4] Sablefish discard ratio = 100 * discard lb / retained lb.

Table 6.--Estimated discard of groundfish species associated with coast-wide, fixed-gear sablefish landings during 2005.

| | **36° to 40°10' N. Lat.** (seaward boundary of ) the RCA at 150 fm) | | | **North of 40°10' N. Lat.** (seaward boundary of ) the RCA at 100 fm) | | | North of 36° N. Lat. Total |
|---|---|---|---|---|---|---|---|
| | Longline | Pot | All gears | Longline | Pot | All gears | |
| **Estimated discard of rebuilding species (mt)** | | | | | | | |
| Lingcod | 0.1 | 0.1 | **0.2** | 9.2 | 1.1 | **10.4** | **10.5** |
| Canary rockfish | 0.0 | 0.0 | **0.0** | 0.0 | 0.0 | **0.0** | **0.0** |
| Widow rockfish | 0.0 | 0.0 | **0.0** | 0.8 | 0.0 | **0.8** | **0.8** |
| Yelloweye rockfish | 0.0 | 0.0 | **0.0** | 0.8 | 0.0 | **0.8** | **0.8** |
| Bocaccio rockfish [1] | 0.0 | 0.0 | **0.0** | na | na | na | **0.0** |
| Cowcod rockfish [1] | 0.0 | 0.0 | **0.0** | na | na | na | **0.0** |
| Pacific ocean perch [2] | na | na | na | 0.3 | 0.0 | **0.3** | **0.3** |
| Darkblotched rockfish | 0.0 | 0.0 | **0.1** | 0.4 | 0.1 | **0.5** | **0.6** |
| **Estimated discard of other species (mt)** | | | | | | | |
| Pacific whiting/hake | 0.0 | 0.0 | **0.0** | 0.5 | 0.1 | **0.6** | **0.6** |
| Shortspine thornyhead | 0.1 | 0.0 | **0.1** | 1.0 | 0.1 | **1.0** | **1.1** |
| Longspine thornyhead | 0.0 | 0.0 | **0.0** | 0.0 | 0.0 | **0.0** | **0.1** |
| Dover sole | 1.0 | 0.2 | **1.2** | 2.1 | 0.4 | **2.5** | **3.7** |
| Arrowtooth flounder | 0.0 | 0.7 | **0.7** | 80.1 | 1.8 | **81.9** | **82.6** |
| Petrale sole | 0.0 | 0.0 | **0.0** | 0.0 | 0.0 | **0.0** | **0.0** |
| English sole | 0.0 | 0.0 | **0.0** | 0.0 | 0.0 | **0.0** | **0.0** |
| Other flatfish | 0.0 | 0.0 | **0.0** | 0.0 | 0.0 | **0.0** | **0.0** |
| Yellowtail rockfish [3] | na | na | na | 0.4 | 0.0 | **0.4** | **0.4** |
| Chilipepper rockfish [1] | 0.0 | 0.0 | **0.0** | 0.0 | 0.0 | **0.0** | **0.0** |
| Other shelf rockfish | 0.0 | 0.0 | **0.0** | 14.1 | 0.1 | **14.1** | **14.2** |
| Blackgill rockfish [4] | 0.4 | 0.0 | **0.4** | na | na | na | **0.4** |
| Splitnose rockfish [4] | 0.0 | 0.0 | **0.0** | na | na | na | **0.0** |
| Other slope rockfish | 0.0 | 0.1 | **0.1** | 17.5 | 0.1 | **17.6** | **17.7** |
| Pacific cod | 0.0 | 0.0 | **0.0** | 2.3 | 0.0 | **2.3** | **2.3** |
| Spiny dogfish | 20.9 | 0.1 | **20.9** | 128.4 | 0.3 | **128.7** | **149.6** |
| Longnose skate | 11.0 | 0.0 | **11.0** | 43.3 | 0.0 | **43.3** | **54.3** |
| Big skate | 0.1 | 0.0 | **0.1** | 45.4 | 0.0 | **45.4** | **45.4** |
| Unspecified skate | 0.2 | 0.0 | **0.2** | 18.8 | 0.0 | **18.8** | **19.0** |
| Other groundfish | 1.0 | 0.5 | **1.5** | 6.2 | 1.1 | **7.3** | **8.8** |
| Dungeness crab | 0.0 | 0.3 | **0.3** | 0.0 | 0.9 | **1.0** | **1.2** |
| Tanner crab | 0.1 | 2.5 | **2.6** | 0.1 | 6.0 | **6.1** | **8.7** |

[1] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.
[2] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Slope Rockfish category.
[3] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.
[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

Table 7.--Number of open-access, fixed-gear trips and sets, with associated landed tonnage, observed in depths less than 50 fm during 2005 by the West Coast Groundfish Observer Program (WCGOP), by port group and gear.

| | Hook and Line | | | Pot | | |
|---|---|---|---|---|---|---|
| WCGOP Port Group | Number of trips | Number of sets | Retained weight (mt) | Number of trips | Number of sets | Retained weight (mt) |
| Astoria | 28 | 32 | 1.9 | | | |
| S Oregon | 100 | 125 | 9.8 | | | |
| Crescent City | 61 | 78 | 10.1 | | | |
| Fort Bragg | 14 | 20 | 0.6 | 1 | 1 | * |
| Monterey | 41 | 47 | 2.1 | 2 | 2 | * |
| Morro Bay | 23 | 33 | 0.7 | | | |
| Santa Barbara | | | | | | |
| Los Angeles | 15 | 16 | 1.0 | 20 | 26 | * |
| ALL PORTS | 282 | 351 | 26.1 | 23 | 29 | 1.7 |

Note: Since both gear groups were used on some trips, the total number of observed trips is less than the sum of the numbers shown for each gear group in this table.

* Data not reported because of confidentiality issues.

Table 8.--Catch weights and discard percentages for target and rebuilding species, by area and depth, from nearshore, open-access, fixed-gear sets observed in depths less than 50 fm during 2005 by the West Coast Groundfish Observer Program.

| Area / Species | 0 - 10 fm | | 11 - 20 fm | | 21 - 50 fm | | Less than 50 fm | |
|---|---|---|---|---|---|---|---|---|
| | Total lbs | Discard % [1] | Total lbs | Discard % [1] | Total lbs | Discard % [1] | Total lbs | Discard % [1] |
| **South of 40°10' N. Lat.** | | | | | | | | |
| Target species | | | | | | | | |
| Shallow nearshore species [2] | 1,102 | 18% | 336 | 32% | 56 | 100% | 1,494 | 24% |
| Deeper nearshore species [3] | 702 | 16% | 1,211 | 20% | 141 | 100% | 2,054 | 24% |
| Black rockfish | 231 | 8% | 315 | 5% | | | 546 | 7% |
| Cabezon | 1,230 | 49% | 101 | 100% | 6 | 100% | 1,337 | 54% |
| Kelp Greenling | 132 | 53% | 25 | 100% | | | 157 | 61% |
| California Sheephead | 1,929 | 28% | 4,103 | 39% | | | 6,032 | 36% |
| Rebuilding species | | | | | | | | |
| Bocaccio Rockfish | | | | | 36 | 0% | 36 | 0% |
| Canary Rockfish | 12 | 100% | 28 | 100% | 56 | 100% | 96 | 100% |
| Widow Rockfish | | | 2 | 0% | | | 2 | 0% |
| Yelloweye Rockfish | | | 10 | 100% | 12 | 100% | 22 | 100% |
| Lingcod | 1,082 | 34% | 1,249 | 48% | 33 | 84% | 2,364 | 42% |
| **North of 40°10' N. Lat.** | | | | | | | | |
| Target species | | | | | | | | |
| Black Rockfish | 15,946 | 2% | 11,888 | 4% | 464 | 5% | 28,298 | 3% |
| Blue Rockfish | 2,624 | 14% | 3,704 | 18% | 140 | 4% | 6,468 | 16% |
| Other minor nearshore rockfish | 275 | 4% | 1,094 | 5% | 539 | 0% | 1,908 | 3% |
| Cabezon | 1,087 | 11% | 3,781 | 5% | 166 | 0% | 5,034 | 6% |
| Kelp Greenling | 776 | 35% | 1,906 | 22% | 12 | 37% | 2,694 | 26% |
| Rebuilding species | | | | | | | | |
| Canary Rockfish | 64 | 100% | 210 | 100% | 104 | 100% | 378 | 100% |
| Widow Rockfish | | | 45 | 21% | 6 | 0% | 51 | 18% |
| Yelloweye Rockfish | | | 73 | 100% | 143 | 100% | 216 | 100% |
| Lingcod | 2,964 | 53% | 5,880 | 45% | 785 | 8% | 9,629 | 44% |

[1] The percentage discarded is calculated as the discard poundage divided by the total catch weight for each species or group.

[2] Includes black and yellow rockfish, kelp rockfish, grass rockfish, gopher rockfish, china rockfish, California scorpionfish.

[3] Includes blue rockfish, brown rockfish, calico rockfish, copper rockfish, olive rockfish, quillback rockfish, treefish.

Table 9.--Estimated fixed-gear discard mortality for nearshore target species, derived using discard observations from the West Coast Groundfish Observer Program, 2005 landed catches, and the Groundfish Management Team nearshore model.

| Area / Species | 0 - 50 fm landed mt | 0 - 50 fm retention rate | 0 - 50 fm catch mt | 0 - 10 fm stratum % of 0-50 fm catch | 0 - 10 fm est. stratum catch mt | 0 - 10 fm estimated stratum discard % | 0 - 10 fm estimated stratum discard mt | 0 - 10 fm mortality rate & weight of discards % | 0 - 10 fm mortality rate & weight of discards mt | 0 - 10 fm retained + discard mortality mt | 11 - 20 fm stratum % of 0-50 fm catch | 11 - 20 fm est. stratum catch mt | 11 - 20 fm estimated stratum discard % | 11 - 20 fm estimated stratum discard mt | 11 - 20 fm mortality rate & weight of discards % | 11 - 20 fm mortality rate & weight of discards mt | 11 - 20 fm retained + discard mortality mt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South of 40°10' N. Lat. | | | | | | | | | | | | | | | | | |
| Shallow nearshore species | **34** | 76% | 45 | 81% | 36 | 18% | 7 | 15% | 1.0 | 31 | 18% | 8 | 32% | 3 | 45% | 1.1 | 7 |
| Black Rockfish | **4** | 93% | 4 | 47% | 2 | 8% | 0 | 10% | 0.0 | 2 | 50% | 2 | 5% | 0 | 40% | 0.0 | 2 |
| Deeper nearshore species | **44** | 76% | 58 | 43% | 25 | 16% | 4 | 10% | 0.4 | 21 | 53% | 31 | 20% | 6 | 40% | 2.5 | 27 |
| Cabezon | **28** | 46% | 59 | 97% | 58 | 49% | 28 | 7% | 2.0 | 31 | 2% | 1 | 100% | 1 | 7% | 0.1 | 0 |
| Kelp Greenling | **1** | 39% | 4 | 98% | 4 | 53% | 2 | 7% | 0.1 | 2 | 1% | 0 | 100% | 0 | 7% | 0.0 | 0 |
| California Sheephead | **39** | 65% | 61 | 81% | 50 | 29% | 14 | 15% | 2.1 | 38 | 18% | 11 | 39% | 4 | 45% | 1.9 | 8 |
| All nearshore groundfish | **151** | 65% | 231 | 75% | 175 | 24% | 41 | 14% | 5.7 | 139 | 23% | 53 | 19% | 10 | 55% | 5.6 | 49 |
| North of 40°10' N. Lat. | | | | | | | | | | | | | | | | | |
| Black Rockfish | **167** | 97% | 172 | 47% | 81 | 2% | 2 | 10% | 0.2 | 80 | 50% | 87 | 4% | 3 | 40% | 1.4 | 84 |
| Blue Rockfish | **18** | 84% | 22 | 26% | 6 | 14% | 1 | 10% | 0.1 | 5 | 69% | 15 | 18% | 3 | 40% | 1.1 | 13 |
| Other minor nearshore rockfish | **17** | 100% | 17 | 55% | 9 | 4% | 0 | 20% | 0.1 | 9 | 35% | 6 | 5% | 0 | 50% | 0.1 | 6 |
| Cabezon | **32** | 94% | 34 | 36% | 12 | 11% | 1 | 7% | 0.1 | 11 | 60% | 21 | 5% | 1 | 7% | 0.1 | 20 |
| Kelp Greenling | **21** | 74% | 29 | 37% | 11 | 35% | 4 | 7% | 0.3 | 7 | 59% | 17 | 22% | 4 | 7% | 0.3 | 14 |
| All nearshore groundfish | **255.11** | 94% | 271 | 44% | 119 | 7% | 8 | 9% | 0.7 | 112 | 53% | 145 | 8% | 11 | 26% | 2.9 | 137 |

| Area / Species | 21 - 50 fm stratum % of 0-50 fm catch | 21 - 50 fm est. stratum catch mt | 21 - 50 fm estimated stratum discard % | 21 - 50 fm estimated stratum discard mt | 21 - 50 fm mortality rate & weight of discards % | 21 - 50 fm mortality rate & weight of discards mt | 21 - 50 fm retained + discard mortality mt | 0 - 50 fm mortality from: retained catch mt | 0 - 50 fm mortality from: discarded catch mt | 0 - 50 fm total mt | 0 - 50 fm discard as a percentage of total mortality |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South of 40°10' N. Lat. | | | | | | | | | | | |
| Shallow nearshore species | 1% | 0 | 100% | 0.5 | 100% | 0.5 | 0 | 34 | 2.6 | 36.6 | 7.0% |
| Black Rockfish | 2% | 0 | 0% | 0.0 | 100% | 0.0 | 0 | 4 | 0.1 | 3.9 | 1.5% |
| Deeper nearshore species | 4% | 2 | 100% | 2.3 | 100% | 2.3 | 2 | 44 | 5.2 | 49.6 | 10.5% |
| Cabezon | 0% | 0 | 100% | 0.2 | 7% | 0.0 | 0 | 28 | 2.1 | 29.6 | 7.1% |
| Kelp Greenling | 1% | 0 | 0% | 0.0 | 7% | 0.0 | 0 | 1 | 0.1 | 1.6 | 8.7% |
| California Sheephead | 1% | 1 | 0% | 0.0 | 100% | 0.0 | 1 | 39 | 4.0 | 43.4 | 9.2% |
| All nearshore groundfish | 1% | 3 | 96% | 3.0 | 95% | 2.8 | 3 | 151 | 14.1 | 164.8 | 8.6% |
| North of 40°10' N. Lat. | | | | | | | | | | | |
| Black Rockfish | 2% | 4 | 5% | 0.2 | 100% | 0.2 | 4 | 167 | 1.7 | 168.4 | 1.0% |
| Blue Rockfish | 5% | 1 | 4% | 0.0 | 100% | 0.0 | 1 | 18 | 1.2 | 19.5 | 6.2% |
| Other minor nearshore rockfish | 10% | 2 | 0% | 0.0 | 100% | 0.0 | 2 | 17 | 0.2 | 17.0 | 1.3% |
| Cabezon | 4% | 2 | 0% | 0.0 | 7% | 0.0 | 2 | 32 | 0.2 | 32.4 | 0.5% |
| Kelp Greenling | 3% | 1 | 37% | 0.3 | 7% | 0.0 | 1 | 21 | 0.5 | 21.8 | 2.5% |
| All nearshore groundfish | 3% | 9 | 6% | 0.6 | 46% | 0.3 | 9 | 255 | 3.9 | 259.0 | 1.5% |

Note: The model uses discard and retention percentages reported by the West Coast Groundfish Observer Program from data collected during 2005.

Table 10.--Estimated mortality of rebuilding species from fixed-gear fishing in depths shallower than 50 fm, based on Groundfish Management Team nearshore bycatch model.

| | Depth intervals (fm) | | | Catch and discard weights (mt) Depth intervals (fm) | | | |
|---|---|---|---|---|---|---|---|
| | 0 - 10 | 11-20 | 21 - 50 | 0 - 10 | 11-20 | 21 - 50 | 0 - 50 |
| **South of 40°10' N. Lat.** | | | | | | | |
| Number of observed sets | 87 | 49 | 9 | | | | |
| Landed nearshore mt | 133 | 43 | 0.1 | | | | |
| Rebuilding species | *Bycatch rates* [1] | | | | | | |
| Canary | 0.38% | 0.86% | 0.86% | 0.50 | 0.37 | 0.00 | 0.87 |
| disc. mort. (%:mt) | 10% | 55% | 100% | 0.05 | 0.20 | 0.00 | **0.25** |
| Bocaccio | | | | | | | |
| catch (%:mt) | 0.00% | 0.17% | 0.17% | 0.00 | 0.07 | 0.00 | 0.07 |
| landed (%:mt) | 0% | 0% | 100% | 0.00 | 0.00 | 0.00 | 0.00 |
| discard (%:mt) | 100% | 100% | 0% | 0.00 | 0.07 | 0.00 | 0.07 |
| disc. mort. (%:mt) | 10% | 55% | 100% | 0.00 | 0.04 | 0.00 | 0.04 |
| total mortality | | | | 0.00 | 0.04 | 0.00 | **0.04** |
| Widow | | | | | | | |
| catch (%:mt) | 0.00% | 0.04% | 0.04% | 0.00 | 0.02 | 0.00 | 0.02 |
| landed (%:mt) | 58% | 44% | 55% | 0.00 | 0.01 | 0.00 | 0.01 |
| discard (%:mt) | 42% | 56% | 45% | 0.00 | 0.01 | 0.00 | 0.01 |
| disc. mort. (%:mt) | 100% | 100% | 100% | 0.00 | 0.01 | 0.00 | 0.01 |
| total mortality | | | | 0.00 | 0.02 | 0.00 | **0.02** |
| Yelloweye | 0.00% | 0.26% | 0.26% | 0.00 | 0.00 | 0.00 | 0.00 |
| disc. mort. (%:mt) | 50% | 90% | 100% | 0.00 | 0.00 | 0.00 | **0.00** |
| Lingcod | | | | | | | |
| catch (%:mt) | 35.35% | 26.08% | 26.08% | 47.19 | 11.19 | 0.03 | 58.40 |
| landed (%:mt) | 66% | 52% | 16% | 31.14 | 5.82 | 0.00 | 36.97 |
| discard (%:mt) | 34% | 48% | 84% | 16.04 | 5.37 | 0.03 | 21.44 |
| disc. mort. (%:mt) | 7% | 7% | 7% | 1.12 | 0.38 | 0.00 | 1.50 |
| total mortality | | | | 32.27 | 6.19 | 0.01 | **38.47** |
| **North of 40°10' N. Lat.** | | | | | | | |
| Number of observed sets | 103 | 120 | 12 | | | | |
| Fleet landed target mt | 111 | 134 | 9 | | | | |
| Rebuilding species | *Bycatch rates* [1] | | | | | | |
| Canary rockfish | 0.39% | 1.85% | 1.85% | 0.43 | 2.47 | 0.16 | 3.06 |
| disc. mort. (%:mt) | 10% | 55% | 100% | 0.04 | 1.36 | 0.16 | **1.56** |
| Yelloweye | 0.00% | 1.21% | 1.21% | 0.00 | 1.62 | 0.10 | 1.73 |
| disc. mort. (%:mt) | 50% | 90% | 100% | 0.00 | 1.46 | 0.10 | **1.57** |
| Widow rockfish | | | | | | | |
| catch (%:mt) | 0.00% | 0.31% | 0.31% | 0.00 | 0.41 | 0.03 | 0.44 |
| landed (%:mt) | 0% | 79% | 100% | 0.00 | 0.33 | 0.03 | 0.35 |
| discard (%:mt) | 100% | 21% | 0% | 0.00 | 0.09 | 0.00 | 0.09 |
| disc. mort. (%:mt) | 100% | 100% | 100% | 0.00 | 0.09 | 0.00 | 0.09 |
| total mortality | | | | 0.00 | 0.41 | 0.03 | **0.44** |
| Lingcod | | | | | | | |
| catch (%:mt) | 17.78% | 40.45% | 40.45% | 19.76 | 54.10 | 3.49 | 77.36 |
| landed (%:mt) | 47% | 55% | 92% | 9.29 | 29.76 | 3.21 | 42.26 |
| discard (%:mt) | 53% | 45% | 8% | 10.47 | 24.35 | 0.28 | 35.10 |
| disc. mort. (%:mt) | 7% | 7% | 7% | 0.73 | 1.70 | 0.02 | 2.46 |
| total mortality | | | | 10.02 | 31.46 | 3.23 | **44.72** |

[1] Bycatch rates for rebuilding species = (retained + discard lb) / retained target species lb

Table 11.--Limited-entry and open-access, fixed-gear groundfish landings (mt) in 2005, by area and fleet.

| | North of 40°10' | | 35° to 40°10' | | South of 35° | | Coast-wide | | All fixed gear | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Limited entry | Open access | Limited entry | Open access | Limited entry | Open access | Limited entry | Open access | North of 40°10' | 35° to 40°10' | South of 35° | South of 40°10' | Coast-wide |
| Sablefish | 1,976 | 520 | 194 | 379 | 73 | 14 | 2,243 | 913 | 2,496 | 573 | 87 | 660 | 3,156 |
| Shortspine thornyhead | 7 | 0 | 11 | 0 | 127 | 0 | 145 | 1 | 8 | 11 | 127 | 138 | 146 |
| Longspine thornyhead | 0 | 0 | 7 | 0 | 10 | 0 | 17 | 0 | 0 | 7 | 10 | 17 | 17 |
| Dover sole | 2 | 0 | 0 | 0 | 0 | | 2 | 0 | 2 | 0 | 0 | 0 | 3 |
| Petrale sole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| English sole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arrowtooth flounder | 4 | 1 | 0 | 0 | 0 | 0 | 4 | 1 | 5 | 0 | 0 | 0 | 5 |
| Other Flatfish | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 2 |
| Blackgill rockfish [1] | na | na | 5 | 6 | 18 | 6 | 23 | 13 | na | 12 | 24 | 36 | 36 |
| Splitnose rockfish [1] | na | na | 1 | 0 | 0 | 0 | 1 | 0 | na | 1 | 0 | 1 | 1 |
| Other slope rockfish | 50 | 10 | 2 | 5 | 1 | 1 | 53 | 16 | 60 | 7 | 2 | 9 | 69 |
| Yellowtail rockfish [2] | 1 | 2 | na | na | na | na | 1 | 2 | 3 | na | na | na | 3 |
| Chilipepper rockfish [3] | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 3 | 3 |
| Other shelf rockfish | 7 | 5 | 1 | 10 | 7 | 7 | 15 | 22 | 12 | 11 | 14 | 24 | 36 |
| Black rockfish | 14 | 152 | 0 | 3 | 0 | 0 | 15 | 156 | 167 | 4 | 0 | 4 | 170 |
| Other nearshore rockfish | 3 | 32 | 0 | 49 | 1 | 6 | 4 | 86 | 34 | 49 | 6 | 56 | 90 |
| Cabezon | 2 | 30 | 0 | 25 | 0 | 2 | 2 | 58 | 32 | 25 | 2 | 28 | 60 |
| Kelp greenling | 2 | 20 | 0 | 1 | 0 | 0 | 2 | 21 | 21 | 1 | 0 | 1 | 23 |
| Pacific cod | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 0 | 3 |
| Spiny dogfish | 230 | 3 | 0 | 0 | 0 | 0 | 230 | 3 | 233 | 0 | 0 | 0 | 233 |
| Longnose+big+Unsp. skate | 14 | 6 | 0 | 0 | 2 | 0 | 16 | 6 | 20 | 0 | 3 | 3 | 23 |
| Other groundfish | 4 | 50 | 27 | 66 | 1 | 3 | 31 | 119 | 54 | 94 | 4 | 97 | 151 |
| Lingcod | 13 | 45 | 1 | 24 | 1 | 1 | 15 | 69 | 58 | 24 | 2 | 26 | 84 |
| Canary rockfish | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| Widow rockfish | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.2 | 0.1 | 0.3 | 0.3 |
| Yelloweye rockfish | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.5 |
| Bocaccio [3] | na | na | 0.5 | 0.6 | 1.2 | 2.0 | 1.6 | 2.6 | na | 1.1 | 3.2 | 4.2 | 4.2 |
| Cowcod [3] | na | na | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | na | 0.0 | 0.0 | 0.0 | 0.0 |
| Pacific ocean perch [4] | 0.4 | 0.3 | na | na | na | na | 0.4 | 0.3 | 0.7 | na | na | na | 0.8 |
| Darkblotched rockfish | 1.9 | 1.9 | 0.1 | 0.3 | 0.0 | 0.0 | 2.0 | 2.2 | 3.8 | 0.4 | 0.0 | 0.4 | 4.2 |

[1] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[2] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[3] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[4] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Slope Rockfish category.

Table 12.--Landings and estimated discards (mt) of groundfish from all fixed-gear trips targeting groundfish in 2005, by area.

| | North of 40°10' N. Lat. | | | South of 40°10' N. Lat. | | | Coast-wide | | |
|---|---|---|---|---|---|---|---|---|---|
| | Landed | Discard | Total | Landed | Discard | Total | Landed | Discard | Total |
| Sablefish | | 346 | | | 76 | | | 421 | |
| mortality | 2,496 | 69 | 2,565 | 660 | 15 | 675 | 3,156 | 84 | 3,240 |
| Shortspine thornyhead | 8 | 1 | 9 | 138 | 0 | 138 | 146 | 1 | 147 |
| Longspine thornyhead | 0 | 0 | 0 | 17 | 0 | 17 | 17 | 0 | 17 |
| Dover sole | 2 | 3 | 5 | 0 | 1 | 1 | 3 | 4 | 6 |
| Petrale sole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| English sole | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arrowtooth flounder | 5 | 82 | 87 | 0 | 1 | 1 | 5 | 83 | 87 |
| Other Flatfish | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 2 |
| Blackgill rockfish [1] | na | na | na | 36 | 0 | 36 | 36 | 0 | 36 |
| Splitnose rockfish [1] | na | na | na | 1 | 0 | 1 | 1 | 0 | 1 |
| Other slope rockfish | 60 | 18 | 78 | 9 | 0 | 9 | 69 | 18 | 87 |
| Yellowtail rockfish [2] | 3 | 0 | 3 | na | na | na | 3 | 0 | 3 |
| Chilipepper rockfish [3] | na | na | na | 3 | 0 | 3 | 3 | 0 | 3 |
| Other shelf rockfish | 12 | 14 | 26 | 24 | 0 | 24 | 36 | 14 | 51 |
| Black rockfish | 167 | 2 | 168 | 4 | 0 | 4 | 170 | 2 | 172 |
| Other nearshore rockfish | 34 | 1 | 36 | 56 | 8 | 63 | 90 | 9 | 99 |
| Cabezon | 32 | 0 | 32 | 28 | 2 | 30 | 60 | 2 | 62 |
| Kelp greenling | 21 | 1 | 22 | 1 | 0 | 2 | 23 | 1 | 23 |
| Pacific cod | 3 | 2 | 5 | 0 | 0 | 0 | 3 | 2 | 5 |
| Spiny dogfish | 233 | 129 | 362 | 0 | 21 | 21 | 233 | 150 | 383 |
| Longnose+big+Unsp. skate | 20 | 107 | 127 | 3 | 11 | 14 | 23 | 119 | 141 |
| Other groundfish | 54 | 7 | 61 | 97 | 1 | 99 | 151 | 9 | 160 |
| Dungeness crab | | 1 | 1 | | 0 | 0 | 0 | 1 | 1 |
| Tanner crab | | 6 | 6 | | 3 | 3 | 0 | 9 | 9 |
| Lingcod | | 55.1 | | | 38.7 | | | 93.8 | |
| mortality | 57.7 | 4.5 | 62.3 | 26.3 | 1.5 | 27.9 | 84.1 | 6.1 | 90.1 |
| Canary rockfish | 0.0 | 1.6 | 1.6 | 0.1 | 0.3 | 0.3 | 0.1 | 1.8 | 1.9 |
| Widow rockfish | 0.1 | 0.9 | 1.0 | 0.3 | 0.0 | 0.3 | 0.3 | 0.9 | 1.3 |
| Yelloweye rockfish | 0.5 | 2.4 | 2.9 | 0.0 | 0.0 | 0.0 | 0.5 | 2.4 | 2.9 |
| Bocaccio [3] | na | na | na | 4.2 | 0.0 | 4.3 | 4.2 | 0.0 | 4.3 |
| Cowcod [3] | na | na | na | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pacific ocean perch [4] | 0.7 | 0.3 | 1.0 | na | na | na | 0.7 | 0.3 | 1.0 |
| Darkblotched rockfish | 3.8 | 0.5 | 4.3 | 0.4 | 0.1 | 0.5 | 4.2 | 0.6 | 4.8 |

[1] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.
[2] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.
[3] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.
[4] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Slope Rockfish category.

Table 13.--Estimated retained and discarded catch (mt) of major west coast groundfish species in the 2005 at-sea and shoreside fisheries for Pacific hake/whiting, by sector.

| | Catcher-processor | | | Mothership | | | Tribal | | | All At-sea | | | Shoreside[1] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | retained | discard | total | retained | discard | total | retained | discard | total | retained | discard | total | retained | discard | total |
| Pacific hake | 78,415 | 475 | 78,890 | 48,451 | 80 | 48,531 | 23,582 | 0 | 23,582 | 150,448 | 555 | 151,003 | 96,184 | 1,390 | 97,574 |
| Sablefish | 9 | 4 | 13 | 1 | 1 | 2 | 0 | 0 | 0 | 10 | 5 | 15 | 22 | 0 | 22 |
| Shortspine thornyhead | 6 | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 7 | 1 | 7 | 0 | 0 | 0 |
| Longspine thornyhead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dover sole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petrale sole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| English sole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arrowtooth flounder | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 3 | 4 | 1 | 0 | 1 |
| Other Flatfish | 2 | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 0 |
| Other slope rockfish | 34 | 5 | 40 | 9 | 3 | 12 | 0 | 0 | 0 | 43 | 8 | 51 | 4 | 0 | 4 |
| Yellowtail rockfish | 3 | 44 | 47 | 21 | 4 | 25 | 39 | 0 | 39 | 64 | 48 | 112 | 95 | 78 | 173 |
| Other shelf rockfish | 0 | 0 | 1 | 4 | 1 | 6 | 0 | 0 | 0 | 5 | 1 | 6 | 27 | 0 | 27 |
| Pacific cod | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Spiny dogfish | 3 | 39 | 42 | 16 | 11 | 28 | 7 | 278 | 285 | 26 | 328 | 355 | 96 | 0 | 96 |
| Longnose+big+Unsp. skate | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| Other groundfish | 0 | 0 | 0 | 0 | 0 | 0 | 349 | 67 | 416 | 349 | 68 | 417 | 188 | 0 | 188 |
| Dungeness crab | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| Tanner crab | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| Lingcod | 0.3 | 0.1 | 0.4 | 0.6 | 1.4 | 2.0 | 0.3 | 0.6 | 1.0 | 1.3 | 2.2 | 3.4 | 5.9 | 0.0 | 5.9 |
| Canary rockfish | 0.1 | 0.2 | 0.3 | 0.5 | 0.2 | 0.7 | 0.4 | 0.0 | 0.4 | 1.0 | 0.5 | 1.4 | 2.2 | 0.0 | 2.2 |
| Widow rockfish | 8.9 | 34.3 | 43.1 | 16.1 | 19.4 | 35.5 | 1.4 | 0.0 | 1.4 | 26.3 | 53.7 | 80.0 | 64.3 | 12.5 | 76.8 |
| Yelloweye rockfish | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| POP | 0.6 | 0.2 | 0.8 | 0.8 | 0.0 | 0.9 | 0.1 | 0.0 | 0.1 | 1.5 | 0.2 | 1.7 | 0.5 | 0.0 | 0.5 |
| Darkblotched | 2.7 | 3.2 | 5.9 | 4.3 | 0.8 | 5.1 | 0.0 | 0.0 | 0.0 | 7.0 | 4.1 | 11.1 | 5.1 | 0.4 | 5.5 |

[1] Includes all trawl landings with more than 2 mt of Pacific hake/whiting. This fishery is a "maximized"-retention fishery; discard amounts reflect fish that, at the time of landing, were either discarded due to quality or forfeited if they were in excess of trawl trip limits.

Table 14.--Coast-wide 2005 commercial fishery rates of discard for major west coast groundfish species, based on fleet-wide landings and estimated amounts of discard from directed groundfish fisheries.

| | Non-hake trawl fishery | | | Combined hake fisheries[1] | | | Combined fixed-gear fisheries | | | All commercial [2] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | retained mt | discarded mt | discarded % of total | retained mt | discarded mt | discarded % of total | retained mt | discarded mt | discarded % of total | retained mt | discarded mt | discarded % of total |
| **Target species** | | | | | | | | | | | | |
| Sablefish | | 524 | | | | | | 421 | | | | |
| mortality | 2,291 | 262 | 10% | 32 | 5 | 14% | 3,156 | 84 | 3% | 5,479 | 352 | 6% |
| Shortspine thornyhead | 494 | 133 | 21% | 7 | 1 | 7% | 146 | 1 | 1% | 646 | 135 | 17% |
| Longspine thornyhead | 631 | 92 | 13% | 0 | 0 | 0% | 17 | 0 | 0% | 648 | 92 | 12% |
| Dover sole | 6,671 | 656 | 9% | 0 | 0 | 11% | 3 | 4 | 58% | 6,674 | 660 | 9% |
| Petrale sole | 2,675 | 55 | 2% | 0 | 0 | 0% | 0 | 0 | 11% | 2,676 | 55 | 2% |
| English sole | 847 | 302 | 26% | 0 | 0 | 50% | | 0 | | 847 | 302 | 26% |
| Arrowtooth flounder | 2,052 | 1,397 | 41% | 2 | 3 | 58% | 5 | 83 | 95% | 2,059 | 1,483 | 42% |
| Other Flatfish | 1,081 | 731 | 40% | 0 | 0 | 0% | 2 | 0 | 1% | 1,083 | 731 | 40% |
| Blackgill rockfish [3] | 51 | 2 | 4% | 0 | 0 | 0% | 36 | 0 | 1% | 87 | 3 | 3% |
| Splitnose rockfish [3] | 86 | 144 | 63% | 0 | 0 | 0% | 1 | 0 | 0% | 87 | 144 | 62% |
| Other slope rockfish | 144 | 27 | 16% | 47 | 8 | 15% | 69 | 18 | 20% | 260 | 53 | 17% |
| Yellowtail rockfish [4] | 27 | 29 | 51% | 159 | 126 | 44% | 3 | 0 | 12% | 189 | 155 | 45% |
| Chilipepper rockfish [5] | 24 | 52 | 68% | 0 | 0 | 0% | 3 | 0 | 0% | 27 | 52 | 65% |
| Other shelf rockfish | 16 | 81 | 83% | 32 | 2 | 5% | 36 | 14 | 28% | 85 | 97 | 53% |
| Black rockfish | 0 | 1 | 54% | 0 | 0 | 0% | 170 | 2 | 1% | 171 | 2 | 1% |
| Other nearshore rockfish | 0 | 0 | 54% | 0 | 0 | 0% | 90 | 9 | 9% | 90 | 9 | 10% |
| Cabezon | 0 | 0 | 0% | 0 | 0 | 0% | 60 | 2 | 4% | 60 | 2 | 4% |
| Kelp greenling | 0 | 0 | 0% | 0 | 0 | 0% | 23 | 1 | 3% | 23 | 1 | 3% |
| Pacific hake | 4 | 822 | 100% | 246,632 | 1,945 | 1% | | | | 246,635 | 2,767 | 1% |
| Pacific cod | 722 | 4 | 1% | 1 | 0 | 3% | 3 | 2 | 47% | 725 | 7 | 1% |
| Spiny dogfish | 126 | 1,067 | 89% | 122 | 328 | 73% | 233 | 150 | 39% | 482 | 1,545 | 76% |
| Longnose+big+Unsp. skate | 858 | 886 | 51% | 1 | 1 | 42% | 23 | 119 | 84% | 882 | 1,005 | 53% |
| Other groundfish | 108 | 1,524 | 93% | 537 | 68 | 11% | 151 | 9 | 6% | 795 | 1,601 | 67% |
| **Rebuilding species (as of 2005)** | | | | | | | | | | | | |
| Lingcod | | 383 | | | | | | 93.8 | | | | |
| mortality | 73 | 192 | 73% | 7 | 2 | 23% | 84 | 6.1 | 7% | 164 | 200 | 55% |
| Canary rockfish | 4.4 | 21.6 | 83% | 3.2 | 0.5 | 12% | 0.1 | 1.8 | 94% | 7.7 | 23.8 | 75% |
| Widow rockfish | 3.0 | 3.3 | 53% | 90.6 | 66.2 | 42% | 0.3 | 0.9 | 73% | 93.9 | 70.5 | 43% |
| Yelloweye rockfish | 0.2 | 0.6 | 73% | 0.0 | 0.0 | 0% | 0.5 | 2.4 | 82% | 0.8 | 3.0 | 80% |
| Bocaccio [5] | 1.6 | 27.7 | 94% | 0.0 | 0.0 | 0% | 4.2 | 0.0 | 1% | 5.8 | 27.7 | 83% |
| Cowcod [5] | 0.0 | 1.4 | 99% | 0.0 | 0.0 | 0% | 0.0 | 0.0 | 0% | 0.0 | 1.4 | 97% |
| Pacific ocean perch [6] | 56.9 | 10.8 | 16% | 2.0 | 0.2 | 10% | 0.8 | 0.3 | 27% | 59.6 | 11.3 | 16% |
| Darkblotched rockfish | 76.7 | 23.7 | 24% | 12.1 | 4.5 | 27% | 4.2 | 0.6 | 12% | 93.0 | 28.7 | 24% |

[1] Includes the commercial shoreside and at-sea fisheries, as well as the tribal at-sea hake fishery

[2] Includes all directed groundfish trawl fisheries, and the tribal at-sea hake fishery.

[3] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[4] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[5] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[6] Amounts in this row are for the area north of 40°10' N. Lat.

Table 15.--Estimated total mortality (mt) of major west coast groundfish species during 2005, by sector.

| | Shoreside commercial fisheries | | | | All at-sea hake fisheries | Shore-side WA Tribal | Total recreational fishing mortality | | | Research | Remaining GMT Scorecard [3] Values | Estimated total fishing mortality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Estimated non-hake trawl [1] | Estimated hake trawl | Estimated non-trawl [2] | Total shoreside mortality | | | CA | OR | WA | | | |
| **Target species** | | | | | | | | | | | | |
| Sablefish | 2,553 | 22 | 3,242 | 5,817 | 15 | 700 | 0 | 1 | 0 | 10 | | 6,543 |
| Shortspine thornyhead | 627 | 0 | 147 | 774 | 7 | 11 | 0 | 0 | 0 | 4 | | 796 |
| Longspine thornyhead | 723 | 0 | 17 | 740 | 0 | 0 | 0 | 0 | 0 | 10 | | 750 |
| Dover sole | 7,327 | 0 | 6 | 7,333 | 0 | 145 | 0 | 0 | 0 | 28 | | 7,507 |
| Petrale sole | 2,732 | 0 | 0 | 2,733 | 0 | 30 | 0 | 0 | 0 | 4 | | 2,766 |
| English sole | 1,151 | 0 | 0 | 1,151 | 0 | 66 | 0 | 0 | 0 | 4 | | 1,222 |
| Arrowtooth flounder | 3,450 | 1 | 87 | 3,539 | 4 | 158 | 0 | 0 | 0 | 5 | | 3,706 |
| Other Flatfish | 1,872 | 0 | 2 | 1,874 | 3 | 47 | 25 | 0 | 2 | 13 | | 1,965 |
| Blackgill rockfish [4] | 53 | 0 | 36 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | | 90 |
| Splitnose rockfish [4] | 230 | 0 | 1 | 231 | 0 | 0 | 0 | 0 | 0 | 7 | | 237 |
| Other slope rockfish | 171 | 4 | 87 | 262 | 51 | 28 | 0 | 0 | 0 | 4 | | 345 |
| Yellowtail rockfish [5] | 56 | 173 | 10 | 239 | 112 | 539 | 9 | 13 | 20 | 3 | | 935 |
| Chilipepper rockfish [6] | 76 | 0 | 3 | 79 | 0 | 0 | 4 | 0 | 0 | 14 | | 97 |
| Other shelf rockfish | 98 | 27 | 52 | 176 | 6 | 10 | 281 | 6 | 1 | 19 | | 501 |
| Black rockfish | 1 | 0 | 174 | 175 | 0 | 0 | 180 | 311 | 271 | 0 | | 937 |
| Other nearshore rockfish | 1 | 0 | 99 | 100 | 0 | 0 | 441 | 41 | 7 | 0 | | 590 |
| Cabezon | 0 | 0 | 62 | 62 | 0 | 0 | 47 | 17 | 7 | 0 | | 133 |
| Kelp greenling | 0 | 0 | 23 | 23 | 0 | 0 | 5 | 4 | 2 | 0 | | 35 |
| Pacific hake/whiting | 826 | 97,574 | 0 | 98,400 | 151,003 | 11,767 | 0 | 0 | 0 | 42 | | 261,212 |
| Pacific cod | 726 | 1 | 5 | 732 | 0 | 124 | 0 | 0 | 8 | 0 | | 864 |
| Spiny dogfish | 1,194 | 96 | 383 | 1,672 | 355 | 6 | 3 | 0 | 0 | 9 | | 2,044 |
| Longnose+big+Unsp. skate | 1,745 | 1 | 141 | 1,887 | 1 | 23 | 0 | 0 | 0 | 8 | | 1,920 |
| Other groundfish | 1,633 | 188 | 160 | 1,981 | 417 | 20 | 0 | 0 | 0 | 8 | | 2,425 |
| Dungeness crab | 254 | 0 | 1 | 255 | 0 | | | | | | | 255 |
| Tanner crab | 252 | 0 | 9 | 261 | 0 | | | | | | | 261 |
| **Rebuilding species (as of 2005)** | | | | | | | | | | | | |
| Lingcod | 266.3 | 5.9 | 91.2 | 363.4 | 3.4 | 29.9 | 299.3 | 131.7 | 58.6 | 4.0 | 0.0 | 890.4 |
| Canary rockfish | 26.0 | 2.2 | 1.9 | 30.1 | 1.4 | 4.3 | 2.0 | 4.9 | 1.9 | 2.3 | 1.8 | 48.7 |
| Widow rockfish | 6.3 | 76.8 | 2.1 | 85.2 | 80.0 | 28.6 | 1.6 | 1.6 | | 1.6 | 0.4 | 198.9 |
| Yelloweye rockfish | 0.8 | 0.0 | 2.9 | 3.8 | 0.0 | 0.8 | 0.9 | 4.1 | 5.2 | 0.6 | 0.3 | 15.7 |
| Bocaccio [6] | 29.3 | 0.0 | 4.5 | 33.8 | 0.0 | 0.0 | 38.1 | 0.0 | 0.1 | 1.7 | 1.3 | 75.1 |
| Cowcod [6] | 1.4 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.1 | 0.0 | 2.0 |
| Pacific ocean perch [7] | 67.7 | 0.5 | 1.0 | 69.2 | 1.7 | 3.5 | 0.0 | 0.0 | 0.0 | 1.8 | 0.0 | 76.2 |
| Darkblotched rockfish | 100.4 | 5.5 | 4.8 | 110.6 | 11.1 | 0.1 | 0.0 | 0.0 | 0.0 | 2.1 | 0.0 | 123.9 |

[1] Includes minor landings by trawlers not targeting groundfish

[2] Includes minor landings made with troll gear

[3] The Pacific Fishery Management Council's Groundfish Management Team Bycatch Scorecard (Table 17) contains estimates of mortality for species that are managed under rebuilding plans.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[5] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[6] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[7] Amounts in this row are for the area north of 40°10' N. Lat.

Table 16.--Estimated total fishing mortality (mt) of major west coast groundfish species during 2005 and corresponding management reference points (harvest specifications).

| | Estimated total fishing mortality (mt) | Management reference points (harvest specifications) | | | |
|---|---|---|---|---|---|
| | | Optimum Yield (total catch) (mt) | Mortality % of Optimum Yield | Allowable Biological Catch (mt) | Mortality % of ABC |
| **Target species** | | | | | |
| Sablefish | 6,543 | 7,761 | 84% | 8,368 | 78% |
| Shortspine thornyhead | 796 | 999 | 80% | 1,055 | 75% |
| Longspine thornyhead | 750 | 2,461 | 30% | 2,461 | 30% |
| Dover sole | 7,507 | 7,476 | 100.4% | 8,522 | 88% |
| Petrale sole | 2,766 | 2,762 | 100.1% | 2,762 | 100.1% |
| English sole | 1,222 | 3,100 | 39% | 3,100 | 39% |
| Arrowtooth flounder | 3,706 | 5,800 | 64% | 5,800 | 64% |
| Other Flatfish | 1,965 | 4,090 | 48% | 6,781 | 29% |
| Blackgill rockfish [1] | 90 | | | 343 | 26% |
| Splitnose rockfish [1] | 237 | 461 | 52% | 615 | 39% |
| Other slope rockfish | 345 | | | | |
| Other slope + blackgill | 435 | 1,799 | 24% | | |
| Yellowtail rockfish [2] | 935 | 3,896 | 24% | 3,896 | 24% |
| Chilipepper rockfish [3] | 97 | 2,700 | 4% | 2,700 | 4% |
| Other shelf rockfish | 501 | 1,612 | 31% | | |
| Black rockfish | 937 | 1,293 | 72% | 1,293 | 72% |
| Other nearshore rockfish | 590 | 737 | 80% | | |
| Cabezon (California only) | 80 | 69 | 116% | 103 | 78% |
| Kelp greenling | 35 | | | | |
| Pacific hake/whiting | 261,212 | 269,069 | 97% | 269,545 | 97% |
| Pacific cod | 864 | 1,600 | 54% | 3,200 | 27% |
| Spiny dogfish | 2,044 | | | | |
| Longnose+big+Unsp. skate | 1,920 | | | | |
| Other groundfish | 2,425 | | | | |
| Other groundfish OY group [5] | 6,424 | 7,300 | 88% | 14,600 | 44% |
| **Rebuilding species (as of 2005)** | | | | | |
| Lingcod | 890.4 | 2,413 | 37% | 2,922 | 30% |
| Canary rockfish | 48.7 | 46.8 | 104% | 270 | 18% |
| Widow rockfish | 198.9 | 285 | 70% | 3,218 | 6% |
| Yelloweye rockfish | 15.7 | 26 | 60% | 54 | 29% |
| Bocaccio [3] | 75.1 | 307 | 24% | 566 | 13% |
| Cowcod [3] | 2.0 | 4.2 | 47% | 24 | 8% |
| Pacific ocean perch [4] | 76.2 | 447 | 17% | 966 | 8% |
| Darkblotched rockfish | 123.9 | 269 | 46% | 269 | 46% |

[1] Amounts in this row are for the area south of 40$^{o}$10' N. Lat. Northern catch is included in the Other Slope Rockfish category.
[2] Amounts in this row are for the area north of 40$^{o}$10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.
[3] Amounts in this row are for the area south of 40$^{o}$10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.
[4] Amounts in this row are for the area north of 40$^{o}$10' N. Lat. Southern catch is included in the Other Slope Rockfish category.
[5] Category includes cabezon, kelp greenling, spiny dogfish, longnose and big skate, and other groundfish.

Table 17.--2005 Groundfish Management Team bycatch scorecard for rebuilding species.

**Estimated Total Mortality Impacts Updated with 2005 OY levels - April 2006 Council Meeting**

| Fishery | Bocaccio *a/* | Canary | Cowcod | Dkbl | POP | Widow | Yelloweye |
|---|---|---|---|---|---|---|---|
| **Limited Entry Trawl- Non-whiting** | **46.6** | **9.5** | **2.7** | **135.9** | **61.0** | **1.0** | **0.4** |
| **Limited Entry Trawl- Whiting** | | | | | | | |
| At-sea whiting motherships | | | | | | | 0.0 |
| At-sea whiting cat-proc | | **3.3** | | **16.4** | **2.1** | **155.8** | 0.0 |
| Shoreside whiting | | | | | | | 0.0 |
| Tribal whiting | | **0.6** | | **0.0** | **0.0** | **1.9** | **0.0** |
| **Tribal** | | | | | | | |
| Midwater Trawl | | 1.8 | | 0.0 | 0.0 | 40.0 | 0.0 |
| Bottom Trawl | | 0.8 | | 0.0 | **3.2** | 0.0 | 0.0 |
| Troll | | 0.5 | | 0.0 | 0.0 | | 0.0 |
| Fixed gear | | 0.3 | | 0.0 | 0.0 | 0.0 | 2.3 |
| **Limited Entry Fixed Gear** | 13.4 | 1.2 | 0.1 | 1.3 | 0.4 | 0.5 | 2.9 |
| **Open Access: Directed Groundfish** | 10.6 | 3.0 | 0.1 | 0.2 | 0.1 | 0.1 | 3.0 |
| **Open Access: Incidental Groundfish** | | | | | | | |
| CA Halibut | 0.1 | 0.1 | | 0.0 | 0.0 | | |
| CA Gillnet b/ | 0.5 | | | 0.0 | 0.0 | 0.0 | |
| CA Sheephead b/ | | | | 0.0 | 0.0 | 0.0 | 0.0 |
| CPS- wetfish b/ | 0.3 | | | | | | |
| CPS- squid c/ | | | | | | | |
| Dungeness crab b/ | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| HMS b/ | | 0.0 | 0.0 | 0.0 | | | |
| Pacific Halibut b/ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pink shrimp | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |
| Ridgeback prawn | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Salmon troll | 0.2 | 1.6 | 0.0 | 0.0 | 0.0 | 0.3 | 0.2 |
| Sea Cucumber | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Spot Prawn (trap) | | | | | | | |
| **Recreational Groundfish d/** | | | | | | | |
| WA | | **6.8** | | | | | **9.3** |
| OR | | | | | | **1.6** | |
| CA | **37.3** | **2.0** | 0.4 | | | **1.6** | **0.9** |
| **Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.** | | | | | | | |
| | **1.7** | **2.3** | **0.1** | **2.1** | **1.8** | **1.1** | **0.6** |
| **Non-EFP Total** | 110.9 | 33.9 | 3.4 | 156.0 | 68.6 | 204.0 | 19.8 |
| **EFPs e/** | | | | | | | |
| | | | | | | | |
| **EFP Subtotal** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **TOTAL** | 110.9 | 33.9 | 3.4 | 156.0 | 68.6 | 204.0 | 19.8 |
| **2005 OY** | **307** | **47.0** | **4.2** | **269** | **447** | **285** | **26** |
| **Difference** | 196.1 | 13.1 | 0.8 | 113.1 | 378.4 | 81.1 | 6.2 |
| **Percent of OY** | 36.1% | 72.1% | 81.0% | 58.0% | 15.3% | 71.6% | 76.0% |
| Key | | = either not applicable; trace amount (<0.01 mt); or not reported in available data sources. | | | | | |

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgement.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish. This suggests that total bocaccio was caught in trace amounts.

d/ Values for yelloweye in California represent specified harvest guidelines.

e/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

**CHANGES INCORPORTATED:**

Updated with 2006 Oys

Deleted Lingcod column (declared rebuilt)

Yelloweye recreational HG for OR/WA:

In Nov 2005, a projected impact higher than the HG was replaced in the scorecard. Best est. was 4.0 mt in OR and 5.1 mt in WA + a 0.3 mt buffer.

The 2006 recreational HG returned to 6.7 mt

LE Trawl Non-whiting impacts were adjusted based on model refinement from catches occurring at the end of 2005 and beginning of 2006

LE Trawl Whiting impacts represent GMT proposed bycatch limits for canary and widow, and projected impacts resulting from the 2006 whiting bycatch model

## Appendix A

Common and scientific names of species included in the Groundfish Fishery Management Plan

**SHARKS**
Big skate, *Raja binoculata*
California skate, *R. inornata*
Leopard shark, *Triakis semifasciata*
Longnose skate, *R. rhina*
Soupfin shark, *Galeorhinus zyopterus*
Spiny dogfish, *Squalus acanthias*

**RATFISH**
Ratfish, *Hydrolagus colliei*

**MORIDS**
Finescale codling, *Antimora microlepis*

**GRENADIERS**
Pacific rattail, *Coryphaenoides acrolepis*

**ROUNDFISH**
Cabezon, *Scorpaenichthys marmoratus*
Kelp greenling, *Hexagrammos decagrammus*
Lingcod, *Ophiodon elongatus*
Pacific cod, *Gadus macrocephalus*
Pacific whiting, (hake) *Merluccius productus*
Sablefish, *Anoplopoma fimbria*

**FLATFISH**
Arrowtooth flounder, (turbot) *Atheresthes stomias*
Butter sole, *Isopsetta isolepis*
Curlfin sole, *Pleuronichthys decurrens*
Dover sole, *Microstomus pacificus*
English sole, *Parophrys vetulus*
Flathead sole, *Hippoglossoides elassodon*
Pacific sanddab, *Citharichthys sordidus*
Petrale sole, *Eopsetta jordani*
Rex sole, *Glyptocephalus zachirus*
Rock sole, *Lepidopsetta bilineata*
Sand sole, *Psettichthys melanostictus*
Starry flounder, *Platichthys stellatus*

**ROCKFISH**
(which includes all genera and species of the family Scorpaenidae, even if not listed, that occur in the Washington, Oregon, and California area)

**Species that area managed with individual Optimum Yields for at least a portion of the Pacific Fishery Management Council area**

Bocaccio, *Sebastes paucispinis*
Canary rockfish, *Sebastes pinniger*
Chilipepper, *Sebastes goodei*
Cowcod, *Sebastes levis*
Darkblotched rockfish, *Sebastes crameri*
Longspine thornyhead, *Sebastolobus altivelis*
Pacific ocean perch, *Sebastes alutus*
Shortbelly rockfish, *Sebastes jordani*
Shortspine thornyhead, *Sebastolobus alascanus*
Splitnose rockfish, *Sebastes diploproa*
Widow rockfish, *Sebastes entomelas*
Yelloweye rockfish, *Sebastes ruberimus*
Yellowtail rockfish, *Sebastes flavidus*

**Minor Rockfish Species**

| North of 40°10' N. lat. | South of 40°10' N. lat. |
|---|---|
| Minor Nearshore Rockfish | |
| black, *Sebastes melanops* | black, *Sebastes melanops* |
| black and yellow, *Sebastes chrysolmelas.* | black and yellow, *Sebastes chrysolmelas* |
| blue, *Sebastes mystinus* | blue, *Sebastes mystinus* |
| brown, *Sebastes auriculatus* | brown, *Sebastes auriculatus* |
| calico, *Sebastes dalli* | calico, *Sebastes dalli* |
| China, *Sebastes nebulosus* | California scorpionfish, *Scorpaena guttata* |
| copper, *Sebastes caurinus* | China, *Sebastes nebulosus* |
| gopher, *Sebastes carnatus* | copper, *Sebastes caurinus* |
| grass, *Sebastes rastrelliger* | gopher, *Sebastes carnatus* |
| kelp, *Sebastes atrovirens* | grass, *Sebastes rastrelliger* |
| olive, *Sebastes serranoides* | kelp, *Sebastes atrovirens* |
| quillback, *Sebastes maliger* | olive, *Sebastes serranoides* |
| treefish, *Sebastes serriceps* | quillback, *Sebastes maliger* |
| | treefish, *Sebastes serriceps* |

| North of $40^{o}$10' N. lat. | South of $40^{o}$10' N. lat. |
|---|---|

## Minor Shelf Rockfish

| North of $40^{o}$10' N. lat. | South of $40^{o}$10' N. lat. |
|---|---|
| bronzespotted, *Sebastes gilli* | bronzespotted, *Sebastes gilli* |
| bocaccio, *Sebastes paucispinis* | chameleon, *Sebastes phillipsi* |
| chameleon, *Sebastes phillipsi* | dwarf-red, *Sebastes rufianus* |
| chilipepper, *Sebastes goodei* | flag, *Sebastes rubrivinctus* |
| cowcod, *Sebastes levis* | freckled, *Sebastes lentiginosus* |
| dwarf-red, *Sebastes rufianus* | greenblotched, *Sebastes rosenblatti* |
| flag, *Sebastes rubrivinctus* | greenspotted, *Sebastes chlorostictus* |
| freckled, *Sebastes lentiginosus* | greenstriped, *Sebastes elongatus* |
| greenblotched, *Sebastes rosenblatti* | halfbanded, *Sebastes semicinctus* |
| greenspotted, *Sebastes chlorostictus* | honeycomb, *Sebastes umbrosus* |
| greenstriped, *Sebastes elongatus* | Mexican, *Sebastes macdonaldi* |
| halfbanded, *Sebastes semicinctus* | pink, *Sebastes eos* |
| honeycomb, *Sebastes umbrosus* | pinkrose, *Sebastes simulator* |
| Mexican, *Sebastes macdonaldi* | pygmy, *Sebastes wilsoni* |
| pink, *Sebastes eos* | redstriped, *Sebastes proriger* |
| pinkrose, *Sebastes simulator* | rosethorn, *Sebastes helvomaculatus* |
| pygmy, *Sebastes wilsoni.* | rosy, *Sebastes rosaceus* |
| redstriped, *Sebastes proriger* | silvergrey, *Sebastes brevispinus* |
| rosethorn, *Sebastes helvomaculatus* | speckled, *Sebastes ovalis* |
| rosy, *Sebastes rosaceus* | squarespot, *Sebastes hopkinsi* |
| silvergrey, *Sebastes brevispinus* | starry, *Sebastes constellatus* |
| speckled, *Sebastes ovalis* | stripetail, *Sebastes saxicola* |
| squarespot, *Sebastes hopkinsi* | swordspine, *Sebastes ensifer* |
| starry, *Sebastes constellatus* | tiger, *Sebastes nigorcinctus* |
| stripetail, *Sebastes saxicola* | vermilion, *Sebastes miniatus* |
| swordspine, *Sebastes ensifer* | yelloweye, *Sebastes ruberrimus* |
| tiger, *Sebastes nigorcinctus* | yellowtail, *Sebastes flavidus* |
| vermilion, *Sebastes miniatus* | |
| yelloweye, *Sebastes ruberrimus* | |

## Minor Slope Rockfish

| North of $40^{o}$10' N. lat. | South of $40^{o}$10' N. lat. |
|---|---|
| aurora, *Sebastes aurora* | aurora, Sebastes aurora |
| bank, *Sebastes rufus* | bank, *Sebastes rufus* |
| blackgill, *Sebastes melanostomus* | blackgill, *Sebastes melanostomus* |
| darkblotched, *Sebastes crameri* | darkblotched, *Sebastes crameri* |
| redbanded, *Sebastes babcocki* | Pacific ocean perch (POP), *Sebastes alutus* |
| rougheye, *Sebastes aleutianus* | redbanded, *Sebastes babcocki* |
| sharpchin, *Sebastes zacentrus* | rougheye, *Sebastes aleutianus* |
| shortraker, *Sebastes borealis* | sharpchin, *Sebastes zacentrus* |
| splitnose, *Sebastes diploproa* | shortraker, *Sebastes borealis* |
| yellowmouth, *Sebastes reedi* | yellowmouth, *Sebastes reedi* |

## Appendix B

Port groups used in West Coast Groundfish Observer Program sampling of nearshore commercial fixed-gear groundfish fisheries

| State | Port Group | Port |
|---|---|---|
| OR | Astoria | Astoria / Warrenton |
| | | Pacific City |
| | | Garibaldi (Tillamook) |
| | Newport | Newport |
| | Coos Bay | Bandon |
| | | Charleston (Coos Bay) |
| | | Florence |
| | | Winchester Bay |
| | Southern Oregon | Brookings |
| | | Gold Beach |
| | | Port Orford |
| CA | Crescent City | Crescent City |
| | | Eureka |
| | | Fields Landing |
| | | Trinidad |
| | Fort Bragg | Albion |
| | | Point Arena |
| | | Bodega Bay |
| | | Fort Bragg |
| | Monterey | Oakland |
| | | Richmond |
| | | San Francisco |
| | | San Francisco Area |
| | | Santa Cruz |
| | | Monterey |
| | | Moss Landing |
| | | Princeton (Half Moon Bay) |
| | Morro Bay | Avila |
| | | Morro Bay |
| | | San Luis Obispo Area |
| | | San Simeon |
| | Santa Barbara | Ventura |
| | | Oxnard |
| | | Santa Barbara |
| | Los Angeles | Dana Point Harbor |
| | | Los Angeles Area |
| | | Los Angeles |
| | | Newport Beach |
| | | Oceanside |
| | | San Diego |

Agenda Item E.2.b
Attachment 2
March 2007

# GEOGRAPHIC DISTRIBUTION OF CANARY BYCATCH IN NORTHERN SHELF GROUNDFISH TRAWL FISHERIES OBSERVED BETWEEN JANUARY 2005 AND APRIL 2006.

Estimates of 2005 canary rockfish bycatch occurring in observed groundfish fisheries were completed recently, as part of a report on total fishing mortality in 2005. The amount of canary mortality estimated in the non-whiting groundfish trawl fishery was found to be substantially higher than had been projected during 2005 using bycatch data collected primarily during Exempted Fishing Permit fishing to test the use of selective flatfish gear. The purpose of this report is to review these findings and to present the Council with more detailed information regarding the geographic distribution of canary bycatch which may be of use in managing the 2007 fishery.

As reported in Table 1, the estimated catch of canary by the non-whiting trawl fleet in 2005 was 26 mt, compared with Groundfish Management Team Scorecard estimates that began 8 mt, and were revised upwards to 9.5 mt by April 2006. Of that 26 mt, 21.5 were attributed to estimated discard in the management area north of $40^{o}$10' N. Lat. Table 2 reports the canary bycatch rates that were used to project trawl catch from the October 2005 throughout 2006. Shown below those values are rates calculated using only observer data collected since selective flatfish gear was first required north of $40^{o}$10' N. Lat. in January of 2005. Independent of depth and season, the canary bycatch rates observed since January 2005 are substantially higher than had be used previously to model the northern selective-gear fishery shoreward of the Rockfish Conservation Area.

In an effort to facilitate management consideration of responses to this situation at scales smaller than the entire area north of $40^{o}$10' N. Lat., bycatch data have been summarized for sub-areas of the north coast. The definition of these sub-areas has been guided by two factors: the availability of potential inseason management boundaries in current regulations and the amount of observer data within these areas. Table 3 lists possible sub-area ranges based on management area boundaries and commonly used geographic coordinates, as published in the Federal Register. Based on the need to preserve the confidentiality of observed vessels and to provide statistically significant numbers of observations for deriving bycatch rates, the 17 possible sub-areas north of $40^{o}$10' N. Lat. were combined to form the eight shown on the right side of Table 3.
The observed retained catch of target species and the associated bycatch of canary in each of the eight sub-areas are presented in Table 4, for each of two seasons and depth categories. Within each stratum, the rate of canary bycatch per 100 lb of retained target species is also shown, along with the number of observed hauls. Corresponding stratum totals for the number of hauls and retained target species tonnage included in 2005 trawl logbooks is also provided. During the summer, when the largest amounts of canary bycatch occur, the highest rate was observed in the sub-area between Cape Arago and Humbug Mountain, which encompasses Coquille Bank, however the amount of trawl effort in this area is the lowest of the eight areas defined for this

analysis. The next highest summer rates are found north of Cape Alava and between Leadbetter Point and the Washington-Oregon border. During the winter, the two areas north of the Queets River in Washington have substantially higher rates of canary bycatch than sub-areas to the south, and no winter fishing was observed between Cape Arago and 40$^{o}$10' N. Lat.

These data are intended to illustrate areas along the north coast where higher canary bycatch has been observed. The limited numbers of observations contained within many of these strata do not allow bycatch to be estimated for even smaller strata and therefore bycatch rates to be developed for management consideration using smaller subareas.

Table 1.--Estimated 2005 canary mortality in the non-whiting groundfish trawl fishery.

| | North of 40°10' | South of 40°10' | Total |
|---|---|---|---|
| Non-whiting trawl fishery | | | |
| Landed catch (mt) | 3.7 | 0.7 | 4.4 |
| Estimated discard (mt) | 21.5 | 0.1 | 21.6 |
| Estimated total catch (mt) | 25.2 | 0.7 | 26.0 |
| Groundfish Management Team Scorecard | | | |
| Initial mortality estimate (mt) | | | 8.0 |
| Revised mortality estimate (mt, April 2006) | | | 9.5 |

Table 2.--Comparison of canary bycatch rates used in projecting the 2006 trawl fishery with rates calculated using only data collected after January 2005, for the area north of 40°10' N. Lat. in depths less than 100 fm.

| | Pounds of canary bycatch per 1,000 lb of retained target species [1] | | | Ratio of new-to-old rates | |
|---|---|---|---|---|---|
| | depths <=75 fm | depths <=100 fm | | depths <=75 fm | depths <=100 fm |
| Rates used in late-2005 and 2006 Bycatch Models | | | | | |
| Winter [2] | 0.836 | 3.056 | | | |
| Summer [2] | 0.986 | 1.437 | | | |
| New rates, using only data from January 2005 through April 2006 | | | | | |
| Winter [2] | 3.942 | 4.598 | | 4.7 | 1.5 |
| Summer [2] | 3.571 | 4.585 | | 3.6 | 3.2 |

[1] Target species include retained amounts of all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish.

[2] Winter season includes bi-monthly periods 1, 2, 6 (January-April; November-December); the Summer season includes bi-monthly periods 3, 4, 5 (May-October).

Table 3.--Boundaries of available sub-areas in management area north of 40°10' N. Lat., based on management areas and commonly used geographic coordinates published in the Federal Register, and combined sub-areas used to summarize observed canary bycatch.

| Available sub-areas | Northern boundary | Southern boundary | Combined sub-areas | Northern boundary | Southern boundary |
|---|---|---|---|---|---|
| N. of Cape Alava | Canada | 48.167 | > N. of Cape Alava | Canada | 48.167 |
| Cape Alava - Queets River | 48.167 | 47.528 | > Cape Alava - Queets River | 48.167 | 47.528 |
| Queets River - Pt. Chehalis | 47.528 | 46.888 | > Queets River - Leadbetter Point | 47.528 | 46.636 |
| Pt. Chehalis - Leadbetter Pt. | 46.888 | 46.636 | | | |
| Leadbetter Point - WA/OR border | 46.636 | 46.267 | > Leadbetter Point - WA/OR border | 46.636 | 46.267 |
| WA/OR border - Cape Falcon | 46.267 | 45.767 | > WA/OR border - Cape Lookout | 46.267 | 45.338 |
| Cape Falcon - Cape Lookout | 45.767 | 45.338 | | | |
| Cape Lookout - Cascade Head | 45.338 | 45.064 | > Cape Lookout - Cape Arago | 45.338 | 43.347 |
| Cascade Head - Heceta Head | 45.064 | 44.138 | | | |
| Heceta Head - Cape Arago | 44.138 | 43.347 | | | |
| Cape Arago - Col.-Eureka area border | 43.347 | 43.000 | > Cape Arago - Humbug Mountain | 43.347 | 42.675 |
| Col.-Eureka area border - Cape Blanco | 43.000 | 42.833 | | | |
| Cape Blanco - Humbug Mountain | 42.833 | 42.675 | | | |
| Humbug Mountain - Marck Arch | 42.675 | 42.228 | > Humbug Mountain - 40o10' N. Lat. | 42.675 | 40.167 |
| Marck Arch - OR/CA Border | 42.228 | 42.000 | | | |
| OR/CA Border - Cape Mendocino | 42.000 | 40.500 | | | |
| Cape Mendocino - 40°10' | 40.500 | 40.167 | | | |

Table 4.--Sub-area summary of canary rockfish bycatch observed by the West Coast Groundfish Observer Program from January 2005 through April 2006 on trawl vessels fishing shoreward of the RCA and north of 40°10' N. Latitude, with associated 2005 logbook totals for hauls and retained target tonnage.

| | | All hauls less than 75 fm | | | | | | All hauls less than 100 fm | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Observer data | | | | Logbook data | | Observer data | | | | Logbook data | |
| Northern sub-area | Season [2] | # of hauls in stratum | Target species [1] retained mts | Total canary catch lbs | Canary lb per 100 lb of retained target sp. [1] | # of hauls in stratum | Target species [1] retained mts | # of hauls in stratum | Target species [1] retained mts | Total canary catch lbs | Canary lb per 100 lb of retained target sp. [1] | # of hauls in stratum | Target species [1] retained mts |
| N. of Cape Alava | | | | | | | | | | | | | |
| | Winter | 86 | 39 | 852 | 1.003 | 203 | 119 | 117 | 66 | 1,421 | 0.971 | 272 | 199 |
| | Summer | 93 | 86 | 1,786 | 0.939 | 592 | 543 | 262 | 302 | 6,090 | 0.916 | 1,204 | 1,264 |
| Cape Alava - Queets River | | | | | | | | | | | | | |
| | Winter | 15 | 5 | 59 | 0.525 | 7 | 2 | 34 | 30 | 458 | 0.697 | 58 | 53 |
| | Summer | 136 | 155 | 925 | 0.270 | 560 | 714 | 212 | 237 | 2,198 | 0.420 | 797 | 1,019 |
| Queets River - Leadbetter Point | | | | | | | | | | | | | |
| | Winter | 93 | 43 | 89 | 0.095 | 263 | 143 | 95 | 45 | 89 | 0.090 | 273 | 153 |
| | Summer | 295 | 218 | 499 | 0.104 | 970 | 660 | 306 | 231 | 612 | 0.120 | 1,020 | 700 |
| Leadbetter Point - WA/OR border | | | | | | | | | | | | | |
| | Winter | 52 | 20 | 15 | 0.033 | 83 | 39 | 61 | 25 | 19 | 0.035 | 121 | 73 |
| | Summer | 91 | 95 | 1,521 | 0.722 | 608 | 423 | 111 | 123 | 1,597 | 0.588 | 818 | 562 |
| WA/OR border - Cape Lookout | | | | | | | | | | | | | |
| | Winter | 31 | 8 | 5 | 0.029 | 28 | 10 | 31 | 8 | 5 | 0.029 | 28 | 10 |
| | Summer | 249 | 161 | 505 | 0.143 | 1,325 | 861 | 294 | 208 | 610 | 0.133 | 1,624 | 1,146 |
| Cape Lookout - Cape Arago | | | | | | | | | | | | | |
| | Winter | 13 | 4 | 10 | 0.111 | 28 | 25 | 67 | 31 | 85 | 0.125 | 81 | 62 |
| | Summer | 90 | 48 | 61 | 0.058 | 435 | 300 | 195 | 140 | 582 | 0.188 | 911 | 780 |
| Cape Arago - Humbug Mountain | | | | | | | | | | | | | |
| | Summer | 15 | 6 | 1,083 | 8.178 | 143 | 97 | 45 | 30 | 1,579 | 2.375 | 223 | 175 |
| Humbug Mountain - 40°10' N. Lat. | | | | | | | | | | | | | |
| | Summer | 68 | 58 | 138 | 0.108 | 607 | 454 | 83 | 81 | 410 | 0.230 | 721 | 613 |
| All North of 40°10' N. Lat. | Winter | 290 | 119 | 1,030 | 0.394 | 612 | 340 | 405 | 205 | 2,077 | 0.460 | 833 | 549 |
| | Summer | 1,037 | 828 | 6,519 | 0.357 | 5,240 | 4,052 | 1,508 | 1,353 | 13,678 | 0.459 | 7,318 | 6,259 |
| | Total | 1,327 | 946 | 7,549 | 0.362 | 5,852 | 4,392 | 1,913 | 1,558 | 15,755 | 0.459 | 8,151 | 6,808 |

[1] Target species include retained amounts of all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish.

[2] Winter season includes bi-monthly periods 1, 2, 6 (January-April; November-December); the Summer season includes bi-monthly periods 3, 4, 5 (May-October)

**Summary of Bronzespotted rockfish (*Sebastes gilli*) conservation concerns**

SW Fisheries Science Center Report
February 2007

Bronzespotted rockfish (*Sebastes gilli*) are a large, relatively rare species that occur mainly in Southern California waters, in deep rocky habitats similar to those for cowcod (*S. levis*). During a review of methods for estimating California fish landings being conducted by the SWFSC and CDFG Marine Division, it was noted that commercial landings of bronzespotted rockfish, after rising to an estimated peak of 94 tons in 1982, dropped rapidly in the late 1980s and remained at very low levels (generally less than 1 ton per year) from 1990 to the present (Figure 1). When plotted relative to the Minor shelf south complex within which this species is managed, this suggests that the decline in landings of bronzespotted preceded the decline in both minor shelf and overall landings of rockfish over recent decades. Very limited information is available from recreational fisheries, however what little information does exist suggests that most of the recreational catch comes from rare trips that catch large numbers of bronzespotted rockfish (Figure 2). Anecdotal information suggests that there are distinctive fishing strategies that were used historically to target bronzespotted.

Port sampling data for southern California from 1984 through 1990 is among the most comprehensive in the historical period, suggesting that landings for the period of greatest observed decline were reliably estimated. Bronzespotted are easily identifiable and it is unlikely that they would be mistaken for a different species. Additionally, a metric currently underdevelopment by NMFS and CDFG staff for evaluating the reliability of species-specific landings estimates of rockfish suggests that bronzespotted are one of the 12 top species with respect to the reliability of landings estimates based on a range of criteria (ease of identification, number of market categories that it occurs in). In his comprehensive review of the life history characteristics for 10 species of commercially important or abundant California rockfish, Phillips (1964) cited both cowcod and bronzespotted as two of the species of commercial importance that should be the subject of future studies.

Despite this recommendation, very little is known about the life history of this species. The spatial distribution is described as ranging from Monterey Bay, CA to Punta Colnett (northern Baja California), with a depth distribution ranging from 75 to 413 meters. Preliminary results from a total of 38 aged fish, of sizes ranging from 35 to 70 cm, suggested slow growth and high longevity. Ages ranged from 17-89 years (Figure 3), considerably older than the oldest ages estimated for cowcod. This would indicate that both the natural mortality rate (M) and the Von-Bertalanffy growth coefficient (K) are considerably lower than those estimated for cowcod, suggesting a life history pattern associated with high vulnerability to fishing.

As a result of data limitations, it may be difficult to conduct a quantitative assessment for this stock. Although the protection already provided by Southern California's Cowcod Conservation Area and existing Rockfish Conservation Areas should be sufficient to protect the stock, there may be other measures that would increase protection considerably with only modest impacts to fisheries. For example, imposing a limit of zero fish on recreational and/or commercial fishermen could ensure that targeting does not take place, and would encourage vessels move when they encounter this species. It is unlikely that the measures necessary to provide greater protection to this stock would result in significant impacts on fisheries under the current management regime.

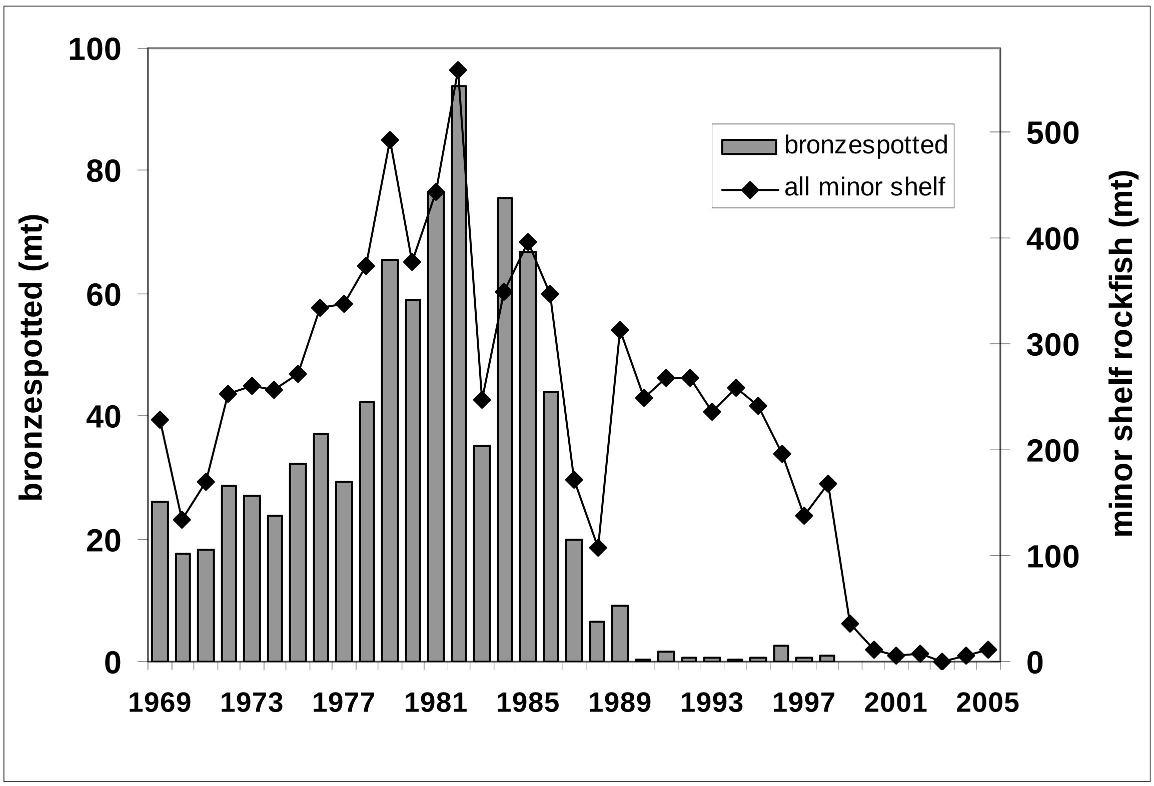


Figure 1. Estimates of commercial landings of bronzespotted rockfish relative to landings of all "Minor shelf" rockfish in the San Diego, Los Angeles and Santa Barbara port groups (CalCOM, January 2007).

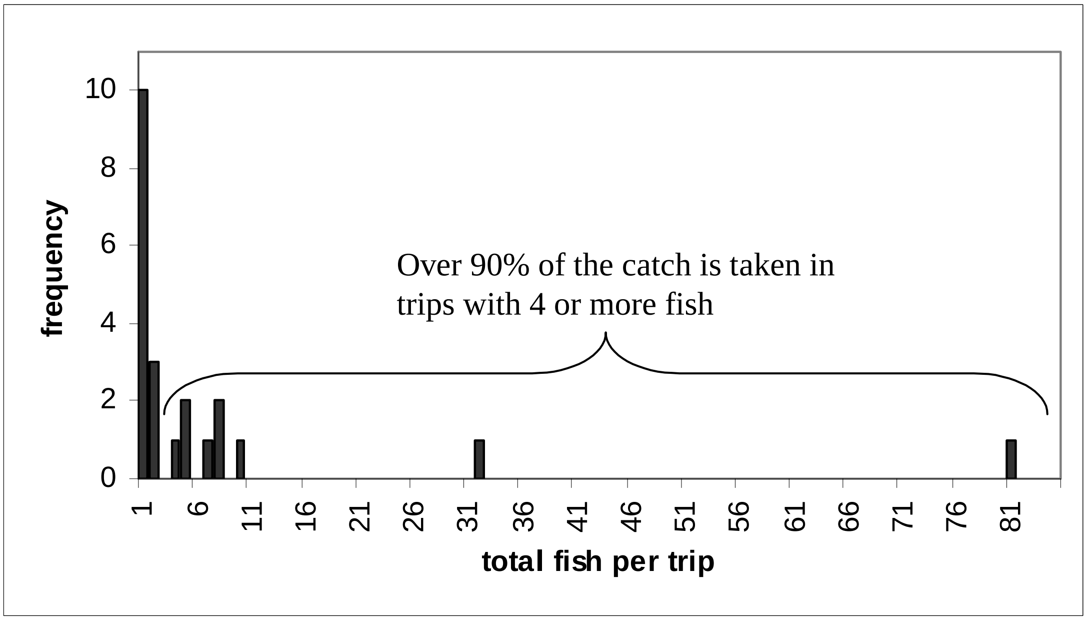


Figure 2: Catch frequency distribution (number of fish per trip) for CPFV trips, suggesting that when bronzespotted rockfish are encountered, they tend to be in clusters.

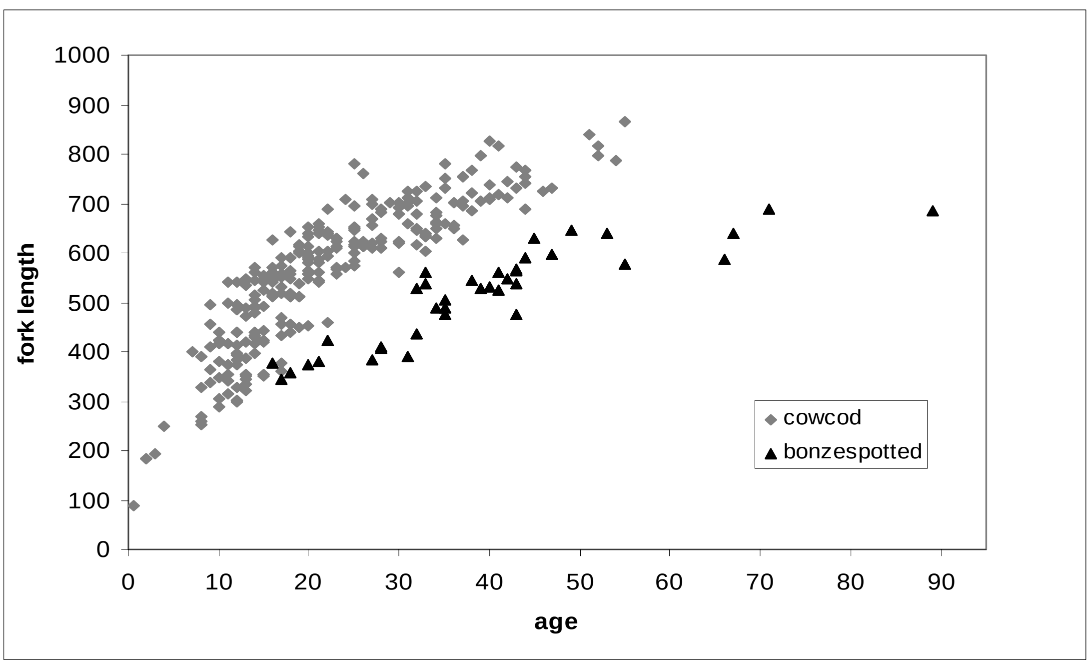


Figure 3: Preliminary age and growth data for bronzespotted rockfish, relative to age and length data used in the most recent (2006) cowcod assessment.

Agenda Item E.3
Situation Summary
March 2007

PACIFIC WHITING HARVEST SPECIFICATIONS
AND MANAGEMENT MEASURES FOR 2007

The Pacific whiting fishery management process is unlike that for other federally-managed West Coast groundfish for 2007 fisheries, for which catch specifications and management measures were adopted by the Council at the June 2006 Council meeting for the two-year period 2007-2008. The Council deferred a decision on setting harvest specifications and management measures for the 2007 Pacific whiting fisheries pending the development and review of a new stock assessment to occur during February 2007. A new Pacific whiting assessment was prepared this winter (Agenda Item E.3.a, Attachments 1 and 2) and reviewed by a Stock Assessment Review (STAR) Panel during February 2007 (Agenda Item E.3.a, Attachment 3). The Council should consider the advice of the STAR Panel, the Scientific and Statistical Committee (SSC), and other advisors before adopting the assessment for use in management decision-making. The assessment, once approved, will be used to set 2007 Pacific whiting harvest specifications and management measures.

In 2004-2006, this transboundary stock was managed jointly with the Department of Fisheries and Oceans, Canada, in the spirit of a new process described in a treaty that has been signed by both countries and recently ratified by the U.S. Senate with the reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act. The primary tenets of the treaty include a joint U.S.-Canada annual assessment and management process (which will presumably be implemented next year), a research commitment, and a harvest sharing agreement providing 73.88% of the coastwide optimum yield (OY) for U.S. fisheries and 26.12% for Canadian fisheries.

The Council is tasked with setting an acceptable biological catch (ABC) and OY for Pacific whiting that will be used to manage 2007 fisheries. Considerations for this decision include the stock's current and projected status with respect to the overfishing threshold, the international agreement with Canada, and overfished species' bycatch concerns.

**<u>Council Action:</u>**

1. **Adopt the 2007 Pacific whiting stock assessment.**
2. **Adopt a 2007 ABC and OY for Pacific whiting.**
3. **Adopt 2007 management measures for Pacific whiting fisheries.**

<u>Reference Materials</u>:

1. Agenda Item E.3.a, Attachment 1: Executive Summary of Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2007.
2. Agenda Item E.3.a, Attachment 2: ***CD copy of*** Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2007.
3. Agenda Item E.3.a, Attachment 3: Report of the Joint Canadian and U.S. Pacific Hake/Whiting Stock Assessment Review Panel.

Agenda Order:

a. Agenda Item Overview John DeVore
b. Reports and Comments of Advisory Bodies
c. Public Comment
d. **Council Action:** Adopt 2007 Stock Assessment, Allowable Biological Catch, Optimum Yield, and Management Measures

PFMC
02/14/07

Agenda Item E.3.a
Attachment 1
March 2007

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# Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2007

***Report of the U.S.-Canada Pacific Hake Joint Technical Committee (JTC)***


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February 14, 2007

## Executive Summary

### *Stock*

This assessment reports the status of the coastal Pacific hake (*Merluccius productus*) resource off the west coast of the United States and Canada. The coastal stock of Pacific hake is currently the most abundant groundfish population in the California Current system. Smaller populations of hake occur in the major inlets of the north Pacific Ocean, including the Strait of Georgia, Puget Sound, and the Gulf of California. However, the coastal stock is distinguished from the inshore populations by larger body size, seasonal migratory behavior, and a pattern of low median recruitment punctuated by extremely large year classes. The population is modeled as a single stock, but the United States and Canadian fishing fleets are treated separately in order to capture some of the spatial variability in Pacific hake distribution.

### *Catches*

Fishery landings from 1966 to 2006 have averaged 162 thousand mt, with a low of 90 thousand mt in 1980 and a peak harvest of 373 thousand mt in 2006. Recent landings have been above the long term average, at 360 thousand mt in 2005, and 360 thousand mt in 2006. Catches in both of these years were predominately comprised by the large 1999 year class. The United States has averaged 159 thousand mt, or 74.6% of the total landings over the time series, with Canadian catch averaging 54 thousand mt. The 2004 and 2005 landings had similar distributions, with 62.9 and 72.1%, respectively, harvested by the United States fishery. The current model assumes no discarding mortality of pacific hake.

Table a. Recent commercial fishery landings (1000s mt).

| Year | US at-sea | US shore based | US Tribal | US total | Canadian foreign and JV | Canadian shore based | Canadian total | Total |
|---|---|---|---|---|---|---|---|---|
| 1996 | 113 | 85 | 15 | 213 | 67 | 26 | 93 | 306 |
| 1997 | 121 | 87 | 25 | 233 | 43 | 49 | 92 | 325 |
| 1998 | 120 | 88 | 25 | 233 | 40 | 48 | 88 | 321 |
| 1999 | 115 | 83 | 26 | 225 | 17 | 70 | 87 | 312 |
| 2000 | 116 | 86 | 7 | 208 | 16 | 6 | 22 | 231 |
| 2001 | 102 | 73 | 7 | 182 | 22 | 32 | 54 | 236 |
| 2002 | 63 | 46 | 23 | 132 | 0 | 51 | 51 | 183 |
| 2003 | 67 | 55 | 21 | 143 | 0 | 62 | 62 | 206 |
| 2004 | 90 | 96 | 24 | 210 | 59 | 65 | 124 | 335 |
| 2005 | 150 | 86 | 24 | 260 | 15 | 85 | 100 | 360 |
| 2006 | 134 | 97 | 35 | 266 | 14 | 80 | 94 | 360 |

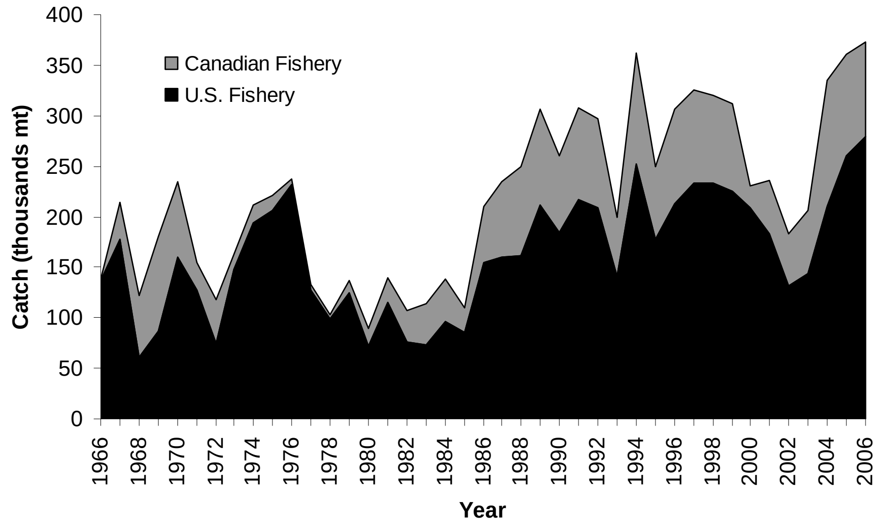



Figure a. Pacific whiting landings (1000s mt) by nation, 1966-2006.

*Data and assessment*

Age-structured assessment models of various forms have been used to assess Pacific hake since the early 1980's, using total fishery catches, fishery age compositions and abundance indices. In 1989, the hake population was modeled using a statistical catch-at-age model (Stock Synthesis) that utilizes fishery catch-at-age data and survey estimates of population biomass and age-composition data (Dorn and Methot, 1991). The model was then converted to AD Model Builder (ADMB) in 1999 by Dorn (1999), using the same basic population dynamics equations. This allowed the assessment to take advantage of ADMB's post-convergence routines to calculate standard errors (or likelihood profiles) for any quantity of interest. Since 2001, Helser et al. (2001, 2003, 2004) have used the same ADMB modeling platform to assess the hake stock and examine important assessment modifications and assumptions, including the time varying nature of the acoustic survey selectivity and catchability. The acoustic survey catchability coefficient ($q$) has been, and continues to be, one of the major sources of uncertainty in the model. Due to the lengthened acoustic survey biomass trends the assessment model was able to freely estimate the acoustic survey $q$. These estimates were substantially below the assumed value of $q$=1.0 from earlier assessments. The 2003 and 2004 assessment presented uncertainty in the final model result as a range of biomass. The lower end of the biomass range was based upon the conventional assumption that the acoustic survey $q$ was equal to 1.0, while the higher end of the range represented a $q$=0.6 assumption. In 2005, the coastal hake stock was modeled using the Stock Synthesis modeling framework (SS2 Version 1.21, December, 2006) which was written by Dr. Richard Methot (Northwest Fisheries Science Center) in AD Model Builder. Conversion of the previous hake model into SS2 was guided by three principles: 1) the incorporation of less derived data, 2) explicitly model the underlying hake growth dynamics, and 3) achieve parsimony[1] in terms on model complexity. "Incorporating less derived data" entailed fitting observed data in their most elemental form. For instance, no pre-processing to convert length data to age compositional data was performed. Also, incorporating conditional age-at-length data, through age-length keys for each fishery and survey, allowed explicit estimation of

[1] Parsimony is defined as a balance between the number of parameters needed to represent a complex state of nature and data quality/quantity to support accurate and precise estimation of those parameters.

expected growth, dispersion about that expectation, and its temporal variability, all conditioned on selectivity.

This year's assessment builds on the same SS2 (Ver 1.23E) approach and incorporates a new coast-wide recruitment index that draws upon data from the expanded SWFSC Santa Cruz and PWCC/NMFS mid water trawl surveys. As in the previous year's assessment, two models are presented to bracket the range of uncertainty in the acoustic survey catchability coefficient, *q*. The base model with steepness fixed at *h*=0.75 and *q*=1.0 represents the endpoint of the lower range while the alternative model which places a prior on *q* (effective *q*=0.7) represents the upper endpoint of the range. As such, model estimates presented below report a range of values representing these endpoints.

*Stock biomass*

Pacific hake spawning biomass declined rapidly after 1984 (4.6-5.1million mt) to the lowest point in the time series in 2000 (0.92-1.15 million mt). This long period of decline was followed by a brief increase to 1.80-2.36 million mt in 2003 as the 1999 year class matured. In 2007 (beginning of year), spawning biomass is estimated to be 1.15 – 1.65 million mt and approximately 32.1%-39.80% of the unfished level. Estimates of uncertainty in level of depletion range from 24.3%-39.7% and 30.7%-48.8% of unfished biomass for the base and alternative models, respectively, based on asymptotic confidence intervals. It should be pointed out that the 2007 estimates of spawning biomass and depletion are not too similar for last years assessment for 2006. The reason for this is that removal of the early SWFSC Santa Cruz pre-recruit time series and inclusion of the new coast-wide pre-recruit index has resulted is a slightly higher 1999, as well as 2003-2004, recruitment strengths.

Table b. Recent trend in Pacific hake spawning biomass and depletion level from the base and alternative SS2 models.

| | Base Model | | | | | | | Alternative Model | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Spawning biomass millions mt | ~ 95% Interval | | | Relative Depletion | ~ 95% Interval | Spawning biomass millions mt | ~ 95% Interval | | | Relative Depletion | ~ 95% Interval |
| 1998 | 1.088 | 0.952 | - | 1.224 | 30.4% | - | 1.299 | 1.335 | - | 1.723 | 31.3% | - |
| 1999 | 0.986 | 0.850 | - | 1.122 | 27.6% | - | 1.203 | 1.219 | - | 1.593 | 29.0% | - |
| 2000 | 0.916 | 0.774 | - | 1.057 | 25.6% | - | 1.149 | 1.113 | - | 1.486 | 27.7% | - |
| 2001 | 1.111 | 0.925 | - | 1.297 | 31.1% | - | 1.424 | 1.013 | - | 1.394 | 34.3% | - |
| 2002 | 1.587 | 1.298 | - | 1.875 | 44.4% | - | 2.058 | 0.946 | - | 1.351 | 49.6% | - |
| 2003 | 1.807 | 1.460 | - | 2.154 | 50.6% | - | 2.360 | 1.147 | - | 1.701 | 56.9% | - |
| 2004 | 1.738 | 1.384 | - | 2.093 | 48.6% | - | 2.295 | 1.624 | - | 2.491 | 55.3% | - |
| 2005 | 1.496 | 1.156 | - | 1.837 | 41.9% | | 2.024 | 1.839 | - | 2.880 | 48.8% | |
| 2006 | 1.295 | 0.954 | - | 1.637 | 36.2% | 28.9% - 43.5% | 1.806 | 1.764 | - | 2.827 | 43.6% | 34.9% - 52.1% |
| 2007 | 1.146 | 0.790 | | 1.502 | 32.1% | 24.3% - 39.7% | 1.651 | 1.514 | | 2.533 | 39.8% | 30.7% - 48.8% |

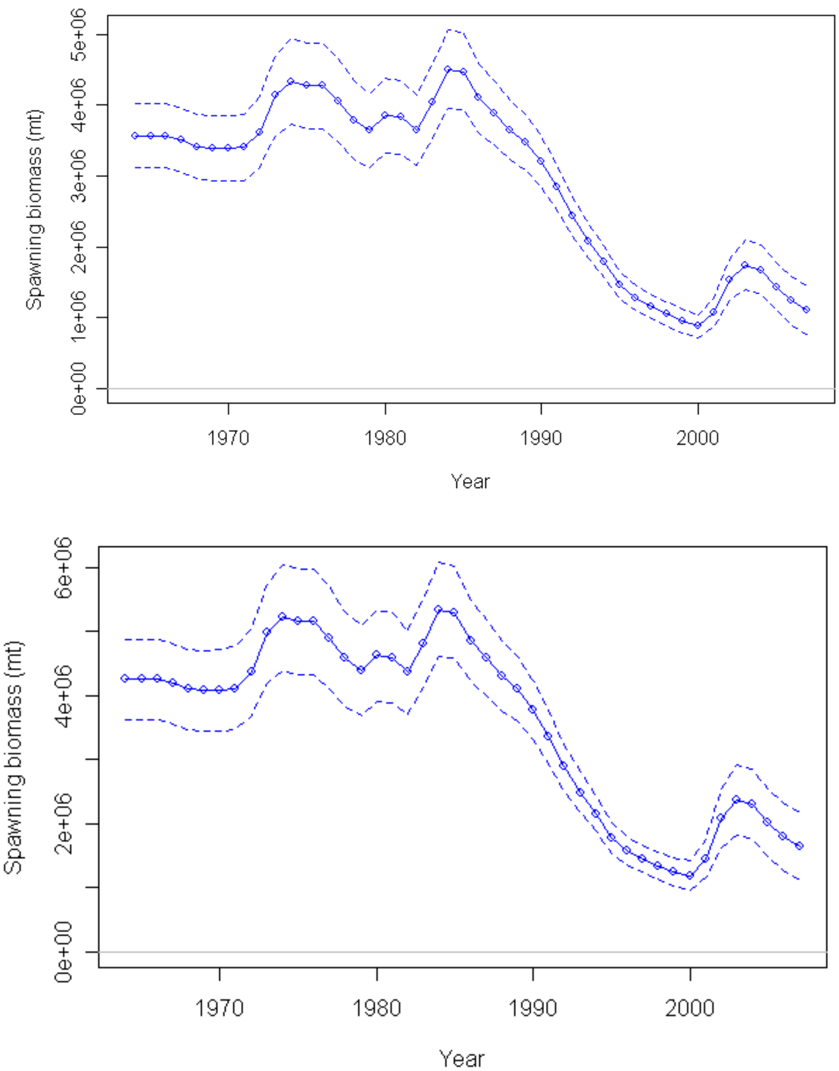



Figure b. Estimated spawning biomass time-series with approximate asymptotic 95% confidence intervals for the base (upper plot) and alternative (lower plot) models.

*Recruitment*

Estimates of Pacific hake recruitment indicate very large year classes in 1980 and 1984, with secondary recruitment events in 1970, 1973 and 1977, earlier in the time series. The recent 1999 year class was the single most dominate cohort since the late 1980s and has in large part support fishery catches during the last few years. Uncertainty in recruitment can be substantial as shown by asymptotic 95% confidence intervals. Recruitment to age 0 before 1967 is assumed to be equal to the long-term mean recruitment. Age-0 recruitment in 2003 is very uncertain, but predicted to be below the mean, despite some evidence to the contrary in the 2005 acoustic survey.

| | Base Model | | | | Alternative Model | | | |
|---|---|---|---|---|---|---|---|---|
| | Recruitment | ~ 95% | | | Recruitment | ~ 95% | | |
| Year | (billions) | Interval | | | (billions) | Interval | | |
| 1998 | 2.887 | 2.435 | - | 3.423 | 3.731 | 2.109 | - | 2.898 |
| 1999 | 14.975 | 12.384 | - | 18.108 | 19.638 | 2.034 | - | 2.911 |
| 2000 | 1.044 | 0.823 | - | 1.323 | 1.373 | 2.977 | - | 4.453 |
| 2001 | 1.423 | 1.106 | - | 1.831 | 1.884 | 15.346 | - | 23.832 |
| 2002 | 0.243 | 0.168 | - | 0.352 | 0.326 | 1.042 | - | 1.761 |
| 2003 | 2.251 | 1.602 | - | 3.164 | 3.048 | 1.426 | - | 2.474 |
| 2004 | 3.030 | 1.795 | - | 5.115 | 4.165 | 0.217 | - | 0.471 |
| 2005 | 1.249 | 0.271 | - | 5.750 | 1.511 | 2.140 | - | 4.348 |
| 2006 | 0.366 | 0.113 | - | 1.187 | 0.474 | 2.413 | - | 6.964 |
| 2007 | 2.094 | 0.353 | - | 12.425 | 2.600 | 0.328 | - | 6.663 |

Table c. Recent estimated trend in Pacific hake recruitment.

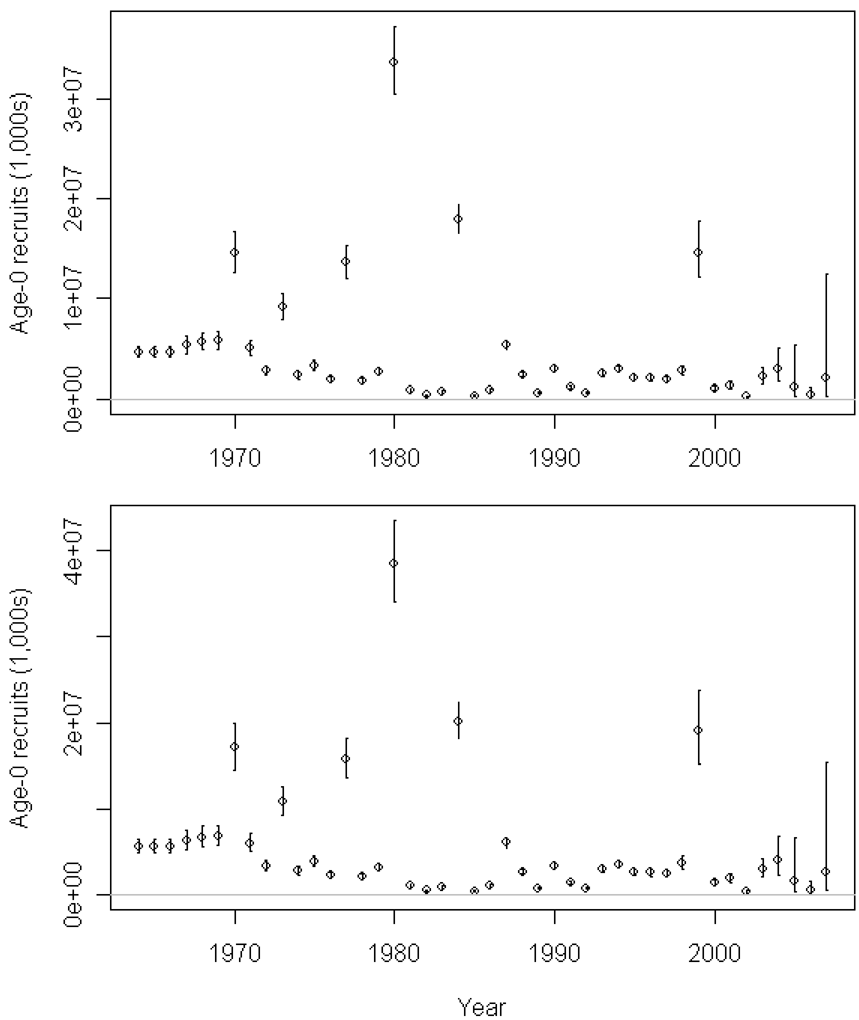
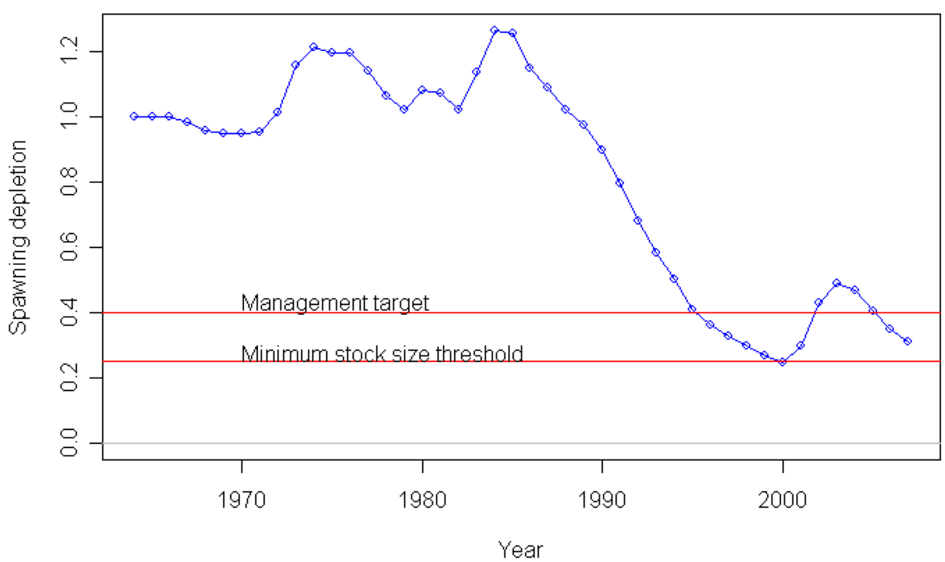



Figure c. Estimated recruitment time-series with approximate asymptotic 95% confidence intervals for the base (upper plot) and alternative (lower plot) models.

*Reference points*

Two types of reference points are reported in this assessment: those based on the assumed population parameters at the beginning of the modeled time period and those based on the most recent time period in a 'forward projection' mode of calculation. This distinction is important since temporal variability in growth and other parameters can result in different biological reference point calculations across alternative chronological periods. All strictly biological reference points (e.g., unexploited spawning biomass) are calculated based on the unexploited conditions at the start of the model, whereas management quantities (MSY, $SB_{msy}$, etc.) are based on the current growth and maturity schedules and are marked throughout this document with an asterisk (*).

Unexploited equilibrium Pacific hake spawning biomass ($B_{zero}$) from the base model was estimated to be 3.57 million mt (~ 95% confidence interval: 3.14 – 4.0 million mt), with a mean expected recruitment of 4.66 billion age-0 hake. Under the alternative model, spawning biomass ($B_{zero}$) from the base model was estimated to be 4.15 million mt (~ 95% confidence interval: 3.57 – 4.73 million mt), with a mean expected recruitment of 5.53 billion age-0 hake. Associated management reference points for target and critical biomass levels for the base model are 1.43 million mt (B40%) and 0.89 million mt (B25%), respectively. Under the alternative model, B40% and B25% are estimated to be 1.66 and 1.04 million mt, respectively. The MSY-proxy harvest amount (F40%) under the base model was estimated to be 531,565* mt (~ 95% confidence interval: 469,581-585,020), and 621,810* mt (~ 95% confidence interval: 535,186-696,527) under the alternative model. The spawning stock biomass that produces the MSY-proxy catch amount under the base model was estimated to be 0.98 million* mt (confidence interval is 0.74-1.20* million mt), and 1.15 million* mt (confidence interval is 0.82 -1.47* million mt) under the alternative model, given current life history parameters.



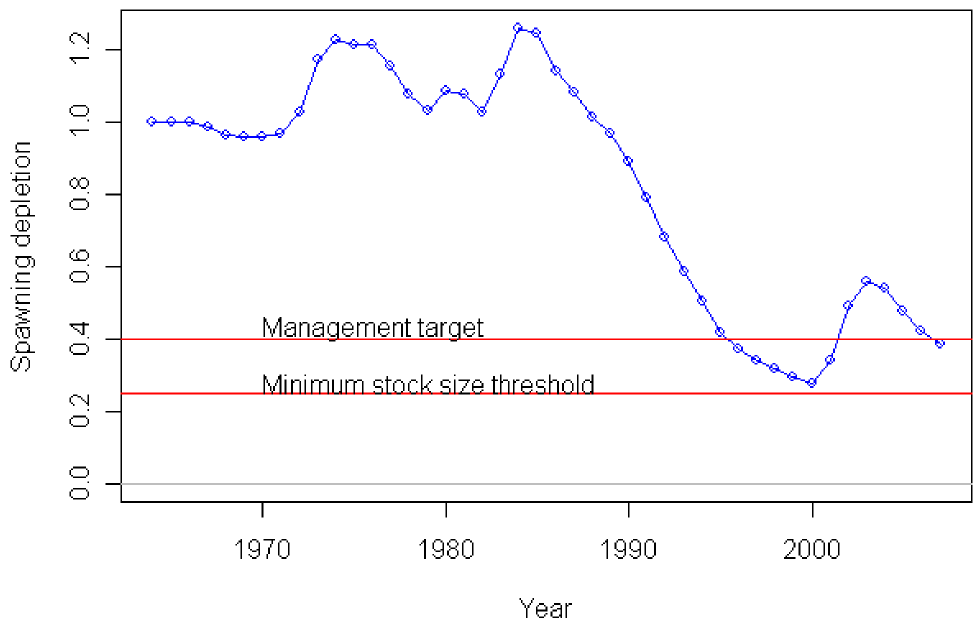


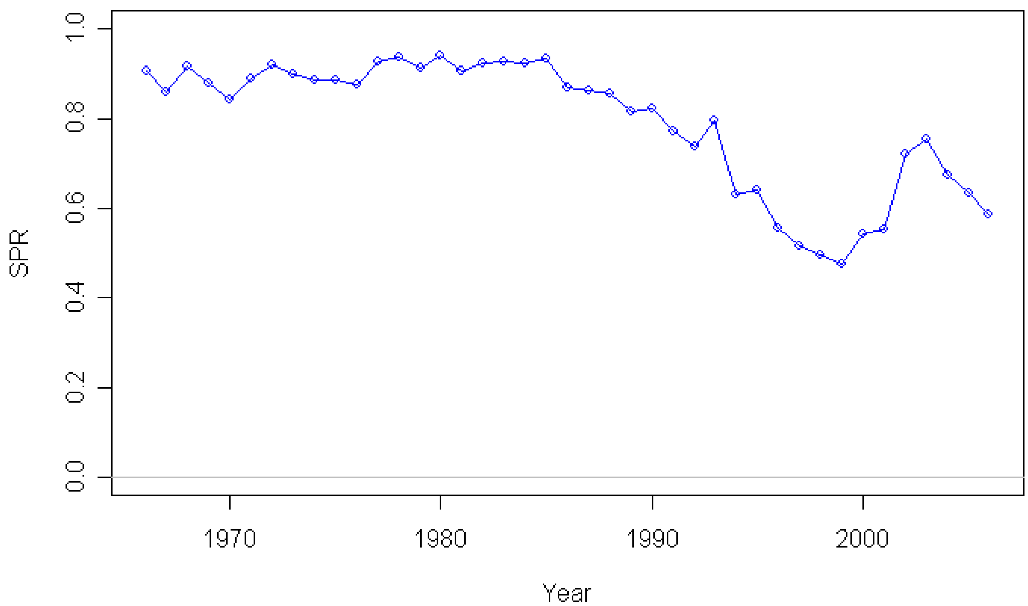

Figure d. Time series of estimated depletion, 1966-2006, for the base (upper plot) and alternative (lower plot) models.

*Exploitation status*

The estimated spawning potential ratio (SPR) for Pacific hake has been above the proxy target of 40% for the history of this fishery. In terms of its exploitation status, Pacific hake are presently below the target biomass level (40% unfished biomass) and above the target SPR rate (40%). The full exploitation history is portrayed graphically below which plots for each year the calculated SPR and spawning biomass level (B) relative to their corresponding targets, F40% and B40%, respectively.

Table d. Recent trend in spawning potential ratio (SPR).

| | Base Model | | alternative Model | |
|---|---|---|---|---|
| Year | Estimated SPR | ~ 95% Interval | Estimated SPR | ~ 95% Interval |
| 1997 | 0.519 | - | 0.569 | - |
| 1998 | 0.498 | - | 0.556 | - |
| 1999 | 0.482 | - | 0.548 | - |
| 2000 | 0.550 | - | 0.624 | - |
| 2001 | 0.562 | - | 0.646 | - |
| 2002 | 0.730 | - | 0.796 | - |
| 2003 | 0.761 | - | 0.823 | - |
| 2004 | 0.683 | - | 0.756 | - |
| 2005 | 0.642 | - | 0.721 | - |
| 2006 | 0.579 | | 0.668 | |



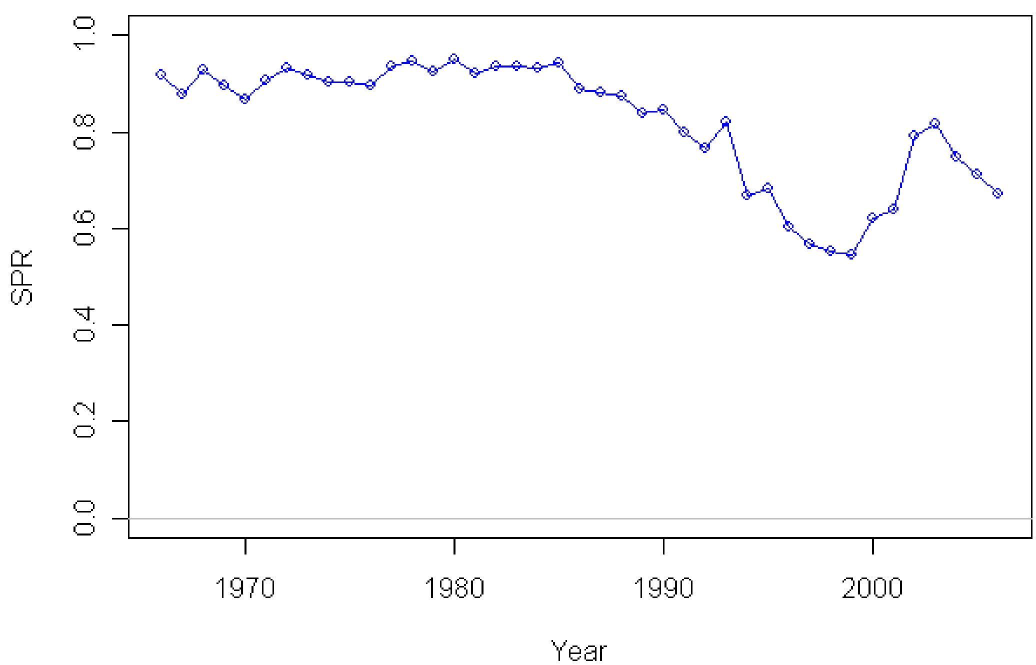
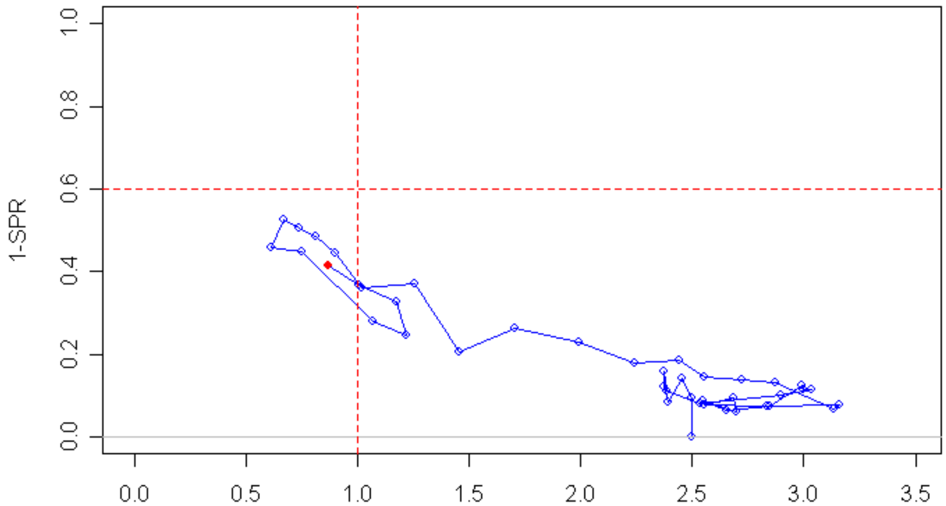




Figure e. Time series of estimated spawning potential ratio from base (upper plot) and alternative (lower plot) models.



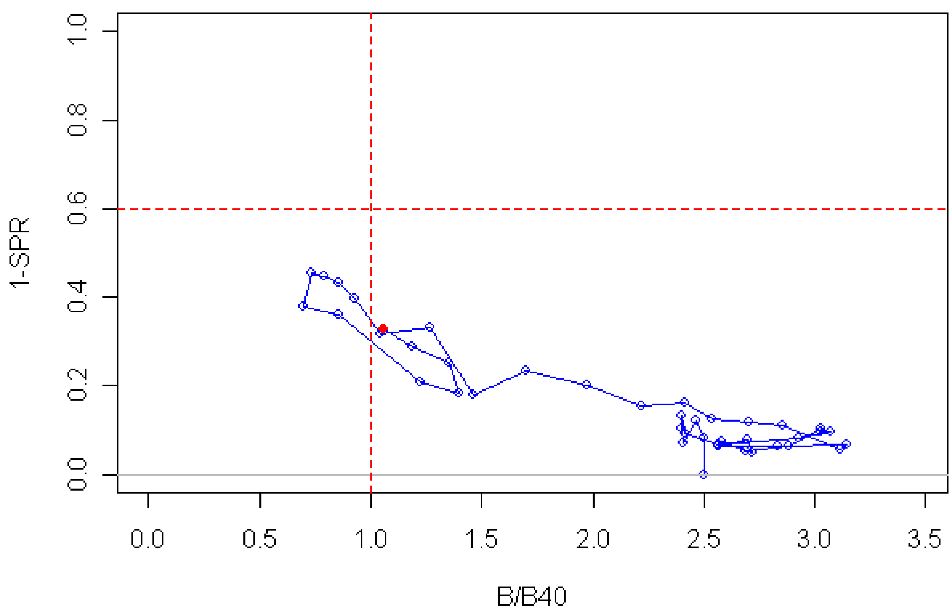




Figure f. Temporal pattern of estimated spawning potential ratio relative to the proxy target of 40% vs estimated spawning biomass relative to the proxy 40% level for base (upper plot) and alternative (lower plot) models.

*Management performance*

Since implementation of the Magnuson Fisheries Conservation and Management Act in the U.S. and the declaration of a 200 mile fishery conservation zone in Canada in the late 1970's, annual quotas have been the primary management tool used to limit the catch of Pacific hake in both zones by foreign and domestic fisheries. The scientists from both countries have collaborated through the Technical Subcommittee of the Canada-US Groundfish Committee (TSC), and there has been informal agreement on the adoption of an annual fishing policy. During the 1990s, however, disagreement between the U.S. and Canada on the division of the acceptable biological catch (ABC) between the two countries led to quota overruns; 1991-1992 quotas summed to 128% of the ABC and quota overruns have averaged 114% from 1991-1999. Since 2000, total catches have been below coastwide ABCs. A recent treaty between the United States and Canada (2003), which awaits final signature, establishes U.S. and Canadian shares of the coastwide allowable biological catch at 73.88% and 26.12%, respectively.

Table e. Recent trend in Pacific hake management performance.

| Year | Total landings (mt) | ABC |
|---|---|---|
| 1996 | 306,100 | 265,000 |
| 1997 | 325,215 | 290,000 |
| 1998 | 320,619 | 290,000 |
| 1999 | 311,855 | 290,000 |
| 2000 | 230,819 | 290,000 |
| 2001 | 235,962 | 238,000 |
| 2002 | 182,883 | 208,000 |
| 2003 | 205,582 | 235,000 |
| 2004 | 334,721 | 514,441 |
| 2005 | 360,306 | 531,124 |
| 2006 | 373,000 | 661,681 |

*Unresolved problems and major uncertainties*

The acoustic survey catchability, *q*, remains uncertain. This is largely driven by an inconsistency in the acoustic survey biomass time series and age compositions; age composition data suggest a large build up of stock biomass in the mid 1980s while the acoustic survey biomass time series is relatively flat since 1977.

*Forecasts*

Forecasts were generated assuming the maximum potential catch would be removed under 40:10 control rule for both the base and alternative models. Projections were based on the relative F contribution of 73.88% and 26.12% coast wide national allocation to the U.S. and Canada, respectively. For base case model, the 2007 coastwide ABC is estimated to be 612,068 mt with an OY of 553,370 mt. Under the alternative model, the 2006 coastwide ABC is estimated to be 904,944 mt with an OY of 883,490 mt. Spawning stock biomass is projected to

decline with a corresponding relative depletion of 24.5% and 29.3% for the base and alternative models, respectively in 2008.

Table f. Three year projection of potential Pacific hake landings, spawning biomass and depletion for the base and alternative models under the 40:10 rule.

| Year | Expected coastwide catch (mt) | Spawning biomass millions mt | | | Depletion percent unfished biomass | | |
|---|---|---|---|---|---|---|---|
| | | Mean | 5% | 95% | Mean | 5% | 95% |
| *Base model, h=0.75, q=1.0* | | | | | | | |
| 2007 | 575,090 | 1.146 | 0.790 | 1.502 | 32.1% | 24.3% | 39.8% |
| 2008 | 377,360 | 0.876 | 0.617 | 1.136 | 24.5% | 19.5% | 29.5% |
| 2009 | 232,040 | 0.690 | 0.472 | 0.909 | 19.3% | 15.0% | 23.6% |
| 2010 | 191,600 | 0.657 | 0.334 | 0.979 | 18.4% | 10.2% | 26.6% |
| *Alt. model, h=0.75, q prior* | | | | | | | |
| 2007 | 878,670 | 1.651 | 1.126 | 2.175 | 39.8% | 30.8% | 48.8% |
| 2008 | 560,070 | 1.215 | 0.844 | 1.585 | 29.3% | 23.6% | 35.0% |
| 2009 | 334,990 | 0.921 | 0.629 | 1.214 | 22.2% | 17.6% | 26.8% |
| 2010 | 258,650 | 0.842 | 0.439 | 1.244 | 20.3% | 11.7% | 28.9% |

*Decision table*

A decision table was constructed to represent the uncertainty on the acoustic survey catchability coefficient, *q*. The base model with a *q*=1.0 represents the lower range while the alternative model which places a prior on *q* (effective *q*=0.7) represents the upper range. Below the decision table shows the consequences of management action given a state of nature. States of nature include the base model (*h*=0.75, *q*=1.0) and the alternative model (*h*=0.75, *q* prior). The management actions include the OY from each state of nature and four constant coastwide catch scenarios.

Table g. Decision table for two states of nature (base and alternative models) and four different harvest strategies given the state of nature.

| | | | State of Nature | |
|---|---|---|---|---|
| **Relative probability** | | | **0.5** | **0.5** |
| **Model** | | | **h = 0.75, q = 1.0** | **h = 0.75, q prior** |
| **Management action** | Total coast-wide Catch (mt) | Year | Relative depletion (2.5%-97.5% interval) | |
| OY Model h=0.75, q=1.0 | 575,090 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 377,360 | 2008 | 0.245 (0.195-0.295) | 0.326 (0.236-0.417) |
| | 232,040 | 2009 | 0.193 (0.150-0.236) | 0.271 (0.180-0.363) |
| | 191,600 | 2010 | 0.184 (0.102-0.266) | 0.257 (0.138-0.376) |
| OY Model h=0.75, q prior | 878,670 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 560,070 | 2008 | 0.208 (0.126-0.290) | 0.293 (0.236-0.350) |
| | 334,990 | 2009 | 0.139 (0.052-0.226) | 0.222 (0.176-0.268) |
| | 258,650 | 2010 | 0.124 (0.008-0.240) | 0.203 (0.117-0.289) |
| Total coast-wide catch = 100,000 mt | 100,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 100,000 | 2008 | 0.305 (0.230-0.379) | 0.377 (0.290-0.463) |
| | 100,000 | 2009 | 0.279 (0204-0.354) | 0.344 (0.259-0.428) |
| | 100,000 | 2010 | 0.274 (0.167-0.381) | 0.333 (0.218-0.447) |
| Total coast-wide catch = 200,000 mt | 200,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 200,000 | 2008 | 0.291 (0.216-0.367) | 0.365 (0.277-0.452) |
| | 200,000 | 2009 | 0.254 (0.177-0.332) | 0.323 (0.233-0.409) |
| | 200,000 | 2010 | 0.239 (0.131-0.348) | 0.303 (0.186-0.419) |
| Total coast-wide catch = 300,000 mt | 300,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 300,000 | 2008 | 0.278 (0.201-0.355) | 0.354 (0.266-0.442) |
| | 300,000 | 2009 | 0.230 (0.150-0.309) | 0.302 (0.213-0.389) |
| | 300,000 | 2010 | 0.205 (0.094-0.316) | 0.273 (0.155-0.392) |
| Total coast-wide catch = 400,000 mt | 400,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 400,000 | 2008 | 0.265 (0.187-0.342) | 0.343 (0.253-0.432) |
| | 400,000 | 2009 | 0.205 (0.124-0.286) | 0.280 (0.190-0.371) |
| | 400,000 | 2010 | 0.170 (0.057-0.283) | 0.244 (0.123-0.364) |

## *Research and data needs*

1) The quantity and quality of biological data prior to 1988 from the Canadian fishery should be evaluated for use in developing length and conditional age at length compositions.
2) Evaluate whether modeling the distinct at-sea and shore based fisheries in the U.S. and Canada explain some lack of fit in the compositional data.
3) Compare spatial distributions of hake across all years and between bottom trawl and acoustic surveys to estimate changes in catchability/availability across years. The two primary issues are related to the changing spatial distribution of the survey as well as the environmental factors that may be responsible for changes in the spatial distribution of hake and their influences on survey catchability and selectivity.

4) Initiate analysis of the acoustic survey data to determine variance estimates for application in the assessment model. The analysis would provide a first cut to define the appropriate CV for the weighting of the acoustic data.
5) Develop an informed prior for the acoustic q. This could be done either with empirical experiments (particularly in off-years for the survey) or in a workshop format with technical experts. There is also the potential to explore putting the target strength estimation in the model directly. This prior should be used in the model when estimating the q parameter.
6) Review the acoustic data to assess whether there are spatial trends in the acoustic survey indices that are not being captured by the model. The analysis should include investigation of the migration (expansion/contraction) of the stock in relation to variation in environmental factors. This would account for potential lack of availability of older animals and how it affects the selectivity function.
7) Investigate aspects of the life history characteristics for Pacific hake and their possible effects on the interrelationship of growth rates and maturity at age. This should include additional data collection of maturity states and fecundity, as current information is limited.
8) Examine the potential use of the CalCOFI data as an index for hake spawning biomass.

Table h. Summary of recent trends in Pacific hake exploitation and stock levels; all values reported at the beginning of the year.

| **Base Model** | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Landings (1000s mt) | 325.2 | 320.6 | 311.9 | 230.8 | 236.0 | 182.9 | 205.6 | 334.7 | 360.3 | 372.3 | NA |
| ABC (1000s mt) | 290 | 290 | 290 | 290 | 238 | 208 | 235 | 514 | 265 | 661 | |
| OY (1000s mt) | | | | | | | | | | | |
| SPR* | 0.520 | 0.500 | 0.483 | 0.551 | 0.562 | 0.729 | 0.760 | 0.679 | 0.637 | 0.588 | NA |
| Total biomass (millions mt) | 2.566 | 2.317 | 2.097 | 1.902 | 1.967 | 4.106 | 3.985 | 3.706 | 3.022 | 2.667 | 2.496 |
| Spawning biomass (millions mt) | 1.197 | 1.088 | 0.986 | 0.916 | 1.111 | 1.587 | 1.807 | 1.738 | 1.496 | 1.295 | 1.146 |
| ~95% interval | 1.063-1.273 | 0.954-1.157 | 0.849-1.054 | 0.767-0.990 | 0.891-1.213 | 1.217-1.746 | 1.358-2.003 | 1.280-1.945 | 1.060-1.703 | 0.857-1.491 | 0.078-1.479 |
| Recruitment (billions) | 1.980 | 2.887 | 14.975 | 1.044 | 1.423 | 0.243 | 2.251 | 3.030 | 1.249 | 0.366 | 2.094 |
| ~95% interval | 1.617-2.245 | 2.271-3.199 | 12.040-17.619 | 0.800-1.283 | 0.972-1.681 | 0.124-0.343 | 1.238-3.233 | 1.737-4.937 | 0.262-5.688 | 0.107-1.128 | 0.353-12.425 |
| Depletion | 33.8% | 30.5% | 27.6% | 25.6% | 31.1% | 44.4% | 50.6% | 48.6% | 41.9% | 36.2% | 32.1% |
| ~95% interval | NA | NA | NA | NA | NA | NA | NA | NA | NAS | 28.9%-43.5% | 24.3%-39.7% |

| **Alternative Model** | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Landings (1000s mt) | 325.2 | 320.6 | 311.9 | 230.8 | 236.0 | 182.9 | 205.6 | 334.7 | 360.3 | 372.3 | NA |
| ABC (1000s mt) | 290 | 290 | 290 | 290 | 238 | 208 | 235 | 514 | 265 | 901 | |
| OY (1000s mt) | | | | | | | | | | | |
| SPR* | 0.567 | 0.553 | 0.544 | 0.620 | 0.640 | 0.791 | 0.818 | 0.750 | 0.713 | 0.673 | NA |
| Total biomass (millions mt) | 3.126 | 2.879 | 2.671 | 2.494 | 2.633 | 5.498 | 5.377 | 4.054 | 4.227 | 3.838 | 3.698 |
| Spawning biomass (millions mt) | 1.406 | 1.299 | 1.203 | 1.149 | 1.424 | 2.058 | 2.360 | 2.295 | 2.024 | 1.806 | 1.651 |
| ~95% interval | 1.150-1.936 | 1.146-1.482 | 1.037-1.368 | 0.934-1.271 | 0.860-1.227 | 1.025-1.551 | 1.437-2.277 | 1.624-2.641 | 1.552-2.598 | 1.322-2.330 | 1.109-2.093 |
| Recruitment (billions) | 2.501 | 3.731 | 19.638 | 1.373 | 1.884 | 0.326 | 3.048 | 4.165 | 1.511 | 0.474 | 2.600 |
| ~95% interval | 2.171-2.884 | 1.893-2.735 | 2.774-4.253 | 13.677-21.956 | 0.953-1.684 | 1.322-2.416 | 0.192-0.505 | 1.978-4.976 | 0.467-5.924 | 0.079-1.315 | 0.428-15.370 |
| Depletion | 33.9% | 31.3% | 29.0% | 27.7% | 34.3% | 49.6% | 56.9% | 55.3% | 48.8% | 43.6% | 39.8% |
| ~95% interval | NA | NA | NA | NA | NA | NA | NA | NA | NA | 34.9%-52.1% | 23.7%-48.8% |

Table i. Summary of Pacific hake reference points.

Base Model

| Quantity | Estimate | ~95% Confidence interval |
|---|---|---|
| Unfished spawning stock biomass ($SB_0$, millions mt) | 3.567 | 3.14 - 4.0 |
| Unfished total biomass ($B_0$, millions mt) | 8.511 | NA |
| Unfished age 3+ biomass (millions mt) | 7.336 | NA |
| Unfished recruitment ($R_0$, billions) | 4.665 | 4.098 – 5.288 |
| Spawning stock biomass at MSY ($SB_{msy}$)* | 0.981 | 0.776 – 1.203 |
| Basis for $SB_{msy}$ | $F_{40\%}$ proxy | NA |
| $SPR_{msy}$* | 40.0% | 33.2%-46.7% |
| Basis for $SPR_{msy}$ | $F_{40\%}$ proxy | NA |
| Exploitation rate corresponding to $SPR_{msy}$* | 24.6% | NA |
| MSY* (mt) | 531,565 | 468,853 – 595,015 |

Alternative Model

| Quantity | Estimate | ~95% Confidence interval |
|---|---|---|
| Unfished spawning stock biomass ($SB_0$, millions mt) | 4.148 | 3.57 – 4.73 |
| Unfished total biomass ($B_0$, millions mt) | 10.220 | NA |
| Unfished age 3+ biomass (millions mt) | 8.869 | NA |
| Unfished recruitment ($R_0$, billions) | 5.534 | 4.796 - 6.420 |
| Spawning stock biomass at MSY ($SB_{msy}$)* | 1.151 | 0.821 - 1.472 |
| Basis for $SB_{msy}$ | $F_{40\%}$ proxy | NA |
| $SPR_{msy}$* | 40.0% | 33.2%-46.7% |
| Basis for $SPR_{msy}$ | $F_{40\%}$ proxy | NA |
| Exploitation rate corresponding to $SPR_{msy}$* | 24.6% | NA |
| MSY* (mt) | 621,810 | 535,186 – 696,527 |

# Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2007

## *Report of the U.S.-Canada Pacific Hake Joint Technical Committee (JTC)*

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February 14, 2007

## Executive Summary

*Stock*

This assessment reports the status of the coastal Pacific hake (*Merluccius productus*) resource off the west coast of the United States and Canada. The coastal stock of Pacific hake is currently the most abundant groundfish population in the California Current system. Smaller populations of hake occur in the major inlets of the north Pacific Ocean, including the Strait of Georgia, Puget Sound, and the Gulf of California. However, the coastal stock is distinguished from the inshore populations by larger body size, seasonal migratory behavior, and a pattern of low median recruitment punctuated by extremely large year classes. The population is modeled as a single stock, but the United States and Canadian fishing fleets are treated separately in order to capture some of the spatial variability in Pacific hake distribution.

*Catches*

Fishery landings from 1966 to 2006 have averaged 162 thousand mt, with a low of 90 thousand mt in 1980 and a peak harvest of 373 thousand mt in 2006. Recent landings have been above the long term average, at 360 thousand mt in 2005, and 360 thousand mt in 2006. Catches in both of these years were predominately comprised by the large 1999 year class. The United States has averaged 159 thousand mt, or 74.6% of the total landings over the time series, with Canadian catch averaging 54 thousand mt. The 2004 and 2005 landings had similar distributions, with 62.9 and 72.1%, respectively, harvested by the United States fishery. The current model assumes no discarding mortality of pacific hake.

Table a. Recent commercial fishery landings (1000s mt).

| Year | US at-sea | US shore based | US Tribal | US total | Canadian foreign and JV | Canadian shore based | Canadian total | Total |
|---|---|---|---|---|---|---|---|---|
| 1996 | 113 | 85 | 15 | 213 | 67 | 26 | 93 | 306 |
| 1997 | 121 | 87 | 25 | 233 | 43 | 49 | 92 | 325 |
| 1998 | 120 | 88 | 25 | 233 | 40 | 48 | 88 | 321 |
| 1999 | 115 | 83 | 26 | 225 | 17 | 70 | 87 | 312 |
| 2000 | 116 | 86 | 7 | 208 | 16 | 6 | 22 | 231 |
| 2001 | 102 | 73 | 7 | 182 | 22 | 32 | 54 | 236 |
| 2002 | 63 | 46 | 23 | 132 | 0 | 51 | 51 | 183 |
| 2003 | 67 | 55 | 21 | 143 | 0 | 62 | 62 | 206 |
| 2004 | 90 | 96 | 24 | 210 | 59 | 65 | 124 | 335 |
| 2005 | 150 | 86 | 24 | 260 | 15 | 85 | 100 | 360 |
| 2006 | 134 | 97 | 35 | 266 | 14 | 80 | 94 | 360 |

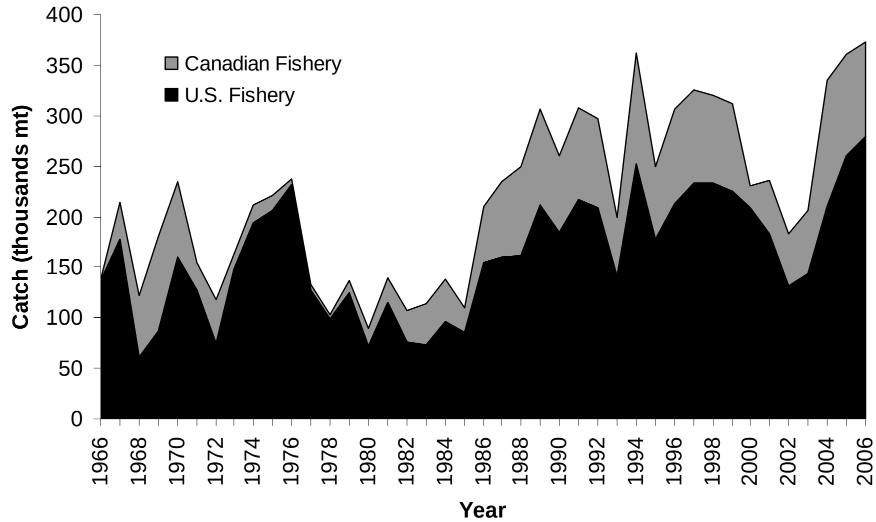



Figure a. Pacific whiting landings (1000s mt) by nation, 1966-2006.

*Data and assessment*

Age-structured assessment models of various forms have been used to assess Pacific hake since the early 1980's, using total fishery catches, fishery age compositions and abundance indices. In 1989, the hake population was modeled using a statistical catch-at-age model (Stock Synthesis) that utilizes fishery catch-at-age data and survey estimates of population biomass and age-composition data (Dorn and Methot, 1991). The model was then converted to AD Model Builder (ADMB) in 1999 by Dorn (1999), using the same basic population dynamics equations. This allowed the assessment to take advantage of ADMB's post-convergence routines to calculate standard errors (or likelihood profiles) for any quantity of interest. Since 2001, Helser et al. (2001, 2003, 2004) have used the same ADMB modeling platform to assess the hake stock and examine important assessment modifications and assumptions, including the time varying nature of the acoustic survey selectivity and catchability. The acoustic survey catchability coefficient ($q$) has been, and continues to be, one of the major sources of uncertainty in the model. Due to the lengthened acoustic survey biomass trends the assessment model was able to freely estimate the acoustic survey $q$. These estimates were substantially below the assumed value of $q$=1.0 from earlier assessments. The 2003 and 2004 assessment presented uncertainty in the final model result as a range of biomass. The lower end of the biomass range was based upon the conventional assumption that the acoustic survey $q$ was equal to 1.0, while the higher end of the range represented a $q$=0.6 assumption. In 2005, the coastal hake stock was modeled using the Stock Synthesis modeling framework (SS2 Version 1.21, December, 2006) which was written by Dr. Richard Methot (Northwest Fisheries Science Center) in AD Model Builder. Conversion of the previous hake model into SS2 was guided by three principles: 1) the incorporation of less derived data, 2) explicitly model the underlying hake growth dynamics, and 3) achieve parsimony[1] in terms on model complexity. "Incorporating less derived data" entailed fitting observed data in their most elemental form. For instance, no pre-processing to convert length data to age compositional data was performed. Also, incorporating conditional age-at-length data, through age-length keys for each fishery and survey, allowed explicit estimation of

[1] Parsimony is defined as a balance between the number of parameters needed to represent a complex state of nature and data quality/quantity to support accurate and precise estimation of those parameters.

expected growth, dispersion about that expectation, and its temporal variability, all conditioned on selectivity.

This year's assessment builds on the same SS2 (Ver 1.23E) approach and incorporates a new coast-wide recruitment index that draws upon data from the expanded SWFSC Santa Cruz and PWCC/NMFS mid water trawl surveys. As in the previous year's assessment, two models are presented to bracket the range of uncertainty in the acoustic survey catchability coefficient, $q$. The base model with steepness fixed at $h$=0.75 and $q$=1.0 represents the endpoint of the lower range while the alternative model which places a prior on $q$ (effective $q$=0.7) represents the upper endpoint of the range. As such, model estimates presented below report a range of values representing these endpoints.

*Stock biomass*

Pacific hake spawning biomass declined rapidly after 1984 (4.6-5.1million mt) to the lowest point in the time series in 2000 (0.92-1.15 million mt). This long period of decline was followed by a brief increase to 1.80-2.36 million mt in 2003 as the 1999 year class matured. In 2007 (beginning of year), spawning biomass is estimated to be 1.15 – 1.65 million mt and approximately 32.1%-39.80% of the unfished level. Estimates of uncertainty in level of depletion range from 24.3%-39.7% and 30.7%-48.8% of unfished biomass for the base and alternative models, respectively, based on asymptotic confidence intervals. It should be pointed out that the 2007 estimates of spawning biomass and depletion are not too similar for last years assessment for 2006. The reason for this is that removal of the early SWFSC Santa Cruz pre-recruit time series and inclusion of the new coast-wide pre-recruit index has resulted is a slightly higher 1999, as well as 2003-2004, recruitment strengths.

Table b. Recent trend in Pacific hake spawning biomass and depletion level from the base and alternative SS2 models.

| | Base Model | | | | Alternative Model | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Spawning biomass millions mt | ~ 95% Interval | Relative Depletion | ~ 95% Interval | Spawning biomass millions mt | ~ 95% Interval | Relative Depletion | ~ 95% Interval |
| 1998 | 1.088 | 0.952 - 1.224 | 30.4% | - | 1.299 | 1.335 - 1.723 | 31.3% | - |
| 1999 | 0.986 | 0.850 - 1.122 | 27.6% | - | 1.203 | 1.219 - 1.593 | 29.0% | - |
| 2000 | 0.916 | 0.774 - 1.057 | 25.6% | - | 1.149 | 1.113 - 1.486 | 27.7% | - |
| 2001 | 1.111 | 0.925 - 1.297 | 31.1% | - | 1.424 | 1.013 - 1.394 | 34.3% | - |
| 2002 | 1.587 | 1.298 - 1.875 | 44.4% | - | 2.058 | 0.946 - 1.351 | 49.6% | - |
| 2003 | 1.807 | 1.460 - 2.154 | 50.6% | - | 2.360 | 1.147 - 1.701 | 56.9% | - |
| 2004 | 1.738 | 1.384 - 2.093 | 48.6% | - | 2.295 | 1.624 - 2.491 | 55.3% | - |
| 2005 | 1.496 | 1.156 - 1.837 | 41.9% | | 2.024 | 1.839 - 2.880 | 48.8% | |
| 2006 | 1.295 | 0.954 - 1.637 | 36.2% | 28.9% - 43.5% | 1.806 | 1.764 - 2.827 | 43.6% | 34.9% - 52.1% |
| 2007 | 1.146 | 0.790 1.502 | 32.1% | 24.3% - 39.7% | 1.651 | 1.514 2.533 | 39.8% | 30.7% - 48.8% |

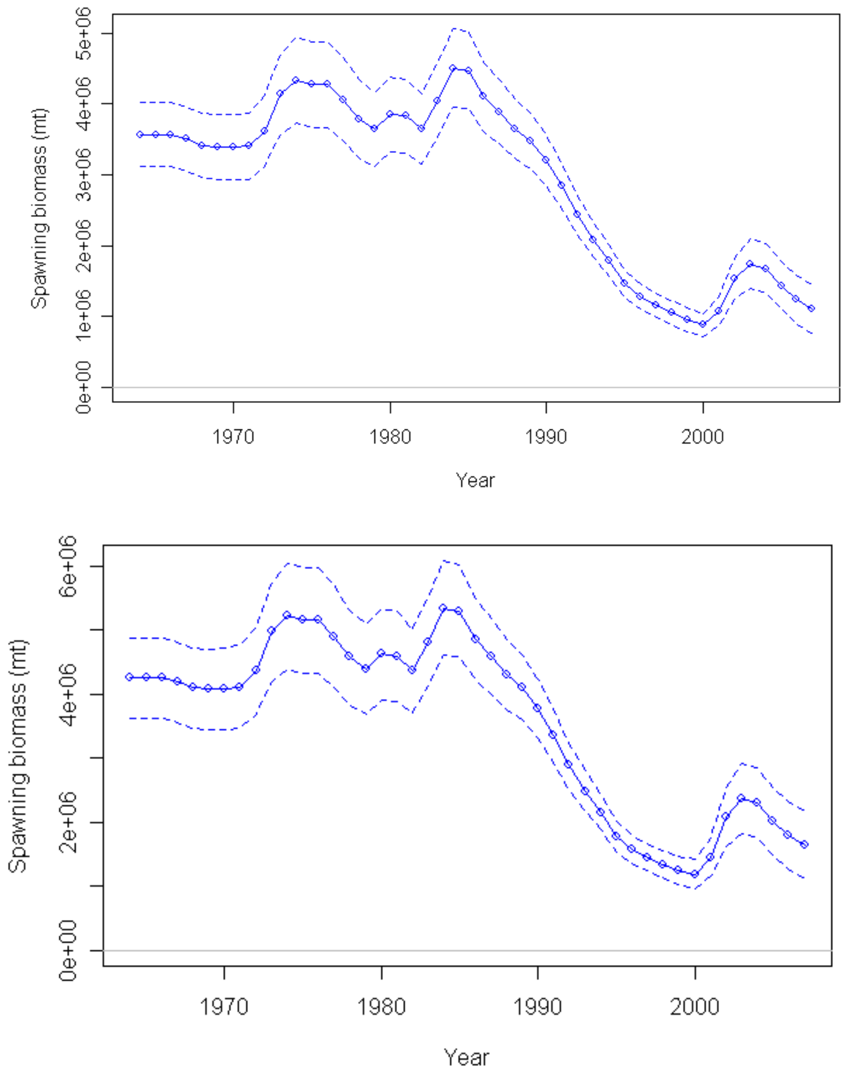



Figure b. Estimated spawning biomass time-series with approximate asymptotic 95% confidence intervals for the base (upper plot) and alternative (lower plot) models.

*Recruitment*

Estimates of Pacific hake recruitment indicate very large year classes in 1980 and 1984, with secondary recruitment events in 1970, 1973 and 1977, earlier in the time series. The recent 1999 year class was the single most dominate cohort since the late 1980s and has in large part support fishery catches during the last few years. Uncertainty in recruitment can be substantial as shown by asymptotic 95% confidence intervals. Recruitment to age 0 before 1967 is assumed to be equal to the long-term mean recruitment. Age-0 recruitment in 2003 is very uncertain, but predicted to be below the mean, despite some evidence to the contrary in the 2005 acoustic survey.

| | Base Model | | | | Alternative Model | | | |
|---|---|---|---|---|---|---|---|---|
| | Recruitment | ~ 95% | | | Recruitment | ~ 95% | | |
| Year | (billions) | Interval | | | (billions) | Interval | | |
| 1998 | 2.887 | 2.435 | - | 3.423 | 3.731 | 2.109 | - | 2.898 |
| 1999 | 14.975 | 12.384 | - | 18.108 | 19.638 | 2.034 | - | 2.911 |
| 2000 | 1.044 | 0.823 | - | 1.323 | 1.373 | 2.977 | - | 4.453 |
| 2001 | 1.423 | 1.106 | - | 1.831 | 1.884 | 15.346 | - | 23.832 |
| 2002 | 0.243 | 0.168 | - | 0.352 | 0.326 | 1.042 | - | 1.761 |
| 2003 | 2.251 | 1.602 | - | 3.164 | 3.048 | 1.426 | - | 2.474 |
| 2004 | 3.030 | 1.795 | - | 5.115 | 4.165 | 0.217 | - | 0.471 |
| 2005 | 1.249 | 0.271 | - | 5.750 | 1.511 | 2.140 | - | 4.348 |
| 2006 | 0.366 | 0.113 | - | 1.187 | 0.474 | 2.413 | - | 6.964 |
| 2007 | 2.094 | 0.353 | - | 12.425 | 2.600 | 0.328 | - | 6.663 |

Table c. Recent estimated trend in Pacific hake recruitment.

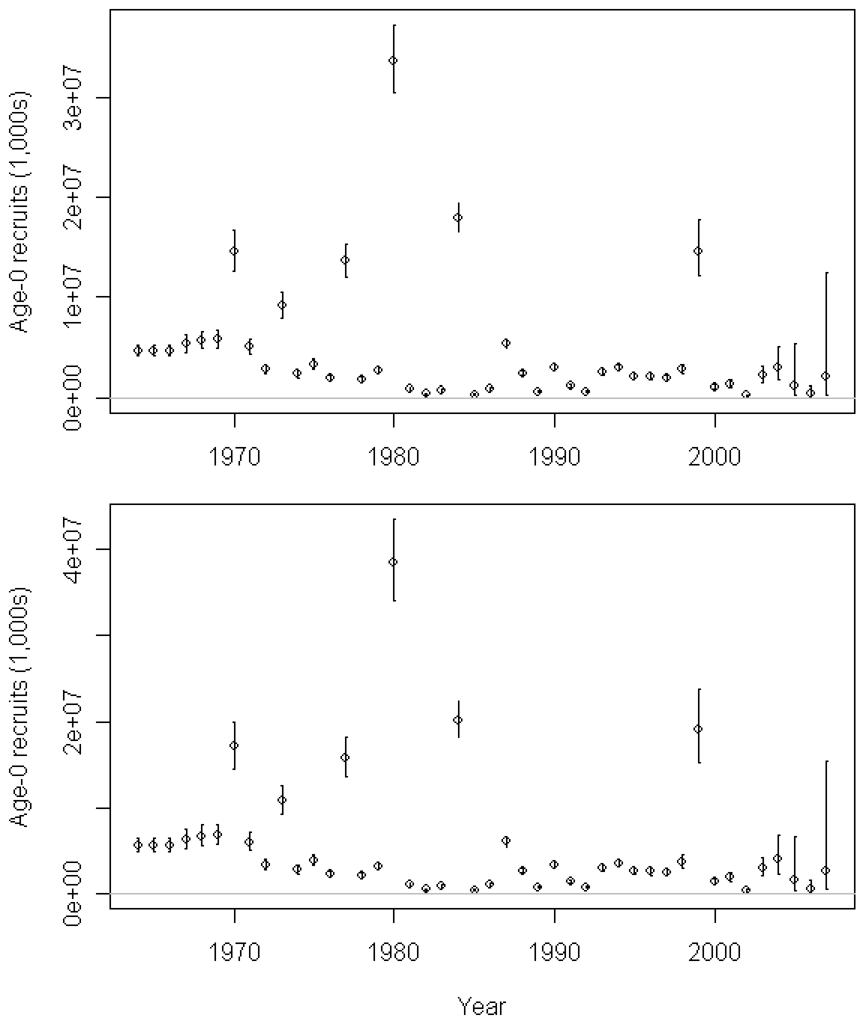
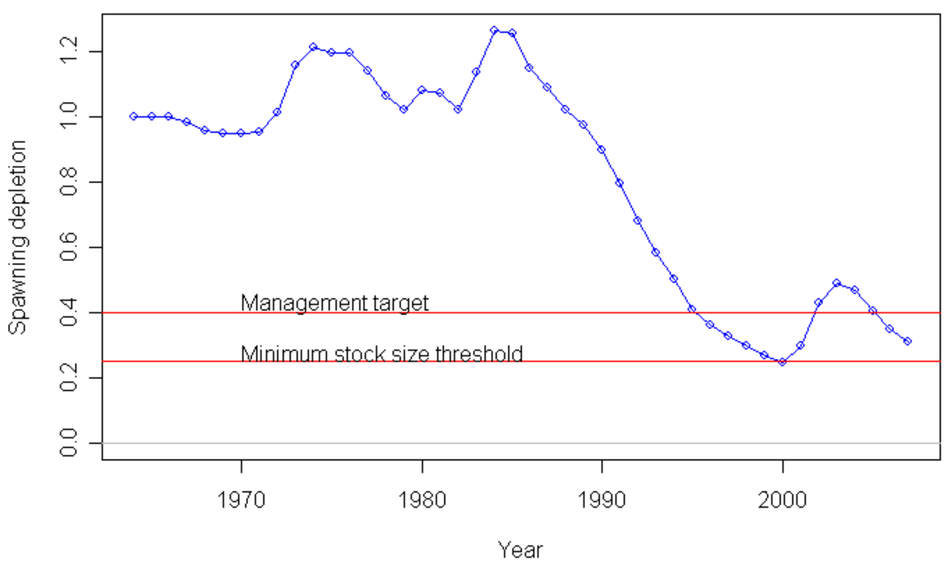



Figure c. Estimated recruitment time-series with approximate asymptotic 95% confidence intervals for the base (upper plot) and alternative (lower plot) models.

*Reference points*

Two types of reference points are reported in this assessment: those based on the assumed population parameters at the beginning of the modeled time period and those based on the most recent time period in a 'forward projection' mode of calculation. This distinction is important since temporal variability in growth and other parameters can result in different biological reference point calculations across alternative chronological periods. All strictly biological reference points (e.g., unexploited spawning biomass) are calculated based on the unexploited conditions at the start of the model, whereas management quantities (MSY, $SB_{msy}$, etc.) are based on the current growth and maturity schedules and are marked throughout this document with an asterisk (*).

Unexploited equilibrium Pacific hake spawning biomass ($B_{zero}$) from the base model was estimated to be 3.57 million mt (~ 95% confidence interval: 3.14 – 4.0 million mt), with a mean expected recruitment of 4.66 billion age-0 hake. Under the alternative model, spawning biomass ($B_{zero}$) from the base model was estimated to be 4.15 million mt (~ 95% confidence interval: 3.57 – 4.73 million mt), with a mean expected recruitment of 5.53 billion age-0 hake. Associated management reference points for target and critical biomass levels for the base model are 1.43 million mt (B40%) and 0.89 million mt (B25%), respectively. Under the alternative model, B40% and B25% are estimated to be 1.66 and 1.04 million mt, respectively. The MSY-proxy harvest amount (F40%) under the base model was estimated to be 531,565* mt (~ 95% confidence interval: 469,581-585,020), and 621,810* mt (~ 95% confidence interval: 535,186-696,527) under the alternative model. The spawning stock biomass that produces the MSY-proxy catch amount under the base model was estimated to be 0.98 million* mt (confidence interval is 0.74-1.20* million mt), and 1.15 million* mt (confidence interval is 0.82 -1.47* million mt) under the alternative model, given current life history parameters.



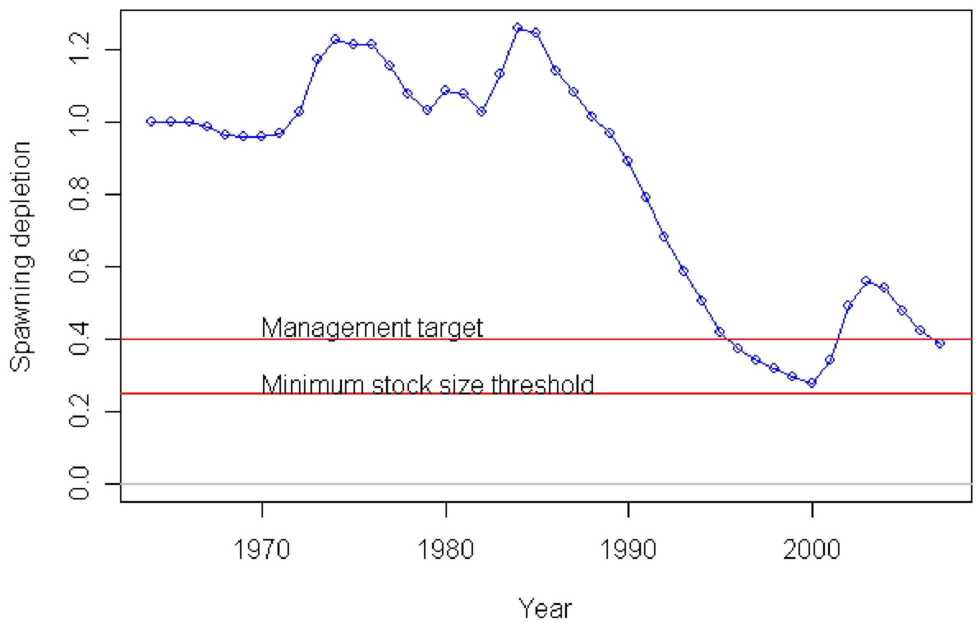


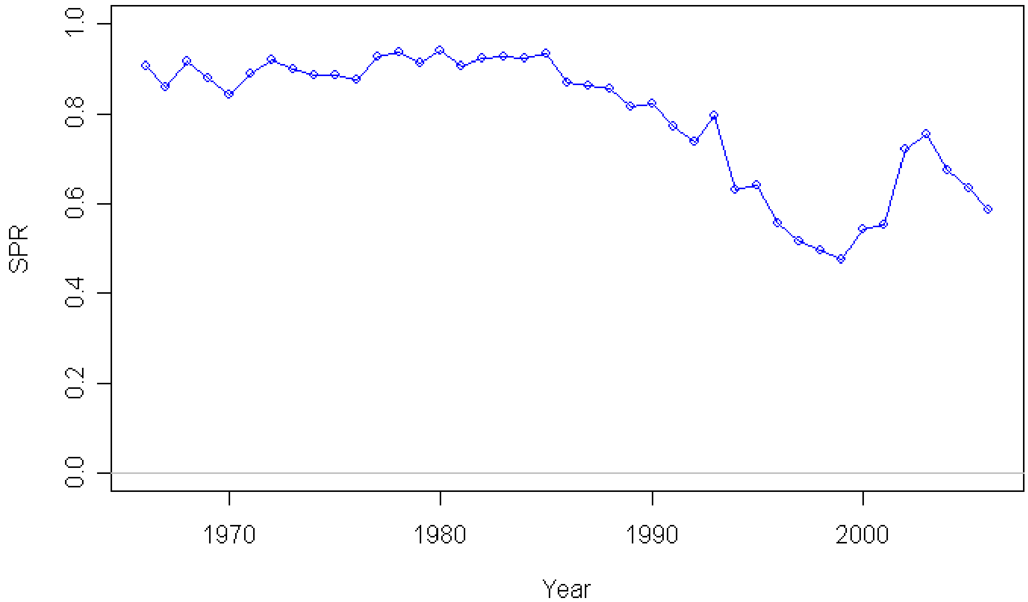

Figure d. Time series of estimated depletion, 1966-2006, for the base (upper plot) and alternative (lower plot) models.

*Exploitation status*

The estimated spawning potential ratio (SPR) for Pacific hake has been above the proxy target of 40% for the history of this fishery. In terms of its exploitation status, Pacific hake are presently below the target biomass level (40% unfished biomass) and above the target SPR rate (40%). The full exploitation history is portrayed graphically below which plots for each year the calculated SPR and spawning biomass level (B) relative to their corresponding targets, F40% and B40%, respectively.

Table d. Recent trend in spawning potential ratio (SPR).

| | Base Model | | alternative Model | |
|---|---|---|---|---|
| Year | Estimated SPR | ~ 95% Interval | Estimated SPR | ~ 95% Interval |
| 1997 | 0.519 | - | 0.569 | - |
| 1998 | 0.498 | - | 0.556 | - |
| 1999 | 0.482 | - | 0.548 | - |
| 2000 | 0.550 | - | 0.624 | - |
| 2001 | 0.562 | - | 0.646 | - |
| 2002 | 0.730 | - | 0.796 | - |
| 2003 | 0.761 | - | 0.823 | - |
| 2004 | 0.683 | - | 0.756 | - |
| 2005 | 0.642 | - | 0.721 | - |
| 2006 | 0.579 | | 0.668 | |



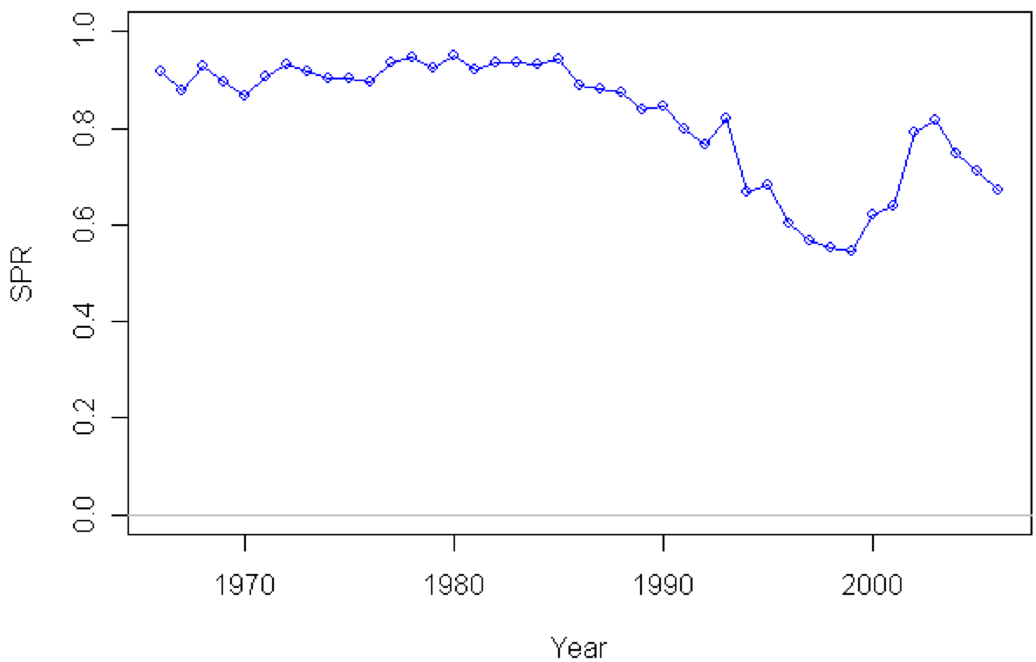
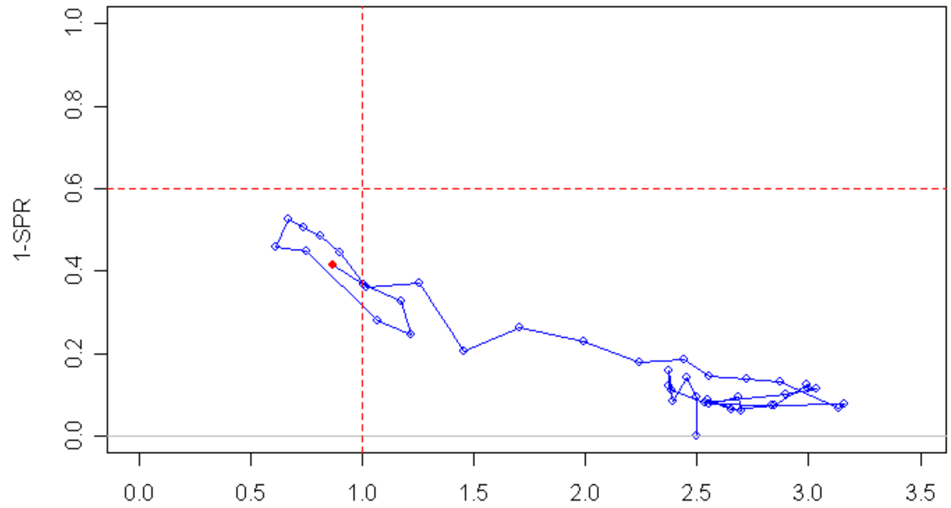




Figure e. Time series of estimated spawning potential ratio from base (upper plot) and alternative (lower plot) models.



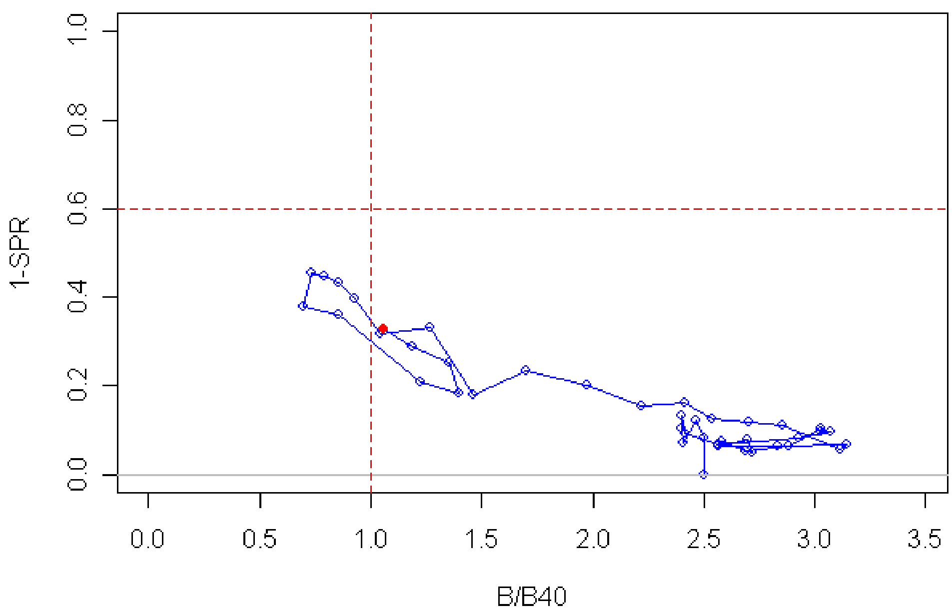




Figure f. Temporal pattern of estimated spawning potential ratio relative to the proxy target of 40% vs estimated spawning biomass relative to the proxy 40% level for base (upper plot) and alternative (lower plot) models.

*Management performance*

Since implementation of the Magnuson Fisheries Conservation and Management Act in the U.S. and the declaration of a 200 mile fishery conservation zone in Canada in the late 1970's, annual quotas have been the primary management tool used to limit the catch of Pacific hake in both zones by foreign and domestic fisheries. The scientists from both countries have collaborated through the Technical Subcommittee of the Canada-US Groundfish Committee (TSC), and there has been informal agreement on the adoption of an annual fishing policy. During the 1990s, however, disagreement between the U.S. and Canada on the division of the acceptable biological catch (ABC) between the two countries led to quota overruns; 1991-1992 quotas summed to 128% of the ABC and quota overruns have averaged 114% from 1991-1999. Since 2000, total catches have been below coastwide ABCs. A recent treaty between the United States and Canada (2003), which awaits final signature, establishes U.S. and Canadian shares of the coastwide allowable biological catch at 73.88% and 26.12%, respectively.

Table e. Recent trend in Pacific hake management performance.

| Year | Total landings (mt) | ABC |
|---|---|---|
| 1996 | 306,100 | 265,000 |
| 1997 | 325,215 | 290,000 |
| 1998 | 320,619 | 290,000 |
| 1999 | 311,855 | 290,000 |
| 2000 | 230,819 | 290,000 |
| 2001 | 235,962 | 238,000 |
| 2002 | 182,883 | 208,000 |
| 2003 | 205,582 | 235,000 |
| 2004 | 334,721 | 514,441 |
| 2005 | 360,306 | 531,124 |
| 2006 | 373,000 | 661,681 |

*Unresolved problems and major uncertainties*

The acoustic survey catchability, *q,* remains uncertain. This is largely driven by an inconsistency in the acoustic survey biomass time series and age compositions; age composition data suggest a large build up of stock biomass in the mid 1980s while the acoustic survey biomass time series is relatively flat since 1977.

*Forecasts*

Forecasts were generated assuming the maximum potential catch would be removed under 40:10 control rule for both the base and alternative models. Projections were based on the relative F contribution of 73.88% and 26.12% coast wide national allocation to the U.S. and Canada, respectively. For base case model, the 2007 coastwide ABC is estimated to be 612,068 mt with an OY of 553,370 mt. Under the alternative model, the 2006 coastwide ABC is estimated to be 904,944 mt with an OY of 883,490 mt. Spawning stock biomass is projected to

decline with a corresponding relative depletion of 24.5% and 29.3% for the base and alternative models, respectively in 2008.

Table f. Three year projection of potential Pacific hake landings, spawning biomass and depletion for the base and alternative models under the 40:10 rule.

| Year | Expected coastwide catch (mt) | Spawning biomass millions mt | | | Depletion percent unfished biomass | | |
|---|---|---|---|---|---|---|---|
| | | Mean | 5% | 95% | Mean | 5% | 95% |
| *Base model, h=0.75, q=1.0* | | | | | | | |
| 2007 | 575,090 | 1.146 | 0.790 | 1.502 | 32.1% | 24.3% | 39.8% |
| 2008 | 377,360 | 0.876 | 0.617 | 1.136 | 24.5% | 19.5% | 29.5% |
| 2009 | 232,040 | 0.690 | 0.472 | 0.909 | 19.3% | 15.0% | 23.6% |
| 2010 | 191,600 | 0.657 | 0.334 | 0.979 | 18.4% | 10.2% | 26.6% |
| *Alt. model, h=0.75, q prior* | | | | | | | |
| 2007 | 878,670 | 1.651 | 1.126 | 2.175 | 39.8% | 30.8% | 48.8% |
| 2008 | 560,070 | 1.215 | 0.844 | 1.585 | 29.3% | 23.6% | 35.0% |
| 2009 | 334,990 | 0.921 | 0.629 | 1.214 | 22.2% | 17.6% | 26.8% |
| 2010 | 258,650 | 0.842 | 0.439 | 1.244 | 20.3% | 11.7% | 28.9% |

### *Decision table*

A decision table was constructed to represent the uncertainty on the acoustic survey catchability coefficient, $q$. The base model with a $q$=1.0 represents the lower range while the alternative model which places a prior on $q$ (effective $q$=0.7) represents the upper range. Below the decision table shows the consequences of management action given a state of nature. States of nature include the base model ($h$=0.75, $q$=1.0) and the alternative model ($h$=0.75, $q$ prior). The management actions include the OY from each state of nature and four constant coastwide catch scenarios.

Table g. Decision table for two states of nature (base and alternative models) and four different harvest strategies given the state of nature.

| | | | State of Nature | |
|---|---|---|---|---|
| **Relative probability** | | | **0.5** | **0.5** |
| **Model** | | | **h = 0.75, q = 1.0** | **h = 0.75, q prior** |
| **Management action** | Total coast-wide Catch (mt) | Year | Relative depletion (2.5%-97.5% interval) | |
| OY Model h=0.75, q=1.0 | 575,090 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 377,360 | 2008 | 0.245 (0.195-0.295) | 0.326 (0.236-0.417) |
| | 232,040 | 2009 | 0.193 (0.150-0.236) | 0.271 (0.180-0.363) |
| | 191,600 | 2010 | 0.184 (0.102-0.266) | 0.257 (0.138-0.376) |
| OY Model h=0.75, q prior | 878,670 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 560,070 | 2008 | 0.208 (0.126-0.290) | 0.293 (0.236-0.350) |
| | 334,990 | 2009 | 0.139 (0.052-0.226) | 0.222 (0.176-0.268) |
| | 258,650 | 2010 | 0.124 (0.008-0.240) | 0.203 (0.117-0.289) |
| Total coast-wide | 100,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 100,000 mt | 100,000 | 2008 | 0.305 (0.230-0.379) | 0.377 (0.290-0.463) |
| | 100,000 | 2009 | 0.279 (0204-0.354) | 0.344 (0.259-0.428) |
| | 100,000 | 2010 | 0.274 (0.167-0.381) | 0.333 (0.218-0.447) |
| Total coast-wide | 200,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 200,000 mt | 200,000 | 2008 | 0.291 (0.216-0.367) | 0.365 (0.277-0.452) |
| | 200,000 | 2009 | 0.254 (0.177-0.332) | 0.323 (0.233-0.409) |
| | 200,000 | 2010 | 0.239 (0.131-0.348) | 0.303 (0.186-0.419) |
| Total coast-wide | 300,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 300,000 mt | 300,000 | 2008 | 0.278 (0.201-0.355) | 0.354 (0.266-0.442) |
| | 300,000 | 2009 | 0.230 (0.150-0.309) | 0.302 (0.213-0.389) |
| | 300,000 | 2010 | 0.205 (0.094-0.316) | 0.273 (0.155-0.392) |
| Total coast-wide | 400,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 400,000 mt | 400,000 | 2008 | 0.265 (0.187-0.342) | 0.343 (0.253-0.432) |
| | 400,000 | 2009 | 0.205 (0.124-0.286) | 0.280 (0.190-0.371) |
| | 400,000 | 2010 | 0.170 (0.057-0.283) | 0.244 (0.123-0.364) |

### *Research and data needs*

1) The quantity and quality of biological data prior to 1988 from the Canadian fishery should be evaluated for use in developing length and conditional age at length compositions.
2) Evaluate whether modeling the distinct at-sea and shore based fisheries in the U.S. and Canada explain some lack of fit in the compositional data.
3) Compare spatial distributions of hake across all years and between bottom trawl and acoustic surveys to estimate changes in catchability/availability across years. The two primary issues are related to the changing spatial distribution of the survey as well as the environmental factors that may be responsible for changes in the spatial distribution of hake and their influences on survey catchability and selectivity.

4) Initiate analysis of the acoustic survey data to determine variance estimates for application in the assessment model. The analysis would provide a first cut to define the appropriate CV for the weighting of the acoustic data.
5) Develop an informed prior for the acoustic q. This could be done either with empirical experiments (particularly in off-years for the survey) or in a workshop format with technical experts. There is also the potential to explore putting the target strength estimation in the model directly. This prior should be used in the model when estimating the q parameter.
6) Review the acoustic data to assess whether there are spatial trends in the acoustic survey indices that are not being captured by the model. The analysis should include investigation of the migration (expansion/contraction) of the stock in relation to variation in environmental factors. This would account for potential lack of availability of older animals and how it affects the selectivity function.
7) Investigate aspects of the life history characteristics for Pacific hake and their possible effects on the interrelationship of growth rates and maturity at age. This should include additional data collection of maturity states and fecundity, as current information is limited.
8) Examine the potential use of the CalCOFI data as an index for hake spawning biomass.

Table h. Summary of recent trends in Pacific hake exploitation and stock levels; all values reported at the beginning of the year.

| **Base Model** | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Landings (1000s mt) | 325.2 | 320.6 | 311.9 | 230.8 | 236.0 | 182.9 | 205.6 | 334.7 | 360.3 | 372.3 | NA |
| ABC (1000s mt) | 290 | 290 | 290 | 290 | 238 | 208 | 235 | 514 | 265 | 661 | |
| OY (1000s mt) | | | | | | | | | | | |
| SPR* | 0.520 | 0.500 | 0.483 | 0.551 | 0.562 | 0.729 | 0.760 | 0.679 | 0.637 | 0.588 | NA |
| Total biomass (millions mt) | 2.566 | 2.317 | 2.097 | 1.902 | 1.967 | 4.106 | 3.985 | 3.706 | 3.022 | 2.667 | 2.496 |
| Spawning biomass | | | | | | | | | | | |
| (millions mt) | 1.197 | 1.088 | 0.986 | 0.916 | 1.111 | 1.587 | 1.807 | 1.738 | 1.496 | 1.295 | 1.146 |
| ~95% interval | 1.063- | 0.954- | 0.849- | 0.767- | 0.891- | 1.217- | 1.358- | 1.280- | 1.060- | 0.857- | 0.078- |
| | 1.273 | 1.157 | 1.054 | 0.990 | 1.213 | 1.746 | 2.003 | 1.945 | 1.703 | 1.491 | 1.479 |
| Recruitment (billions) | 1.980 | 2.887 | 14.975 | 1.044 | 1.423 | 0.243 | 2.251 | 3.030 | 1.249 | 0.366 | 2.094 |
| ~95% interval | 1.617- | 2.271- | 12.040- | 0.800- | 0.972- | 0.124- | 1.238- | 1.737- | 0.262- | 0.107- | 0.353- |
| | 2.245 | 3.199 | 17.619 | 1.283 | 1.681 | 0.343 | 3.233 | 4.937 | 5.688 | 1.128 | 12.425 |
| Depletion | 33.8% | 30.5% | 27.6% | 25.6% | 31.1% | 44.4% | 50.6% | 48.6% | 41.9% | 36.2% | 32.1% |
| ~95% interval | | | | | | | | | | 28.9%- | 24.3%- |
| | NA | NA | NA | NA | NA | NA | NA | NA | NAS | 43.5% | 39.7% |

| **Alternative Model** | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Landings (1000s mt) | 325.2 | 320.6 | 311.9 | 230.8 | 236.0 | 182.9 | 205.6 | 334.7 | 360.3 | 372.3 | NA |
| ABC (1000s mt) | 290 | 290 | 290 | 290 | 238 | 208 | 235 | 514 | 265 | 901 | |
| OY (1000s mt) | | | | | | | | | | | |
| SPR* | 0.567 | 0.553 | 0.544 | 0.620 | 0.640 | 0.791 | 0.818 | 0.750 | 0.713 | 0.673 | NA |
| Total biomass (millions mt) | 3.126 | 2.879 | 2.671 | 2.494 | 2.633 | 5.498 | 5.377 | 4.054 | 4.227 | 3.838 | 3.698 |
| Spawning biomass | | | | | | | | | | | |
| (millions mt) | 1.406 | 1.299 | 1.203 | 1.149 | 1.424 | 2.058 | 2.360 | 2.295 | 2.024 | 1.806 | 1.651 |
| ~95% interval | 1.150- | 1.146- | 1.037- | 0.934- | 0.860- | 1.025- | 1.437- | 1.624- | 1.552- | 1.322- | 1.109- |
| | 1.936 | 1.482 | 1.368 | 1.271 | 1.227 | 1.551 | 2.277 | 2.641 | 2.598 | 2.330 | 2.093 |
| Recruitment (billions) | 2.501 | 3.731 | 19.638 | 1.373 | 1.884 | 0.326 | 3.048 | 4.165 | 1.511 | 0.474 | 2.600 |
| ~95% interval | 2.171- | 1.893- | 2.774- | 13.677- | 0.953- | 1.322- | 0.192- | 1.978- | 0.467- | 0.079- | 0.428- |
| | 2.884 | 2.735 | 4.253 | 21.956 | 1.684 | 2.416 | 0.505 | 4.976 | 5.924 | 1.315 | 15.370 |
| Depletion | 33.9% | 31.3% | 29.0% | 27.7% | 34.3% | 49.6% | 56.9% | 55.3% | 48.8% | 43.6% | 39.8% |
| ~95% interval | | | | | | | | | | 34.9%- | 23.7%- |
| | NA | NA | NA | NA | NA | NA | NA | NA | NA | 52.1% | 48.8% |

Table i. Summary of Pacific hake reference points.

Base Model

| Quantity | Estimate | ~95% Confidence interval |
|---|---|---|
| Unfished spawning stock biomass (*$SB_0$*, millions mt) | 3.567 | 3.14 - 4.0 |
| Unfished total biomass (*$B_0$*, millions mt) | 8.511 | NA |
| Unfished age 3+ biomass (millions mt) | 7.336 | NA |
| Unfished recruitment (*$R_0$*, billions) | 4.665 | 4.098 – 5.288 |
| Spawning stock biomass at MSY (*$SB_{msy}$*)* | 0.981 | 0.776 – 1.203 |
| Basis for *$SB_{msy}$* | $F_{40\%}$ proxy | NA |
| *$SPR_{msy}$** | 40.0% | 33.2%-46.7% |
| Basis for *$SPR_{msy}$* | $F_{40\%}$ proxy | NA |
| Exploitation rate corresponding to *$SPR_{msy}$** | 24.6% | NA |
| MSY* (mt) | 531,565 | 468,853 – 595,015 |

Alternative Model

| Quantity | Estimate | ~95% Confidence interval |
|---|---|---|
| Unfished spawning stock biomass (*$SB_0$*, millions mt) | 4.148 | 3.57 – 4.73 |
| Unfished total biomass (*$B_0$*, millions mt) | 10.220 | NA |
| Unfished age 3+ biomass (millions mt) | 8.869 | NA |
| Unfished recruitment (*$R_0$*, billions) | 5.534 | 4.796 - 6.420 |
| Spawning stock biomass at MSY (*$SB_{msy}$*)* | 1.151 | 0.821 - 1.472 |
| Basis for *$SB_{msy}$* | $F_{40\%}$ proxy | NA |
| *$SPR_{msy}$** | 40.0% | 33.2%-46.7% |
| Basis for *$SPR_{msy}$* | $F_{40\%}$ proxy | NA |
| Exploitation rate corresponding to *$SPR_{msy}$** | 24.6% | NA |
| MSY* (mt) | 621,810 | 535,186 – 696,527 |

## INTRODUCTION

This assessment was undertaken according to the terms and conditions of the Treaty "Agreement between the Government of the United States and the Government of Canada on Pacific Hake/Whiting", signed at Seattle, Washington, on November 21, 2003. Under this agreement, which was ratified as part of the reauthorization of the Magnuson-Stevens Act by Congress, Pacific hake (a.k.a. Pacific whiting) stock assessments are to be prepared by the Hake Technical Working Group comprised of U.S. and Canadian scientists and reviewed by a Scientific Review Group (SRG), with memberships as appointed by both parties to the agreement. While these entities have not been formally established, the current assessment was cooperatively prepared and reviewed as outlined in this agreement. As background, separate Canadian and U.S. assessments were submitted to each nation's assessment review process prior to 1997. In the past, this practice has resulted in differing yield options being forwarded to each country's managers for this single, yet shared trans-boundary fish stock. Multiple interpretations of Pacific hake status made it difficult to coordinate overall management policy. To address this problem, the working group agreed in 1997 to present scientific advice in a single collaborative assessment, while that agreement was officially formalized in 2003. To further advance the coordination of scientific advice on Pacific hake, this report was submitted to a joint Canada-U.S. SRG for technical review in fulfillment of the agreement and to satisfy management responsibilities of both the U.S. Pacific Fisheries Management Council (PFMC) and the Canadian Pacific Stock Assessment Review Committee (PSARC). The Review Group meeting was held in Seattle, WA at the Northwest Fisheries Science Center, during Feb 5-9, 2007.

### Stock Structure and Life History

Pacific hake (*Merluccius productus*), also referred to as Pacific whiting, is a codlike species distributed along the west coast of North America generally ranging from $25^0$ N. to $51^0$ N. latitude. It is among about 11 other species of hakes from the genus, *Merluccidae*, which are distributed worldwide in both hemispheres of the Atlantic and Pacific Oceans and collectively constitute nearly two million mt of catch annually (Alheit and Pitcher 1995). The coastal stock of Pacific hake is currently the most abundant groundfish population in the California Current system. Smaller populations of this species occur in the major inlets of the North Pacific Ocean, including the Strait of Georgia, Puget Sound, and the Gulf of California. Electrophoretic studies indicate that Strait of Georgia and the Puget Sound populations are genetically distinct from the coastal population (Utter 1971). Genetic differences have also been found between the coastal population and hake off the west coast of Baja California (Vrooman and Paloma 1977). The coastal stock is distinguished from the inshore populations by larger body size, seasonal migratory behavior, and a pattern of low median recruitment punctuated by extremely large year classes.

The coastal stock of Pacific hake typically ranges from the waters off southern California to Queen Charlotte Sound. Distributions of eggs, larvae, and infrequent observations of spawning aggregations indicate that Pacific hake spawning occurs off south-central California during January-March. Due to the difficulty of locating major offshore spawning concentrations, details of spawning behavior of hake remains poorly understood (Saunders and McFarlane 1997). In spring, adult Pacific hake migrate onshore and to the north to feed along the continental shelf and slope from northern California to Vancouver Island. In summer, Pacific hake form extensive midwater aggregations in association with the continental shelf break, with highest densities located over bottom depths of 200-300 m (Dorn et al. 1994). Pacific hake feed on euphausiids, pandalid shrimp, and pelagic schooling fish (such as eulachon and Pacific herring) (Livingston and Bailey 1985). Larger Pacific hake become increasingly piscivorous, and Pacific herring are commonly a large component of hake diet off Vancouver Island. Although Pacific hake are cannibalistic, the geographic separation of juveniles and adults usually prevents cannibalism from being an important factor in their population dynamics (Buckley and Livingston 1997).

Older (age 5+), larger, and predominantly female hake exhibit the greatest northern migration each season. During El Niño events, a larger proportion of the stock migrates into Canadian waters, apparently due to intensified northward transport during the period of active migration (Dorn 1995). Range extensions to the north also occur during El Niño conditions, as evidenced by reports of hake from southeast Alaska during these warm water years. Throughout the warm period experienced in 1990s, there have been changes in typical patterns of hake distribution: Spawning activity has been recorded north of California, and frequent reports of unusual numbers of juveniles from Oregon to British Columbia suggest that juvenile settlement patterns have also shifted northwards in the late 1990s. Because of this shift, juveniles may be subjected to increased predation from cannibalism and to increased vulnerability to fishing mortality. Subsequently, La Nina conditions apparently caused a southward shift in the center of the stock's distribution and a smaller portion of the population was found in Canadian waters in the 2001 survey.

**Fisheries**

The fishery for the coastal population of Pacific hake occurs primarily during April-November along the coasts of northern California, Oregon, Washington, and British Columbia. The fishery is conducted almost exclusively with midwater trawls. Most fishing activity occurs over bottom depths of 100-500 m, but offshore extensions of fishing activity have occurred. The history of the coastal hake fishery is characterized by rapid changes brought about by the development of foreign fisheries in 1966, joint-venture fisheries in the early 1980's, and domestic fisheries in 1990's (Fig. 1).

Large-scale harvesting of Pacific hake in the U.S. zone began in 1966 when factory trawlers from the former Soviet Union began targeting Pacific hake. During the mid 1970's, factory trawlers from Poland, Federal Republic of Germany, the former German Democratic Republic and Bulgaria also participated in the fishery. During 1966-1979, the catch in U.S. waters averaged 137,000 t per year (Table 1). A joint-venture fishery was initiated in 1978 between two U.S. trawlers and Soviet factory trawlers acting as mother ships (the practice where the catch from several boats is brought back to the larger, slower ship for processing and storage until the return to land). By 1982, the joint-venture catch surpassed the foreign catch. In the late

1980's, joint-ventures involved fishing companies from Poland, Japan, former Soviet Union, Republic of Korea and the People's Republic of China. In 1989, the U.S. fleet capacity had grown to a level sufficient to harvest the entire quota, and no foreign fishing was allowed. In contrast, Canada allocates a portion of the Pacific hake catch to joint-venture operations once shore-side capacity is filled.

Historically, the foreign and joint-venture fisheries produced fillets and headed and gutted products. In 1989, Japanese mother ships began producing surimi from Pacific hake, using a newly developed process to inhibit myxozoan-induced proteolysis. In 1990, domestic catcher-processors and mother ships entered the Pacific hake fishery in the U.S. zone. Previously, these vessels had engaged primarily in Alaskan pollock fisheries. The development of surimi production techniques for walleye pollock was expanded to include Pacific hake as a viable alternative. In 1991, the joint-venture fishery for Pacific hake ended because of the increased level of participation by domestic catcher-processors and mother ships, and the growth of shore-based processing capacity. Shore-based processors of Pacific hake had been constrained historically by a limited domestic market for Pacific hake fillets and headed and gutted products. The construction of surimi plants in Newport and Astoria, Oregon led to a rapid expansion of shore-based landings in the U.S. fishery in the early 1990's.

The sectors involved in the Pacific hake fishery in Canada exhibits a similar pattern, although phasing out of the foreign and joint-venture fisheries has lagged a few years relative to the U.S. Since 1968, more Pacific hake have been landed than any other species in the groundfish fishery on Canada's west coast (Table 1). Prior to 1977, the fishing vessels from the former Soviet Union caught the majority of Pacific hake in the Canadian zone, with Poland and Japan accounting for much smaller landings. Since declaration of the 200-mile extended fishing zone in 1977, the Canadian fishery has been divided into shore-based, joint-venture, and foreign fisheries. In 1990, the foreign fishery was phased out, but the demand of Canadian shore-based processors remains below the available yield, thus the joint-venture fishery will continued through 2002. Poland is the only country that participated in the 1998 joint-venture fishery. The majority of the shore-based landings of the coastal hake stock is processed into surimi, fillets, or mince by processing plants at Ucluelet, Port Alberni, and Delta, British Columbia. Small deliveries were made in 1998 to plants in Washington and Oregon. Although significant aggregations of hake are found as far north as Queen Charlotte Sound, in most years the fishery has been concentrated below 49° N latitude off the south coast of Vancouver Island, where there are sufficient quantities of fish in proximity to processing plants.

## Management of Pacific hake

Since implementation of the Magnuson-Stevens Fishery Conservation and Management Act in the U.S. and the declaration of a 200-mile fishery conservation zone in Canada in the late 1970's, annual harvest quotas have been the primary management tool used to limit the catch of Pacific hake. Scientists from both countries have historically collaborated through the Technical Subcommittee of the Canada-US Groundfish Committee (TSC), and there have been informal agreements on the adoption of annual fishing policies. During the 1990s, however, disagreements between the U.S. and Canada on the allotment of the acceptable biological catch (ABC) between U.S. and Canadian fisheries lead to quota overruns; 1991-1992 quotas summed to 128% of the ABC, while in 1993-1999 the combined quotas were 107% of the ABC on average. The 2002 and 2003 fishing year were somewhat different from years past in that the ABC of Pacific hake was utilized at an average of 87%. In the signed Pacific hake agreement between the United States and Canada 73.88% and 26.12%, respectively, of the coastwide allowable biological catch is to be allocated between the two countries. Furthermore, the agreement establishes a Joint Technical Committee to exchange data and conduct stock assessments, which will be reviewed by a Scientific Review Group. This document represents the efforts of the aborning joint US-Canada Technical Committee.

*United States*

Prior to 1989, catches in the U.S. zone were substantially below the harvest guideline, but since 1989 the entire harvest guideline has been caught with the exceptions in 2000, 2001 and 2003, in which 90%, 96% and 96% of the quota were taken, respectively. The total U.S. catch has not significantly exceeded the harvest guideline for the U.S. zone, indicating that in-season management procedures have been effective.

In the U.S. zone, participants in the directed fishery are required to use pelagic trawls with a codend mesh that is at least 7.5 cm (3 inches). Regulations also restrict the area and season of fishing to reduce the bycatch of Chinook salmon, and several depleted rockfish stocks. More recently, yields in the U.S. zone have been restricted to level below optimum yields due to widow rockfish bycatch in the Pacific hake fishery. At-sea processing and night fishing (midnight to one hour after official sunrise) are prohibited south of 42° N latitude. Fishing is prohibited in the Klamath and Columbia River Conservation zones, and a trip limit of 10,000 pounds is established for Pacific hake caught inside the 100-fathom contour in the Eureka INPFC area. During 1992-95, the U.S. fishery opened on April 15, however in 1996 the opening date was advanced to May 15. Shore-based fishing is allowed after April 1 south of 42° N. latitude., but is limited to 5% of the shore-based allocation being taken prior to the opening of the main shore-based fishery. The main shore-based fishery opens on June 15. Prior to 1997, at-sea processing was prohibited by regulation when 60 percent of the harvest guideline was reached. The current allocation agreement, effective since 1997, divides the U.S. non-tribal harvest guideline between factory trawlers (34%), vessels delivering to at-sea processors (24%), and vessels delivering to shore-based processing plants (42%).

Shortly after the 1997 allocation agreement was approved by the PFMC, fishing companies with factory trawler permits established the Pacific Whiting Conservation Cooperative (PWCC). The primary role of the PWCC is to allocate the factor trawler quota between its members. Anticipated benefits of the PWCC include more efficient allocation of resources by fishing companies, improvements in processing efficiency and product quality, and a reduction in waste and bycatch rates relative to the former “derby” fishery in which all vessels competed for a fleet-wide quota. The PWCC also initiated recruitment research to support hake stock assessment. As part of this effort, PWCC sponsored a juvenile recruit survey in summer of 1998 and 2001, which since 2002 is presently ongoing in collaboration and support by NMFS.

*Canada*

The Canadian Department of Fisheries and Oceans (DFO) is responsible for managing the Canadian hake fishery. Prior to 1987, the quota was not reached due to low demand for hake. In subsequent years the quota has been fully subscribed, and total catch has been successfully restricted to ±5% of the quota.

Domestic requirements are given priority in allocating yield between domestic and joint-venture fisheries. During the season, progress towards the domestic allocation is monitored and any anticipated surplus is re-allocated to the joint-venture fishery. The Hake Consortium of British Columbia coordinates the day-to-day fleet operations within the joint-venture fishery. Through 1996, the Consortium split the available yield equally among participants or pools of participants. In 1997, an Individual Vessel Quota (IVQ) system was implemented for the British Columbia trawl fleet. IVQs of Pacific hake were allotted to license holders based on a combination of vessel size and landing history. Vessels are permitted to deliver Joint-venture hake quota to domestic shore-side processors. However, vessels are not permitted to deliver domestic allocation to Joint-venture/processor operations at sea. There is no direct allocation to individual shoreside processors. License holders declare the proportion of their hake quota that will be landed in the domestic market, and shoreside processors must secure catch from vessel license holders.

**Overview of Recent Fishery and Management**

United States

The coastwide acceptable biological catch (ABC) for 2004 was estimated to be 514,441 mt based on the $F_{msy}$ proxy harvest rate of F40% applied to the model in which acoustic survey catchability (q) was assumed to be 1.0 (Helser et al. 2004). This was the largest ABC in recent years and reflected substantial increases in biomass (above 40% unfished biomass) due to the presence of the strong 1999 year-class. The final commercial US optimum yield (OY) was set at 250,000 mt due to constraints imposed by bycatch of canary and widow rockfish in the hake fishery. The Makah tribe was allocated 32,500 mt in 2004. For the 2005 fishing season, the coastwide OY was estimated to be 364,197 mt, with 269,069 mt apportioned to the U.S. fishery. The 2005 OY was nearly 100% utilized. The coastwide 2006 ABC was estimated to be 661,680 mt (based on the q=1.0 model assumption), with a coastwide OY set at 364,842 mt. The U.S. fishery OY of 269,069 mt was fully utilized.

The at-sea sector's distribution of catch in 2004 ranged slightly stronger northward with roughly 50% of the catch occurring north and south of Newport, Oregon (Fig. 2). The total at-sea sector harvested approximately 43% (90,200 mt) of the total U.S. catch of 210,400 mt. In

2005, at sea catches extended from south of Cape Blanco to Cape Flattery, with nearly even distribution north and south of Newport.

The shore-based sector harvested 46% (96,200 mt) of the total U.S. catch of 210,400 mt in 2004. As in previous years, the dominate ports were Newport (38,800 mt) followed by Westport (30,000 mt) and Astoria (16,000 mt). The 2005 shore-based fishery began on June 15 and ended on August 18, and utilized approximately 94% of the commercial optimum yield of 97,469 mt.

Since 1996, the Makah Indian Tribe has conducted a separate fishery in its" usual and accustomed fishing area." During the 2004 and 2005 fishing season, the distribution of Pacific hake provided favorable conditions to support the fishery in the Makah tribal fishing area;, where the Makahs harvested approximately 74% (24,000 mt) of the Tribal allocation and 11% of total US catch in 2004. The 2005 Makah fishery, which began on May 1 and ended on August 15, utilized 28,325 mt, (approximately 81% of the 35,000 mt allocation).

Canada

DFO managers allow a 15% discrepancy between the quota and total catch. The quota may be exceeded by up to 15% in any given year, which is then deducted from the quota for the subsequent year. Conversely, if less than the quota is taken, up to 15% can be carried over into the next year. For instance, the overage in 1998 (Table 2) is due to carry-over from 1997 when 9% of the quota was not taken. During 1999-2001 the PSARC groundfish subcommittee recommended to DFO managers yields based on F40% (40-10) option and Canadian managers adopted allowable catches prescribed at 30% of the coastwide ABC (Table 14; Dorn et al. 1999).

The all-nation catch in Canadian waters was 53,585 mt in 2001, up from only 22,401 mt in 2000 (Table 1). In 2000, the shore-based landings in the Canadian zone hit a record low since 1990 due to a decrease in availability. Catches in 2001 increased substantially over those of 2000 for both the Joint Venture and shore-based sectors over catches in 2000, but were still below recommended TAC. Total Canadian catches in 2002 and 2003 were 50,769 mt and 62,090 mt, respectively, and were harvested exclusively by the shore-side sector; constituting nearly 87% of the total allocation of that country. In 2004, the allowable catch in Canada was 26.14% of the coastwide ABC, approximately 134,000 mt. Catches were nearly split equally between the shore-based and joint venture sectors, totaling 124,000 mt. Canadian Pacific hake catches were fully utilized in the 2005 fishing season with 85,284 mt and 15,178 mt taken by the Domestic and Joint Venture fisheries, respectively. In 2006, the Joint Venture and Domestic fisheries harvested 13,700 mt and 80,000 mt, respectively.

## ASSESSMENT

### Modeling Approaches

Age-structured assessment models have been used to assess Pacific hake since the early 1980's. Modeling approaches have evolved as new analytical techniques have been developed. Initially, a cohort analysis tuned to fishery CPUE was used (Francis et al. 1982). Later, the cohort analysis was tuned to NMFS triennial acoustic survey estimates of absolute abundance at age (Hollowed et al. 1988a). Since 1989, a stock synthesis model that utilizes fishery catch-at-age data and acoustic survey estimates of population biomass and age composition has been the primary assessment method (Dorn and Methot, 1991). Dorn et al. (1999) converted the age-structured stock synthesis Pacific hake model to an age-structured model using AD model builder (Fournier 1996). AD model builder's post-convergence routines permit calculation of standard errors (or likelihood profiles) for any quantity of interest, allowing for a unified approach to the treatment of uncertainty in estimation and forward projection. Since 2001, Helser et al. (2001, 2003, 2004) have used the same ADMB modeling platform to assess the hake stock and examine important modifications and assumptions, including the time varying nature of the acoustic survey selectivity and catchability. The acoustic survey catchability coefficient ($q$) has been, and continues to be, one of the major sources of uncertainty in the model. Due to the lengthened acoustic survey biomass trends the assessment model was able to freely estimate the acoustic survey $q$. These estimates were substantially below the assumed value of $q$=1.0 from earlier assessments. The 2003 and 2004 assessment presented uncertainty in the final model result as a range of biomass. The lower end of the biomass range was based upon the conventional assumption that the acoustic survey $q$ was equal to 1.0, while the higher end of the range represented a $q$=0.6 assumption.

In 2006, the hake population model was migrated to the Stock Synthesis modeling framework (SS2 Version 1.21, December, 2006) which was written by Dr. Richard Methot (Northwest Fisheries Science Center) in AD Model Builder (Helser et al. 2006). Conversion of the previous hake model into SS2 was guided by three principles: 1) the incorporation of less derived data, 2) explicitly model the underlying hake growth dynamics, and 3) achieve parsimony[2] in terms on model complexity. "Incorporating less derived data" entailed fitting observed data in their most elemental form. For instance, no pre-processing to convert length data to age compositional data was performed. Also, incorporating conditional age-at-length data, through age-length keys for each fishery and survey, allowed explicit estimation of expected growth, dispersion about that expectation, and its temporal variability, all conditioned on selectivity. The primary goal was to achieve parsimony of model complexity without loss of performance in maximum likelihood estimation, and was assessed through a combination of diagnostics, convergence criteria and comparative analysis with MCMC integration. This year's assessment represents an update of last years' model with fishery data through 2006 and the inclusion of a new coastwide pacific hake recruitment index. The coastwide recruitment index was derived from data collected from the SWFSC Santa Cruz Laboratory's and Pacific Whiting

[2] Parsimony is a balance between the number of parameters needed to represent a complex state of nature and data quality/quantity to support accurate and precise estimation of those parameters.

Conservation Cooperative/National Marine Fisheries Service (PWCC/NMFS) midwater trawl surverys. Additional acoustic survey information will not be available until the winter of 2007.

**Data Sources**

The data used in the stock assessment model included:

- Total catch from the U.S. and Canadian fisheries (1966-2006).

- Length compositions from the U.S. fishery (1975-2006) and Canadian fishery (1988-2006).

- Age compositions from the U.S. fishery (1973-1974) and Canadian fishery (1977-1987). These are the traditional age compositional data generated by applying fishery length compositions to an age-length key. Use of this approached was necessary to fill in gaps for those years in which biological samples could not be re-acquired from standard procedures.

- Conditional age-at-length compositions from the U.S. fishery (1975-2006) and Canadian fishery (1988-2006).

- Biomass indices, length compositions and conditional age-at-length composition data from the Joint US-Canadian acoustic/midwater trawl surveys (1977, 1980, 1983, 1986, 1989, 1992, 1995, 1998, 2001, 2003, and 2005). Note: the 1986 acoustic survey biomass index was omitted due to transducer and calibration problems.

- Indices of young-of-the-year abundance from the Santa Cruz Laboratory larval rockfish surveys (1986-2005) and the PWCC/NMFS midwater trawl surveys (2001-2006). A coastwide index of hake recruitment was generated based on data from both the SWFSC Santa Cruz and PWCC/NMFS surveys to account for recent northerly extension of hake recruitment along the coast.

As in the previous hake model, the U.S. and Canadian fisheries were modeled separately. The model also used biological parameters to estimate spawning and population biomass to obtain predictions of fishery and survey biomass from the parameters estimated by the model. These parameters were:

- Proportion mature at length (not estimated in model).

- Population allometric growth relationship, as estimated from the acoustic survey (not estimated in model).

- Initial estimates of growth including CVs of length at age for the youngest and oldest fish (estimated in model).

- Natural mortality (*M,* not estimated in model).

*Total catch*

Table 1 lists the catch of Pacific hake for 1966-2006 by nation and fishery. Catches in U.S. waters for 1966-1980 are from Bailey et al. (1982). Prior to 1977, the at-sea catch was reported by foreign nationals without independent verification by observers. Bailey et al. (1982) suggest that the catch from 1968 to 1976 may have been under-reported because the apparent catch per vessel-day for the foreign feet increased after observers were placed on foreign vessels in the late 1970's. For 1981-2006, the shore-based landings are from Pacific Fishery Information Network (PacFIN). Foreign and joint-venture catches for 1981-1990, and domestic at-sea catches for 1991-2006 are estimated by the North Pacific Groundfish Observer Program (NPGOP).

At-sea discards are included in the foreign, joint-venture, at-sea domestic catches in the U.S. zone. Discards have been recently estimated for the shore-based fishery but are nominal relative to the total fishery catch. The majority of vessels in the U.S. shore-based fishery operate under experimental fishing permits that require them to retain all catch and bycatch for sampling by plant observers. Canadian joint-venture catches are monitored by at-sea observers, which are placed on all processing vessels. Observers use volume/density methods to estimate total catch. Domestic Canadian landings are recorded by dockside monitors using total catch weights provided by processing plants. Catch data from Canadian JV and domestic fisheries were provided by Greg Workman (DFO, Pacific Biological Station, Nanaimo, B.C.).

*Fishery-dependent Data*

Since the SS2 model uses length compositions and conditional age-at-length compositions, a complete reconstruction of these data inputs was required. Biological information from the U.S. at-sea commercial Pacific hake fishery was extracted from the NORPAC database management system maintained at the Alaska Fisheries Science Center. A query of length, weight and age information yielded biological samples from the Foreign and Joint Venture fisheries from 1975-1990, and from the domestic at sea fishery from 1991-2006. Specifically these data included sex-specific length and age data collected at the haul level by observers, where random samples of fish lengths from a known sampled haul weight and otoliths are then collected on a length-stratified basis. Detailed sampling information including the numbers of hauls sampled, lengths collected, and otoliths aged in the Foreign, JV and domestic at-sea fisheries are presented in Table 2.

Biological samples from the U.S. shore-based fishery were collected by port samplers from ports with substantial landings of Pacific hake: primarily Newport, Astoria, Crescent City, and Westport, from 1991-2006. Port samplers routinely take one sample per offload or trip in the port consisting of 100 randomly selected fish for individual length and weight, and 20 random samples per offload for otolith extraction and subsequent aging. It should be noted that the sampling unit here is the trip rather than the haul as in the case of the at-sea fishery. Since detailed haul-level information is not recorded on trip landings documentation in the shore-based fishery, and hauls sampled in the at-sea fishery can not be aggregated to a comparable trip level, there is no least common denominator for aggregating at-sea and shore-based fishery samples. As a result, samples sizes were simply summed over hauls and trips for U.S. fishery length- and age-compositions, however each fishery was weighted according to the proportion of its catch.

The Canadian domestic shore-based fishery is subject to 10% observer coverage. On observed trips, an otolith sample is taken from the first haul of the trip with associated length information, followed by length samples on subsequent hauls. For unobserved trips, port samplers obtain biological data from the landed catch. Observed domestic haul-level information is then aggregated to the trip level to be consistent with the unobserved trips that are sampled in ports. Sampled weight of the catch from which biological information is collected must be inferred from year-specific length-weight relationships. Canadian domestic fishery biological samples were only available from 1996-2006, and detailed sampling information is presented in Table 3.

For the Canadian at-sea Joint Venture fishery, an observer aboard the factory ship records the codend weight for each codend transferred from companion catcher boats. However, length samples are only collected every second day of fishing operations, and an otolith sample is only collected once a week. Length and age samples are taken randomly from a given codend. Since sample weight from which biological information is taken is not recorded, sample weight must be inferred from a weight-length relationship applied to all lengths taken and summed over haul. Length and age information was only available from the Joint Venture fishery from 1988-2006. As in the case with the U.S. at-sea fishery, the basic sampling unit in the Canadian Joint Venture fishery is assumed to be a haul. Detailed sampling information for the Canadian Joint Venture fishery is also presented in Table 3.

The length and age data were analyzed based on the sampling protocols used to collect them, and expanded to estimate the corresponding statistic from entire landed catch by fishery and each year that sampling occurred. In general, the analytic steps can be summarized as follows:

1) Count lengths (or ages) in each size (or age) bin (1 cm/year) for each haul in the at-sea fishery and for each trip in the shore-based fishery, generating “raw” frequency data.
2) Expand the raw frequencies from the haul or trip level to account for the catch weight sampled in each trip.
3) Expand the summed frequencies by fishery sector to account for the total landings.
4) Calculate sample sizes (number of samples and number of fish within sample) and normalize to proportions that sum to unity within each year.

To complete step (2), it was necessary to derive a multiplicative expansion factor for the observed raw length frequencies of the sample. This expansion factor was calculated for each sample corresponding to the ratio of the total catch weight in a haul or trip divided by the total sampled weight from which biological samples were taken within the haul or trip. In some cases, where there was not an estimated sample weight (more common in the Canadian domestic shore-based trips), a predicted weight of the sample was computed by applying a year-specific length-weight relationship to each length in the sample, then summing these weights. Anomalies that could emerge where very small numbers of fish lengths were collected from very large landings were avoided by constraining expansion factors to not exceed the $95^{th}$ percentile of all expansion factors calculated for each year and fishery. The expanded lengths (N at each length times the expansion factor for the sample) were then summed within each fishery sector, and then weighted a second time by the relative proportion of catches by fishery within each year and nation. Finally, the year-specific length frequencies were summed over fishery sector and normalized so that the sum of all lengths in a single year and nation was equal to unity.

Tables 4 and 5 provide a detailed sampling summary, by fishery and nation, including the number of unique samples (hauls in the JV fishery and trips in the domestic fishery) by year and other sampling metrics of the relative efficiency of sample effort. Ultimately, the total sample size (# samples) by year is the multinomial sample size included in the stock assessment model. In both the U.S. and Canada, at-sea biological samples are collected at the haul level while shore-based samples are collected at the trip level. Tables 4 and 5 provide comparisons of sampling levels relative to the total sector catches in each country. In recent U.S. fisheries, between 9% and 16% of all shore-based catch has been sampled, compared to 40% to 60% of the at-sea catch. In both cases, fraction sampled has increased over time. Between 2000 and 2006, a sample was taken, on average, once per 575 mt of hake caught in the shore-based fishery, compared to once per 45 mt of catch in the at-sea fishery. Sample sizes for conditional age at length compositions for the U.S. and Canadian fisheries are given in Tables 6 and 7, respectively.

U.S. fishery length compositions representing fish caught in both the at-sea and shore-based fisheries are shown in Figures 3 and 4. It should be noted that there are some differences in the length compositions between the at sea and shore-based domestic fisheries, suggesting that future attempts should be made to model them separately. In general, the composite U.S. fishery length compositions confirm the well known pattern of year class strengths, including the dominant 1980 and 1984 and secondary 1970, 1977 and 1999 year classes moving through the size structure (Figure 4). These relationships suggest that the sizes of hake which are vulnerable to the U.S. fishery have changed over time, possibly due to growth, selectivity or both. This is particularly evident as larger fish before 1990 and a shift to smaller fish between 1995 and 2000. These features will be explored within the population dynamics model.

As with the U.S. fleet sectors, differences in length compositions between the Canadian Joint-venture and domestic fleets among some years warrant exploration of fitting the fisheries separately. This however was not done in this assessment due to time limitations. The composite Canadian fishery length compositions (Figures 5 and 6) indicate that the Canadian fleets exploit larger and presumably older hake. A particularly interesting feature of these length compositions is that the Canadian fleet prosecuted a seemingly fast growing 1994 year class of hake in 1995 (age 1), 1996 (age 2) and subsequent years. It is unclear whether this is due to size- vs. age-based selectivity, however, it is well known that larger (and older) hake migrate further northward annually (Dorn, 1995). As in the U.S. fishery, Canadian length compositions show some temporal pattern in the range of fish exploited by the fishery (Figure 6).

U.S. and Canadian fishery conditional age-at-length compositions constitute the bulk of data in this assessment and provide information on recruitment strength, growth and growth variability. These data are shown graphically for the U.S. fishery from 1975-2005 and from 1988-2005 for the Canadian hake fishery in Figures 7 and 8, respectively. Since age-composition data used in the old hake assessment extended further back in time than the conditional age-at-length data generated here, the older data were also included in the assessment model to augment information on recruitment earlier in the time series and are shown in Figure 9.

*Triennial Shelf Trawl Survey*

The Alaska Fisheries Science Center has conducted a triennial bottom trawl survey along the west coast of North America between 1977-2001 (Wilkins et al. 1998). In 2003, the Northwest Fisheries Science Center took responsibility for the triennial bottom trawl survey. Despite similar seasonal timing of the two surveys, the 2003 survey differed in size/horsepower of the chartered fishing vessels and bottom trawl gear used. For this reason, the continuity of the shelf survey remains to be evaluated. In addition, the presence of significant densities of hake both offshore and to the north of the area covered by the trawl survey limits the usefulness of this survey to assess the hake population. More over, bottom trawl used in the survey is limited in its effectiveness at catching mid-water schooling hake. For these reasons the triennial shelf trawl survey is presently not used in the assessment.

*Acoustic Survey (Biomass, length and age composition*)

Integrated acoustic and trawl surveys, used to assess the distribution, abundance and biology of coastal Pacific hake, *Merluccius productus*, along the west coasts of the United States and Canada. The Pacific Biological Station (PBS) of the Canadian Department of Fisheries and Oceans (DFO) has conducted annual surveys along the Canadian west coast since 1990. From 1977-2001, surveys in U.S. waters were conducted triennially by Alaska Fisheries Science Center (AFSC). The triennial surveys in 1995, 1998, and 2001 were carried out jointly by AFSC and PBS. Following 2001, the responsibility for the US portion of the survey was transferred to the Fishery Resource Analysis and Monitoring (FRAM) Division of NOAA's Northwest Fisheries Science Center (NWFSC). Following the transfer, the survey was scheduled on a bi-annual basis, with joint acoustic surveys conducted by FRAM and PBS in 2003 and 2005.

The 2005 survey was conducted jointly by US and Canadian science teams aboard the NOAA vessel *Miller Freeman* from 20 June to 19 August, spanning the continental slope and shelf areas the length of the West Coast from south of Monterey California (35.7º N) to the

Dixon Entrance area (54.8º N). A total of 106 line transects, generally oriented east-west and spaced at 10 or 20 nm intervals, were completed (Figure 10). During the 2005 acoustic survey, aggregations of coastal Pacific hake were detected as far south as 37º N (Monterey Bay) and extending nearly continuously to the furthest northerly area surveyed at Dixon Entrance. Areas of prominent concentrations of hake included the waters off Point Arena (ca. 39º N) and north of Cape Mendocino, California (ca. 41º N), in the area south of Heceta Bank, Oregon (ca. 44º N), the waters spanning the US-Canadian border off Cape Flattery and La Perouse Bank (ca. 48.5E N), and locally within Queen Charlotte Sound (ca. 51º N). Mid-water and bottom trawls, deployed to verify size and species composition and collect biological information (i.e., age composition, sex), found that smaller individuals - age-2 fish - were prevalent in the southern portion of their range, but the coastal Pacific hake stock continued to be dominated by representatives of the 1999 year-class (age 6) throughout most of their range, except for the occurrence of numbers of larger Pacific hake in the north.

As with the fishery data, acoustic survey length and conditional age compositions were used to reconstruct the age structure of the hake population. In general, biological samples taken by midwater trawls were post-stratified based on geographic proximity and similarity in size composition. Each sample was given equal weight without regard to the total catch weight. The composite length frequency was then used for characterizing the hake distribution along each particular transect and were the basis for predicting the expected backscattering cross section for Pacific hake based on the fish size-target strength relationship $TS_{db}$ = 20logL-68 (Traynor 1996.). Estimates of numbers (or biomass) of hake at length (or age) for individual cells were summed for each transect to derive a coast-wide estimate. Details of this procedure can be found in Fleischer et al. (2005).

Acoustic survey sampling information including the number of hauls, numbers of length taken and hake aged are provided in Tables 8 and 9. The 2005 acoustic survey size composition shows a dominate peak at 45 cm indicating the persistence of the 1999 year class in the population (Figure 11). A secondary peak around 33 cm suggests the potential of a 2003 year class. Model structure in the size compositions of the previous acoustic surveys also confirm the dominant 1980 and 1984 year classes present in the mid-1980s to early 1990s. Proportions at size are given in Figure 12 and conditional age-at-length proportions are shown in Figure 13.

Based on the estimates from the acoustic survey, Pacific hake biomass has declined by 32% from 1.8 million mt in 2003 to 1.26 million mt in 2005 (Table 10). In general, acoustic survey estimates of biomass indicate that the hake population has varied with little trend since the first survey in 1977 to the most recent in 2005 survey (Figure 14). Error bars shown around point estimates of biomass are not estimated but rather assumed based on reliability of the survey in a given year and are used as input in SS2 (CV=0.5 1977-1989, CV=0.25 1992-2005). It should be noted that while shown in this plot the 1986 acoustic survey biomass estimate is not used in the assessment due to transducer calibration problems during survey operations that year (The decision to omit this data point was made during the 2003 STAR panel review).

*Aging Error*

Since aging Pacific hake was transferred to the Northwest Fisheries Science Center in 2001, an effort was made to cross-calibrate age reader agreement. Cross-calibration was performed on a total of 197 otoliths from the 2003 acoustic survey between the Northwest Fisheries Science Center (NWFSC) and Department of Fisheries and Oceans (DFO). Overall agreement between NWFSC/DFO was 50%, and for ages assigned that were aged within one and two years, the agreement was 86% and 96%, respectively. As would be expected, agreement between the three labs was better for younger fish than for older fish. These cross-calibration results were somewhat better than 2001 comparisons between NWFSC/DFO, but poorer than 1998 comparisons between AFSC (Alaska Fishery Science Center) and DFO. It should be noted, however, that agreement between two age readers at NWFSC was closer to 87%, with 98% agreement within one year of age. Agreement for ages 3-4 and ages 5-7 was 82% and 40%, respectively, for NWFSC between reader comparisons, with similar results for NWFSC/DFO comparisons. Also, when ages did not agree between the three labs, the NWFSC tended to assign older ages than DFO. Additional comparisons are needed to further calibrate ageing criteria between agencies. For the present model, aging error has not been included.

*Pre-recruit surveys*

The Santa Cruz Laboratory (SCL) of NOAA’s Southwest Fisheries Science Center has conducted annual surveys since 1983 to estimate the relative abundance of pelagic juvenile rockfish off central California. Although not specifically designed to sample juvenile hake, young-of-the-year hake appear frequently in the midwater trawl catches. In this assessment, as in the previous assessments, this survey is used to produce a tuning index for recruitment to age-0 (Table 11, Figure 15). This index was created using a generalized linear model (GLM) fit to the log-transformed CPUEs (Ralston et al. 1998; Sakuma and Ralston 1996). Specifically, the year effect from the GLM was back-transformed to obtain an index of abundance. Only the Monterey outside stratum was used because of its higher correlation with hake recruitment. Also, Dorn et al. (1999) showed that the juvenile index was significantly correlated to the predicted recruitment two years later in the stock assessment model. The Santa Cruz series average CV, estimated from the GLM, was calculated to be approximately 0.50. Relative accuracy of the Santa Cruz and PWCC/NWFSC pre-recruit surveys will be evaluated in future work.

The PWCC and NWFSC, in cooperation with the SCL, have been conducting an expanded survey of juvenile hake and rockfish relative abundance and distribution to include Oregon and California since 1999. This survey is an expansion of the SCL juvenile survey, which is conducted between Monterrey Bay and Pt. Reyes, California. Prior to 2001, results between the PWCC/NWFSC survey and the SCL survey were not comparable because of trawl gear differences. Since 2001, the gear has been comparable and side-by-side comparisons were made between the contracted vessel *Excalibur* and the NOAA vessel *David Starr Jordan.*
The cooperative PWCC/NWFSC pre-recruit survey uses a modified anchovy midwater trawl with an 86' headrope and ½" codend with a 1/4” liner was used to obtain samples of juvenile

hake and rockfish. Trawling was done at night with the head rope at 30 m at a speed of 2.7 kt. Some trawls were made prior to dusk to compare day/night differences in catch. Trawl tows of 15 minutes duration at target depth were conducted along transects located at 30 nm intervals along the coast. Stations were located along each transect from 50m bottom depth seaward to 700 m with hauls taken over bottom depths of 50, 100, 200, 300, and 500 meters at each transect.

Recent pre-recruit surveys conducted by PWCC/NMFS have found concentrations of pacific hake young-of-year in more northerly waters of the coast. This explains the largely disparate pre-recruit hake abundance trends between the PWCC/NMFS and the SCL surveys in 2003. In an effort to obtain a more comprehensive coastwide survey of hake recruitment, a Delta-GLM was applied to catch data from both the SCL and PWCC/NMFS midwater trawl data. The Delta-GLM approach is a type of mixture distribution analysis which models the zero and non-zero information from catch data separately (Pennington 1983, Stefansson 1996). Specifically a logistic regression, which assumes a binomial error model, is used to model the proportion positive, while a lognormal error model is used to model the non-zero catches given a positive catch. The forms of the binomial and lognormal GLMs are:

$$p_i = \log\left[\frac{\pi_{ij}}{(1-\pi_{ij})}\right] = m + \tau_i + S_j + l_k + (S \cdot l_{jk})$$

$$c_i = g(\mu_{ij}) = m + \tau_i + S_j + l_k + (S \cdot l_{jk})$$

where: $m$ is the model intercept, $\tau$ is the year effect, $S$ is the survey effect, $l$ is the latitude (seven discrete 1 degree latitude bins) effect. The survey effect accounts for potential differences between catch data associated with PWCC/NMFS and SCL surveys while the latitudinal effect attempts to capture changes in relative abundance of young-of-year hake. In particular, peak relative abundance shift from approximately 38 to 42 degrees latitude between 2001 and 2004. An index of abundance is obtained by taking the product of the inverse link of the year effects for each GLM. Variances were obtained using a numerical procedure in which a Monte Carlo approach (based on 10,000 replicates) was used by taking replicate draws from multivariate normal distributions of the MLE estimates of the mean parameter vector and the variance-covariance matrices.

Trends in the coastwide index and associated 95% intervals are shown in Figure 15 and Table 11a. While the coastwide index does include SCL data, the trends in hake recruitment between the coastwide and SCL index are comparable for the years of overlap, 2001-2006. Specifically, both indices show large values in 2004 compared to the surrounding years, followed by very low values in 2005 and 2006. Given the brevity of the coastwide time series it is difficult to judge how the magnitude of these values from 2001-2006 compare on a historical basis. Details of the data used for this analysis are given in Table 11b.

*CalCOFI Ichthyoplankton Survey*

Pacific hake larvae have been routinely collected in the CalCOFI survey (Horn and Smith, 1997). The survey, which began in 1949, was conducted annually until 1966 when it occurred every 3 years up to 1984. Coverage of the survey was generally restricted between San Diego and Point Conception. Beginning in 1985 the survey has been conducted annually with it's northward boundary extended in some years to San Francisco. Lo (2006) has developed a time series of hake larval production which may be useful for indexing spawning stock biomass. However, as with the SWFSC Santa Cruz pre-recruit survey, limited spatial coverage of the CalCOFI survey may be problematic if spawning of the hake population occurs north of San Francisco as would be implied by the recent northward extension of recruit densities. A more detailed evaluation of this data is warranted for inclusion in the present assessment model.

**Biological Parameters**

*Growth*

There is a considerable amount of variability in the length-at-age data collected during the acoustic surveys since 1977. The process governing variation in growth may include effects from size-selective fishing, changes in size selectivity over time, and variation in growth rates over time. In order to explore alternative specifications for hake growth within SS2, we fit alternative growth models to the length-at-age data collected in the acoustic surveys (assuming size-selectivity in the acoustic surveys has been constant over time). The first of these models is a simple time-varying growth model, where the growth coefficient (k) is allowed to vary over time. This assumes that all extant cohorts are subject to time varying changes in the metabolic rates (presumably associated with changes in available food). This is the version of the growth model that is presently implemented in Stock Synthesis 2 (SS2). The second growth model assumes that growth is density-dependent. That is, the density of each cohort determines the overall growth rate and each cohort has its own asymptotic length. The third model is similar to the second model; however, in this case we assume the growth coefficient (k) is cohort specific. Details of this analysis are given in Helser et al. (2006).

Temporal variability in hake growth is shown in Figure 16 in terms of the observed lengths at age from the acoustic survey from 1977-2005. Of the 3 alternative growth models, the model with cohort specific $l_2$ (asymptotic size) values explains more of the variation in the length-age data versus the time varying k model and cohort k model (Figure 16). In particular, cohort based L2 begins relatively high (> 55 cm) prior to 1980 (Figure 22) and then appears to decline rapidly as the very large 1980 and 1984 year class grow. Expected size at age, based on the cohort based L2, parameter are above the expected size for the other models in the 1977, 1980, and 1983 survey data (Figure 16). Likewise, cohort based k declines rapidly between the mid 1970s and middle 1980s (Figure 17). Is should be noted that these cohort based models do not assume the cumulative affects of size-selective fisheries. To properly represent the cumulative affects of size-selective fisheries in this approach, the cohort based growth model should be integrated into the assessment model itself. This would provide a fruitful area of research for improving SS2. In this case it would not be necessary to use the conditional MLE for the numbers at age; this information could be provided from the stock assessment model itself. Since this feature is not currently implemented in SS2, blocks were created aggregating various years in which it was anticipated the cohort affects on growth would be manifested (See *Model Selection and Evaluation* below).

*Size/Age at Maturity*

The fraction mature by size was estimated using data from Dorn and Saunders (1997) with a logistic regression. These data consisted of 782 individual ovary collections based on visual maturity determinations by observers. The highest variability in the percentage of each length bin that was mature within an age group occurred at ages 3 and 4, with virtually all age-one fish immature and age 4+ hake mature. Within ages 3 and 4, the proportion of mature hake increased with larger sizes such that only 25% were mature at 31 cm while 100% were mature at 41 cm. Maturity in hake probably varies both as a function of length and age, however, for the purposes of parameterizing SS2 the logistic regression model was fit as a function of length. Maturity proportions by length are shown in Figure 18. Less then 10% of the fish smaller than 32 cm are mature, while 100% maturity is achieved by 45 cm.

*Natural mortality*

The natural mortality currently used for Pacific hake stock assessment and population modeling is 0.23. This estimate was obtained by tracking the decline in abundance of a year class from one triennial acoustic survey to the next (Dorn et. al 1994). Pacific hake longevity data, natural mortality rates reported for Merluciids in general, and previously published estimates of Pacific hake natural mortality indicate that natural morality rates in the range 0.20-0.30 could be considered plausible for Pacific hake (Dorn 1996).

**Model description**

This assessment used the Stock Synthesis modeling framework written by Dr. Richard Methot at the NWFSC (SS2 Version 1.21). The Stock Synthesis application provides a general framework for the modeling fish stocks because the complexity of the population dynamics can be made commensurate with the data quantity and quality. In this regard, both complex and simple models were explored. The Pacific hake population is assumed to be a single coastwide stock along the Pacific coast of the United States and Canada. As in the previous model, sexes are combined in the current model in representing the underlying dynamics and in all data sources where this was possible: growth and fishery and survey size/age compositions. The accumulator age for the internal dynamics of the population was set at 15 years, well beyond the expectation of asymptotic growth. The length structure ranged from 20 cm to 70 cm. The years explicitly modeled were 1966-2006 (last year of available data). Initial population conditions were assumed to be in equilibrium prior to the first year of the model. No initial fishing mortality was estimated and the spawning biomass was assumed equal to Bzero in 1966, preceding the advent of the distant water fleets during the mid-to-late 1960s. The level of hake removals prior to 1966 is unknown, but there were no directed commercial fisheries for hake until the arrival of foreign fleets in the mid to late 1960s.

The following narrative of the model structure is accompanied by the detailed parameter specifications and assumptions found in Table 12. The assessment model includes two national fisheries: US and Canadian trawl fisheries. Arguably, the U.S. at-sea and shore-based fisheries, as well as the Canadian JV and domestic fisheries could be modeled separately for reasons mentioned above. However, in this assessment each nation's fleets are combined and implicitly assumed to have the same selectivity patterns. The selectivity curves for the acoustic survey and the U.S. and Canadian fisheries are assumed to be dome-shaped and modeled as a function of age using the double logistic function (option 19 in SS2). Considerable discussion continues to be centered on asymptotic vs. dome-shaped selectivity for the acoustic survey: dome-shaped selectivity implies a greater proportion of older hake in the population than that observed in the survey. While this topic warrants more detailed analysis, preliminary work comparing the numbers at age in both the acoustic and bottom trawl surveys indicate empirical evidence in support of an acoustic survey selectivity that is dome-shaped (Figure 19). As will be discussed in greater detail below, a time-varying selectivity option for the U.S. and Canadian fisheries, in which the parameters are treated as a random walk process, was initially implemented as a means to provide a direct comparison between the previous hake model and SS2. While some of the fundamental underlying assumptions differed between these two modeling platforms, the specification of selectivity, survey catchability, recruitment deviations and growth parameters were tuned in as close as possible in order to confirm results of the basic population dynamic equations. The model specification in SS2 was then simplified in terms of reducing model complexity to achieve parsimony with the data. This reduced model is considered the base model.

For the base case model, as well as the previous model, instantaneous natural mortality (M) is assumed to be age- and time-independent and equal to 0.23 $y^{-1}$. The stock-recruitment function was a Beverton-Holt parameterization, with the log of mean unexploited recruitment estimated. When freely estimated, the steepness parameter was close to the upper limit of 1.0, thus implying that recruitment is independent of the level of spawning biomass. However, for this assessment steepness was assumed to be $h$=0.75 based on several meta-analyses of marine fish stocks (Myers et al. 1999, Myers et al. 2002). Year-specific recruitment deviations were estimated from 1967-2003. This structure was based upon inspection of year-specific standard deviations relative to the input value of $sigma_R$.

The constraint and bias correction standard deviation, $sigma_R$, is treated as a fixed quantity in SS2. Typically, the value is derived through an iterative process of adjusting the input value corresponding to the minimal difference between the root means square error (RMSE) of the predicted recruitment deviations and the input value. This ensures that the approximate bias-correction term would be appropriately and internally consistent for predicted recruitments estimated in the model and projected forward in time. Initial models runs began with the value used in the previous hake model, $sigma_R$ = 1.17, but were iterated to 1.14. In addition, input sample sizes were iterated by examining the relationship between effective sample size estimated in the model and the observed input sample sizes.

Maturity of Pacific hake is assumed to have a logistic functional form, increasing sigmoidally to an asymptote as a function of size (Figure 20). Fecundity (spawning output) is assumed to be a function only of mass and equivalent in form to the maturity-at-length relationship. Individual growth is modeled for combined sexes and based on the von Bertalanffy growth function. All von Bertalanffy growth parameters, including the growth coefficient k, length at minimum age, length at maximum age (15 years old), CVs of size at age, as well as time blocks describing changes in some parameters, were estimated within the model. The explicit temporal parameterization is shown in Table 12.

Multinomial sample sizes for the length composition and conditional age at length data used in this assessment are based on the number of hauls or trips sampled for the commercial at sea and shore-based fisheries, respectively, and the number of tows in the research surveys. Sample sizes for conditional age-at-length data were taken from the number of fish aged. Standard deviations from the survey indices were not adjusted, as the RMSE from preliminary model runs were consistent with the mean of the input standard deviations. The base case model employs equal emphasis factors (lambdas=1.0) for each likelihood component, however, sensitivity analyses are performed.

**Modeling Results**

*Comparative Models*

A brief retrospective analysis compared model results by including only updated fishery data through 2006, using the same model structure and assumptions as the 2006 assessment. Not unexpectedly, trends in key model output variables including recruitment deviations, recruitments, 3+ biomass and spawning depletion were virtually identical (Figure 21), suggesting little if any retrospective bias. A more thorough retrospective analysis which systematically removes one year of data and sequentially re-running the SS2 model also confirmed little bias.

The second comparative analysis examined the effects of including the coastwide hake recruitment index on model results, while using fishery data through 2006. The new model included two separate recruitment indices: the first, spanning 1986-2000, consisted solely of the SWFSC Santa Cruz data; the second consisted of the coastwide index based on SWFSC Santa Cruz/PWCC/NMFS data for the remaining 2001-2006 period. Comparison of these models' results again reveals few differences in estimated recruitments and trends in biomass and depletion (Figure 22). The value of incorporating a coastwide recruitment index lies more in the accuracy of recruitment forecasts than in estimates of historic recruitment, due to the richness of the size- and age-composition data series available for this species. The RMSE of the model fit to the coastwide recruitment index is roughly half that of the RMSE (~0.67) of the model fit to the SWFSC Santa Cruz index (~1.4), while sigmaR is about 1.13. As such, for the six years of data that are available the coastwide index may provide a useful tool to inform most recent recruitments (last 2-3 recruitments), which are generally poorly informed by the other data sources. During the 2007 STAR Panel it was agreed to drop the SWFSC Santa Cruz pre-recruit survey (data) from the model from 1986-2000 due to the extremely limited spatial coverage during those years. For subsequent discussion, the base and alternative models use only the coast-wide pre-recruit index.

*Model selection and evaluation*

An effort was made to explore many levels of model complexity in order to achieve a model that was parsimonious in the number of estimated parameters, but also retained a realistic level of complexity in representing the underlying population dynamics. Many preliminary models were fit to the data and evaluated based on residual patterns, plausibility of estimated model parameters and convergence criteria. However, only a subset of these models was retained for sensitivity analysis (see below), and the base case model reflects the best aspects from each these exploratory analyses.

Based on past and current experience with modeling hake dynamics, a complex modeling structure was used as the starting point for explorations of more parsimonious alternatives. Factors that were important in this decision included: 1) a persistent structure of recruitment deviations, most notably the 1980 and 1984 cohorts, have a large impact on the scale parameter logRzero, 2) hake growth has varied substantially over time either through density-dependent and or environmental factors, and 3) fishery selectivity has varied temporally in response to the presence of one or two dominant year classes in the exploitable population. Based on this knowledge our approach was to reduce the total number of parameters, but maintain the underlying dynamic, temporal structure of the hake population.

The wealth of conditional age-at-length data from the commercial fleets and acoustic survey provided a great deal of flexibility in modeling potential changes in growth curves over time. The comparative analysis used a ‘random walk’ approach to growth, but it was felt that this approach might be over-parameterized since empirical examination of the growth parameters outside the model suggested a pattern of discrete changes between multi-year periods. Preserving some degree of temporal variability was clearly warranted, since specifying growth as time-invariant resulted in a decline of roughly 8,000 likelihood units in the objective function, relative to the random-walk structure. Through an iterative process of gradually increasing the size of adjacent-year blocks and examining residuals, a block structure was developed that sacrificed little in the value of the objective function and seemed consistent with empirical observations. Two blocks were used for the L2 parameter, 1966-1983 and 1984-2006, which allowed the model to account for the larger asymptotic fish size and the generally prevalence of larger observed during the early period. Three blocks were used to partition the growth parameter k: 1966-1980, 1981-1986, and 1987-2006. The middle period was intended to allow the model accommodate the slightly smaller body size of age 4-6 year old fish during those years. The temporal structure of hake growth in terms of the expected size at age is (Figure 23) characterized as an early period from 1966 to the early 1980s where expected maximum size (i.e., L2) is high relative to the subsequent period from the mid 1980s to 2006, and a decline in growth rates (i.e., smaller expected size at age for ages 4-6) during the early-to-mid 1980s. In the most recent block, 1987-2006, growth returns to near baseline rates but the expected maximum size is lower.

As with growth, we employed the same approach and developed a block structure that seemed consistent with the empirical data. In particular, both the U.S. and Canadian fisheries consisted of four discrete temporal blocks. For the U.S. fishery, separate selectivity functions were estimated for the periods: 1966-1983, 1984-1992, 1993-2000, and 2001-2006. Selectivity functions for the Canadian fishery were estimated for the periods: 1966-1994, 1995-2000, 2001-2002, and 2003-2006. The acoustic survey selectivity was estimated freely but was time invariant. The estimated selectivity curves are shown in Figure 24 with parameter estimates and asymptotic standard deviations in Table 13. The shapes of the curves for both the U.S. and Canadian fisheries appear to be quite reasonable, even with the apparent temporal shifts in the curves. The U.S. fishery selectivity curves show substantial temporal variation in both the ascending and descending limbs. As might be expected, U.S. fishery selectivity increased on the younger aged fish (ages 3 and 4) as the dominant 1980 and 1984 year classes become vulnerable to exploitation during the mid 1980s to early 1990s. As these cohorts grew into the older age structure and persisted in the fishable stock U.S. fishery selectivity increased on the older ages as seen as an increase in the descending curve in 1993-2006. Canadian fishery selectivity curves also show variability through time (it should be noted that Canadian fishery selectivity curves on older fish were assumed to be the same through). As is the case with the U.S., changes in ascending-limb selectivity appear to be associated with availability of a specific year class and its exploitation by the Canadian fleets, which can be observed in the exploitation of the 1994 year class during1995-2000.

Model fits to size-composition data are shown as predicted length frequency distributions, Pearson residual plots, and effective vs. observed sample sizes and illustrated separately for the U.S. fishery (Figures 25-27), Canadian fishery (Figures 28-30) and acoustic survey (Figures 31-33). In general, model fits to the U.S. fishery length-frequency distributions show reasonable predictions given the observed data (Figure 25). Predictions seem be consistent with the observed length compositions in terms of hitting the modes of the distribution and range of sizes exploited. Comparison of observed and calculated effective sample sizes for U.S. fishery length frequencies show no clear relationship, but generally indicate that model fits are as good as expected given the input sample sizes and length frequency data (Figure 26). It should be noted that the input samples sizes shown in Figure 30 for the U.S. length and length-at-age compositions have already been iteratively tuned to 0.3 and 0.5, respectively, of their original input sizes. Some lack of fit does appear to be evident in the U.S. fishery length compositions, but this is generally restricted to the largest sizes, especially in the earlier years (Figure 27).

The model fit the Canadian fishery length composition data slightly less well than the U.S. fishery, but this may not be surprising given the fewer years of data (Figure 28). Predicted length distributions were on the mode for most years with the exception of 2000, 2001, and 2002 suggesting a pool of larger hake was exploited during those years than predicted by the model. The model was also not able to accommodate well the catches of smaller hake in 1995-1998.

This suggests that hake spawned in Canadian waters in 1994 and were exploited by the Canadian fleet as young fish. This pattern has not been observed in the Canadian fishery during any other period. Despite the lack of fit created by these anomalies, overall the model fit these data as well as expected given the observed data and input sample sizes (Figure 29). Canadian size- or age-composition data did not require iterative re-scaling of input sample sizes. Pearson residuals of length compositions data also illustrate the apparent lack of fit in the mid-1990s and early 2000s (Figure 30).

Predicted lengths for the acoustic survey were also generally on the modes with the observed size compositions. But in a number of years (1980, 1995, and 2005) the model was unable to effectively reproduce the observed bi-modal structure (Figure 31). Comparison of effective vs. input sample sizes suggest that the model fit these data as well as expected, given the observed data and input sample sizes (Figure 32). Figure 33 illustrates model lack of fit, consistent with the model's inability to reproduce the bi-model structure of the observed size compositions.

Given the assumption of age-based selectivity for the fisheries and the volume of conditional age-at-length data, the model generally fits the age data better than the length-composition data. Plots of effective vs. input sample sizes indicate that the model fit the data as well as expected, given the data and sample sizes (Figure 26, Figure 29, and Figure 32). As with the U.S. fishery length compositions, the U.S. fishery age-composition sample sizes were iterated to 50% of the original input sample sizes. The Canadian and acoustic survey conditional age-at-length compositions were unmodified. Model fits to the conditional age-at-length data are illustrated for 1988 (Figures 34-35) and 2005 (Figure 37-39). Plots of Pearson residuals by fishery for 1988 and 2005 are provided in Figures 36 and 40, respectively. These years were chosen to show the structure of the conditional age-at-length data when several dominant year classes were present. In 1988, the large 1980 (age 8) and 1984 (age 4) cohorts are evident in the size bins between 39 and 50 cm in both the U.S. and Canadian fisheries. The 1977 year class is also present as age 11 fish in size bins greater than 50 cm. Model fits to the conditional age-at-length compositions are generally in agreement with the observed data in both the U.S. (Figure 34) and Canadian fisheries (Figure 35). The discrepancy of model fits to the observed data at length bins greater than 59 cm reflects relatively small sample sizes and cannot be differentiated from noise. Pearson residuals for the U.S. and Canadian conditional age-at-length data for 1988 show no severe patterns of lack of fit (Figure 36). The 1999 year class was the dominant year class in the 2005 U.S. fishery, Canadian fishery and acoustic survey conditional age-at-length compositions, and the model fit approximately this well (Figure 37-39). The acoustic survey age-compositions also show the presence of the 2003 year class as age-2 fish in the 28-38 cm length bins (Figure 39). Again, the model appears to fit the conditional age-at-length data reasonably well (Figure 40). The full suite of standardized Pearson residuals for all fisheries and survey conditional age-at-length data in each year are shown in detail in Figure 41.

The model's fit to the acoustic survey biomass time series seems reasonable given the error structure assumed for the index (Figure 42). For biomass points since 1992, which are assumed to have less error than pre-1992 data, the predicted biomasses are within asymptotic

95% confidence intervals for all years except 2001. Given the assumed error on the Santa Cruz juvenile hake recruitment index, the model fits the observed data quite well (Figure 43a). As plotted in log-space the index appears rather flat and the model fits the slight departures from the mean, as in the case of the 1999 year class (in 2001). Except for 2002, the model fits the coastwide index well, being within roughly one asymptotic standard error of the mean in each year (Figure 43b). The fit suggests that the model predicts a better than average 2004 year class. Linearity between the model prediction and observed index suggests no evidence on compensation.

*Assessment Model Results*

The acoustic survey catchability coefficient, $q$, defines the dominant axis of uncertainty. This parameter essentially globally scales population biomass higher if $q$ is lower and lower if $q$ is higher. As in the previous year's assessment, two models are presented to bracket the range of uncertainty in the acoustic survey catchability coefficient, $q$. The base model with steepness fixed at $h$=0.75 and $q$=1.0 represents the endpoint of the lower range while the alternative model which places a prior on $q$ (effective $q$=0.7) represents the upper endpoint of the range. As such, model estimates presented below report a range of values representing these endpoints.

The predicted time series of hake recruitments, as well as recruitment uncertainty, recruitment deviations from the S-R curve, and yearly estimates of variability are shown in Figure 44. The model estimated very large year classes in 1980 and 1984, with secondary recruitment events in 1970, 1973 and 1977. The 1999 year class was the single most dominate cohort since the late 1980s, and is estimated to be the third largest since 1966. Uncertainty in recruitment can be substantial as shown by asymptotic 95% confidence intervals (Figure 44). Based on the assumption of log-normal error about the mean log recruitment, uncertainty increases with the magnitude of recruitment. Recruitment to age 0 before 1967 is assumed to be equal to mean recruitment, while recruitment from 1967 to 2006 is estimated from the data. Age-0 recruitment in 2004 is predicted to be slightly above average as informed by both the coastwide index and U.S. fishery data. Except for the actual magnitude of estimated recruitments, the patterns in recruitment deviations and uncertainty are qualitatively the same under both the base and alternative models.

Summary of Pacific hake population time trends in 3+ biomass, recruitment, spawning biomass, relative depletion, spawning potential ratio (SPR) and fishery performance are shown in Figures 45-47 for the base model and in Figures 48-50 under the alternative model. Summary Pacific hake biomass (age 3+) under unfished conditions (< 1966) was estimated to be 7.3 millions mt (Table 14a). Summary biomass increased briefly during the mid-1970s, as the 1970 and 1973 year classes recruited, then declined briefly until 1980 (Figure 45, Table 14a). Summary biomass increased again to the highest level in the time series in 1983 as the very large 1980 and 1984 classes entered the population (Figure 45, Table 14a). The hake population then experienced a long period of decline as fishing increased and few large recruitment events occurred between 1985 and 2001. Summary biomass increased slightly in 2002 due to recruitment of the 1999 year class, but has subsequently declined as the U.S. and Canadian fisheries prosecute this dominate cohort in the exploitable biomass. Trends in summary biomass and recruitment under the alternative model are nearly identical but larger in magnitude (Figure 48, Table 14b).

Pacific hake spawning biomass trend is similar to that for summary biomass (Figure 47 and 50, Table 14a and 14b). Under both the base and alternative models, spawning biomass declined rapidly after peaking in 1984 (4.6 and 5.3 million mt, respectively) to the lowest point in the time series in 2000 (0.9 and 1.2 million mt), followed subsequently by a brief increase to 1.81 and 2.4 million mt, respectively, in 2003. In 2007, spawning biomass is estimated to be 1.15 million mt, and is at 32.0 % (~95% CI range from 24.3% to 36.7%; Figure 47, Table 14a) of the unfished level (Figure 49; Table 14a) under the base model. Under the alternative model, spawning biomass is 1.6 million mt with an associated relative depletion of 39.8% (~95% CI range from 30.7% to 48.8%, Figure 50, Table 14b). Approximate asymptotic intervals about the MLE for spawning biomass and recruitment for the entire times series are given in Tables 15a and 15b for the base and alternative models, respectively

*Reference points (biomass and exploitation rate)*

Because of temporal changes in growth, there are two types of reference points reported in this assessment: those based on the assumed population parameters at the beginning of the modeled time period and those based on the most recent time period in a 'forward projection' mode of calculation. All strictly biological reference points (e.g., unexploited spawning biomass) are calculated based on the unexploited conditions at the start of the model, whereas management quantities (MSY, $SB_{msy}$, etc.) are based on the current growth and maturity schedules and are marked throughout this document with an asterisk (*).

Given the current life history parameters and long term exploitation patterns, the fishing mortality that reduces the spawning potential of the stock to 40% of the unfished level is referred to as F40%, which is the default Pacific Fishery Management Council proxy for $F_{MSY}$ for Pacific hake. Similarly, the proxy for $B_{MSY}$ is spawning biomass corresponding to 40% of the unfished stock size (B40%). Unexploited equilibrium Pacific hake spawning biomass ($B_{zero}$) from the base model was estimated to be 3.57 million mt (~ 95% confidence interval: 3.11 – 4.02 million mt), with a mean expected recruitment of 4.25 billion age-0 hake. Under the alternative model, spawning biomass ($B_{zero}$) from the base model was estimated to be 4.29 million mt (~ 95% confidence interval: 3.63 – 4.87 million mt), with a mean expected recruitment of 5.55 billion age-0 hake. Associated management reference points for target and critical biomass levels for the base model are 1.43 million mt (B40%) and 0.89 million mt (B25%), respectively. Under the alternative model, B40% and B25% are estimated to be 1.70 and 1.06 million mt, respectively. The MSY-proxy harvest amount (F40%) under the base model was estimated to be 536,600* mt (~ 95% confidence interval: 468,853-595,015), and 637,240* mt (~ 95% confidence interval: 544,073-717,014) under the alternative model. The spawning stock biomass that produces the MSY-proxy catch amount under the base model was estimated to be 0.97 million* mt (confidence interval is 0.77-1.20* million mt), and 1.18 million* mt (confidence interval is 0.83 - 1.47* million mt) under the alternative model, given current life history parameters.

The full exploitation history under the base and alternative models is portrayed graphically in Figures 47 and 50, respectively, which plot for each year the calculated spawning potential ratio (1-SPR) and spawning biomass level (B) relative to their corresponding targets, F40% and B40%, respectively. As seen from Figures 47 and 50 estimated spawning potential ratio for Pacific hake has generally been above both the 40% proxy target MSY and $B_{MSY}$ level for several decades. During the last decade both target reference points have gradually declined as stock biomass decreased under moderately high removals. While SPR has been above proxy target of 40% for Pacific hake, the biomass relative to the B40 reference target dropped briefly below the target in recent years.

*Harvest projections*

Forecasts were generated assuming the maximum potential catch would be removed under the 40:10 harvest control rule. Projections were based on the relative F contribution from the U.S. and Canadian fishery commensurate with the 73.88% and 26.12% coast wide national allocation to the U.S. and Canada, respectively, as specified in the Treaty. Table 16 and Figure 51 (10 year projections) presents 3-year projections using the base case and alternative models. Spawning biomass is expected to continue to decline in 2008 (after the 2007 fishing season with catches equal to the full OY taken) to 876 thousand mt (~95% CI 0.79 – 1.5 million mt) with a corresponding depletion level of 24.5% (~95% CI 19.5% - 29.5%) of unfished biomass for the base model. Under the alternative model, spawning biomass in 2008 is 1.2 million mt (~95% CI 0.84 - 1.59 million mt) with a corresponding relative depletion of 29.3% (~95% CI 23.6% - 35.0%). Additional forecasts under slightly lower removal levels (less than the OY and similar to recent fishery catches), 100,000 mt, 200,000mt, 300,000 mt, and 400,000 mt, show a slightly more optimistic scenario for spawning biomass and depletion levels in 2008 (Table 17). Under the scenario where full OY is taken each year and assuming current recruitment and estimates of mean log recruitment into the future, the stock is projected to decline below 25% unfished biomass but gradually increase over the next 10 years (Figure 51), assuming average levels of recruitment.

*Uncertainty and reliability*

Uncertainty in current stock size and other state variables were explored using a Markov Chain Monte Carlo (MCMC) simulation in AD model builder. Although MCMC has been used mostly in Bayesian applications, it can also be used to obtain likelihood-based confidence regions (Punt and Hilborn 1997). It has the advantage of producing the true marginal likelihood (or marginal distributions) of the parameter, rather than the conditional mode, as with the likelihood profile. We ran the MCMC routine in ADMB drawing 1,000,000 samples in which one in every 1000$^{th}$ sample was saved to reduce autocorrelation in the chain sequence. Results of the MCMC simulation were evaluated for nonconvergence to the target posterior distribution as prescribed in Gelman et al. (2004). The final samples from the MCMC were used to develop the probability distributions of the marginal posterior of management quantities and were compared to MLE asymptotic estimates of uncertainty.

Convergence diagnostics of selected parameters from the MCMC simulation provided no evidence for lack of convergence in the base model, in either the primary estimated parameters (Figure 52) or derived quantities such as spawning stock biomass and recruitment (Figure 53). In nearly all cases, parameter autocorrelation was less than +/- 0.15. Furthermore, most of the primary parameters or derived variables have a Geweke statistic of less than +/- 1.96 indicating stationarity of the parameter mean. Finally, parameters passed the Heidelberger-Welch statistic test. If this test is passed, the retained sample is deemed to estimate the posterior mean with acceptable precision, while failure implies that a longer MCMC run is needed to increase the accuracy of the posterior estimates for the given variable. Based on the above diagnostic tests the retained MCMC sample appears acceptable for use in characterizing the uncertainty (distribution) of state variables.

Results of the Markov Chain Monte Carlo simulation show the uncertainty in 2007 female spawning biomass and relative depletion from the base (Figure 54) and alternative models (Figure 55). There is 50% probability that 2007 spawning biomass from the base model is 1.1 million mt and has less than a 7% probability of being below minimum biomass threshold of 25% Bzero. Comparatively, there is a 50% probability that 2007 spawning biomass from the alternative model is 1.7 million mt and less than 1% probability of being below 25% Bzero. In general, there was very good agreement between distributions from MCMC integration and asymptotic variance estimates from the Hessian estimated using maximum likelihood in SS2. Further, comparison of 75 parametric bootstraps generated from the expectation and assumed model errors were in close agreement with MLE and MCMC integration provide additional evidence confirming convergence of MLE and reliability of the model and data assumptions. Details of this analysis can be found in Helser et al. (2006).

## ACKNOWLEDGMENTS

Stock assessments draw upon many sources. The following individuals contributed information, data, or ideas: Mike Guttormsen, Chris Wilson, and Mark Wilkins (NMFS, Alaska Fisheries Science Center); Steven Ralston (NMFS, Southwest Fisheries Science Center); Patrick McDonald and Jonathan Nottage (Oregon Department of Fish and Wildlife); Vidar Wespestad (Pacific Whiting Conservation Cooperative); John Wallace (NMFS; Northwest Fisheries Science Center); Ken Cooke (DFO, Pacific Biological Station). Their assistance is gratefully acknowledged. Special thanks to Larry Hufnagle, Rebecca Thomas, Steve Deblois, and Patrick Ressler for the timely production of the 2005 acoustic survey biomass data. Dr. Richard Methot (Office of Science and Technology, NWFSC) provided valuable discussion and was very responsive in modifying SS2 source code to accommodate migration into SS2. The Joint Technical committee also extends its thanks to the STAR panel for insightful suggestions and discussion.

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Table 1. Annual catches of Pacific hake (1,000 t) in U.S. and Canadian management zones by foreign, joint venture (JV), domestic at-sea, domestic shore-based, and tribal fisheries, 1966-2006.

| | U.S. | | | | | | Canada | | | | U.S. and |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Domestic | | | | | | | | Canada |
| Year | Foreign | JV | At-sea | Shore | Tribal | Total | Foreign | JV | Shore | Total | total |
| 1966 | 137.000 | 0.000 | 0.000 | 0.000 | 0.000 | 137.000 | 0.700 | 0.000 | 0.000 | 0.700 | 137.700 |
| 1967 | 168.699 | 0.000 | 0.000 | 8.963 | 0.000 | 177.662 | 36.713 | 0.000 | 0.000 | 36.713 | 214.375 |
| 1968 | 60.660 | 0.000 | 0.000 | 0.159 | 0.000 | 60.819 | 61.361 | 0.000 | 0.000 | 61.361 | 122.180 |
| 1969 | 86.187 | 0.000 | 0.000 | 0.093 | 0.000 | 86.280 | 93.851 | 0.000 | 0.000 | 93.851 | 180.131 |
| 1970 | 159.509 | 0.000 | 0.000 | 0.066 | 0.000 | 159.575 | 75.009 | 0.000 | 0.000 | 75.009 | 234.584 |
| 1971 | 126.485 | 0.000 | 0.000 | 1.428 | 0.000 | 127.913 | 26.699 | 0.000 | 0.000 | 26.699 | 154.612 |
| 1972 | 74.093 | 0.000 | 0.000 | 0.040 | 0.000 | 74.133 | 43.413 | 0.000 | 0.000 | 43.413 | 117.546 |
| 1973 | 147.441 | 0.000 | 0.000 | 0.072 | 0.000 | 147.513 | 15.125 | 0.000 | 0.001 | 15.126 | 162.639 |
| 1974 | 194.108 | 0.000 | 0.000 | 0.001 | 0.000 | 194.109 | 17.146 | 0.000 | 0.004 | 17.150 | 211.259 |
| 1975 | 205.654 | 0.000 | 0.000 | 0.002 | 0.000 | 205.656 | 15.704 | 0.000 | 0.000 | 15.704 | 221.360 |
| 1976 | 231.331 | 0.000 | 0.000 | 0.218 | 0.000 | 231.549 | 5.972 | 0.000 | 0.000 | 5.972 | 237.521 |
| 1977 | 127.013 | 0.000 | 0.000 | 0.489 | 0.000 | 127.502 | 5.191 | 0.000 | 0.000 | 5.191 | 132.693 |
| 1978 | 96.827 | 0.856 | 0.000 | 0.689 | 0.000 | 98.372 | 3.453 | 1.814 | 0.000 | 5.267 | 103.639 |
| 1979 | 114.909 | 8.834 | 0.000 | 0.937 | 0.000 | 124.680 | 7.900 | 4.233 | 0.302 | 12.435 | 137.115 |
| 1980 | 44.023 | 27.537 | 0.000 | 0.792 | 0.000 | 72.352 | 5.273 | 12.214 | 0.097 | 17.584 | 89.936 |
| 1981 | 70.365 | 43.556 | 0.000 | 0.839 | 0.000 | 114.760 | 3.919 | 17.159 | 3.283 | 24.361 | 139.121 |
| 1982 | 7.089 | 67.464 | 0.000 | 1.024 | 0.000 | 75.577 | 12.479 | 19.676 | 0.002 | 32.157 | 107.734 |
| 1983 | 0.000 | 72.100 | 0.000 | 1.050 | 0.000 | 73.150 | 13.117 | 27.657 | 0.000 | 40.774 | 113.924 |
| 1984 | 14.722 | 78.889 | 0.000 | 2.721 | 0.000 | 96.332 | 13.203 | 28.906 | 0.000 | 42.109 | 138.441 |
| 1985 | 49.853 | 31.692 | 0.000 | 3.894 | 0.000 | 85.439 | 10.533 | 13.237 | 1.192 | 24.962 | 110.401 |
| 1986 | 69.861 | 81.640 | 0.000 | 3.463 | 0.000 | 154.964 | 23.743 | 30.136 | 1.774 | 55.653 | 210.617 |
| 1987 | 49.656 | 105.997 | 0.000 | 4.795 | 0.000 | 160.448 | 21.453 | 48.076 | 4.170 | 73.699 | 234.147 |
| 1988 | 18.041 | 135.781 | 0.000 | 6.876 | 0.000 | 160.698 | 38.084 | 49.243 | 0.830 | 88.157 | 248.855 |
| 1989 | 0.000 | 203.578 | 0.000 | 7.418 | 0.000 | 210.996 | 29.753 | 62.618 | 2.563 | 94.934 | 305.930 |
| 1990 | 0.000 | 170.972 | 4.713 | 8.115 | 0.000 | 183.800 | 3.814 | 68.313 | 4.022 | 76.149 | 259.949 |
| 1991 | 0.000 | 0.000 | 196.905 | 20.600 | 0.000 | 217.505 | 5.605 | 68.133 | 16.178 | 89.916 | 307.421 |
| 1992 | 0.000 | 0.000 | 152.449 | 56.127 | 0.000 | 208.576 | 0.000 | 68.779 | 20.048 | 88.827 | 297.403 |
| 1993 | 0.000 | 0.000 | 99.103 | 42.119 | 0.000 | 141.222 | 0.000 | 46.422 | 12.355 | 58.777 | 199.999 |
| 1994 | 0.000 | 0.000 | 179.073 | 73.656 | 0.000 | 252.729 | 0.000 | 85.162 | 23.782 | 108.944 | 361.673 |
| 1995 | 0.000 | 0.000 | 102.624 | 74.965 | 0.000 | 177.589 | 0.000 | 26.191 | 46.193 | 72.384 | 249.973 |
| 1996 | 0.000 | 0.000 | 112.776 | 85.127 | 14.999 | 212.902 | 0.000 | 66.779 | 26.395 | 93.174 | 306.076 |
| 1997 | 0.000 | 0.000 | 121.173 | 87.410 | 24.840 | 233.423 | 0.000 | 42.565 | 49.227 | 91.792 | 325.215 |
| 1998 | 0.000 | 0.000 | 120.452 | 87.856 | 24.509 | 232.817 | 0.000 | 39.728 | 48.074 | 87.802 | 320.619 |
| 1999 | 0.000 | 0.000 | 115.259 | 83.419 | 25.844 | 224.522 | 0.000 | 17.201 | 70.132 | 87.333 | 311.855 |
| 2000 | 0.000 | 0.000 | 116.090 | 85.828 | 6.500 | 208.418 | 0.960 | 15.059 | 6.382 | 22.401 | 230.819 |
| 2001 | 0.000 | 0.000 | 102.129 | 73.474 | 6.774 | 182.377 | 0.000 | 21.650 | 31.935 | 53.585 | 235.962 |
| 2002 | 0.000 | 0.000 | 63.258 | 45.708 | 23.148 | 132.114 | 0.000 | 0.000 | 50.769 | 50.769 | 182.883 |
| 2003 | 0.000 | 0.000 | 67.473 | 55.335 | 20.684 | 143.492 | 0.000 | 0.000 | 62.090 | 62.090 | 205.582 |
| 2004 | 0.000 | 0.000 | 90.258 | 96.229 | 23.997 | 210.484 | 0.000 | 58.892 | 65.345 | 124.237 | 334.721 |
| 2005 | 0.000 | 0.000 | 150.400 | 85.914 | 23.530 | 259.844 | 0.000 | 15.178 | 85.284 | 100.462 | 360.306 |
| 2006 | 0.000 | 0.000 | 134.219 | 97.403 | 34.517 | 266.139 | 0.000 | 13.751 | 80.011 | 93.762 | 359.901 |
| Average 1966-2006 | | | | | | 162.084 | | | | 55.400 | 217.483 |

Table 2. U.S. fishery sampling information by sector showing the number of hauls (or trips), number of lengths and number of ages taken by year. Sample sizes shown are the number of hauls or trips where length samples were taken.

| U.S. At-sea fishery length samples | | | | U.S. Shore-based fishery | | | |
|---|---|---|---|---|---|---|---|
| Year | No. Hauls | No. Lengths | No. Aged | Year | No. Trips | No. Lengths | No. Aged |
| 1973 | - | - | - | 1973 | - | - | - |
| 1974 | - | - | - | 1974 | - | - | - |
| 1975 | 13 | 486 | 332 | 1975 | - | - | - |
| 1976 | 249 | 48,433 | 4,077 | 1976 | - | - | - |
| 1977 | 1,071 | 140,338 | 7,693 | 1977 | - | - | - |
| 1978 | 1,135 | 122,531 | 5,926 | 1978 | - | - | - |
| 1979 | 1,539 | 170,951 | 3,132 | 1979 | - | - | - |
| 1980 | 811 | 101,528 | 4,442 | 1980 | - | - | - |
| 1981 | 1,093 | 135,333 | 4,273 | 1981 | - | - | - |
| 1982 | 1,142 | 169,525 | 4,601 | 1982 | - | - | - |
| 1983 | 1,069 | 163,992 | 3,219 | 1983 | - | - | - |
| 1984 | 2,035 | 237,004 | 3,300 | 1984 | - | - | - |
| 1985 | 2,061 | 259,583 | 2,450 | 1985 | - | - | - |
| 1986 | 3,878 | 467,932 | 3,136 | 1986 | - | - | - |
| 1987 | 3,406 | 428,732 | 3,185 | 1987 | - | - | - |
| 1988 | 3,035 | 412,277 | 3,214 | 1988 | - | - | - |
| 1989 | 2,581 | 354,890 | 3,041 | 1989 | - | - | - |
| 1990 | 2,039 | 260,998 | 3,112 | 1990 | - | - | - |
| 1991 | 800 | 94,685 | 1,333 | 1991 | 17 | 1,273 | 934 |
| 1992 | 787 | 72,294 | 2,175 | 1992 | 49 | 3,152 | 1,062 |
| 1993 | 406 | 31,887 | 1,196 | 1993 | 36 | 1,919 | 845 |
| 1994 | 569 | 41,143 | 1,775 | 1994 | 80 | 4,939 | 1,457 |
| 1995 | 413 | 29,035 | 690 | 1995 | 57 | 3,388 | 1,441 |
| 1996 | 510 | 32,133 | 1,333 | 1996 | 47 | 3,330 | 1,123 |
| 1997 | 614 | 47,863 | 1,147 | 1997 | 67 | 4,272 | 1,759 |
| 1998 | 740 | 47,511 | 1,158 | 1998 | 63 | 3,979 | 2,021 |
| 1999 | 2,176 | 49,192 | 1,047 | 1999 | 92 | 4,280 | 1,452 |
| 2000 | 2,118 | 48,153 | 1,257 | 2000 | 81 | 2,490 | 1,314 |
| 2001 | 2,133 | 48,426 | 2,111 | 2001 | 106 | 4,290 | 1,983 |
| 2002 | 1,727 | 39,485 | 1,695 | 2002 | 94 | 3,890 | 1,582 |
| 2003 | 1,814 | 37,772 | 1,761 | 2003 | 101 | 3,866 | 1,561 |
| 2004 | 2,668 | 57,014 | 1,875 | 2004 | 129 | 7,170 | 1,440 |
| 2005 | 2,956 | 62,944 | 2,451 | 2005 | 108 | 6,166 | 1,160 |
| 2006 | 2,824 | 58,094 | 2,058 | 2006 | 156 | 8,974 | 1,547 |

Table 3. Canadian fishery sampling information by sector showing the number of hauls (or trips), number of lengths and number of ages taken by year. Sample sizes shown are the number of hauls or trips where length samples were taken.

| | Canadian JV fishery samples | | | | Canadian shore-based fishery samples | | |
|---|---|---|---|---|---|---|---|
| Year | No. Hauls | No. Lengths | No. Aged | Year | No. Trips | No. Lengths | No. Aged |
| 1988 | 231 | 75,767 | 1,557 | 1988 | - | - | - |
| 1989 | 261 | 56,202 | 1,353 | 1989 | - | - | - |
| 1990 | 171 | 33,312 | 1,024 | 1990 | - | - | - |
| 1991 | 632 | 97,205 | 1,057 | 1991 | - | - | - |
| 1992 | 429 | 60,391 | 1,786 | 1992 | - | - | - |
| 1993 | 500 | 70,522 | 1,228 | 1993 | - | - | - |
| 1994 | 875 | 122,871 | 2,196 | 1994 | - | - | - |
| 1995 | 183 | 20,552 | 1,747 | 1995 | - | - | - |
| 1996 | 813 | 99,228 | 1,526 | 1996 | 548 | 116 | - |
| 1997 | 414 | 16,957 | 1,430 | 1997 | 1,044 | 41,782 | 50 |
| 1998 | 468 | 45,117 | 1,113 | 1998 | 962 | 28,173 | 454 |
| 1999 | 66 | 8,663 | 812 | 1999 | 1,384 | 40,964 | 1,318 |
| 2000 | 375 | 45,946 | 1,536 | 2000 | 155 | 1,001 | 50 |
| 2001 | 284 | 26,817 | 1,424 | 2001 | 698 | 14,008 | - |
| 2002 | - | - | - | 2002 | 959 | 12,385 | 1,337 |
| 2003 | - | - | - | 2003 | 1,148 | 20,436 | 1,065 |
| 2004 | 595 | 60,025 | 1,102 | 2004 | 946 | 4,920 | 1,581 |
| 2005 | 58 | 5,206 | 292 | 2005 | 1,088 | 14,424 | 1,379 |
| 2006 | 126 | 11,223 | 334 | 2006 | 136 | 12,743 | 1,170 |

Table 4. U.S. fishery sampling summary by sector showing number of samples, total sampled weight, total fishery weight, and sampling intensity given as the percent of total catch weight sampled and catch weight per sample taken.

| | U.S. At-sea sampling (foreign, JV, domestic) | | | | | U.S. Shore-based fishery sampling | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | No. Hauls | Sampled weight (mt) | Total fishery landings (mt) | % total weight Sampled | Weight (mt) per sample | No. Trips | Sampled weight (mt) | Total fishery landings (mt) | % total weight Sampled | Weight (mt) per sample |
| 1975 | 13 | 47 | 205,654 | 0.02% | 15,820 | - | - | - | - | - |
| 1976 | 249 | 4,165 | 231,331 | 1.80% | 929 | - | - | - | - | - |
| 1977 | 1,071 | 4,239 | 127,013 | 3.34% | 119 | - | - | - | - | - |
| 1978 | 1,135 | 4,769 | 97,683 | 4.88% | 86 | - | - | - | - | - |
| 1979 | 1,539 | 6,797 | 123,743 | 5.49% | 80 | - | - | - | - | - |
| 1980 | 811 | 10,074 | 71,560 | 14.08% | 88 | - | - | - | - | - |
| 1981 | 1,093 | 9,846 | 113,921 | 8.64% | 104 | - | - | - | - | - |
| 1982 | 1,142 | 23,956 | 74,553 | 32.13% | 65 | - | - | - | - | - |
| 1983 | 1,069 | 27,110 | 72,100 | 37.60% | 67 | - | - | - | - | - |
| 1984 | 2,035 | 13,603 | 93,611 | 14.53% | 46 | - | - | - | - | - |
| 1985 | 2,061 | 11,842 | 81,545 | 14.52% | 40 | - | - | - | - | - |
| 1986 | 3,878 | 24,602 | 151,501 | 16.24% | 39 | - | - | - | - | - |
| 1987 | 3,406 | 22,349 | 155,653 | 14.36% | 46 | - | - | - | - | - |
| 1988 | 3,035 | 21,499 | 153,822 | 13.98% | 51 | - | - | - | - | - |
| 1989 | 2,581 | 20,560 | 203,578 | 10.10% | 79 | - | - | - | - | - |
| 1990 | 2,039 | 16,264 | 175,685 | 9.26% | 86 | - | - | - | - | - |
| 1991 | 800 | 15,833 | 196,905 | 8.04% | 246 | 17 | 683 | 20,600 | 3.32% | 1,212 |
| 1992 | 787 | 17,781 | 152,449 | 11.66% | 194 | 49 | 1,964 | 56,127 | 3.50% | 1,145 |
| 1993 | 406 | 11,306 | 99,103 | 11.41% | 244 | 36 | 1,619 | 42,119 | 3.84% | 1,170 |
| 1994 | 569 | 13,959 | 179,073 | 7.80% | 315 | 80 | 4,461 | 73,656 | 6.06% | 921 |
| 1995 | 413 | 9,833 | 102,624 | 9.58% | 248 | 57 | 3,224 | 74,965 | 4.30% | 1,315 |
| 1996 | 510 | 13,813 | 112,776 | 12.25% | 221 | 47 | 3,036 | 85,127 | 3.57% | 1,811 |
| 1997 | 614 | 17,264 | 121,173 | 14.25% | 197 | 67 | 4,670 | 87,410 | 5.34% | 1,305 |
| 1998 | 740 | 17,370 | 120,452 | 14.42% | 163 | 63 | 4,231 | 87,856 | 4.82% | 1,395 |
| 1999 | 2,176 | 47,541 | 115,259 | 41.25% | 53 | 92 | 6,740 | 83,419 | 8.08% | 907 |
| 2000 | 2,118 | 48,482 | 116,090 | 41.76% | 55 | 81 | 7,735 | 85,828 | 9.01% | 1,060 |
| 2001 | 2,133 | 43,459 | 102,129 | 42.55% | 48 | 106 | 8,524 | 73,474 | 11.60% | 693 |
| 2002 | 1,727 | 37,252 | 63,258 | 58.89% | 37 | 94 | 7,089 | 45,708 | 15.51% | 486 |
| 2003 | 1,814 | 38,067 | 67,473 | 56.42% | 37 | 101 | 7,676 | 55,335 | 13.87% | 548 |
| 2004 | 2,668 | 53,411 | 90,258 | 59.18% | 34 | 129 | 10,918 | 96,229 | 11.35% | 746 |
| 2005 | 2,956 | 66,356 | 150,400 | 44.12% | 51 | 108 | 8,997 | 85,914 | 10.47% | 796 |
| 2006 | 2,824 | 60,435 | 134,562 | 44.91% | 48 | 156 | 13,646 | 115,980 | 11.77% | 743 |

Table 5. Canadian fishery sampling summary by sector showing number of samples, total sampled weight, total fishery weight, and sampling intensity given as the percent of total catch weight sampled and catch weight per sample taken.

| | Canadian JV fishery sampling | | | | | Canadian Shore-based fishery sampling | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | No. Hauls | Sampled weight (mt) | Total fishery landings (mt) | % total weight Sampled | Weight (mt) per sample | No. Trips | Sampled weight (mt) | Total fishery landings (mt) | % total weight Sampled | Weight (mt) per sample |
| 1988 | 231 | 4,184 | 49,243 | 8.50% | 213 | - | - | - | - | - |
| 1989 | 261 | 4,679 | 62,618 | 7.47% | 240 | - | - | - | - | - |
| 1990 | 171 | 3,396 | 68,313 | 4.97% | 399 | - | - | - | - | - |
| 1991 | 632 | 13,054 | 68,133 | 19.16% | 108 | - | - | - | - | - |
| 1992 | 429 | 8,901 | 68,779 | 12.94% | 160 | - | - | - | - | - |
| 1993 | 500 | 8,929 | 46,422 | 19.23% | 93 | - | - | - | - | - |
| 1994 | 875 | 15,387 | 85,162 | 18.07% | 97 | - | - | - | - | - |
| 1995 | 183 | 3,770 | 26,191 | 14.39% | 143 | - | - | - | - | - |
| 1996 | 813 | 14,863 | 66,779 | 22.26% | 82 | 463 | 21297 | 26395 | 80.69% | 57 |
| 1997 | 414 | 8,325 | 42,565 | 19.56% | 103 | 1011 | 44802 | 49227 | 91.01% | 49 |
| 1998 | 468 | 9,638 | 39,728 | 24.26% | 85 | 897 | 45982 | 48074 | 95.65% | 54 |
| 1999 | 66 | 1,970 | 17,201 | 11.45% | 261 | 1332 | 66700 | 70132 | 95.11% | 53 |
| 2000 | 375 | 6,557 | 15,059 | 43.54% | 40 | 131 | 5791 | 6382 | 90.74% | 49 |
| 2001 | 284 | 6,072 | 21,650 | 28.05% | 76 | 689 | 30852 | 31935 | 96.61% | 46 |
| 2002 | - | - | - | - | - | 1033 | 49189 | 50769 | 96.89% | 49 |
| 2003 | - | - | - | - | - | 1183 | 61110 | 62090 | 98.42% | 52 |
| 2004 | 595 | 14,620 | 58,892 | 24.83% | 99 | 976 | 58624 | 65345 | 89.71% | 67 |
| 2005 | 58 | 1,630 | 15,178 | 10.74% | 262 | 1088 | 67242 | 85284 | 78.84% | 78 |
| 2006 | 126 | 2,702 | 13,715 | 19.70% | 109 | 136 | 14555 | 80011 | 18.19% | 588 |

Table 6. U.S. fishery sample sizes for conditional age at length. Sample size shown by year and length bin represent the sum of the total number of hauls (in the at-sea fishery) and trips (in the shore-based fishery) contributing age information to each 1 cm length category.

| | Year samples were taken | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Length | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
| 20 | | | 1 | | 1 | 1 | 5 | | | | | | | | |
| 21 | | | 1 | 2 | | 3 | 9 | | | | | | | | |
| 22 | | 1 | | 2 | | 2 | 13 | | | | | | | | |
| 23 | 1 | 1 | | 4 | | 1 | 23 | | | | | | | | |
| 24 | 1 | 1 | | 4 | | 2 | 25 | 2 | | | | 1 | | | |
| 25 | 1 | 3 | | 10 | 1 | 1 | 29 | 5 | | | | | | | |
| 26 | 2 | 1 | | 10 | 2 | | 40 | 11 | 1 | | 1 | | | 1 | |
| 27 | 2 | 4 | | 9 | 2 | 1 | 34 | 9 | | 1 | | | | | |
| 28 | 1 | 5 | | 14 | 4 | 1 | 22 | 12 | | | 1 | | | | |
| 29 | 3 | 4 | | 7 | 10 | 1 | 21 | 18 | 6 | | 2 | 1 | | 1 | 2 |
| 30 | 5 | 4 | | 4 | 21 | 1 | 16 | 37 | 10 | | 1 | 5 | | | 3 |
| 31 | 3 | 6 | 2 | 2 | 27 | | 12 | 38 | 11 | 3 | 3 | 8 | | 1 | 9 |
| 32 | 5 | 8 | | | 30 | 3 | 6 | 52 | 23 | 1 | 3 | 19 | | 2 | 15 |
| 33 | 2 | 9 | 4 | | 46 | 4 | 9 | 62 | 23 | 2 | 3 | 22 | 3 | 2 | 15 |
| 34 | 4 | 10 | 5 | | 33 | 9 | 12 | 66 | 35 | 6 | 2 | 49 | 6 | 3 | 8 |
| 35 | 4 | 7 | 12 | | 24 | 19 | 16 | 62 | 39 | 12 | 1 | 41 | 16 | 3 | 10 |
| 36 | 5 | 13 | 28 | 3 | 17 | 38 | 28 | 55 | 51 | 25 | 1 | 42 | 29 | 3 | 13 |
| 37 | 5 | 23 | 56 | 7 | 19 | 66 | 49 | 59 | 55 | 41 | 2 | 40 | 60 | 15 | 9 |
| 38 | 3 | 26 | 71 | 17 | 12 | 74 | 59 | 48 | 62 | 72 | 7 | 39 | 79 | 56 | 17 |
| 39 | 2 | 45 | 99 | 51 | 11 | 84 | 78 | 50 | 58 | 112 | 16 | 36 | 88 | 101 | 40 |
| 40 | 6 | 58 | 114 | 88 | 17 | 89 | 94 | 62 | 62 | 121 | 43 | 51 | 97 | 129 | 79 |
| 41 | 10 | 53 | 146 | 129 | 25 | 83 | 84 | 66 | 69 | 135 | 78 | 85 | 104 | 141 | 120 |
| 42 | 9 | 55 | 141 | 176 | 36 | 93 | 85 | 86 | 77 | 125 | 107 | 114 | 112 | 141 | 129 |
| 43 | 9 | 56 | 160 | 171 | 44 | 88 | 88 | 94 | 72 | 112 | 121 | 119 | 121 | 145 | 125 |
| 44 | 10 | 54 | 160 | 158 | 65 | 100 | 101 | 99 | 69 | 93 | 124 | 110 | 117 | 153 | 127 |
| 45 | 8 | 47 | 147 | 165 | 72 | 111 | 101 | 100 | 69 | 82 | 115 | 113 | 113 | 152 | 125 |
| 46 | 9 | 47 | 142 | 148 | 74 | 114 | 107 | 99 | 75 | 83 | 101 | 105 | 106 | 150 | 130 |
| 47 | 7 | 39 | 132 | 144 | 84 | 96 | 114 | 103 | 74 | 74 | 79 | 100 | 102 | 137 | 133 |
| 48 | 10 | 42 | 128 | 154 | 83 | 90 | 122 | 111 | 70 | 67 | 63 | 83 | 92 | 123 | 118 |
| 49 | 8 | 44 | 136 | 143 | 76 | 85 | 122 | 116 | 69 | 66 | 58 | 67 | 83 | 81 | 98 |
| 50 | 4 | 57 | 123 | 147 | 83 | 90 | 105 | 101 | 71 | 50 | 52 | 77 | 59 | 68 | 74 |
| 51 | 5 | 62 | 135 | 156 | 89 | 87 | 113 | 112 | 59 | 49 | 25 | 59 | 40 | 45 | 49 |
| 52 | 6 | 60 | 140 | 184 | 85 | 92 | 107 | 100 | 66 | 43 | 24 | 51 | 31 | 34 | 40 |
| 53 | | 69 | 146 | 178 | 86 | 94 | 116 | 106 | 66 | 28 | 17 | 52 | 18 | 22 | 35 |
| 54 | 2 | 64 | 147 | 186 | 78 | 105 | 96 | 104 | 61 | 20 | 15 | 44 | 14 | 15 | 27 |
| 55 | 4 | 58 | 161 | 176 | 70 | 102 | 80 | 86 | 57 | 11 | 11 | 27 | 8 | 14 | 14 |
| 56 | | 67 | 139 | 156 | 66 | 102 | 65 | 85 | 44 | 5 | 3 | 31 | 5 | 8 | 15 |
| 57 | 1 | 65 | 131 | 115 | 58 | 102 | 56 | 81 | 32 | 5 | 4 | 24 | 5 | 13 | 8 |
| 58 | 1 | 62 | 94 | 103 | 41 | 88 | 39 | 48 | 32 | 4 | 3 | 11 | 3 | 11 | 8 |
| 59 | 2 | 57 | 95 | 60 | 47 | 52 | 34 | 53 | 17 | 7 | | 11 | 2 | 4 | 7 |
| 60 | 1 | 56 | 73 | 60 | 22 | 60 | 36 | 37 | 22 | 2 | 1 | 7 | 5 | 6 | 3 |
| 61 | | 48 | 60 | 45 | 26 | 39 | 30 | 28 | 15 | | 1 | 8 | 3 | 5 | 6 |
| 62 | | 45 | 52 | 41 | 16 | 27 | 20 | 17 | 9 | 4 | | 7 | 6 | 1 | |
| 63 | | 30 | 46 | 27 | 12 | 25 | 20 | 21 | 12 | 4 | | 3 | 1 | | 3 |
| 64 | | 36 | 42 | 26 | 8 | 26 | 16 | 21 | 6 | 2 | | 6 | 2 | 4 | 1 |
| 65 | | 33 | 23 | 18 | 13 | 19 | 8 | 18 | 6 | 1 | | 5 | 3 | 3 | 1 |
| 66 | | 33 | 17 | 14 | 11 | 12 | 10 | 9 | 4 | | | 6 | 1 | 4 | 2 |
| 67 | | 33 | 15 | 18 | 6 | 11 | 10 | 10 | 4 | 1 | | 4 | 2 | | |
| 68 | 1 | 28 | 18 | 13 | 8 | 9 | 5 | 6 | 5 | 2 | 1 | 3 | 3 | 2 | 4 |
| 69 | 1 | 25 | 17 | 10 | 4 | 7 | 7 | 6 | 1 | 3 | | 4 | 1 | 3 | |
| 70 | | 71 | 62 | 60 | 16 | 14 | 15 | 14 | 12 | 9 | | 25 | 5 | 12 | 4 |

Table 6. continued.

| | Year samples were taken | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Length | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| 20 | | 2 | | | | 1 | | | | | | | | | | | 1 |
| 21 | | 2 | | | | | | | | | | | | | | | 1 |
| 22 | | 1 | | | | | | | | | | | | | | | 1 |
| 23 | | 1 | | | | | | | | | | | | | | | 2 |
| 24 | | | | | | | | | | | | | | | | | 4 |
| 25 | | | | | | | | | | | | | | | | | 6 |
| 26 | | | | | | | | | | | | | | | | | 7 |
| 27 | | | 1 | | | | | | | | | 1 | | | | | 11 |
| 28 | 2 | | 2 | | | | | | | | 2 | | | | | | 11 |
| 29 | 6 | | 5 | | | | | | | 2 | 2 | | | | | | 10 |
| 30 | 5 | 1 | 6 | | 1 | | 1 | | | 8 | 3 | 6 | | | | | 9 |
| 31 | 15 | 2 | 8 | 4 | | | 6 | | | 8 | 3 | 7 | 1 | | 1 | | 7 |
| 32 | 22 | 5 | 5 | 1 | | 1 | 9 | | 2 | 9 | 2 | 15 | | | | | 14 |
| 33 | 24 | 13 | 3 | 5 | 1 | | 17 | | 4 | 19 | 1 | 19 | | | | 1 | 28 |
| 34 | 45 | 23 | 4 | 5 | | 1 | 23 | 1 | 1 | 29 | 2 | 28 | 1 | | | 2 | 51 |
| 35 | 51 | 32 | 3 | 17 | 3 | | 30 | 1 | 5 | 41 | 2 | 32 | 2 | | | 4 | 96 |
| 36 | 76 | 33 | 6 | 31 | 9 | | 30 | 7 | 13 | 38 | 6 | 50 | 11 | 2 | | | 107 |
| 37 | 84 | 39 | 22 | 42 | 19 | 2 | 23 | 16 | 17 | 41 | 18 | 55 | 19 | 2 | 1 | 2 | 128 |
| 38 | 94 | 37 | 23 | 45 | 42 | 4 | 27 | 32 | 30 | 54 | 16 | 61 | 45 | 6 | 7 | 3 | 187 |
| 39 | 98 | 46 | 58 | 49 | 64 | 2 | 33 | 47 | 36 | 60 | 24 | 56 | 80 | 25 | 23 | 6 | 275 |
| 40 | 104 | 50 | 66 | 44 | 70 | 6 | 38 | 59 | 50 | 53 | 36 | 61 | 113 | 61 | 45 | 25 | 298 |
| 41 | 95 | 55 | 78 | 38 | 66 | 18 | 35 | 77 | 56 | 59 | 43 | 97 | 128 | 133 | 90 | 49 | 328 |
| 42 | 96 | 59 | 84 | 50 | 73 | 31 | 36 | 83 | 73 | 49 | 56 | 100 | 117 | 199 | 133 | 125 | 248 |
| 43 | 93 | 58 | 82 | 57 | 81 | 33 | 50 | 84 | 97 | 77 | 85 | 100 | 100 | 227 | 216 | 242 | 187 |
| 44 | 91 | 54 | 81 | 64 | 99 | 38 | 65 | 70 | 102 | 70 | 86 | 112 | 85 | 203 | 227 | 309 | 112 |
| 45 | 82 | 53 | 81 | 65 | 99 | 37 | 73 | 71 | 90 | 84 | 89 | 121 | 63 | 156 | 225 | 318 | 72 |
| 46 | 88 | 53 | 81 | 63 | 98 | 36 | 74 | 57 | 77 | 63 | 106 | 136 | 53 | 106 | 177 | 267 | 45 |
| 47 | 82 | 47 | 84 | 58 | 95 | 39 | 72 | 53 | 51 | 63 | 120 | 136 | 61 | 67 | 105 | 199 | 18 |
| 48 | 84 | 48 | 84 | 62 | 90 | 38 | 64 | 41 | 43 | 47 | 100 | 153 | 65 | 49 | 79 | 114 | 8 |
| 49 | 73 | 44 | 82 | 46 | 91 | 37 | 59 | 28 | 25 | 31 | 95 | 118 | 74 | 33 | 39 | 72 | 2 |
| 50 | 72 | 36 | 73 | 30 | 63 | 33 | 47 | 27 | 17 | 17 | 75 | 86 | 76 | 33 | 26 | 46 | 8 |
| 51 | 74 | 18 | 59 | 22 | 34 | 25 | 30 | 21 | 7 | 13 | 55 | 59 | 68 | 17 | 8 | 31 | 3 |
| 52 | 58 | 9 | 39 | 9 | 25 | 23 | 29 | 11 | 3 | 9 | 34 | 50 | 55 | 15 | 12 | 9 | 6 |
| 53 | 43 | 6 | 35 | 4 | 15 | 13 | 10 | 11 | 3 | 6 | 17 | 37 | 48 | 5 | 5 | 11 | 4 |
| 54 | 34 | 6 | 26 | 7 | 13 | 10 | 12 | 5 | 2 | 3 | 17 | 34 | 38 | 7 | 3 | 6 | 1 |
| 55 | 20 | 7 | 20 | 6 | 8 | 8 | 7 | 1 | 4 | | 9 | 10 | 27 | 4 | 2 | 3 | 2 |
| 56 | 15 | 2 | 15 | 1 | 4 | 6 | 4 | 3 | 1 | | 12 | 8 | 17 | 3 | 2 | 4 | 1 |
| 57 | 14 | 3 | 15 | 2 | 5 | 4 | 1 | 1 | | 3 | 4 | 11 | 13 | | 2 | 3 | 1 |
| 58 | 14 | 2 | 9 | | 6 | 6 | 3 | 1 | 1 | 2 | 3 | 1 | 7 | | 2 | 1 | 2 |
| 59 | 11 | 3 | 9 | 1 | 2 | 3 | 3 | 1 | 1 | | 5 | 2 | 4 | 1 | 1 | 2 | 1 |
| 60 | 14 | | 7 | | 3 | 1 | 1 | 1 | | 1 | 4 | 4 | 4 | | 2 | | 3 |
| 61 | 15 | 3 | 5 | 2 | 1 | 1 | 2 | 1 | | 2 | 2 | 1 | 2 | | | 1 | 2 |
| 62 | 9 | 3 | 5 | | 1 | 2 | 2 | | 1 | 1 | 4 | | 3 | | 1 | | 5 |
| 63 | 9 | 3 | 2 | | 1 | 1 | 1 | 1 | | | 1 | | 1 | | | | |
| 64 | 8 | | 3 | | 1 | | 1 | | | | | | 2 | | | | |
| 65 | 8 | 2 | 2 | | 2 | | 1 | | 1 | | 2 | 1 | 1 | 1 | | | |
| 66 | 8 | 5 | 2 | | | | | 1 | | | | | 1 | | | 1 | |
| 67 | 6 | 2 | | | 1 | | 1 | | | | | | | | 1 | | |
| 68 | 6 | 2 | 2 | | 1 | | | | | | | | | | | 1 | |
| 69 | 7 | 1 | | 1 | 1 | | | | | | | | | | | | |
| 70 | 20 | 8 | 6 | 1 | 3 | 1 | 2 | 2 | | | | | 1 | | | | |

Table 7. Canadian fishery sample sizes for conditional age at length. Sample size shown by year and length bin represent the sum of the total number of hauls (in the joint venture fishery) and trips (in the shore-based domestic fishery) contributing age information to each 1 cm length category.

| | Year samples were taken | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| 20 | | | | | | | | | | | 1 | | | | | | | | |
| 21 | | | | | | | | | | | | 1 | | | | | | | |
| 22 | | | | | | | | | | | | 1 | | | | | | | |
| 23 | | | | | | | | 1 | | | | 2 | | | | | | | |
| 24 | | | | | | | | 2 | | | | | | | | | | | |
| 25 | | | | | | | | 2 | | | | | | | | | | | |
| 26 | | | | | | | | 1 | | | | 2 | | | | | | | |
| 27 | | | | | | | | 1 | | | | | | | | | | | |
| 28 | | | | | | | | 1 | | | 1 | | | | | | | | |
| 29 | | | | | | | | | | | | 1 | | | | | 1 | | |
| 30 | | | | | | | | | | | | 1 | | | | | 1 | | |
| 31 | | | | | | | | | 2 | | | 3 | 1 | 1 | | | | | |
| 32 | | | | | | | | | 2 | | | 5 | | | | 2 | 1 | | |
| 33 | | | | | | | 1 | 1 | 3 | | | 10 | | | | 2 | 1 | | |
| 34 | | | | | | 1 | | | 3 | | 1 | 7 | 1 | | | | 2 | | |
| 35 | 1 | | | | | | 1 | | 4 | | | 10 | 3 | | | | 1 | | |
| 36 | | | | | | 1 | 1 | | 8 | | 4 | 16 | 4 | | | 1 | 1 | | |
| 37 | 1 | | | | 1 | | 1 | | 9 | | 8 | 17 | 5 | | 1 | | 2 | | |
| 38 | 1 | | 2 | | 1 | | | | 12 | 1 | 10 | 19 | 6 | | | | 2 | 2 | |
| 39 | 3 | | 3 | 1 | 2 | | | | 7 | 7 | 17 | 26 | 5 | | | | 3 | | 2 |
| 40 | 4 | 2 | 3 | 1 | 3 | 5 | | | 8 | 10 | 18 | 27 | 9 | | | 1 | 11 | 1 | 1 |
| 41 | 4 | 5 | 4 | 1 | 9 | 10 | 6 | 1 | 6 | 17 | 19 | 30 | 13 | 1 | | 3 | 20 | 3 | 3 |
| 42 | 4 | 6 | 5 | 3 | 15 | 14 | 10 | 6 | 14 | 21 | 25 | 35 | 14 | 3 | | 11 | 26 | 12 | 3 |
| 43 | 5 | 6 | 6 | 6 | 22 | 17 | 20 | 11 | 15 | 22 | 24 | 36 | 14 | 4 | 8 | 14 | 31 | 17 | 5 |
| 44 | 5 | 6 | 4 | 14 | 27 | 17 | 24 | 18 | 22 | 22 | 25 | 35 | 17 | 6 | 3 | 14 | 32 | 19 | 7 |
| 45 | 5 | 6 | 4 | 16 | 29 | 18 | 28 | 21 | 24 | 23 | 25 | 37 | 16 | 11 | 5 | 15 | 32 | 20 | 9 |
| 46 | 5 | 6 | 4 | 16 | 29 | 18 | 29 | 21 | 24 | 23 | 25 | 38 | 18 | 15 | 11 | 15 | 32 | 20 | 8 |
| 47 | 5 | 6 | 4 | 16 | 29 | 18 | 30 | 21 | 24 | 23 | 25 | 38 | 19 | 18 | 15 | 15 | 32 | 20 | 10 |
| 48 | 5 | 6 | 4 | 16 | 29 | 18 | 31 | 21 | 24 | 23 | 23 | 34 | 19 | 20 | 22 | 15 | 31 | 19 | 9 |
| 49 | 5 | 6 | 4 | 16 | 29 | 18 | 30 | 21 | 23 | 22 | 21 | 35 | 19 | 20 | 24 | 15 | 31 | 17 | 10 |
| 50 | 5 | 6 | 5 | 16 | 27 | 17 | 28 | 21 | 23 | 22 | 22 | 31 | 20 | 20 | 25 | 15 | 31 | 12 | 11 |
| 51 | 5 | 6 | 5 | 16 | 28 | 13 | 28 | 21 | 22 | 18 | 17 | 27 | 18 | 20 | 26 | 13 | 27 | 12 | 10 |
| 52 | 5 | 6 | 6 | 13 | 16 | 12 | 27 | 17 | 17 | 18 | 8 | 22 | 16 | 20 | 26 | 13 | 18 | 2 | 8 |
| 53 | 5 | 6 | 4 | 13 | 15 | 4 | 23 | 17 | 11 | 14 | 8 | 14 | 17 | 19 | 26 | 11 | 17 | 5 | 7 |
| 54 | 5 | 4 | 5 | 8 | 12 | 5 | 18 | 14 | 12 | 9 | 6 | 11 | 15 | 18 | 26 | 11 | 13 | 7 | 5 |
| 55 | 4 | 5 | 3 | 4 | 7 | 1 | 21 | 11 | 4 | 5 | 2 | 9 | 9 | 19 | 26 | 9 | 11 | 6 | 4 |
| 56 | 4 | 4 | 4 | 8 | 4 | | 12 | 7 | 7 | 2 | 2 | 6 | 10 | 17 | 25 | 7 | 5 | 4 | 6 |
| 57 | 4 | 4 | 4 | 3 | 4 | | 9 | 5 | 7 | 3 | 3 | 2 | 6 | 17 | 25 | 6 | 7 | 2 | 4 |
| 58 | 4 | 3 | 3 | 5 | 4 | 5 | 6 | 9 | 6 | | 2 | 4 | 6 | 17 | 21 | 8 | 3 | 2 | 3 |
| 59 | 3 | 2 | 4 | 3 | 1 | | 8 | 6 | 1 | 1 | 1 | 4 | 8 | 12 | 13 | 5 | 1 | 1 | 5 |
| 60 | 3 | 2 | 3 | 2 | 3 | | 6 | 4 | 4 | 1 | | 1 | 4 | 9 | 18 | 5 | 5 | | 3 |
| 61 | 2 | 1 | 2 | 2 | | | 5 | 4 | 4 | | | 1 | 4 | 7 | 12 | 3 | 2 | 1 | 5 |
| 62 | 1 | 3 | 4 | 2 | 1 | | 3 | 1 | 1 | | | 1 | | 4 | 12 | 1 | 1 | | |
| 63 | 1 | 3 | 4 | | 2 | | 2 | 2 | | | 1 | | 2 | 2 | 7 | 1 | 2 | | 1 |
| 64 | 1 | 2 | 2 | 1 | | | 3 | 3 | | 1 | | 1 | 1 | 2 | 2 | 1 | | 1 | 2 |
| 65 | 1 | 1 | 2 | | | | 5 | 1 | 2 | | | | | 3 | 1 | 1 | 1 | 1 | 1 |
| 66 | | 1 | 1 | 1 | | | 1 | 1 | 1 | | | 2 | 1 | 1 | 2 | | 1 | | 1 |
| 67 | | 2 | 2 | | | | | 1 | | | | | 1 | 2 | 1 | | | | |
| 68 | | | | 1 | | | | | 1 | 1 | | | | | 1 | 1 | 1 | | |
| 69 | | | 1 | 1 | | | | 1 | | | | | | | | | 1 | | |
| 70 | 1 | 4 | 1 | 1 | 1 | | 2 | 1 | | | | | 1 | | | | | | 1 |

Table 8. Acoustic survey sampling information showing the number of hauls, number of lengths and number of hake aged by year.

| Year | No. hauls | No. lengths | No. aged |
|---|---|---|---|
| 1977 | 85 | 11,695 | 4,262 |
| 1980 | 49 | 8,296 | 2,952 |
| 1983 | 35 | 8,614 | 1,327 |
| 1986 | 43 | 12,702 | 2,074 |
| 1989 | 22 | 5,606 | 1,730 |
| 1992 | 43 | 15,852 | 2,184 |
| 1995 | 69 | 22,896 | 2,118 |
| 1998 | 84 | 33,347 | 2,417 |
| 2001 | 49 | 16,442 | 2,536 |
| 2003 | 71 | 19,357 | 3,007 |
| 2005 | 49 | 13.644 | 1,905 |

Table 9. Acoustic survey sample sizes for conditional age at length. Sample size shown by year and length bin represent the sum of the total number of hauls contributing age information to each 1 cm length. category.

| | Number hauls by length and year | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Length | 1977 | 1980 | 1983 | 1986 | 1989 | 1992 | 1995 | 1998 | 2001 | 2003 | 2005 |
| 24 | | | | | | 2 | | 1 | | | |
| 25 | | | | | | 2 | | 3 | | 1 | |
| 26 | 1 | | | | | 2 | | 2 | | | |
| 27 | | | | | 1 | 4 | | 4 | 2 | | |
| 28 | 1 | | | | | 2 | 2 | 10 | | 1 | 1 |
| 29 | 1 | 1 | | 2 | | 5 | 1 | 13 | | | 1 |
| 30 | 1 | | | 3 | | 7 | 2 | 16 | 3 | 2 | 4 |
| 31 | 2 | | | 6 | | 7 | 4 | 20 | 8 | 2 | 6 |
| 32 | 3 | | | 8 | | 8 | 9 | 23 | 14 | 4 | 7 |
| 33 | 4 | | 2 | 8 | 1 | 8 | 13 | 23 | 17 | 4 | 10 |
| 34 | 3 | 4 | 4 | 9 | 3 | 8 | 15 | 31 | 20 | 8 | 8 |
| 35 | 9 | 7 | 3 | 9 | 4 | 7 | 21 | 31 | 20 | 8 | 10 |
| 36 | 14 | 9 | 5 | 11 | 6 | 6 | 20 | 30 | 20 | 8 | 9 |
| 37 | 16 | 10 | 7 | 8 | 8 | 6 | 17 | 36 | 17 | 9 | 10 |
| 38 | 14 | 12 | 8 | 10 | 7 | 5 | 14 | 39 | 13 | 14 | 8 |
| 39 | 17 | 10 | 9 | 5 | 9 | 8 | 6 | 50 | 10 | 14 | 10 |
| 40 | 20 | 12 | 13 | 6 | 10 | 7 | 11 | 44 | 17 | 29 | 6 |
| 41 | 22 | 11 | 11 | 12 | 15 | 10 | 15 | 55 | 14 | 43 | 22 |
| 42 | 24 | 10 | 11 | 21 | 20 | 24 | 26 | 62 | 18 | 56 | 28 |
| 43 | 29 | 12 | 9 | 21 | 20 | 28 | 40 | 66 | 22 | 55 | 36 |
| 44 | 34 | 13 | 13 | 20 | 20 | 36 | 45 | 64 | 17 | 59 | 41 |
| 45 | 40 | 16 | 12 | 21 | 20 | 38 | 49 | 57 | 29 | 61 | 42 |
| 46 | 41 | 18 | 13 | 21 | 20 | 39 | 53 | 49 | 29 | 53 | 41 |
| 47 | 45 | 19 | 12 | 17 | 18 | 37 | 50 | 51 | 30 | 55 | 39 |
| 48 | 48 | 21 | 13 | 18 | 16 | 34 | 47 | 46 | 30 | 43 | 32 |
| 49 | 48 | 24 | 12 | 16 | 16 | 30 | 38 | 31 | 28 | 41 | 27 |
| 50 | 45 | 22 | 12 | 16 | 10 | 22 | 27 | 22 | 27 | 32 | 23 |
| 51 | 47 | 22 | 11 | 16 | 8 | 18 | 17 | 9 | 25 | 28 | 12 |
| 52 | 46 | 21 | 10 | 11 | 9 | 14 | 14 | 5 | 26 | 24 | 12 |
| 53 | 44 | 19 | 9 | 13 | 6 | 6 | 10 | 6 | 24 | 19 | 9 |
| 54 | 40 | 18 | 8 | 8 | 5 | 3 | 7 | 4 | 25 | 12 | 5 |
| 55 | 38 | 17 | 6 | 9 | 2 | 4 | 5 | 2 | 18 | 12 | 3 |
| 56 | 31 | 19 | 5 | 4 | 2 | 5 | 6 | 2 | 13 | 7 | 5 |
| 57 | 33 | 16 | 7 | 4 | | 4 | 3 | 3 | 10 | 6 | 2 |
| 58 | 27 | 11 | 2 | 3 | 3 | 3 | 5 | 5 | 10 | 5 | 1 |
| 59 | 19 | 14 | 3 | 3 | 2 | 1 | 2 | | 7 | 3 | 1 |
| 60 | 18 | 7 | 1 | 4 | 2 | 1 | 2 | 1 | 8 | 6 | |
| 61 | 16 | 4 | 2 | 3 | | 1 | 1 | 2 | 5 | 2 | |
| 62 | 11 | 3 | 2 | 2 | | 2 | 4 | | 3 | 5 | |
| 63 | 11 | 2 | 1 | | 1 | 3 | 2 | | 2 | | |
| 64 | 10 | 2 | | 3 | 1 | | 1 | | 4 | 2 | 1 |
| 65 | 8 | 3 | 1 | 1 | 1 | | 2 | | 3 | 2 | 1 |
| 66 | 8 | 2 | 1 | | | | 2 | | 2 | 2 | |
| 67 | 8 | 2 | | 1 | | | 2 | | 1 | 2 | |
| 68 | 7 | 4 | | 1 | | | | | 2 | | 1 |
| 69 | 4 | 3 | 1 | 1 | 1 | | 1 | 1 | 4 | 2 | 1 |
| 70 | 7 | 3 | | 1 | 2 | | 3 | | 4 | 6 | 6 |

Table 10. Acoustic survey estimates of Pacific whiting biomass and age composition. Surveys in 1995 and 1998 were cooperative surveys between AFSC and DFO. Biomass and age composition for 1977-89 were adjusted as described in Dorn (1996) to account for changes in target strength, depth and geographic coverage. Biomass estimates at 20 log l - 68 in 1992 and 1995 are from Wilson and Guttormson (1997). The biomass in 1995 includes 27,251 t of Pacific whiting found by the DFO survey vessel W.E. Ricker in Queen Charlotte Sound. (This estimate was obtained from 43,200 t, the biomass at -35 dB/kg multiplied by 0.631, a conversion factor from -35 dB/kg to 20 log l - 68 for the U.S. survey north of 50°30' N lat.). In 1992, 1995, and 1998, 20,702 t, 30,032 t, and 8,034 t of age-1 fish respectively is not included in the total survey biomass. In 2001-2005 no age one fish were captured in survey trawls. Estimates of biomass and numbers at age from 1977-1992 include revised based on year-specific deep-water and northern expansion factors (Helser et al. 2004).

| | Total biomass at 20 log l - 68 (1,000 t) | Number at age (million) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1977 | 1915.01 | 0.24 | 151.94 | 144.57 | 902.04 | 82.60 | 115.79 | 1001.86 | 138.13 | 102.08 | 58.53 | 54.82 | 28.54 | 10.61 | 2.79 | 3.46 |
| 1980 | 2115.09 | 0.00 | 16.18 | 1971.21 | 190.90 | 115.65 | 94.42 | 417.83 | 154.83 | 333.21 | 133.62 | 78.76 | 13.26 | 22.81 | 4.75 | 3.49 |
| 1983 | 1646.68 | 0.00 | 1.10 | 3254.35 | 107.83 | 32.62 | 428.59 | 68.59 | 47.27 | 33.71 | 92.68 | 21.86 | 25.80 | 26.90 | 4.32 | 0.00 |
| 1986 | 2857.06 | 0.00 | 4555.66 | 119.65 | 21.04 | 148.80 | 2004.57 | 215.71 | 171.63 | 225.45 | 27.33 | 28.72 | 2.08 | 10.85 | 3.49 | 0.00 |
| 1989 | 1237.69 | 0.00 | 411.82 | 141.76 | 31.19 | 1276.32 | 28.43 | 10.08 | 18.30 | 435.18 | 22.95 | 1.75 | 43.08 | 0.00 | 0.00 | 1.76 |
| 1992 | 2169.20 | 230.71 | 318.37 | 42.50 | 246.38 | 630.74 | 77.96 | 31.61 | 1541.82 | 46.68 | 28.08 | 14.14 | 533.23 | 27.13 | 0.00 | 28.42 |
| 1995 | 1385.00 | 316.41 | 880.52 | 117.80 | 32.62 | 575.90 | 26.58 | 88.78 | 403.38 | 5.90 | 0.00 | 429.34 | 0.96 | 17.42 | 0.00 | 130.39 |
| 1998 | 1185.00 | 98.31 | 414.33 | 460.41 | 386.81 | 481.76 | 34.52 | 135.59 | 215.61 | 26.41 | 39.14 | 120.27 | 7.68 | 4.92 | 104.47 | 29.19 |
| 2001 | 737.00 | 0.00 | 1471.36 | 185.56 | 109.35 | 117.25 | 54.26 | 54.03 | 29.41 | 17.11 | 12.03 | 5.07 | 4.48 | 8.73 | 0.83 | 3.10 |
| 2003 | 1840.00 | 5.19 | 99.78 | 84.88 | 2146.50 | 366.87 | 92.55 | 201.22 | 133.09 | 73.54 | 74.67 | 24.06 | 14.18 | 14.63 | 10.33 | 14.12 |
| 2005 | 1265.16 | 8.65 | 601.86 | 61.02 | 180.86 | 129.98 | 1210.5 | 132.12 | 45.07 | 61.09 | 34.83 | 28.17 | 11.9 | 6.11 | 0.81 | 4.35 |

Table 11a. Hake pre-recruit (age-0 fish) indices from the SWFSC Santa Cruz midwater trawl juvenile groundfish survey (estimates are based on log-transformed hake catch per tow in numbers from Monterey outside stratum only, Sakuma and Ralston 1997) and the coast-wide survey which includes data from the PWCC/NMFS and SWFSC Santa Cruz surveys.

| | SWFSC Santa Cruz hake pre-recruit index | | | | Coast-wide survey SWFSC/PWCC/NMFS hake pre-recruit index | | | |
|---|---|---|---|---|---|---|---|---|
| Year | log(numbers) | S.E | Antilog (bias corrected) | Year | Catch per tow | S.D. | CV | S.E. (log space) |
| 1986 | 2.989 | 0.552 | 18.87 | 1986 | - | - | - | - |
| 1987 | 6.691 | 0.537 | 803.92 | 1987 | - | - | - | - |
| 1988 | 5.294 | 0.507 | 198.17 | 1988 | - | - | - | - |
| 1989 | 2.232 | 0.526 | 8.32 | 1989 | - | - | - | - |
| 1990 | 3.778 | 0.526 | 42.72 | 1990 | - | - | - | - |
| 1991 | 4.187 | 0.535 | 64.81 | 1991 | - | - | - | - |
| 1992 | 2.797 | 0.540 | 15.39 | 1992 | - | - | - | - |
| 1993 | 7.266 | 0.522 | 1,430.09 | 1993 | - | - | - | - |
| 1994 | 3.661 | 0.523 | 37.90 | 1994 | - | - | - | - |
| 1995 | 2.131 | 0.523 | 7.43 | 1995 | - | - | - | - |
| 1996 | 4.929 | 0.536 | 137.21 | 1996 | - | - | - | - |
| 1997 | 3.011 | 0.556 | 19.31 | 1997 | - | - | - | - |
| 1998 | 1.716 | 0.539 | 4.56 | 1998 | - | - | - | - |
| 1999 | 4.724 | 0.534 | 111.66 | 1999 | - | - | - | - |
| 2000 | 2.819 | 0.541 | 15.75 | 2000 | - | - | - | - |
| 2001 | 3.637 | 0.526 | 36.99 | 2001 | 9.490 | 4.629 | 0.488 | 0.462 |
| 2002 | 2.347 | 0.558 | 9.45 | 2002 | 6.429 | 3.414 | 0.531 | 0.498 |
| 2003 | 0.733 | 0.526 | 1.08 | 2003 | 6.648 | 3.266 | 0.491 | 0.465 |
| 2004 | 4.771 | 0.526 | 117.05 | 2004 | 19.228 | 7.882 | 0.410 | 0.394 |
| 2005 | 0.540 | 0.511 | 0.72 | 2005 | 3.271 | 2.169 | 0.663 | 0.604 |
| 2006 | 0.409 | 0.509 | 0.51 | 2006 | 1.411 | 0.844 | 0.598 | 0.553 |

Table 11b. Basic data used to develop a coast-wide hake pre-recruit index based on SWFSC Santa Cruz midwater groundfish trawl and PWCC/NMFS midwater trawl surveys. These data include total number of zero and non-zero tows, mean and variance of log(catch numbers) of all and all non-zero tows for each year from 2001-2006 and eight latitudinal strata.

Basic catch data: Tows with zero and non-zero catches

| | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Latitudinal Stratum | Num zero | Num pos. | Num zero | Num pos. | Num zero | Num pos. | Num zero | Num pos. | Num zero | Num pos. | Num zero | Num pos. |
| 35 | 5 | 8 | 5 | 10 | 9 | 3 | 15 | 33 | 25 | 30 | 36 | 32 |
| 36 | 11 | 32 | 20 | 25 | 27 | 19 | 15 | 30 | 40 | 12 | 34 | 9 |
| 37 | 10 | 38 | 10 | 27 | 29 | 30 | 12 | 47 | 50 | 4 | 41 | 4 |
| 38 | 2 | 24 | 2 | 22 | 4 | 28 | 4 | 28 | 26 | 5 | 22 | 29 |
| 39 | 2 | 8 | 1 | 9 | 1 | 9 | 1 | 14 | 14 | 7 | 8 | 17 |
| 40 | 3 | 11 | 0 | 10 | 2 | 9 | 5 | 10 | 4 | 7 | 3 | 13 |
| 41 | 6 | 6 | 3 | 7 | 2 | 9 | 0 | 10 | 1 | 9 | 1 | 9 |
| 42 | 26 | 2 | 28 | 2 | 6 | 26 | 26 | 35 | 27 | 40 | 25 | 43 |
| All | 65 | 129 | 69 | 112 | 80 | 133 | 78 | 207 | 187 | 114 | 170 | 156 |
| Proportion positive | | 0.66 | | 0.62 | | 0.62 | | 0.73 | | 0.38 | | 0.48 |

Mean and variance of log catch numbers (all hauls)

| | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Latitudinal Stratum | Mean | Var | Mean | Var | Mean | Var | Mean | Var | Mean | Var | Mean | Var |
| 35 | 2.827 | 8.061 | 1.818 | 3.339 | 0.851 | 3.544 | 1.682 | 2.773 | 2.495 | 7.678 | 0.769 | 1.387 |
| 36 | 2.504 | 4.261 | 1.554 | 4.419 | 0.845 | 1.803 | 2.746 | 6.641 | 0.218 | 0.449 | 0.435 | 1.146 |
| 37 | 2.658 | 4.430 | 1.771 | 2.924 | 0.995 | 2.763 | 3.091 | 6.521 | 0.013 | 0.009 | 0.111 | 0.261 |
| 38 | 2.753 | 5.230 | 3.493 | 4.534 | 2.520 | 4.509 | 4.046 | 7.502 | 0.103 | 0.109 | 0.919 | 1.448 |
| 39 | 2.073 | 2.854 | 4.817 | 4.904 | 3.587 | 3.834 | 6.098 | 6.520 | 0.411 | 0.710 | 1.908 | 3.159 |
| 40 | 2.144 | 3.414 | 1.881 | 0.948 | 2.674 | 6.913 | 2.385 | 5.379 | 1.346 | 1.811 | 2.417 | 2.746 |
| 41 | 0.860 | 1.005 | 1.326 | 1.197 | 5.493 | 10.601 | 5.185 | 12.953 | 4.288 | 7.031 | 1.954 | 0.724 |
| 42 | 0.069 | 0.135 | 0.065 | 0.126 | 2.391 | 6.698 | 1.631 | 6.707 | 1.787 | 4.887 | 1.230 | 1.380 |
| All | 2.096 | 4.525 | 1.816 | 4.294 | 1.834 | 5.407 | 2.789 | 7.534 | 1.125 | 4.151 | 0.958 | 1.720 |

Mean and variance of log catch numbers (non-zero hauls)

| | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Latitudinal Stratum | Mean | Var | Mean | Var | Mean | Var | Mean | Var | Mean | Var | Mean | Var |
| 35 | 4.594 | 4.542 | 2.727 | 2.440 | 3.404 | 6.460 | 2.447 | 2.143 | 4.574 | 4.460 | 1.635 | 1.537 |
| 36 | 3.365 | 2.783 | 2.798 | 4.477 | 2.045 | 1.916 | 4.119 | 4.225 | 0.947 | 1.329 | 2.077 | 2.177 |
| 37 | 3.358 | 3.216 | 2.427 | 2.396 | 1.956 | 3.579 | 3.880 | 5.094 | 0.173 | 0.120 | 1.253 | 1.924 |
| 38 | 2.982 | 4.971 | 3.810 | 3.699 | 2.880 | 4.101 | 4.624 | 5.843 | 0.636 | 0.397 | 1.616 | 1.419 |
| 39 | 2.591 | 2.135 | 5.352 | 2.294 | 3.986 | 2.526 | 6.534 | 3.957 | 1.233 | 1.185 | 2.806 | 2.061 |
| 40 | 2.728 | 2.684 | 1.881 | 0.948 | 3.269 | 6.456 | 3.578 | 3.627 | 2.115 | 1.122 | 2.975 | 1.635 |
| 41 | 1.719 | 0.438 | 1.894 | 0.539 | 6.714 | 4.031 | 5.185 | 12.953 | 4.765 | 5.356 | 2.171 | 0.284 |
| 42 | 0.973 | 1.893 | 0.973 | 1.893 | 2.942 | 6.617 | 2.842 | 8.291 | 2.993 | 4.567 | 1.945 | 0.777 |
| All | 3.152 | 3.468 | 2.935 | 3.650 | 2.937 | 5.420 | 3.839 | 6.333 | 2.969 | 5.494 | 2.003 | 1.501 |

Table 12. Parameter assumptions and model configuration of Stock Synthesis II (Ver. 1.23E) for Pacific hake. The alternative model imposes a prior on the Ln acoustic survey q equivalent to mean = 1.0 and standard deviation = 0.10.

| Parameter | Number Estimated | Bounds (low,high) | Prior (Mean, SD) |
|---|---|---|---|
| Natural Mortality | - | NA | Fixed at 0.23 |
| *Stock and recruitment* | | | |
| Ln(Rzero) | 1 | (11,15) | ~N(15,99) |
| Steepness | - | NA | Fixed at 0.75 |
| Sigma R (based on 1967-2003 R devs) | - | NA | Fixed at 1.131 |
| Ln(Recruitment deviations): 1967-2005 | 39 | (-15,15) | ~Ln(N(0.Sigma R)) |
| *Catchability* | | | |
| Ln(Acoustic survey) | - | NA | fixed at 1.0 / q prior 1 |
| Ln(Recruitment survey, 1986-2000) | 1 | (-15,10) | ~N(-1,99) |
| Ln(Recruitment survey, 2001-2006) | 1 | (-15,10) | ~N(-1,99) |
| *Selectivity (double logistic)* | | | |
| US Fishery: | | | |
| Base Period block: 1966 - 1983 | | | |
| Ascending inflection (ln trans.) | 1 | (1,10) | ~N(3,99) |
| Ascending slope | 1 | (0.001,10) | ~N(2.5,99) |
| Descending inflection (ln trans.) | 1 | (1,20) | ~N(12,99) |
| Descending slope | 1 | (0.001,10) | ~N(1.0,99) |
| Temporal blocks for all: 1984-1992, 1993-2000, 2001-2005 | 12 | same as above | same as above |
| Canadian Fishery: | | | |
| Base Period block: 1966 - 1994 | | | |
| Ascending inflection (ln trans.) | 1 | (1,20) | ~N(3,99) |
| Ascending slope | 1 | (0.001,10) | ~N(1.0,99) |
| Descending inflection (ln trans.) | 1 | (1,40) | ~N(13,99) |
| Descending slope | 1 | (0.001,10) | ~N(1.0,99) |
| Temporal blocks for ascending infl and slp: 1995-2000, 2001-2002, 2003-2005 | 6 | same as above | same as above |
| Acoustic Survey: | | | |
| Ascending inflection (ln trans.) | 1 | (1,10) | ~N(3,99) |
| Ascending slope | 1 | (0.001,10) | ~N(1.0,99) |
| Descending inflection (ln trans.) | 1 | (1,20) | ~N(7,99) |
| Descending slope | 1 | (0.001,10) | ~N(1.0,99) |
| *Individual growth* | | | |
| Sex combined: | | | |
| Length at age min (age 2) | 1 | (10,40) | ~N(33,99) |
| base period Lmax 1966-1983 | 1 | (30,70) | ~N(53,99) |
| blocks for Lmax: 1984-2005 | 1 | (30,70) | ~N(53,99) |
| base period von Bertalanffy K, 1966-1980 and 1987-2005 | 1 | (0.1,0.7) | ~N(0.3,99) |
| blocks for von Bertalanffy K, 1981-1986 | 1 | (0.1,0.7) | ~N(0.3,99) |
| CV of length at age min | 1 | (0.01,0.35) | ~N(0.1,99) |
| CV of length at age max | - | NA | fixed at 0 |

[1] Alternative model includes estimation of Acoustic survey q ~ LN(0.0, 0.112)

Table 13. Maximum likelihood model parameter estimates with asymptotic standard deviations from Stock Synthesis II (Ver. 1.23E) applied to Pacific hake for the base and alternative models.

| | Base Model, *q* =1.0, *h* =0.75 | | *h* =0.75, *q* prior | |
|---|---|---|---|---|
| Parameter | MLE | Asympt. SD | MLE | Asympt. SD |
| *Stock and recruitment* | | | | |
| Ln(Rzero) | 15.353 | 0.065 | 15.353 | 0.065 |
| *Catchability* | | | | |
| Ln(Acoustic survey) | NE | NE | -0.429 | 0.092 |
| Ln(Recruitment survey) | -8.951 | 0.340 | -9.131 | 0.342 |
| Ln(Recruitment survey) | -12.011 | 0.340 | -12.276 | 0.346 |
| *Selectivity (double logistic)* | | | | |
| US Fishery: | | | | |
| Base Period block: 1966 - 1983 | | | | |
| Ascending inflection (ln trans.) | 3.382 | 0.071 | 3.330 | 0.073 |
| Ascending slope | 1.667 | 0.077 | 1.690 | 0.078 |
| Descending inflection (ln trans.) | 11.945 | 0.116 | 11.850 | 0.113 |
| Descending slope | 1.064 | 0.050 | 1.044 | 0.048 |
| Block 1984 - 1992 | | | | |
| Ascending inflection (ln trans.) | 2.509 | 0.045 | 2.477 | 0.044 |
| Ascending slope | 2.522 | 0.141 | 2.570 | 0.146 |
| Descending inflection (ln trans.) | 12.556 | 0.147 | 12.440 | 0.149 |
| Descending slope | 1.273 | 0.085 | 1.226 | 0.081 |
| Block 1993- 2000 | | | | |
| Ascending inflection (ln trans.) | 2.940 | 0.064 | 2.945 | 0.056 |
| Ascending slope | 2.376 | 0.115 | 2.386 | 0.111 |
| Descending inflection (ln trans.) | 13.996 | 0.160 | 13.859 | 0.165 |
| Descending slope | 1.607 | 0.245 | 1.486 | 0.204 |
| Block 2001- 2005 | | | | |
| Ascending inflection (ln trans.) | 2.931 | 0.045 | 2.923 | 0.042 |
| Ascending slope | 3.009 | 0.131 | 3.060 | 0.137 |
| Descending inflection (ln trans.) | 12.451 | 1.548 | 13.040 | 0.489 |
| Descending slope | 1.164 | 0.790 | 1.547 | 0.427 |
| Canadian Fishery: | | | | |
| Base Period block: 1966 - 1994 | | | | |
| Ascending inflection (ln trans.) | 5.168 | 0.129 | 5.124 | 0.127 |
| Ascending slope | 1.317 | 0.093 | 1.323 | 0.095 |
| Descending inflection (ln trans.) | 13.120 | 0.180 | 12.990 | 0.153 |
| Descending slope | 1.366 | 0.141 | 1.285 | 0.098 |
| Base Period block: 1995 - 2000 | | | | |
| Ascending inflection (ln trans.) | 4.582 | 0.317 | 4.528 | 0.301 |
| Ascending slope | 0.633 | 0.070 | 0.667 | 0.074 |
| Base Period block: 2001 - 2002 | | | | |
| Ascending inflection (ln trans.) | 3.604 | 0.108 | 3.627 | 0.104 |
| Ascending slope | 4.995 | 0.757 | 4.994 | 0.761 |
| Base Period block: 2003 - 2005 | | | | |
| Ascending inflection (ln trans.) | 4.825 | 0.176 | 4.705 | 0.137 |
| Ascending slope | 1.703 | 0.182 | 1.712 | 0.185 |
| Acoustic Survey: | | | | |
| Ascending inflection (ln trans.) | 11.585 | 0.191 | 11.633 | 0.192 |
| Ascending slope | 0.940 | 0.040 | 0.936 | 0.039 |
| Descending inflection (ln trans.) | 2.415 | 0.231 | 2.445 | 0.230 |
| Descending slope | 0.859 | 0.044 | 0.865 | 0.043 |
| *Growth Parameters:* | | | | |
| Length at age min (Lmin, age 2) | 33.120 | 0.085 | 33.077 | 0.096 |
| Base period Lmax, 1966-1983 | 52.948 | 0.064 | 53.021 | 0.128 |
| Block for Lmax: 1984-2005 | 49.779 | 0.035 | 49.893 | 0.113 |
| Base period K, 1966-1980, 1987-200 | 0.334 | 0.002 | 0.331 | 0.007 |
| Blocks for K: 1981-1986 | 0.215 | 0.004 | 0.212 | 0.007 |
| CV of length at age min | 0.072 | 0.000 | 0.072 | 0.001 |

Table 14a. Time series of estimated 3+ biomass, spawning biomass, recruitment, and utilization for 1966-2007 from the ***base model*** using Stock Synthesis II (Ver. 1.23E). U.S. and Canadian exploitation rate is the catch in biomass divided by the vulnerable biomass at the start of the year. Population (3+) and spawning biomass is in millions of tons at the start of the year. Recruitment is given in billions of age-0 fish.

| | 3+ Population | Spawning | Age 0 | Depletion | | Exploitation Rate | |
|---|---|---|---|---|---|---|---|
| Year | biomass (mt) | biomass (mt) | Recruits | % Bzero | U.S. exploitation rate | Canada exploitation rate | Total |
| 1966 | 7.336 | 3.574 | 4.665 | 100.00% | 2.73% | 0.02% | 2.75% |
| 1967 | 7.207 | 3.511 | 5.326 | 98.23% | 3.62% | 0.99% | 4.61% |
| 1968 | 7.025 | 3.421 | 5.656 | 95.71% | 1.28% | 1.72% | 2.99% |
| 1969 | 6.958 | 3.398 | 5.781 | 95.07% | 1.82% | 2.67% | 4.49% |
| 1970 | 6.973 | 3.394 | 14.480 | 94.97% | 3.38% | 2.17% | 5.55% |
| 1971 | 7.026 | 3.412 | 5.071 | 95.47% | 2.68% | 0.79% | 3.47% |
| 1972 | 7.199 | 3.631 | 2.804 | 101.59% | 1.47% | 1.25% | 2.73% |
| 1973 | 8.999 | 4.154 | 9.185 | 116.23% | 2.59% | 0.41% | 3.01% |
| 1974 | 9.127 | 4.359 | 2.317 | 121.94% | 3.01% | 0.43% | 3.44% |
| 1975 | 8.593 | 4.300 | 3.305 | 120.30% | 3.12% | 0.35% | 3.47% |
| 1976 | 9.084 | 4.302 | 1.912 | 120.36% | 3.60% | 0.12% | 3.72% |
| 1977 | 8.362 | 4.094 | 13.619 | 114.54% | 2.04% | 0.11% | 2.15% |
| 1978 | 7.831 | 3.822 | 1.768 | 106.93% | 1.68% | 0.11% | 1.79% |
| 1979 | 7.079 | 3.673 | 2.755 | 102.75% | 2.30% | 0.28% | 2.58% |
| 1980 | 8.464 | 3.888 | 33.666 | 108.78% | 1.37% | 0.42% | 1.79% |
| 1981 | 7.748 | 3.872 | 0.841 | 108.33% | 2.11% | 0.62% | 2.73% |
| 1982 | 7.063 | 3.685 | 0.359 | 103.09% | 1.39% | 0.82% | 2.21% |
| 1983 | 11.564 | 4.100 | 0.776 | 114.70% | 1.18% | 1.00% | 2.18% |
| 1984 | 10.916 | 4.573 | 17.961 | 127.95% | 1.07% | 0.98% | 2.05% |
| 1985 | 9.466 | 4.544 | 0.334 | 127.12% | 1.10% | 0.51% | 1.60% |
| 1986 | 8.135 | 4.165 | 0.863 | 116.52% | 2.19% | 1.03% | 3.22% |
| 1987 | 9.471 | 3.953 | 5.403 | 110.59% | 2.14% | 1.45% | 3.58% |
| 1988 | 8.399 | 3.711 | 2.388 | 103.83% | 2.29% | 1.91% | 4.20% |
| 1989 | 7.263 | 3.543 | 0.617 | 99.12% | 3.48% | 2.16% | 5.64% |
| 1990 | 6.834 | 3.259 | 2.958 | 91.19% | 3.40% | 1.85% | 5.24% |
| 1991 | 6.056 | 2.898 | 1.195 | 81.07% | 4.65% | 2.51% | 7.15% |
| 1992 | 4.999 | 2.480 | 0.591 | 69.38% | 5.57% | 2.98% | 8.55% |
| 1993 | 4.446 | 2.124 | 2.530 | 59.41% | 4.20% | 2.44% | 6.64% |
| 1994 | 3.809 | 1.833 | 3.015 | 51.27% | 9.13% | 5.65% | 14.78% |
| 1995 | 2.999 | 1.492 | 2.137 | 41.74% | 8.48% | 4.29% | 12.76% |
| 1996 | 2.719 | 1.316 | 2.060 | 36.81% | 11.50% | 6.39% | 17.89% |
| 1997 | 2.566 | 1.197 | 1.980 | 33.48% | 13.36% | 7.47% | 20.83% |
| 1998 | 2.317 | 1.088 | 2.887 | 30.45% | 14.37% | 8.12% | 22.49% |
| 1999 | 2.097 | 0.986 | 14.975 | 27.59% | 15.17% | 8.76% | 23.92% |
| 2000 | 1.902 | 0.916 | 1.044 | 25.62% | 14.81% | 2.33% | 17.14% |
| 2001 | 1.967 | 1.111 | 1.423 | 31.09% | 12.24% | 4.86% | 17.10% |
| 2002 | 4.106 | 1.587 | 0.243 | 44.39% | 4.95% | 3.88% | 8.83% |
| 2003 | 3.985 | 1.807 | 2.251 | 50.56% | 4.13% | 4.68% | 8.81% |
| 2004 | 3.706 | 1.738 | 3.030 | 48.64% | 6.56% | 6.03% | 12.59% |
| 2005 | 3.022 | 1.496 | 1.249 | 41.86% | 9.44% | 4.54% | 13.98% |
| 2006 | 2.667 | 1.295 | 0.366 | 36.24% | 12.56% | 5.04% | 17.60% |
| 2007 | 2.496 | 1.146 | 2.094 | 32.06% | - | - | - |
| 2006 5% - 95% Asymptotic Interval | | | | 36.24% | 28.9% - 43.5% | | |
| 2007 5% - 95% Asymptotic Interval | | | | 32.06% | 24.3% - 39.7% | | |

Table 14b. Time series of estimated 3+ biomass, spawning biomass, recruitment, and utilization for 1966-2007 from the ***alternative model*** using Stock Synthesis II (Ver. 1.23E). U.S. and Canadian exploitation rate is the catch in biomass divided by the vulnerable biomass at the start of the year. Population (3+) and spawning biomass is in millions of tons at the start of the year. Recruitment is given in billions of age-0 fish.

| Year | 3+ Population biomass (mt) | Spawning biomass (mt) | Age 0 Recruits | Depletion % Bzero | Exploitation Rate U.S. exploitation rate | Canada exploitation rate | Total |
|---|---|---|---|---|---|---|---|
| 1966 | 8.698 | 4.148 | 5.534 | 100.00% | 2.30% | 0.02% | 2.32% |
| 1967 | 8.569 | 4.085 | 6.311 | 98.47% | 3.04% | 0.83% | 3.87% |
| 1968 | 8.387 | 3.995 | 6.686 | 96.30% | 1.07% | 1.43% | 2.50% |
| 1969 | 8.320 | 3.973 | 6.819 | 95.79% | 1.52% | 2.22% | 3.74% |
| 1970 | 8.356 | 3.977 | 17.053 | 95.87% | 2.81% | 1.80% | 4.61% |
| 1971 | 8.440 | 4.006 | 5.966 | 96.58% | 2.22% | 0.65% | 2.87% |
| 1972 | 8.645 | 4.258 | 3.295 | 102.65% | 1.22% | 1.04% | 2.25% |
| 1973 | 10.757 | 4.852 | 10.773 | 116.98% | 2.15% | 0.34% | 2.50% |
| 1974 | 10.906 | 5.084 | 2.710 | 122.57% | 2.51% | 0.36% | 2.86% |
| 1975 | 10.283 | 5.019 | 3.860 | 121.01% | 2.60% | 0.29% | 2.89% |
| 1976 | 10.861 | 5.026 | 2.229 | 121.17% | 3.00% | 0.10% | 3.11% |
| 1977 | 10.016 | 4.790 | 15.805 | 115.49% | 1.70% | 0.09% | 1.79% |
| 1978 | 9.375 | 4.470 | 2.044 | 107.77% | 1.41% | 0.09% | 1.50% |
| 1979 | 8.472 | 4.286 | 3.172 | 103.33% | 1.93% | 0.23% | 2.17% |
| 1980 | 10.055 | 4.517 | 38.699 | 108.89% | 1.15% | 0.35% | 1.51% |
| 1981 | 9.196 | 4.483 | 0.962 | 108.08% | 1.78% | 0.52% | 2.30% |
| 1982 | 8.382 | 4.262 | 0.410 | 102.74% | 1.18% | 0.69% | 1.87% |
| 1983 | 13.526 | 4.723 | 0.881 | 113.87% | 1.00% | 0.85% | 1.85% |
| 1984 | 12.756 | 5.254 | 20.271 | 126.65% | 0.92% | 0.83% | 1.75% |
| 1985 | 11.069 | 5.216 | 0.375 | 125.74% | 0.95% | 0.43% | 1.38% |
| 1986 | 9.516 | 4.773 | 0.967 | 115.07% | 1.89% | 0.88% | 2.77% |
| 1987 | 10.991 | 4.518 | 6.036 | 108.92% | 1.85% | 1.24% | 3.09% |
| 1988 | 9.755 | 4.233 | 2.667 | 102.05% | 1.99% | 1.64% | 3.63% |
| 1989 | 8.450 | 4.030 | 0.691 | 97.15% | 3.03% | 1.85% | 4.88% |
| 1990 | 7.945 | 3.703 | 3.330 | 89.26% | 2.95% | 1.59% | 4.54% |
| 1991 | 7.046 | 3.291 | 1.353 | 79.34% | 4.05% | 2.16% | 6.22% |
| 1992 | 5.846 | 2.823 | 0.676 | 68.07% | 4.87% | 2.58% | 7.45% |
| 1993 | 5.217 | 2.424 | 2.933 | 58.45% | 3.65% | 2.11% | 5.76% |
| 1994 | 4.484 | 2.096 | 3.567 | 50.52% | 7.91% | 4.84% | 12.75% |
| 1995 | 3.578 | 1.723 | 2.585 | 41.53% | 7.21% | 3.56% | 10.77% |
| 1996 | 3.269 | 1.529 | 2.549 | 36.87% | 9.67% | 5.27% | 14.94% |
| 1997 | 3.126 | 1.406 | 2.501 | 33.89% | 11.07% | 6.02% | 17.09% |
| 1998 | 2.879 | 1.299 | 3.731 | 31.33% | 11.64% | 6.33% | 17.97% |
| 1999 | 2.671 | 1.203 | 19.638 | 29.01% | 11.92% | 6.60% | 18.52% |
| 2000 | 2.494 | 1.149 | 1.373 | 27.69% | 11.25% | 1.70% | 12.95% |
| 2001 | 2.633 | 1.424 | 1.884 | 34.33% | 9.35% | 3.59% | 12.94% |
| 2002 | 5.498 | 2.058 | 0.326 | 49.60% | 3.70% | 2.80% | 6.49% |
| 2003 | 5.377 | 2.360 | 3.048 | 56.88% | 3.09% | 3.16% | 6.25% |
| 2004 | 5.054 | 2.295 | 4.165 | 55.34% | 4.91% | 4.12% | 9.03% |
| 2005 | 4.227 | 2.024 | 1.511 | 48.78% | 7.01% | 3.15% | 10.16% |
| 2006 | 3.838 | 1.806 | 0.474 | 43.55% | 9.21% | 3.43% | 12.64% |
| 2007 | 3.698 | 1.651 | 2.600 | 39.79% | - | - | - |
| 2006 5% - 95% Asymptotic Interval | | | | 43.55% | 34.9% - 52.1% | | |
| 2007 5% - 95% Asymptotic Interval | | | | 39.79% | 30.7% - 48.8% | | |

Table 15a. Estimates of uncertainty as expressed by asymptotic 95% confidence intervals of spawning biomass and recruitment to age-0 from the ***base model***. Deviations from log mean recruitment were estimated between 1967-2006 and values given for 2007 represent mean recruitment from the stock recruitment curve.

| | Spawning biomass (millions, mt) | | | Recruitment to Age-0 (billions) | | |
|---|---|---|---|---|---|---|
| | | Asymptotic interval | | | Asymptotic interval | |
| Year | MLE | 5% | 95% | MLE | 5% | 95% |
| 1966 | 3.574 | 3.116 | 3.944 | 4.665 | 4.135 | 5.263 |
| 1967 | 3.511 | 3.053 | 3.880 | 5.326 | 4.531 | 6.260 |
| 1968 | 3.421 | 2.963 | 3.790 | 5.656 | 4.853 | 6.592 |
| 1969 | 3.398 | 2.939 | 3.768 | 5.781 | 4.982 | 6.709 |
| 1970 | 3.394 | 2.930 | 3.769 | 14.480 | 12.636 | 16.593 |
| 1971 | 3.412 | 2.936 | 3.796 | 5.071 | 4.376 | 5.878 |
| 1972 | 3.631 | 3.122 | 4.042 | 2.804 | 2.399 | 3.278 |
| 1973 | 4.154 | 3.574 | 4.622 | 9.185 | 8.011 | 10.530 |
| 1974 | 4.359 | 3.743 | 4.854 | 2.317 | 1.993 | 2.693 |
| 1975 | 4.300 | 3.682 | 4.799 | 3.305 | 2.864 | 3.814 |
| 1976 | 4.302 | 3.678 | 4.807 | 1.912 | 1.631 | 2.241 |
| 1977 | 4.094 | 3.491 | 4.583 | 13.619 | 12.086 | 15.347 |
| 1978 | 3.822 | 3.258 | 4.280 | 1.768 | 1.506 | 2.075 |
| 1979 | 3.673 | 3.140 | 4.105 | 2.755 | 2.382 | 3.186 |
| 1980 | 3.888 | 3.349 | 4.323 | 33.666 | 30.500 | 37.161 |
| 1981 | 3.872 | 3.349 | 4.291 | 0.841 | 0.687 | 1.030 |
| 1982 | 3.685 | 3.192 | 4.075 | 0.359 | 0.274 | 0.472 |
| 1983 | 4.100 | 3.582 | 4.496 | 0.776 | 0.644 | 0.935 |
| 1984 | 4.573 | 4.024 | 4.980 | 17.961 | 16.605 | 19.428 |
| 1985 | 4.544 | 4.007 | 4.933 | 0.334 | 0.264 | 0.422 |
| 1986 | 4.165 | 3.681 | 4.509 | 0.863 | 0.746 | 0.998 |
| 1987 | 3.953 | 3.502 | 4.260 | 5.403 | 4.991 | 5.849 |
| 1988 | 3.711 | 3.294 | 3.983 | 2.388 | 2.176 | 2.621 |
| 1989 | 3.543 | 3.154 | 3.786 | 0.617 | 0.535 | 0.710 |
| 1990 | 3.259 | 2.905 | 3.474 | 2.958 | 2.703 | 3.237 |
| 1991 | 2.898 | 2.584 | 3.085 | 1.195 | 1.070 | 1.335 |
| 1992 | 2.480 | 2.206 | 2.640 | 0.591 | 0.514 | 0.679 |
| 1993 | 2.124 | 1.885 | 2.260 | 2.530 | 2.292 | 2.793 |
| 1994 | 1.833 | 1.625 | 1.949 | 3.015 | 2.713 | 3.349 |
| 1995 | 1.492 | 1.312 | 1.591 | 2.137 | 1.897 | 2.409 |
| 1996 | 1.316 | 1.153 | 1.403 | 2.060 | 1.805 | 2.352 |
| 1997 | 1.197 | 1.042 | 1.278 | 1.980 | 1.704 | 2.300 |
| 1998 | 1.088 | 0.938 | 1.168 | 2.887 | 2.435 | 3.423 |
| 1999 | 0.986 | 0.837 | 1.067 | 14.975 | 12.384 | 18.108 |
| 2000 | 0.916 | 0.762 | 1.003 | 1.044 | 0.823 | 1.323 |
| 2001 | 1.111 | 0.912 | 1.244 | 1.423 | 1.106 | 1.831 |
| 2002 | 1.587 | 1.286 | 1.820 | 0.243 | 0.168 | 0.352 |
| 2003 | 1.807 | 1.450 | 2.099 | 2.251 | 1.602 | 3.164 |
| 2004 | 1.738 | 1.375 | 2.043 | 3.030 | 1.795 | 5.115 |
| 2005 | 1.496 | 1.147 | 1.793 | 1.249 | 0.271 | 5.750 |
| 2006 | 1.295 | 0.948 | 1.601 | 0.366 | 0.113 | 1.187 |
| 2007 | 1.146 | 0.786 | 1.474 | 2.094 | 0.353 | 12.425 |

Table 15b. Estimates of uncertainty as expressed by asymptotic 95% confidence intervals of spawning biomass and recruitment to age-0 from the ***alternative model***. Deviations from log mean recruitment were estimated between 1967-2006 and values given for 2007 represent mean recruitment from the stock recruitment curve.

| | Spawning biomass (millions, mt) | | | Recruitment to Age-0 (billions) | | |
|---|---|---|---|---|---|---|
| | | Asymptotic interval | | | Asymptotic interval | |
| Year | MLE | 5% | 95% | MLE | 5% | 95% |
| 1966 | 4.148 | 3.568 | 4.728 | 5.534 | 4.710 | 6.221 |
| 1967 | 4.085 | 3.505 | 4.665 | 6.311 | 4.710 | 6.221 |
| 1968 | 3.995 | 3.415 | 4.574 | 6.686 | 4.710 | 6.221 |
| 1969 | 3.973 | 3.392 | 4.554 | 6.819 | 5.177 | 7.374 |
| 1970 | 3.977 | 3.389 | 4.565 | 17.053 | 5.511 | 7.728 |
| 1971 | 4.006 | 3.404 | 4.608 | 5.966 | 5.668 | 7.882 |
| 1972 | 4.258 | 3.616 | 4.899 | 3.295 | 14.236 | 19.342 |
| 1973 | 4.852 | 4.125 | 5.580 | 10.773 | 4.943 | 6.849 |
| 1974 | 5.084 | 4.317 | 5.851 | 2.710 | 2.722 | 3.829 |
| 1975 | 5.019 | 4.251 | 5.787 | 3.860 | 9.109 | 12.370 |
| 1976 | 5.026 | 4.251 | 5.801 | 2.229 | 2.239 | 3.117 |
| 1977 | 4.790 | 4.042 | 5.538 | 15.805 | 3.213 | 4.408 |
| 1978 | 4.470 | 3.771 | 5.169 | 2.044 | 1.836 | 2.585 |
| 1979 | 4.286 | 3.625 | 4.947 | 3.172 | 13.471 | 17.637 |
| 1980 | 4.517 | 3.845 | 5.188 | 38.699 | 1.679 | 2.366 |
| 1981 | 4.483 | 3.832 | 5.134 | 0.962 | 2.641 | 3.614 |
| 1982 | 4.262 | 3.651 | 4.873 | 0.410 | 34.118 | 42.831 |
| 1983 | 4.723 | 4.083 | 5.363 | 0.881 | 0.762 | 1.158 |
| 1984 | 5.254 | 4.577 | 5.930 | 20.271 | 0.303 | 0.528 |
| 1985 | 5.216 | 4.557 | 5.874 | 0.375 | 0.713 | 1.048 |
| 1986 | 4.773 | 4.181 | 5.365 | 0.967 | 18.009 | 21.681 |
| 1987 | 4.518 | 3.972 | 5.064 | 6.036 | 0.291 | 0.468 |
| 1988 | 4.233 | 3.732 | 4.734 | 2.667 | 0.811 | 1.101 |
| 1989 | 4.030 | 3.566 | 4.494 | 0.691 | 5.343 | 6.412 |
| 1990 | 3.703 | 3.281 | 4.124 | 3.330 | 2.355 | 2.887 |
| 1991 | 3.291 | 2.919 | 3.664 | 1.353 | 0.581 | 0.778 |
| 1992 | 2.823 | 2.499 | 3.147 | 0.676 | 2.935 | 3.570 |
| 1993 | 2.424 | 2.143 | 2.706 | 2.933 | 1.163 | 1.477 |
| 1994 | 2.096 | 1.851 | 2.340 | 3.567 | 0.566 | 0.762 |
| 1995 | 1.723 | 1.510 | 1.936 | 2.585 | 2.538 | 3.189 |
| 1996 | 1.529 | 1.335 | 1.723 | 2.549 | 3.037 | 3.892 |
| 1997 | 1.406 | 1.219 | 1.593 | 2.501 | 2.171 | 2.884 |
| 1998 | 1.299 | 1.113 | 1.486 | 3.731 | 2.109 | 2.898 |
| 1999 | 1.203 | 1.013 | 1.394 | 19.638 | 2.034 | 2.911 |
| 2000 | 1.149 | 0.946 | 1.351 | 1.373 | 2.977 | 4.453 |
| 2001 | 1.424 | 1.147 | 1.701 | 1.884 | 15.346 | 23.832 |
| 2002 | 2.058 | 1.624 | 2.491 | 0.326 | 1.042 | 1.761 |
| 2003 | 2.360 | 1.839 | 2.880 | 3.048 | 1.426 | 2.474 |
| 2004 | 2.295 | 1.764 | 2.827 | 4.165 | 0.217 | 0.471 |
| 2005 | 2.024 | 1.514 | 2.533 | 1.511 | 2.140 | 4.348 |
| 2006 | 1.806 | 1.299 | 2.314 | 0.474 | 2.413 | 6.964 |
| 2007 | 1.651 | 1.126 | 2.175 | 2.600 | 0.328 | 6.663 |

Table 16. Three year projections of Pacific hake assuming the maximum potential catch would be removed under the 40:10 harvest control rule. Projections were based on the relative F contribution from the U.S. and Canadian fishery commensurate with the 74% and 26% coast wide national allocation

| Year | Expected coastwide catch (mt) | Spawning biomass millions mt Mean | 5% | 95% | Depletion percent unfished biomass Mean | 5% | 95% |
|---|---|---|---|---|---|---|---|
| *Base model, h=0.75, q=1.0* | | | | | | | |
| 2007 | 575,090 | 1.146 | 0.790 | 1.502 | 32.1% | 24.3% | 39.8% |
| 2008 | 377,360 | 0.876 | 0.617 | 1.136 | 24.5% | 19.5% | 29.5% |
| 2009 | 232,040 | 0.690 | 0.472 | 0.909 | 19.3% | 15.0% | 23.6% |
| 2010 | 191,600 | 0.657 | 0.334 | 0.979 | 18.4% | 10.2% | 26.6% |
| *Alt. model, h=0.75, q prior* | | | | | | | |
| 2007 | 878,670 | 1.651 | 1.126 | 2.175 | 39.8% | 30.8% | 48.8% |
| 2008 | 560,070 | 1.215 | 0.844 | 1.585 | 29.3% | 23.6% | 35.0% |
| 2009 | 334,990 | 0.921 | 0.629 | 1.214 | 22.2% | 17.6% | 26.8% |
| 2010 | 258,650 | 0.842 | 0.439 | 1.244 | 20.3% | 11.7% | 28.9% |

Table 17. Decision table showing the consequences of management action given a state of nature. States of nature include the base model (h=0.75, q=1.0) and the alternative model (h=0.75, q prior). The management actions include the optimum yield (OY) from each state of nature and constant coast wide catch scenarios.

| | | | State of Nature | |
|---|---|---|---|---|
| **Relative probability** | | | **0.5** | **0.5** |
| **Model** | | | **h = 0.75, q = 1.0** | **h = 0.75, q prior** |
| **Management action** | Total coast-wide Catch (mt) | Year | Relative depletion (2.5%-97.5% interval) | |
| OY Model h=0.75, q=1.0 | 575,090 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 377,360 | 2008 | 0.245 (0.195-0.295) | 0.326 (0.236-0.417) |
| | 232,040 | 2009 | 0.193 (0.150-0.236) | 0.271 (0.180-0.363) |
| | 191,600 | 2010 | 0.184 (0.102-0.266) | 0.257 (0.138-0.376) |
| OY Model h=0.75, q prior | 878,670 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 560,070 | 2008 | 0.208 (0.126-0.290) | 0.293 (0.236-0.350) |
| | 334,990 | 2009 | 0.139 (0.052-0.226) | 0.222 (0.176-0.268) |
| | 258,650 | 2010 | 0.124 (0.008-0.240) | 0.203 (0.117-0.289) |
| Total coast-wide | 100,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 100,000 mt | 100,000 | 2008 | 0.305 (0.230-0.379) | 0.377 (0.290-0.463) |
| | 100,000 | 2009 | 0.279 (0204-0.354) | 0.344 (0.259-0.428) |
| | 100,000 | 2010 | 0.274 (0.167-0.381) | 0.333 (0.218-0.447) |
| Total coast-wide | 200,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 200,000 mt | 200,000 | 2008 | 0.291 (0.216-0.367) | 0.365 (0.277-0.452) |
| | 200,000 | 2009 | 0.254 (0.177-0.332) | 0.323 (0.233-0.409) |
| | 200,000 | 2010 | 0.239 (0.131-0.348) | 0.303 (0.186-0.419) |
| Total coast-wide | 300,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 300,000 mt | 300,000 | 2008 | 0.278 (0.201-0.355) | 0.354 (0.266-0.442) |
| | 300,000 | 2009 | 0.230 (0.150-0.309) | 0.302 (0.213-0.389) |
| | 300,000 | 2010 | 0.205 (0.094-0.316) | 0.273 (0.155-0.392) |
| Total coast-wide | 400,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 400,000 mt | 400,000 | 2008 | 0.265 (0.187-0.342) | 0.343 (0.253-0.432) |
| | 400,000 | 2009 | 0.205 (0.124-0.286) | 0.280 (0.190-0.371) |
| | 400,000 | 2010 | 0.170 (0.057-0.283) | 0.244 (0.123-0.364) |

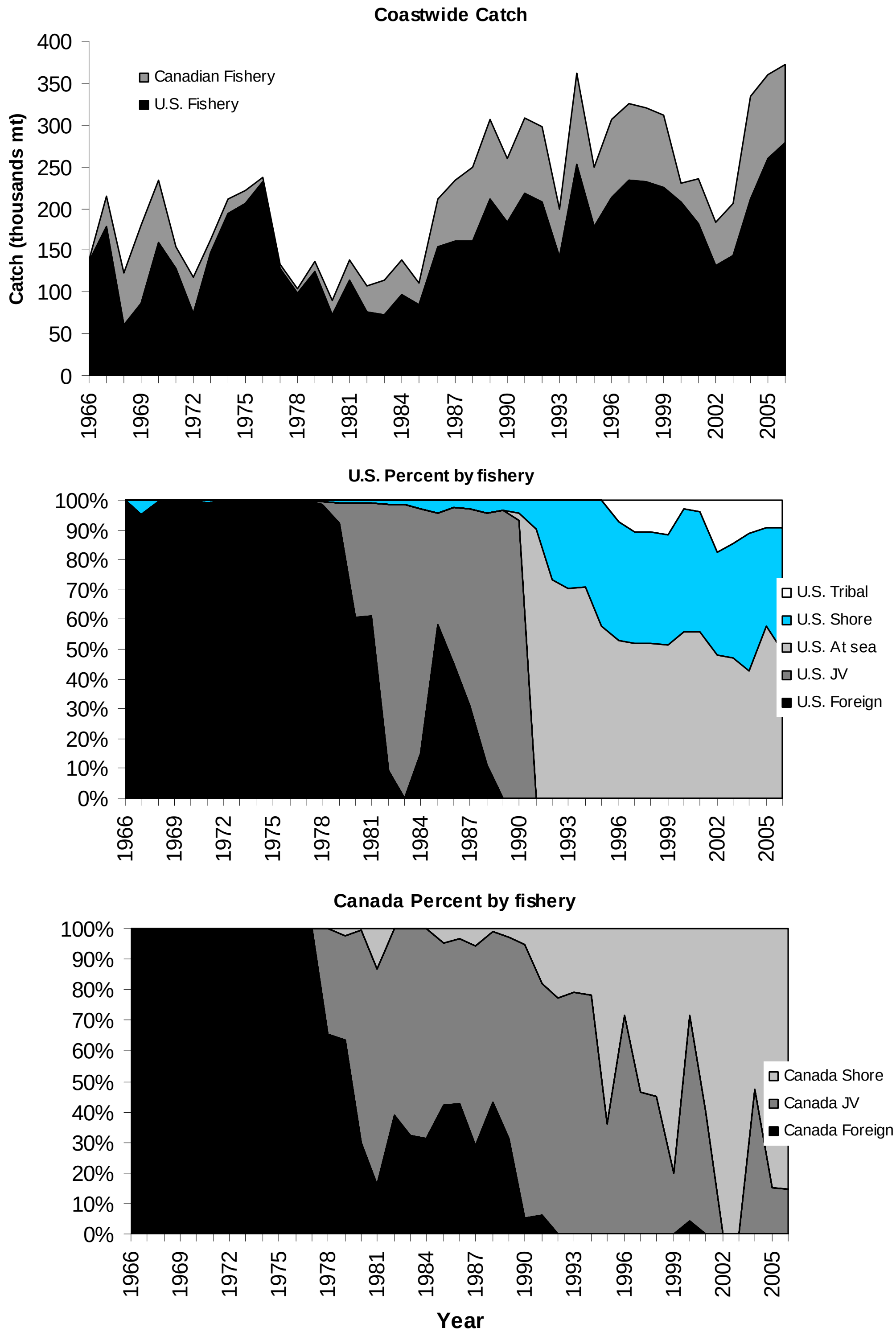



Figure 1. Pacific hake catches by fishery and national fishing sector, 1966-2006.

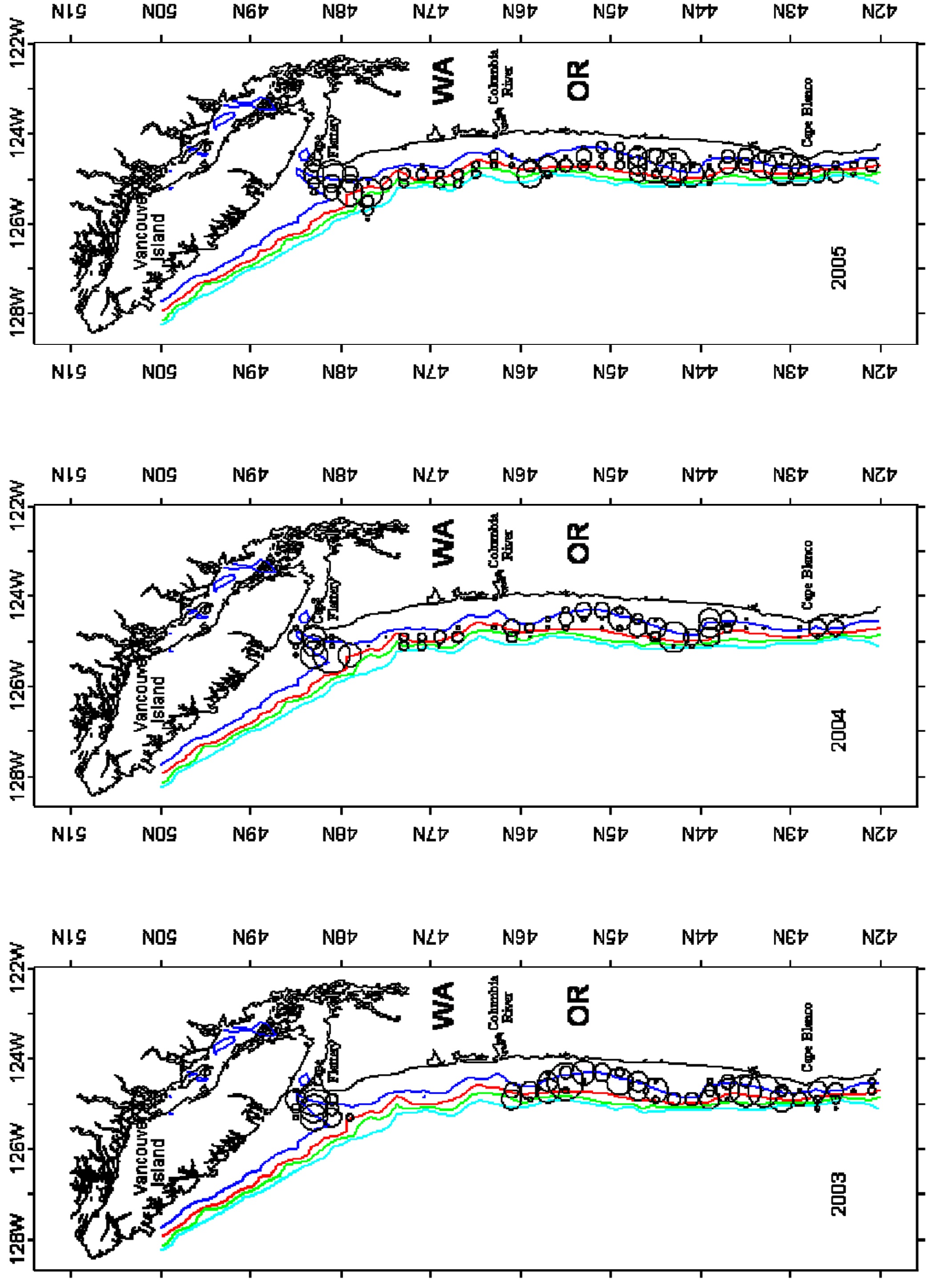



Figure 2. Distribution of at sea Pacific hake catches off the coast of the U.S. in 2003 (bottom), 2004 (middle) and 2005 (top).

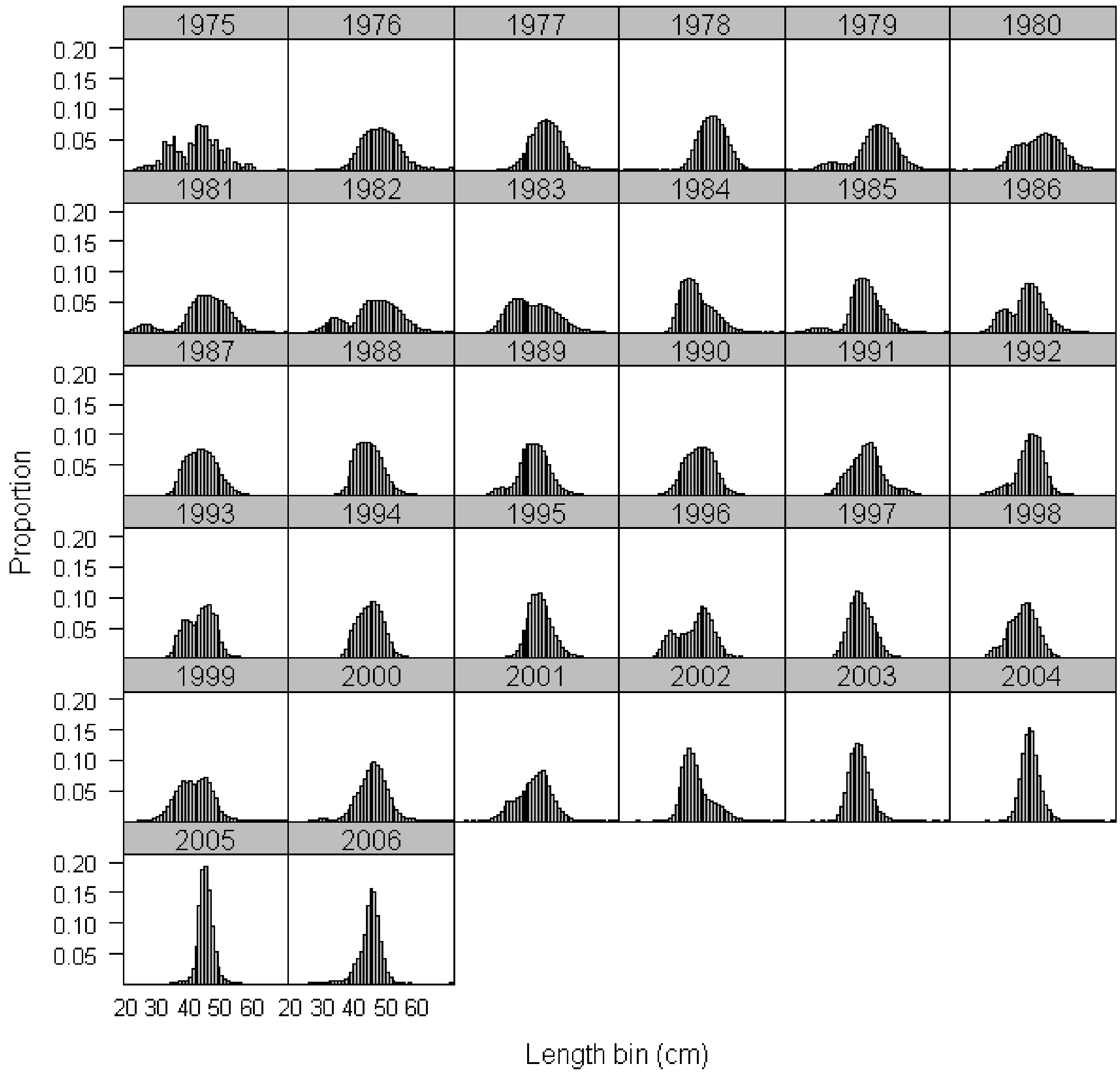



Figure 3. Plot of composite U.S. fishery size compositions of Pacific hake from fisheries operating off the west coast of the U.S., 1975-2006.

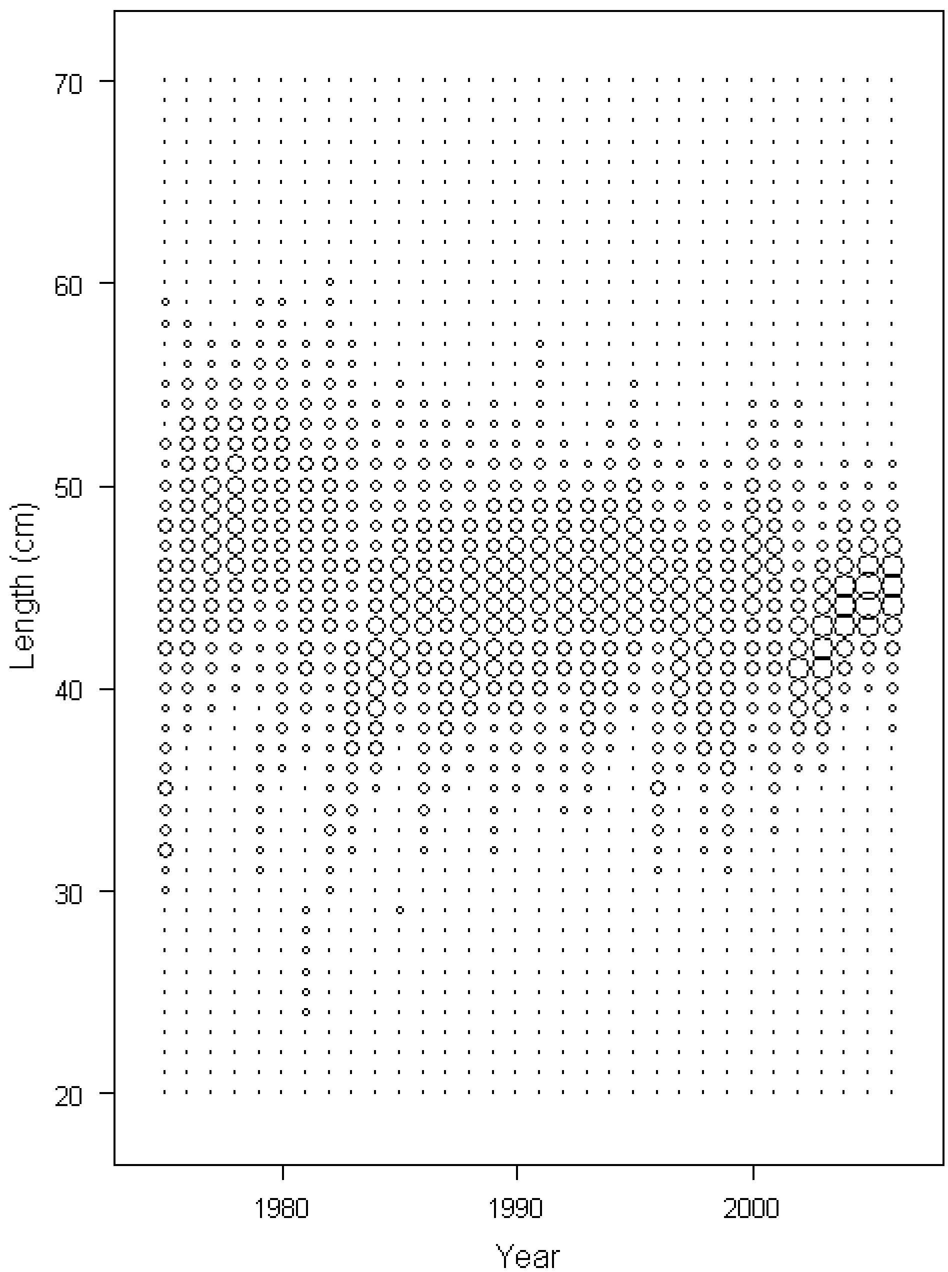



Figure 4. Composite U.S. fishery size compositions of Pacific hake from all fisheries operating off the west coast of the U.S., 1975-2006. Diameter of circles are proportional by year.

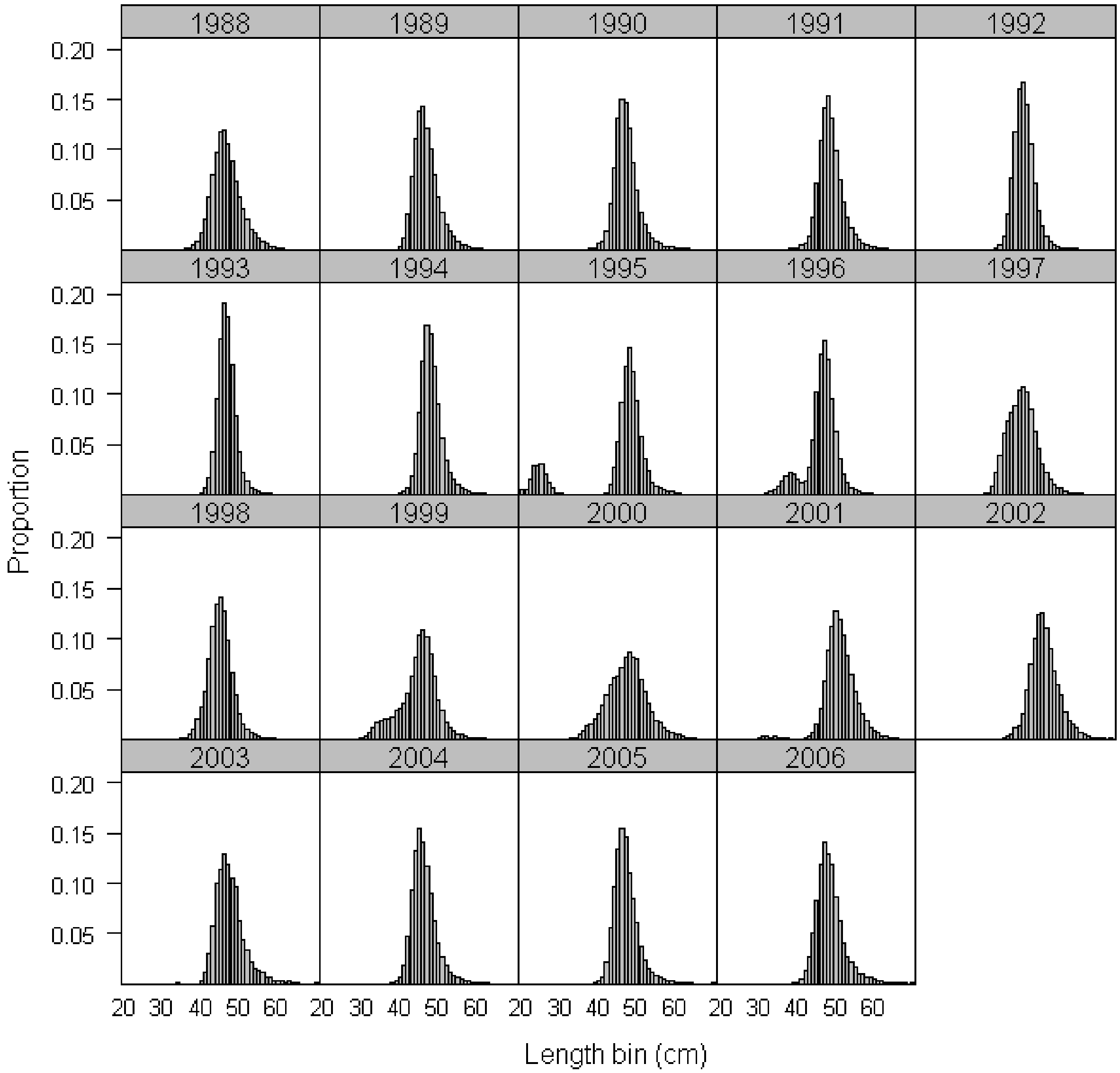



Figure 5. Plot of composite Canadian fishery size compositions of Pacific hake from fisheries operating off the west coast of the U.S., 1975-2006.

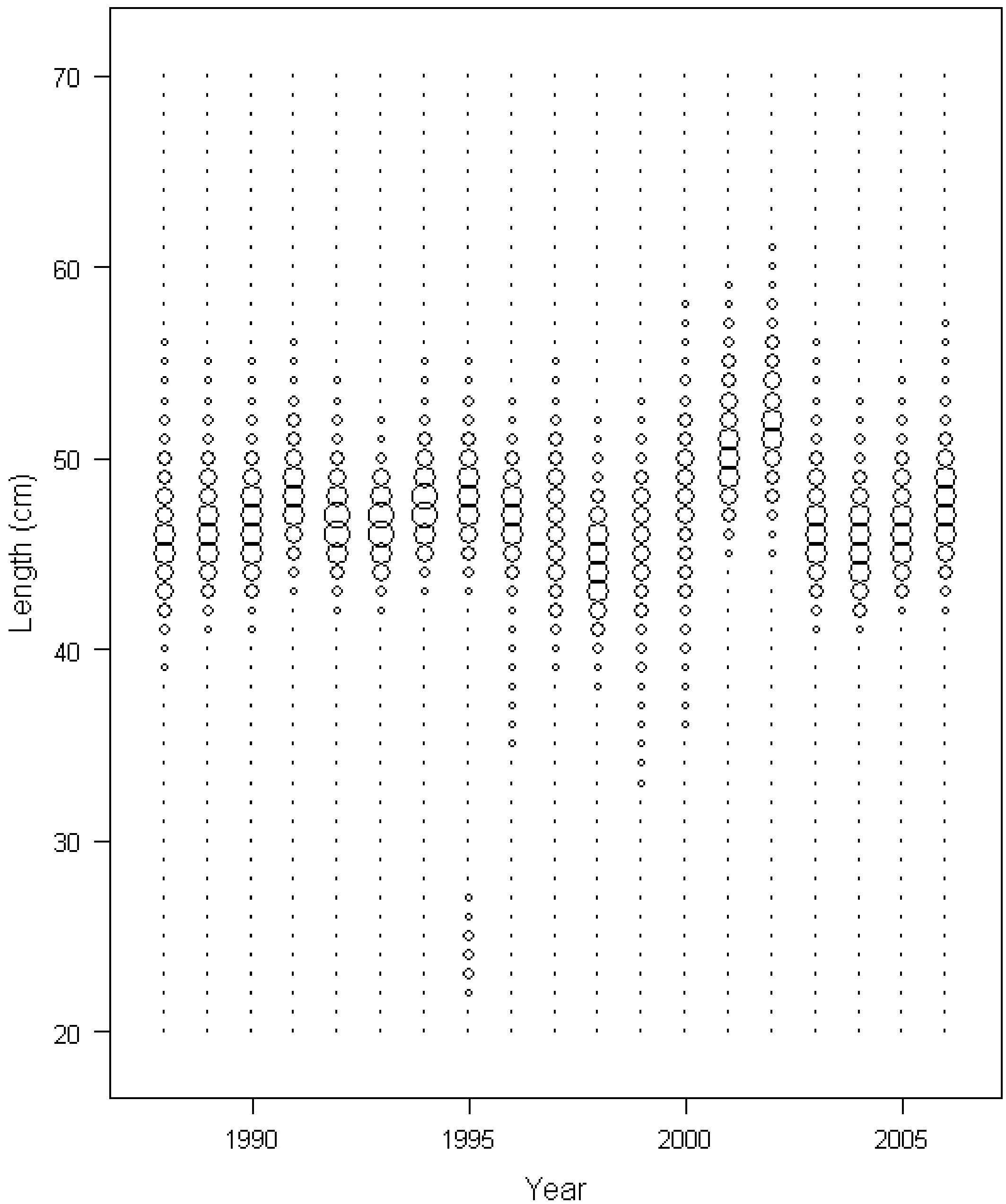



Figure 6. Size compositions of Pacific hake from the Canadian fishery, 1988-2006. Diameter of circles are proportional by year.

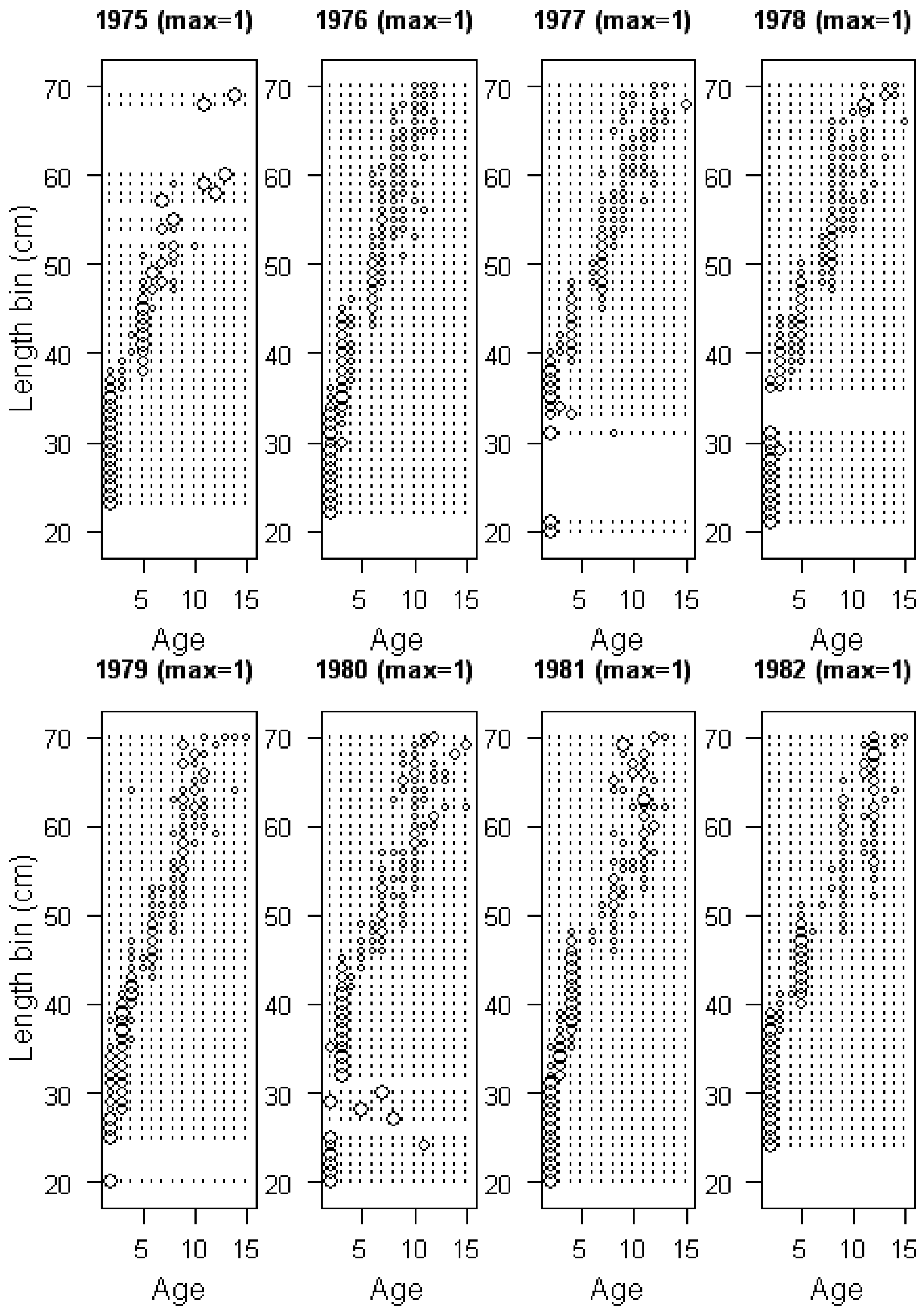



Figure 7. Bubble plots of U.S. fishery conditional age at length composition of Pacific hake by year (as input directly into model). Circle diameter is proportional within length class.

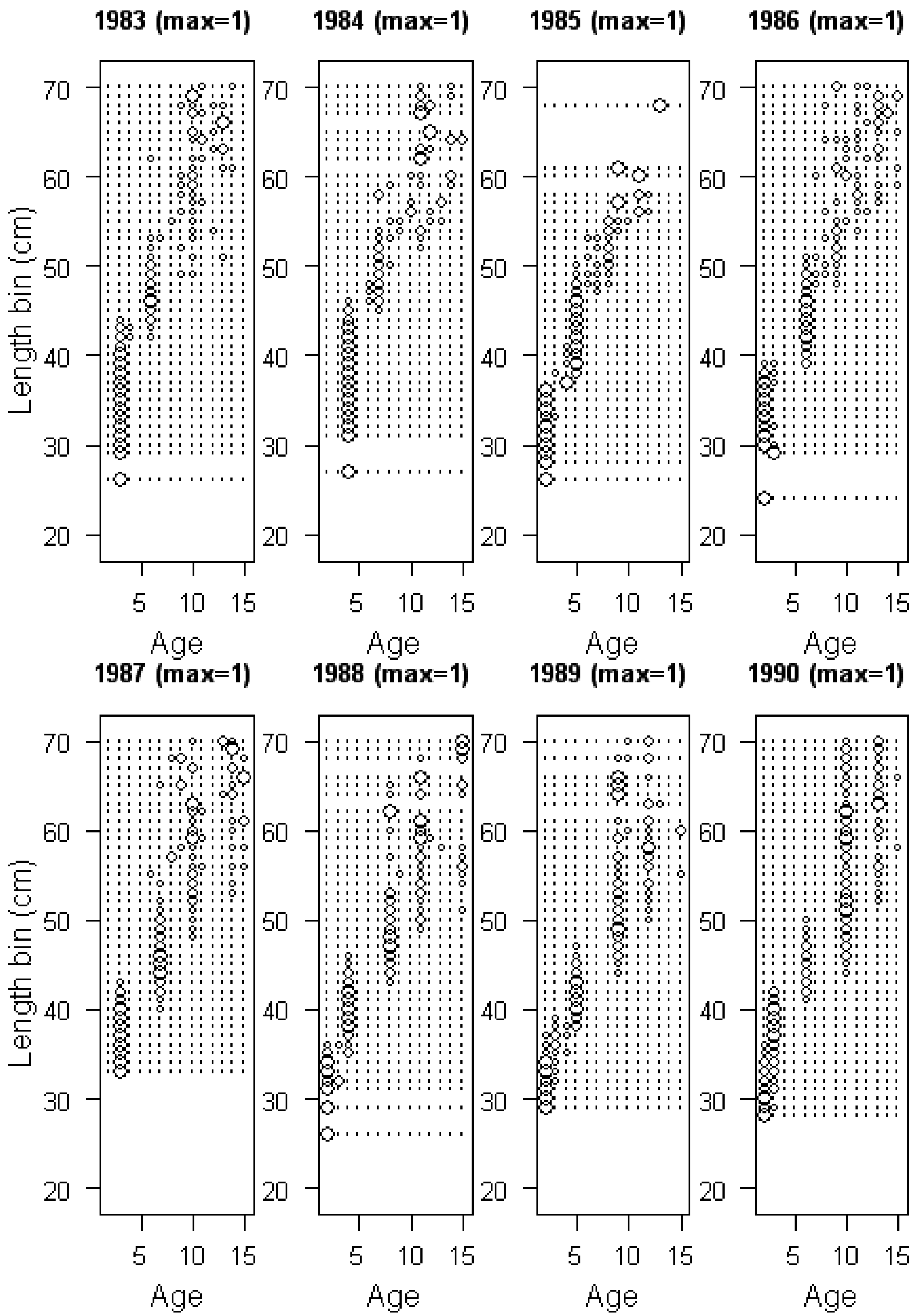



Figure 7. (continued).

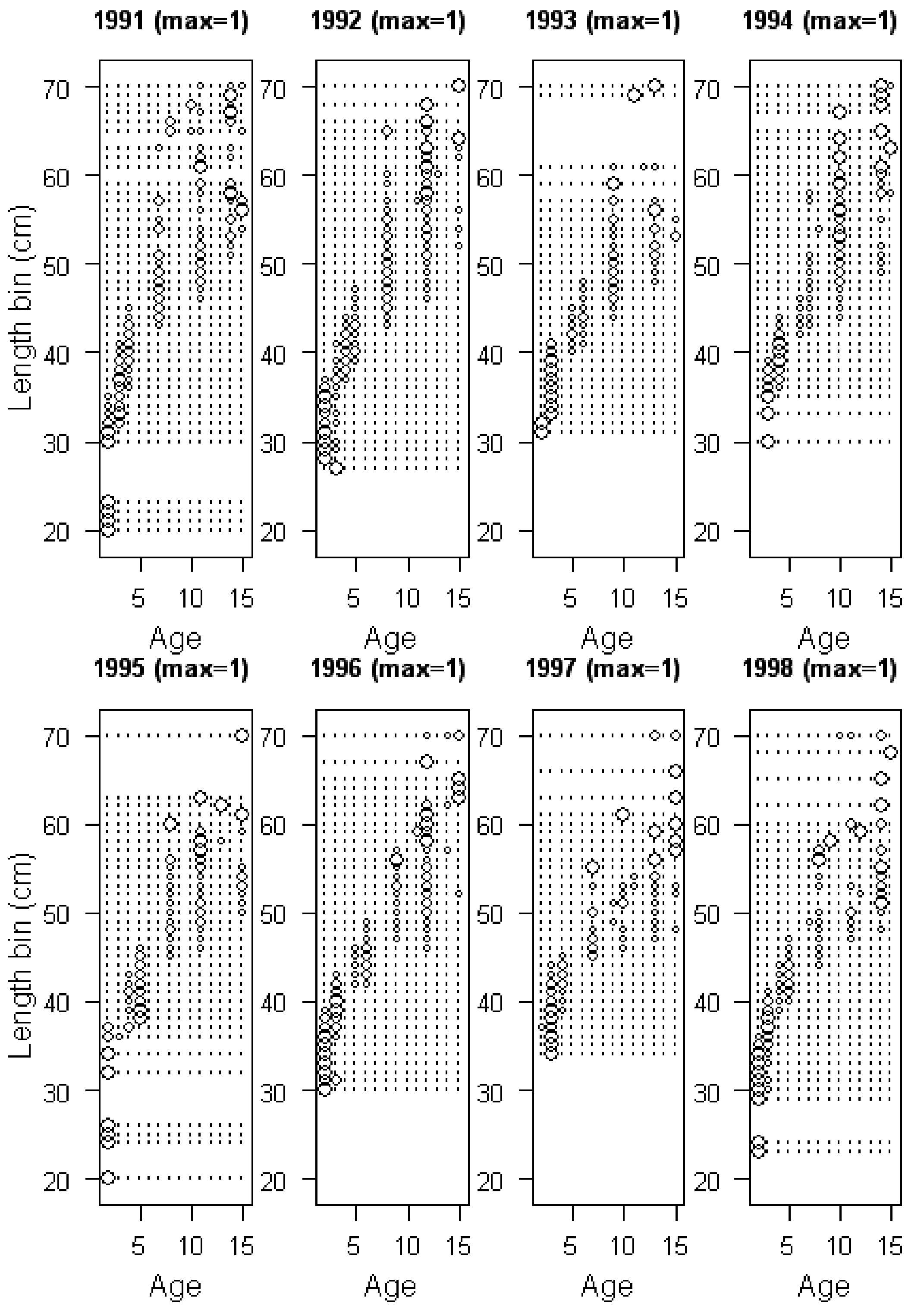



Figure 7. (continued).

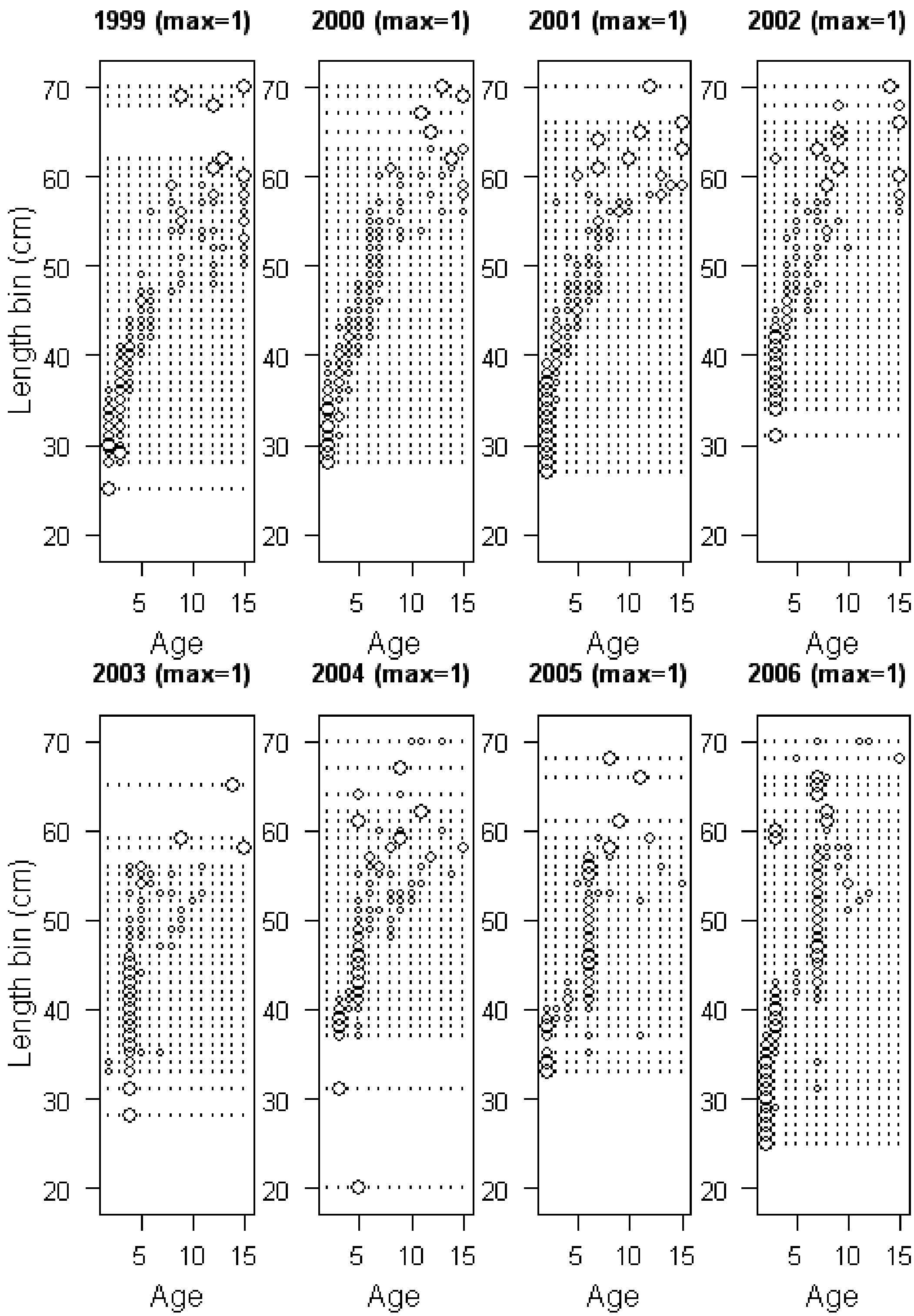



Figure 7. (continued).

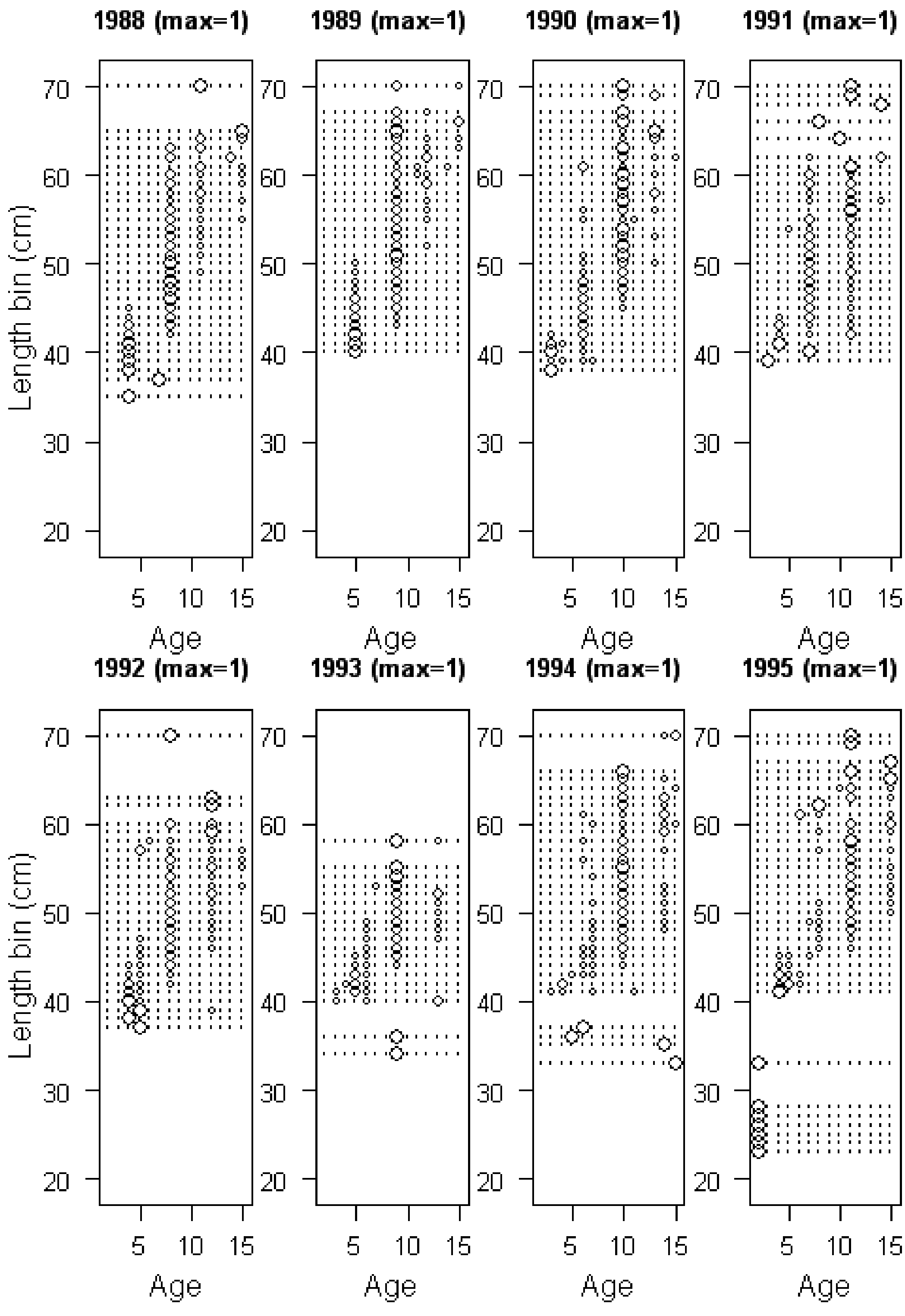



Figure 8. Bubble plots of Canadian fishery conditional age at length composition of Pacific hake by year (as input directly into model). Circle diameter is proportional within length class.

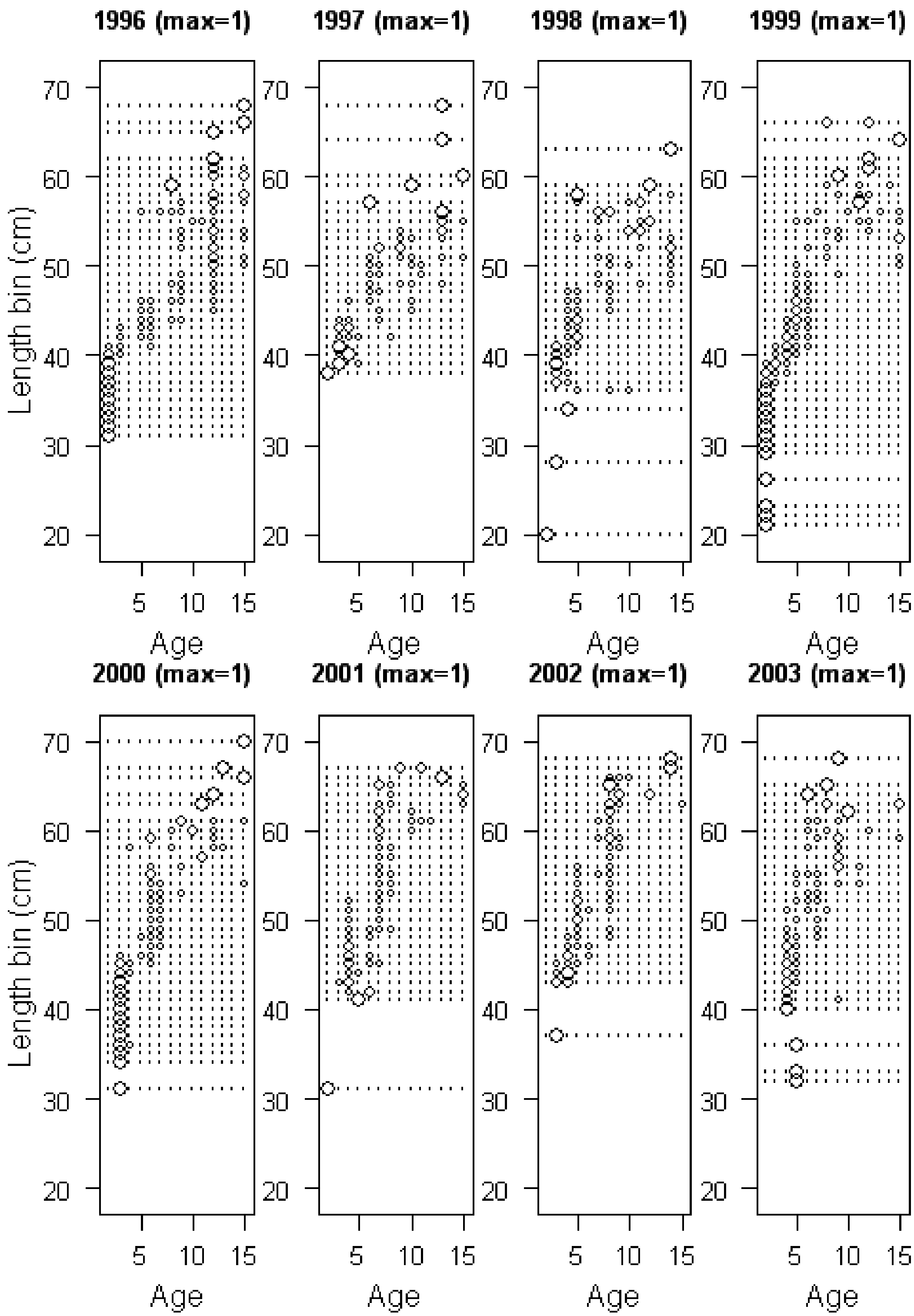



Figure. 8 (continued.)

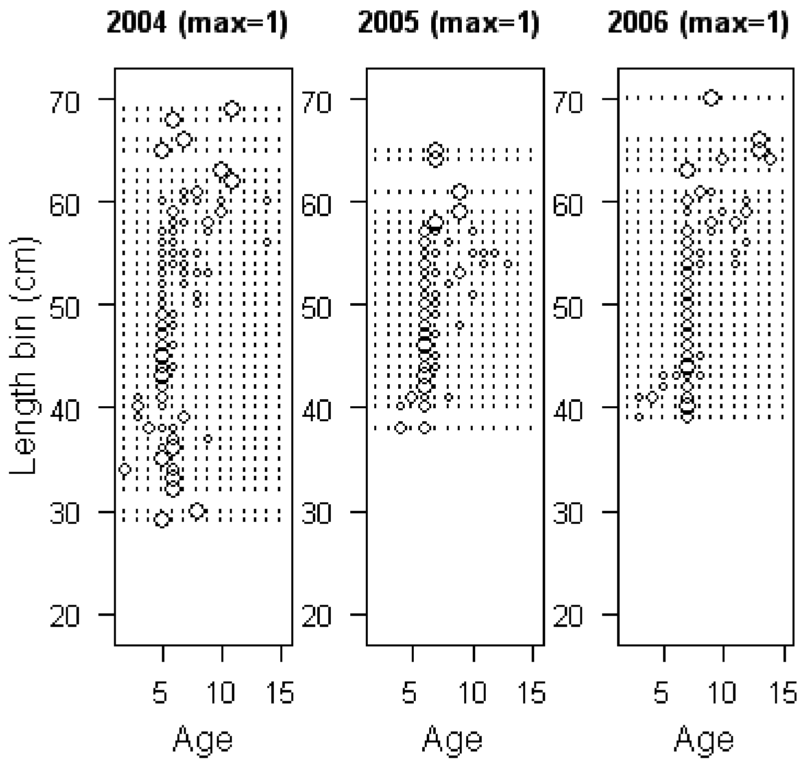



Figure. 8 (continued.)

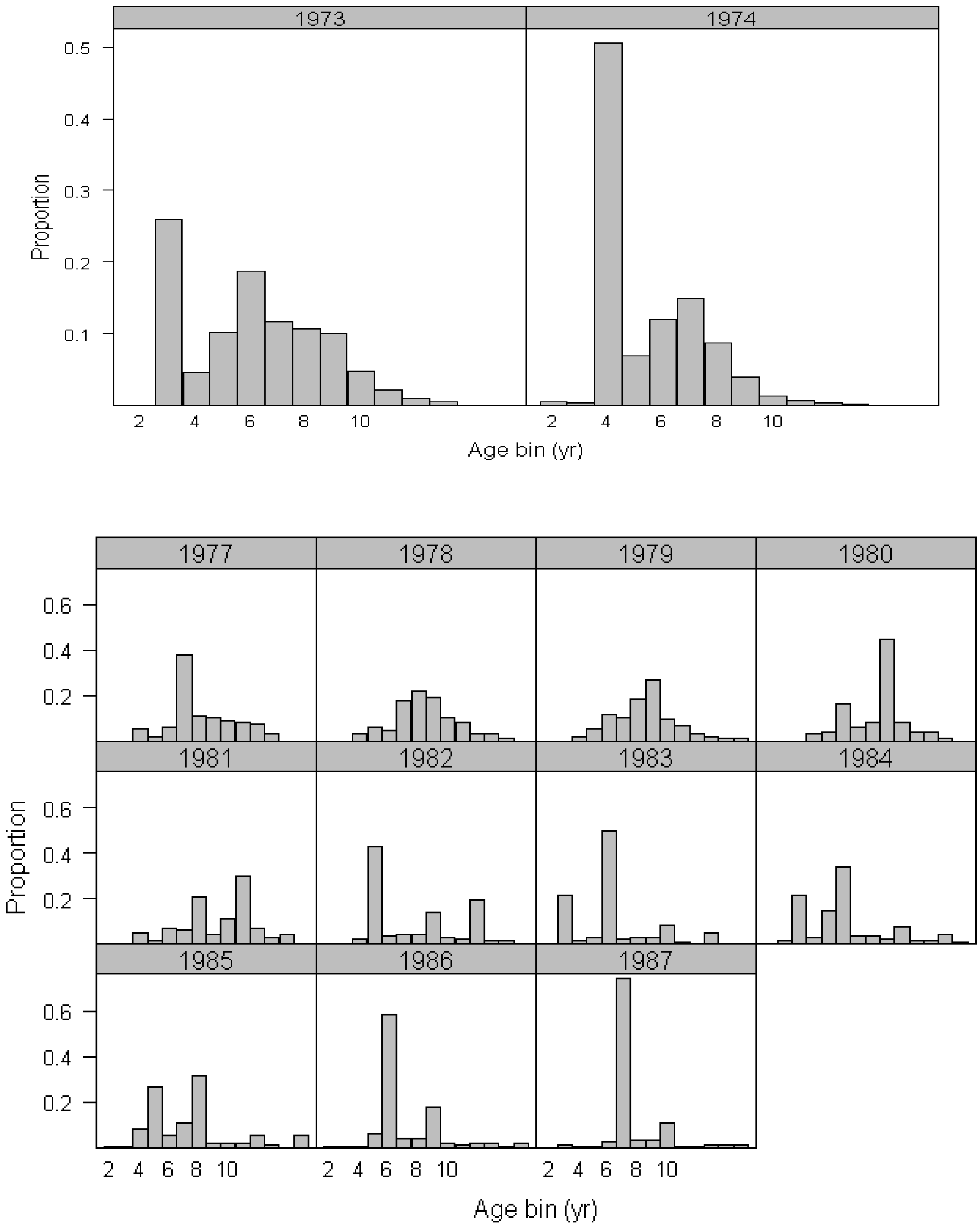



Figure 9. U.S. fishery age composition (top panel) and Canadian fishery age composition (bottom panel) of Pacific hake from previous model used in current assessment model.

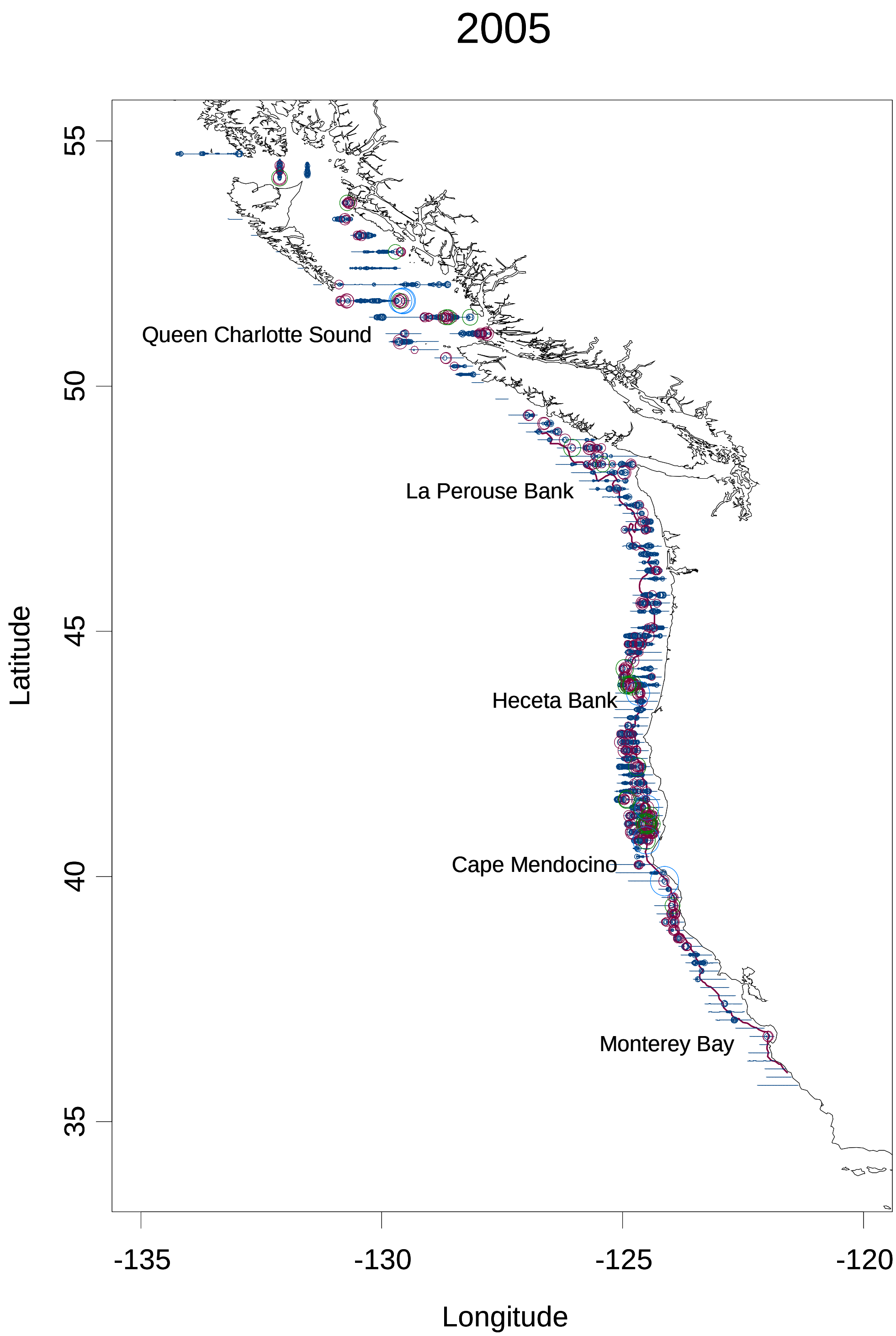



Figure 10. Line transects and occurrence of acoustic area backscattering attributable to Pacific hake in the 2005 joint US-Canada acoustic survey. Diameter of circles is proportional to measured backscatter levels.

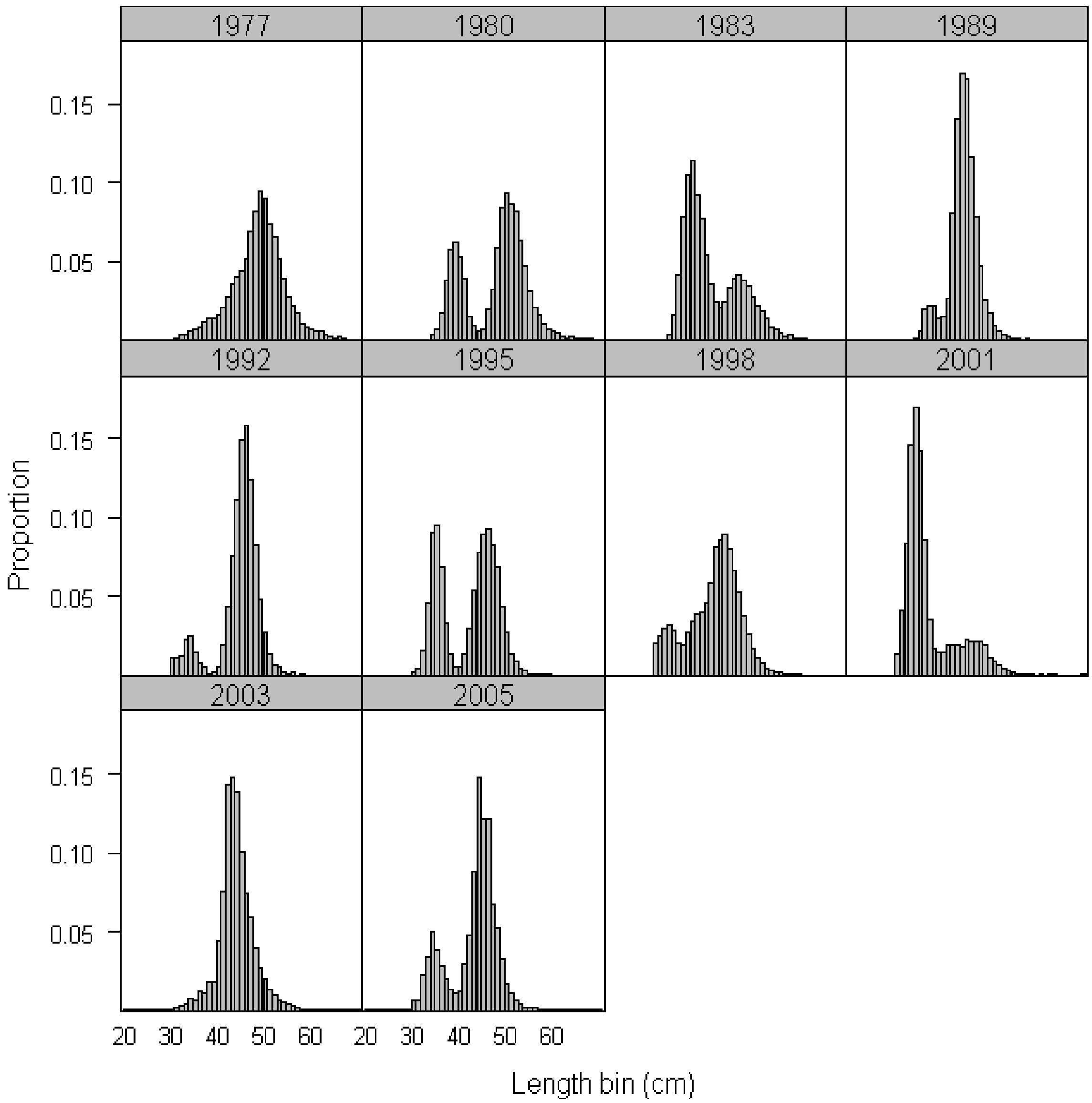



Figure 11. Plot of size compositions of Pacific hake sampled in acoustic surveys, 1977-2005.

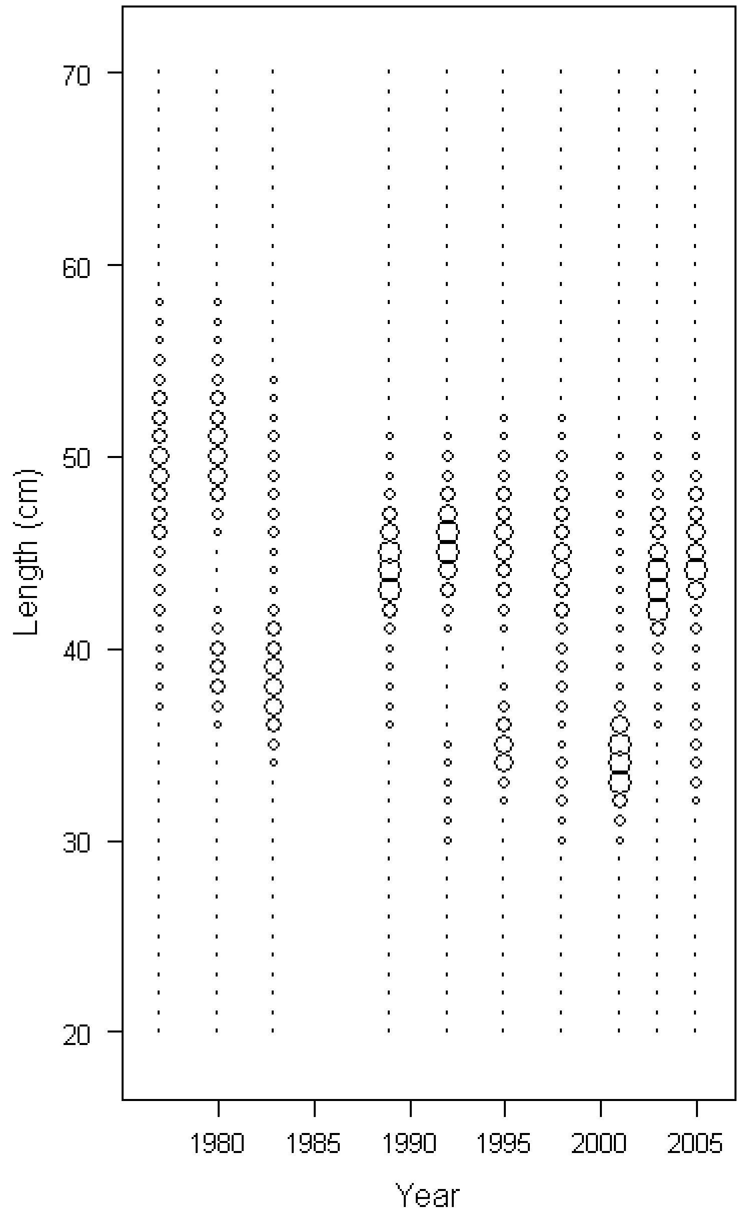



Figure 12. Composite acoustic survey size compositions of Pacific hake from the joint U.S. Canadian coastwide survey, 1977-2005. Proportions sum to unit by year.

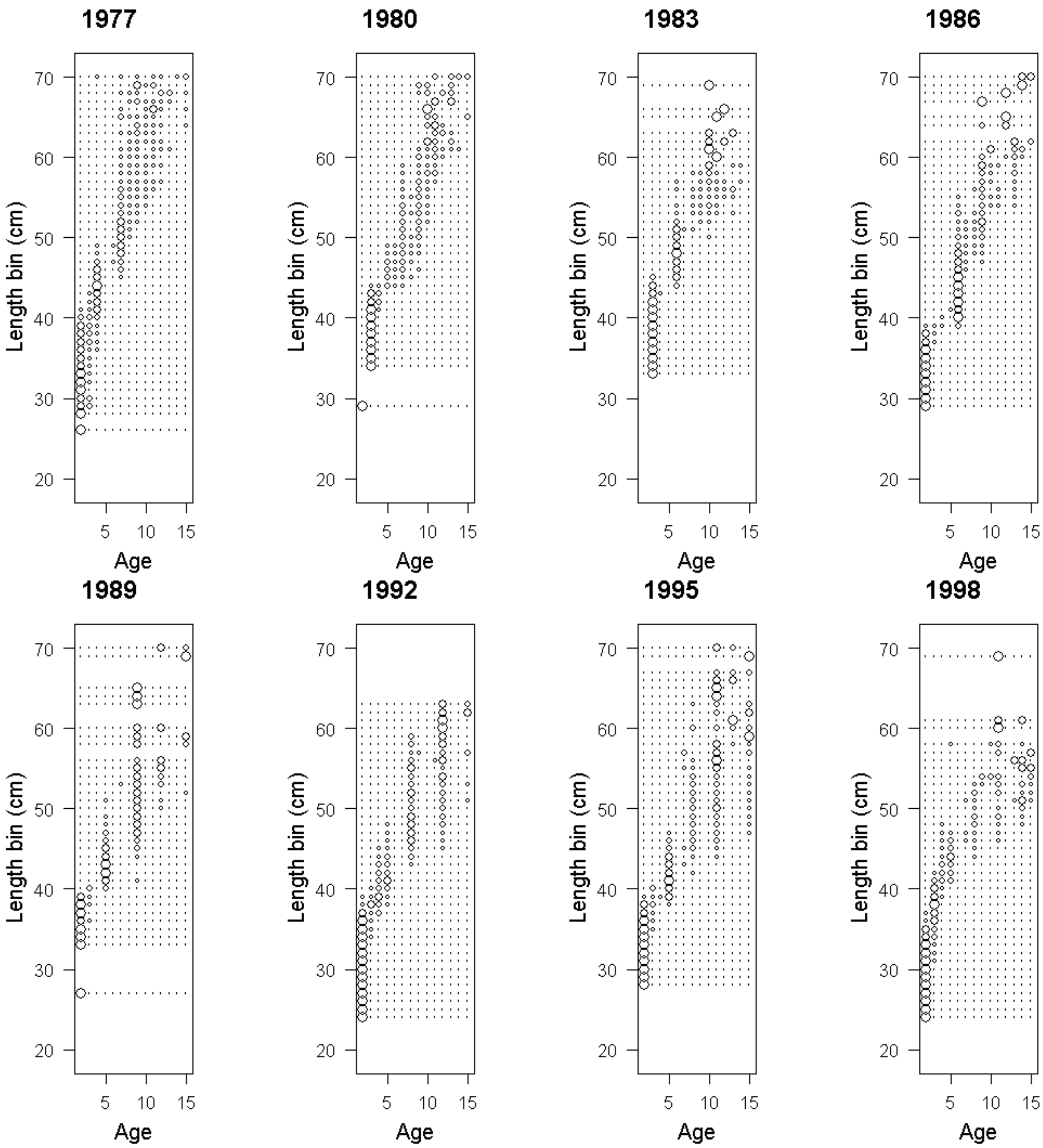



Figure 13. Bubble plots of acoustic survey conditional age at length composition by year (as input directly into model). Circle diameter is proportional within length class.

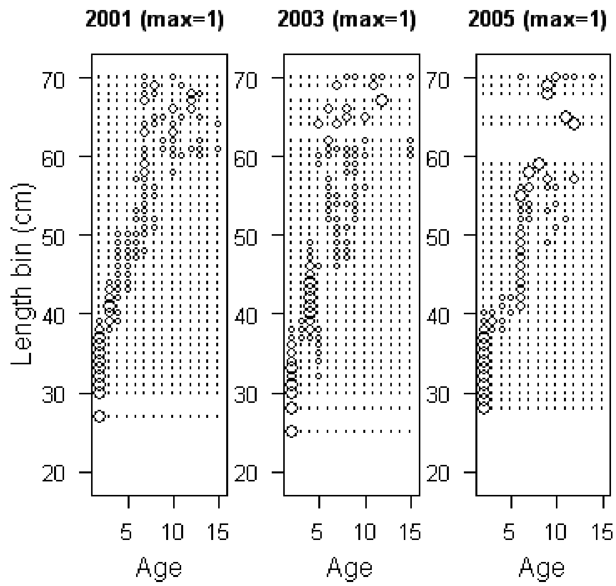



Figure 13. contined.

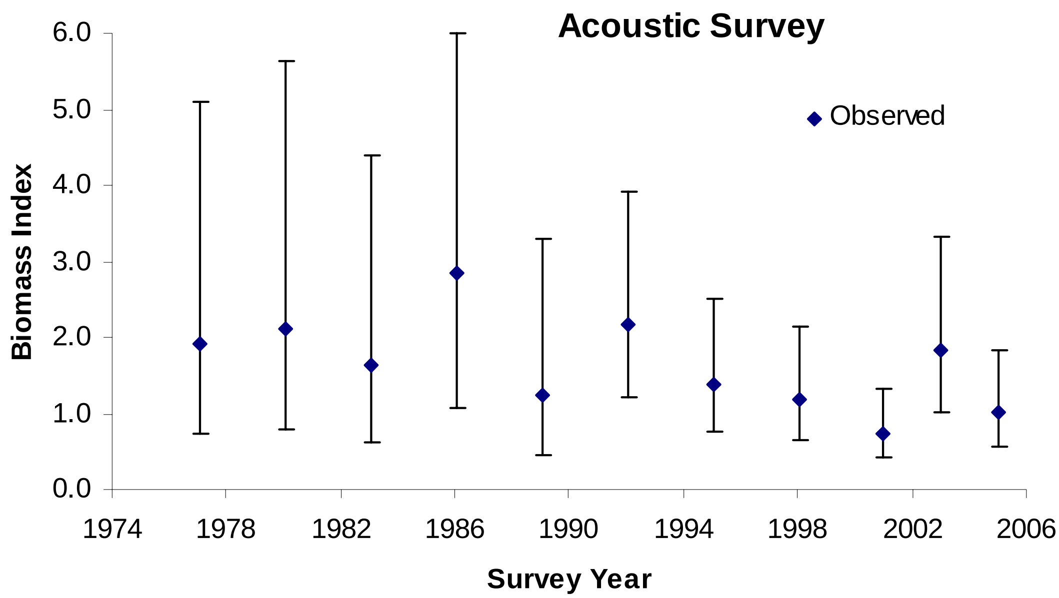
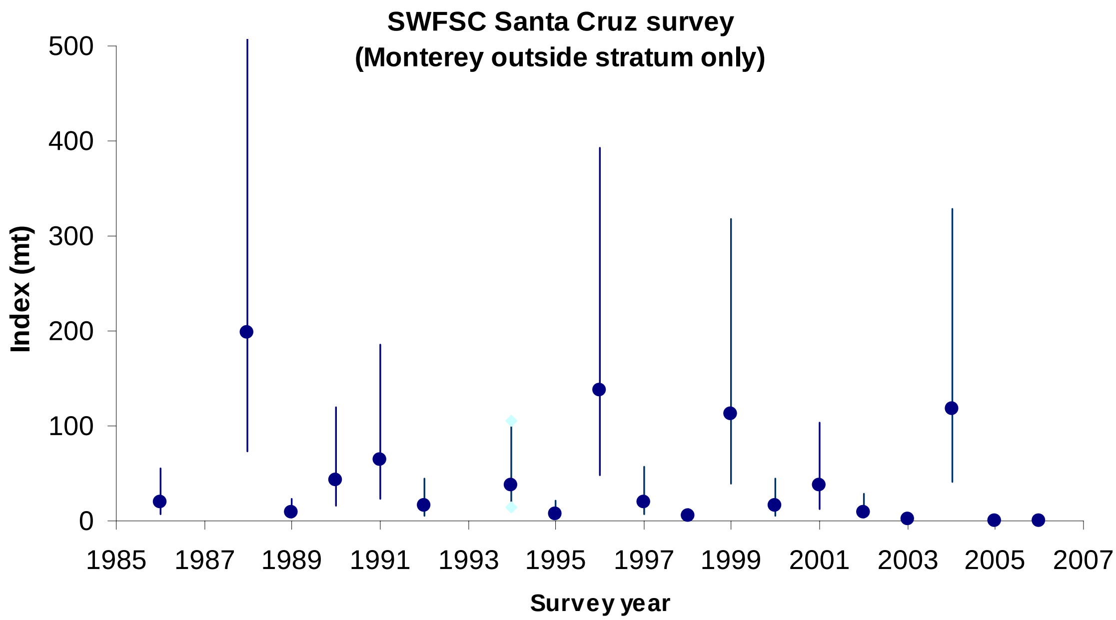



Figure 14. Time series of acoustic survey Pacific hake biomass (millions mt), 1977-2005. Error bars are not estimated but rather assumed based on the reliability of the survey.



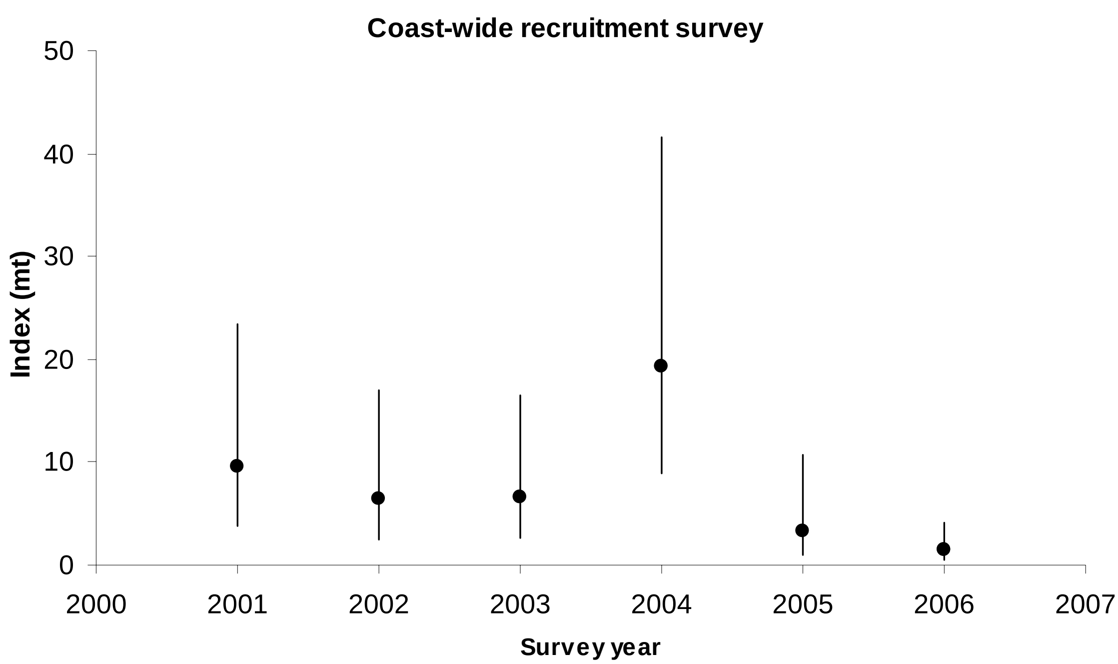




Figure 15. A) Plot of time series of the South West Fisheries Science Center Santa Cruz pre-recruit survey (Monterey outside stratum only) for young-of-year Pacific hake. Estimates and error bars are taken from back-transformed (bias corrected) year effects from GLM. B) Coast-wide Pacific hake pre-recruit survey indices based on data collected from SWFSC Santa Cruz and the joint PWCC-NMFS surveys. Estimates and error bars are obtained from a Monte Carlo simulation of a Delta-GLM analysis.

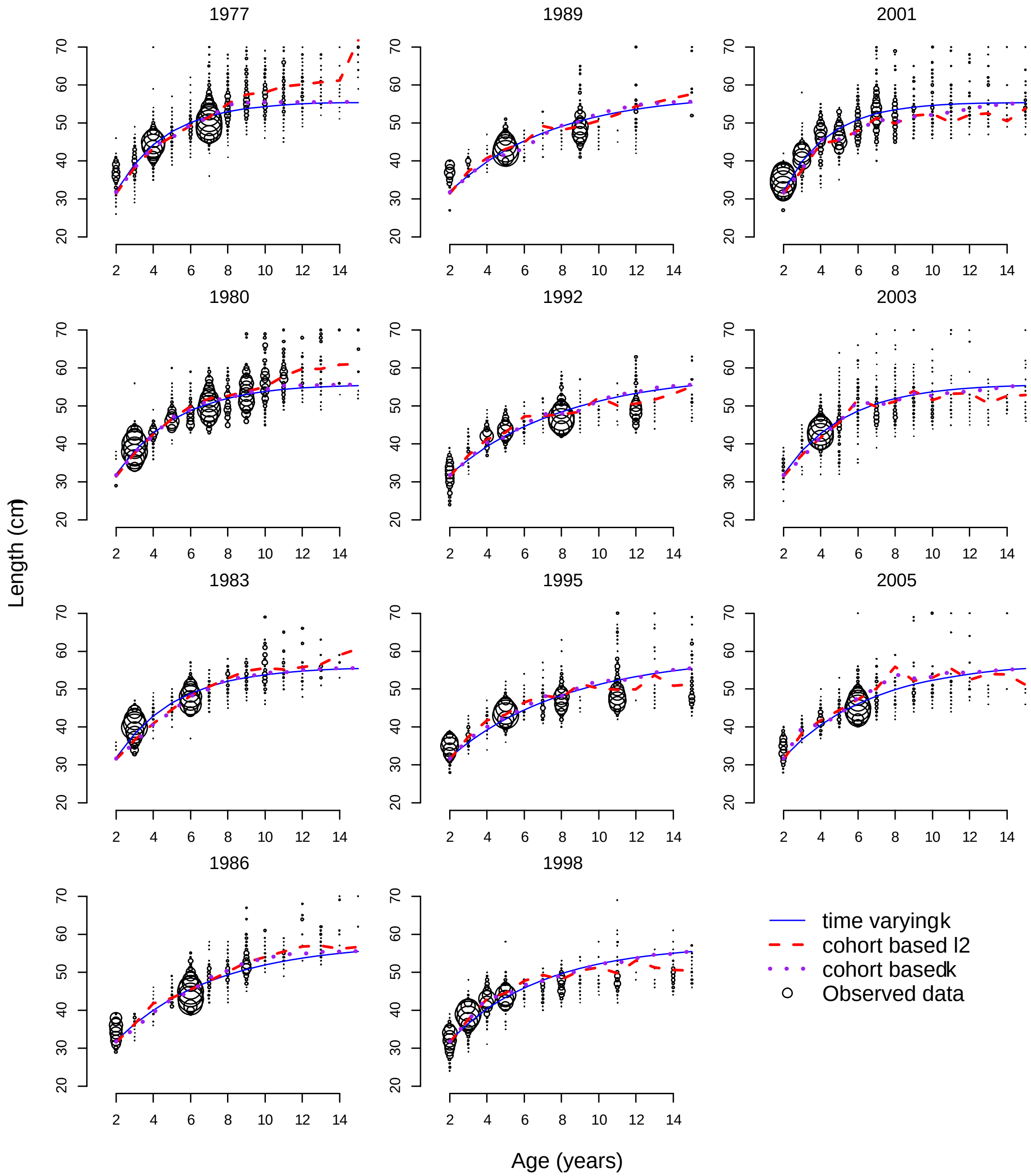



Figure 16. Time varying and cohort based fits of the von Bertalanffy growth model to Pacific hake age data from the acoustic survey, 1977-2005. Growth trajectories show expected size at age based on the different models applied.

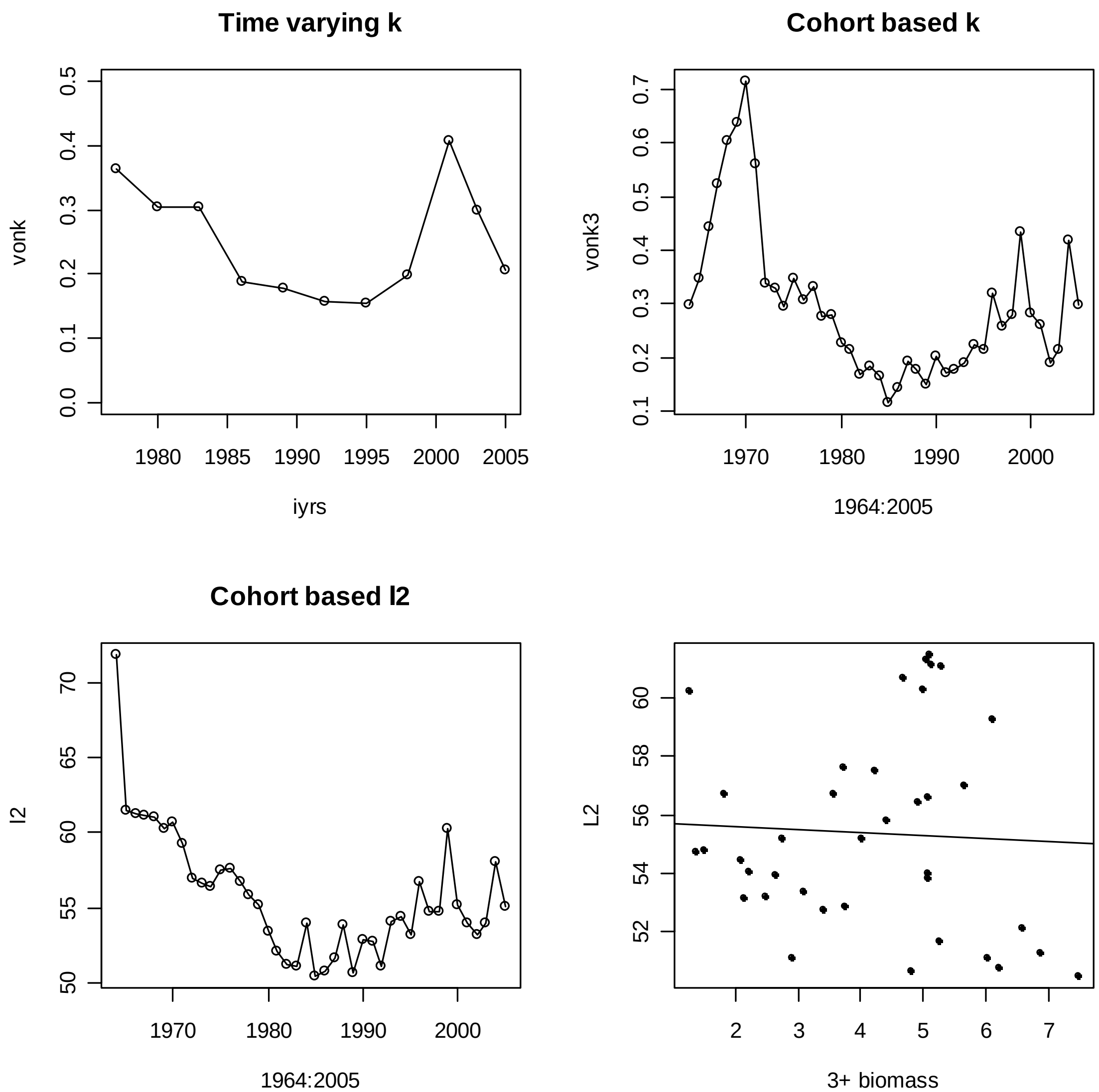



Figure 17. Time varying and cohort based fits of the von Bertalanffy growth model to Pacific hake age data from the acoustic survey, 1977-2005.

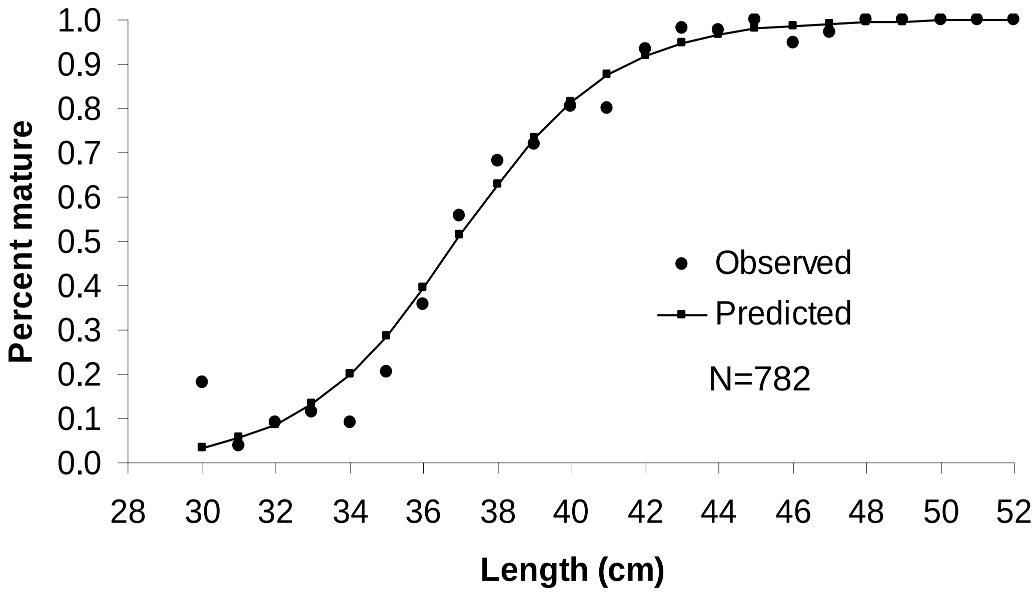



Figure 18. Observed and predicted fraction of Pacific hake mature at length.

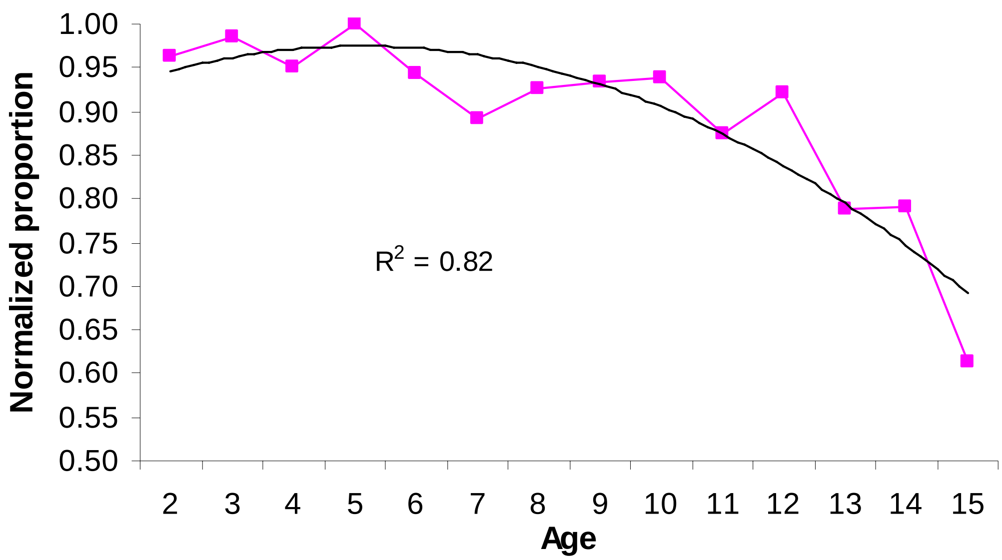



Figure 19. Plot of the normalized (divided by maximum value) average (1977-2001) ratio of acoustic survey numbers at age to the sum of acoustic survey and triennial bottom trawl survey numbers at age. This analysis was used as empirical evidence for exploration of dome-shaped selectivity in the acoustic survey.

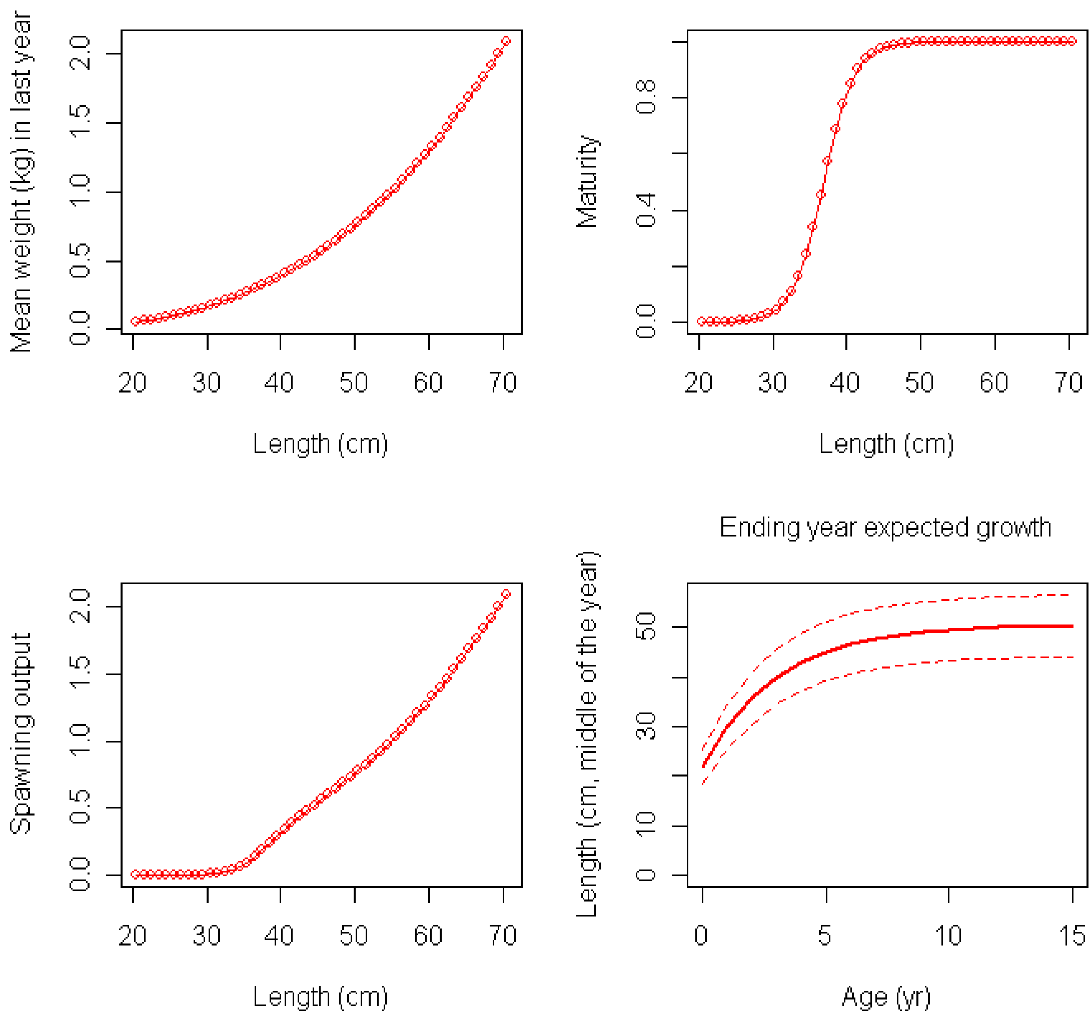



Figure 20. Biological parameters (functional forms) assumed in the hake model.

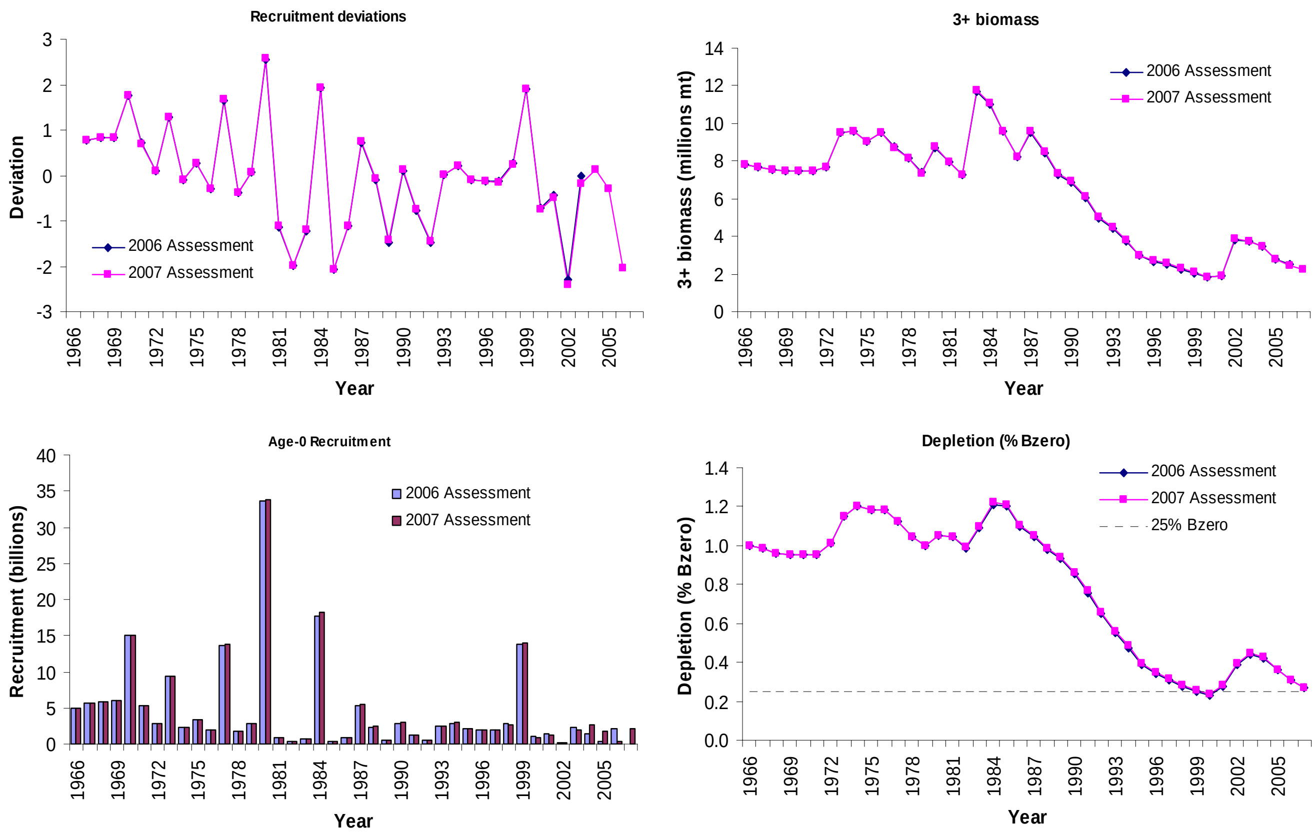



Figure 21. Time series of recruitment deviations, recruitment to age 0, summary biomass (3 +), and depletion (% unfished biomass) from comparative assessment model results between the 2006 (Helser et. al. 2005) and the present assessment. Note the only difference between model results is the inclusion of 2006 U.S. and Canadian fishery data.

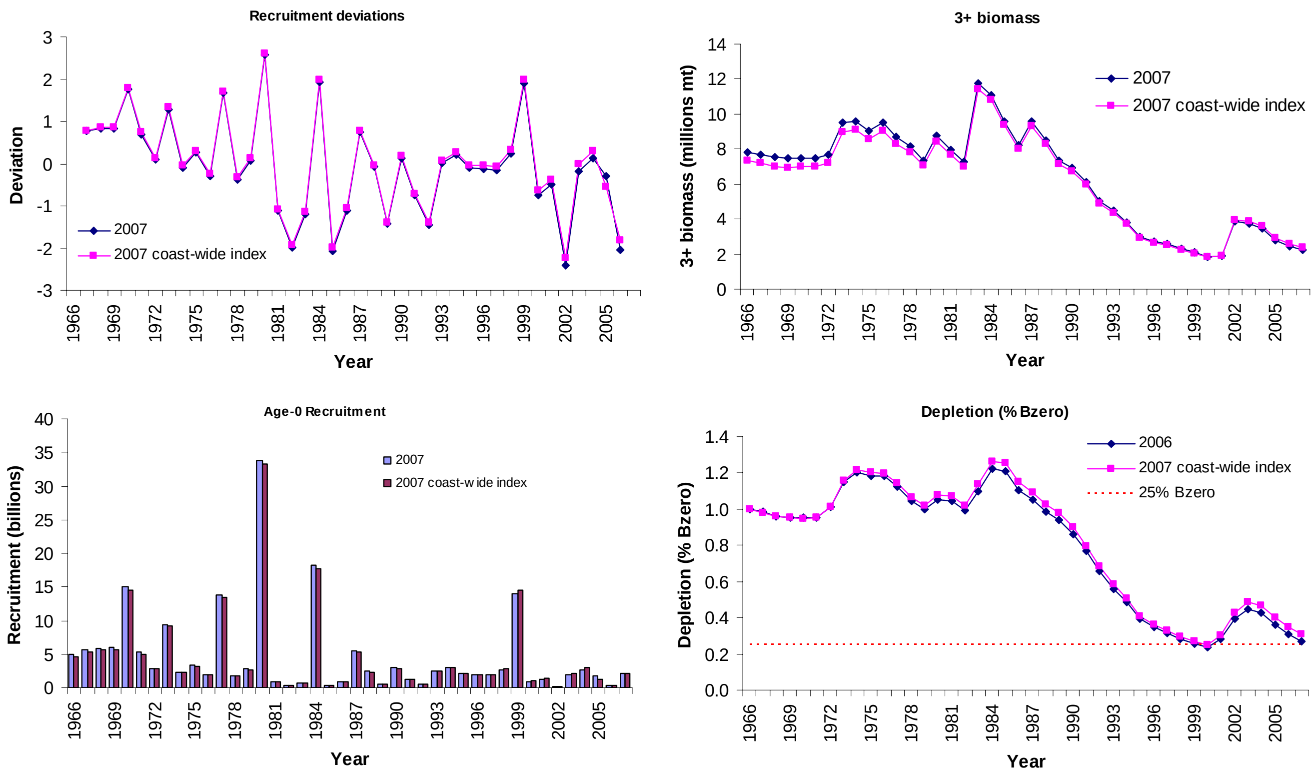



Figure 22. Time series of recruitment deviations, recruitment to age 0, summary biomass (3 +), and depletion (% unfished biomass) from comparative assessment model results between the base assessment model using the SWFSC Santa Cruz recruitment survey (Monterey outside stratum only), 1986-2006 and two separate recruitment surveys; SWFSC Santa Cruz 1986-2000 and the Coast-wide recruitment survey 2001-2006.

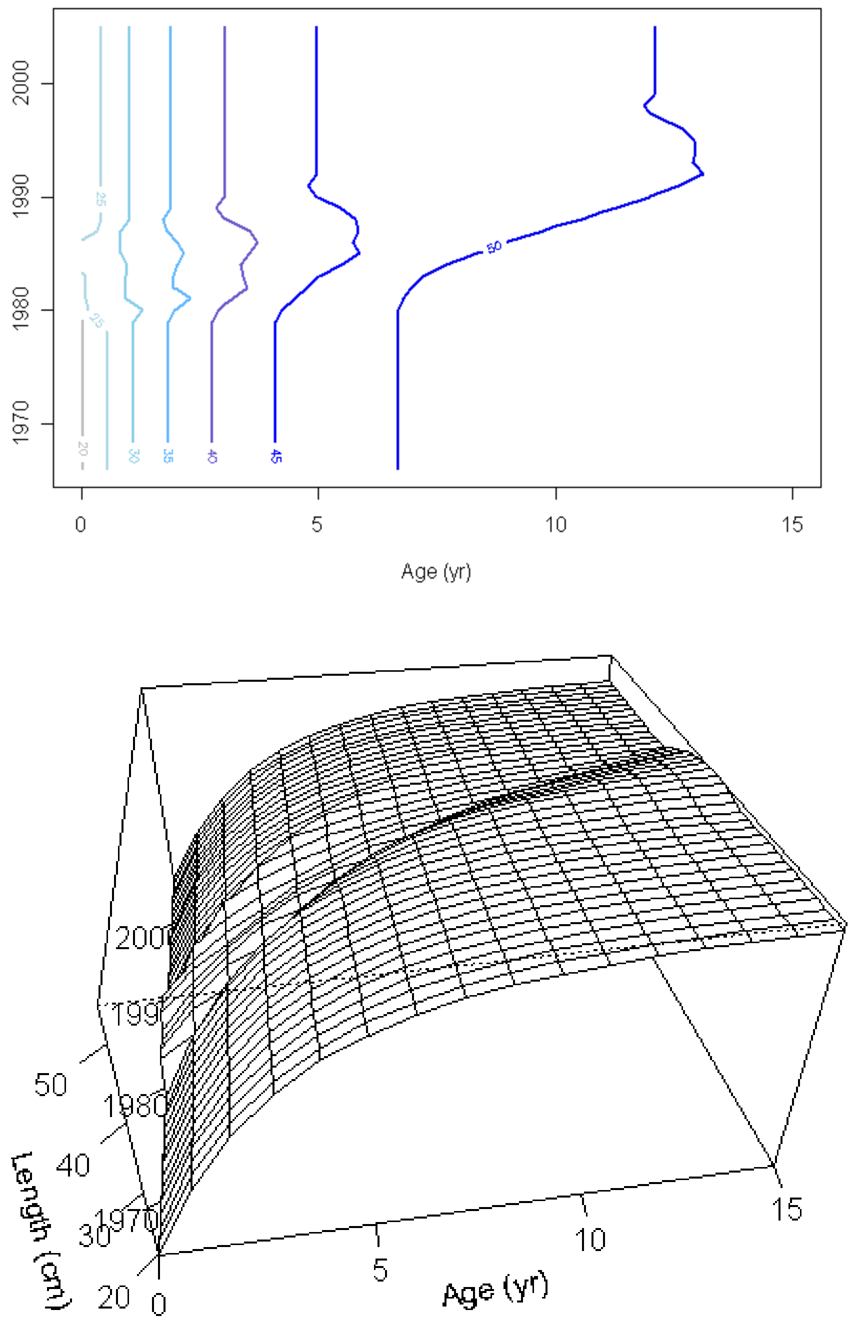



Figure 23. Time varying trajectory of growth in size at age assumed for Pacific Hake.

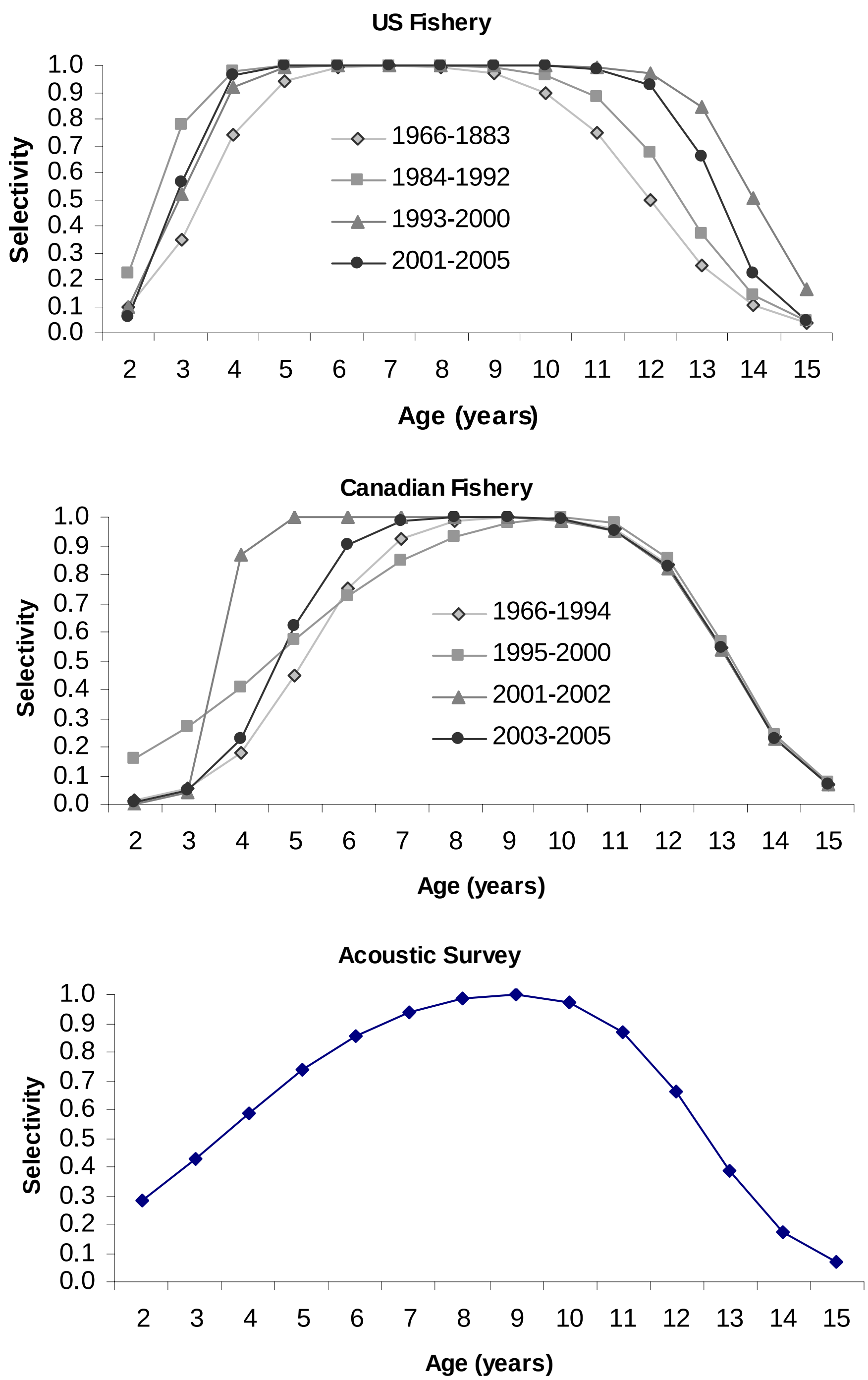



Figure 24. Estimated selectivity curves for different time blocks in the U.S. fishery, the Canadian fishery and acoustic survey. Selectivity in the acoustic survey was Assumed to be time-invariant.

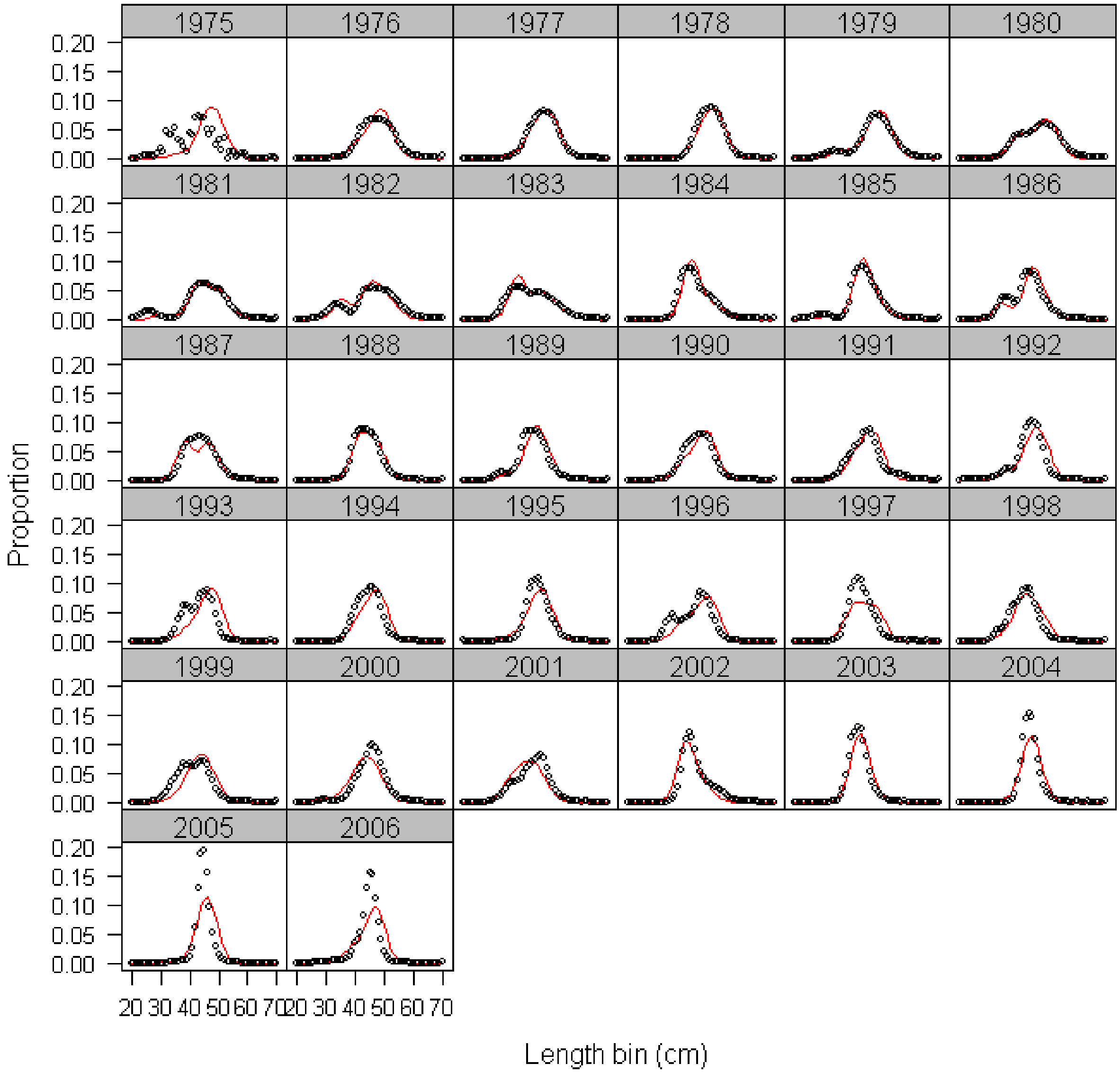



Figure 25. Predicted fits to the observed U.S. fishery length composition data.

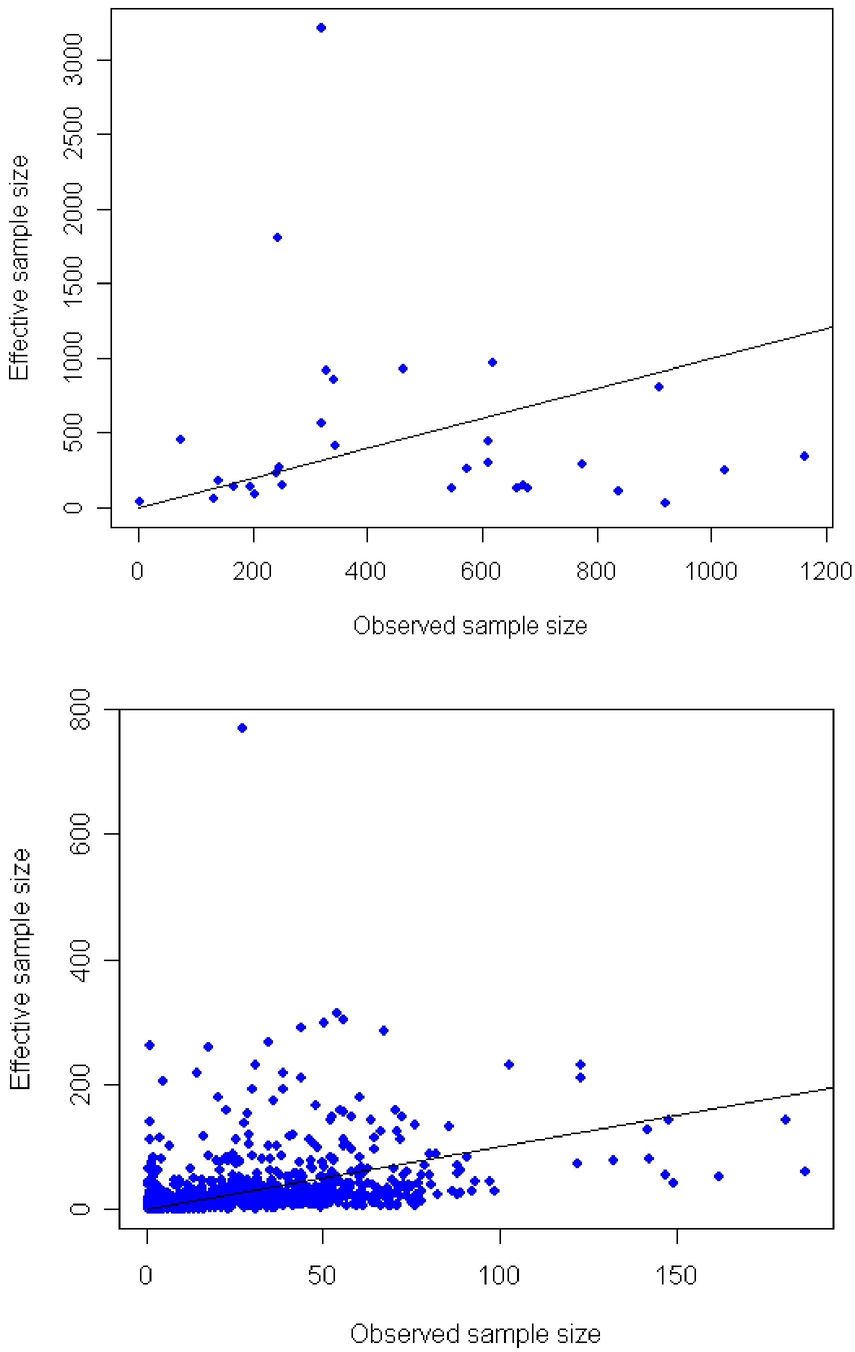



Figure 26. Effective vs. input sample sizes for the U.S. fishery length compositions (top panel) and conditional age at length compositions (bottom panel).

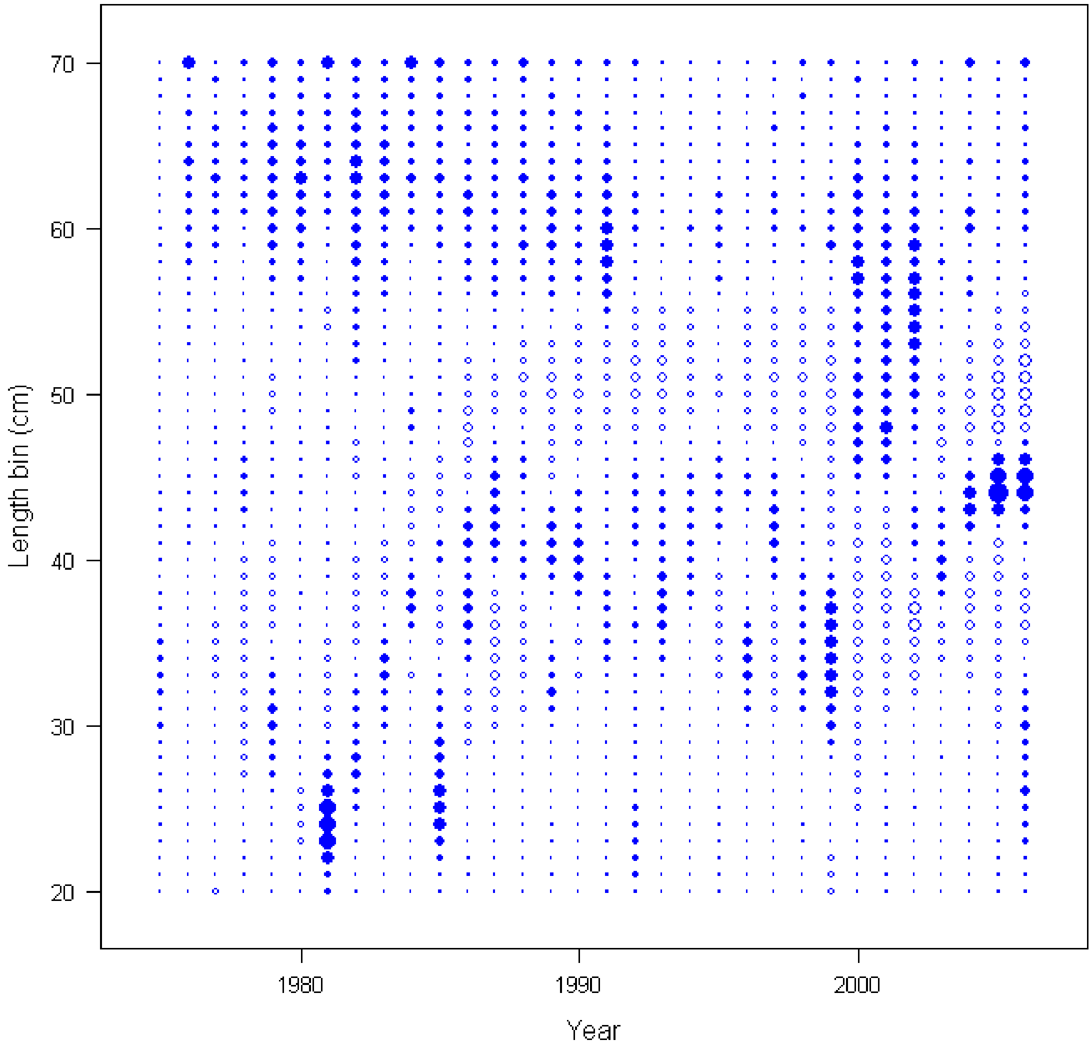



Figure 27. Pearson residuals of model fits to the U.S. fishery length composition data.

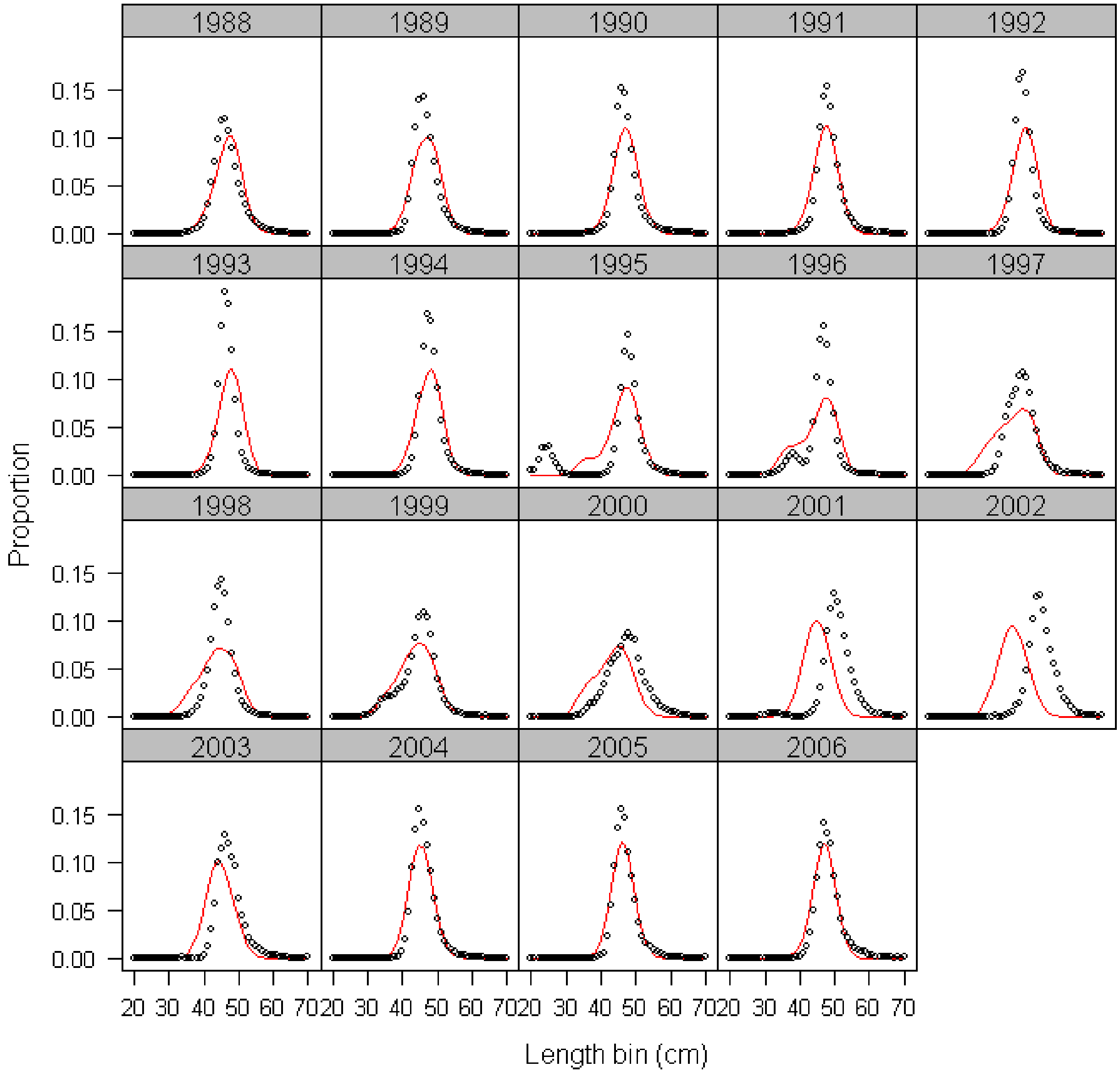



Figure 28. Predicted fits to the observed Canadian fishery length composition data.

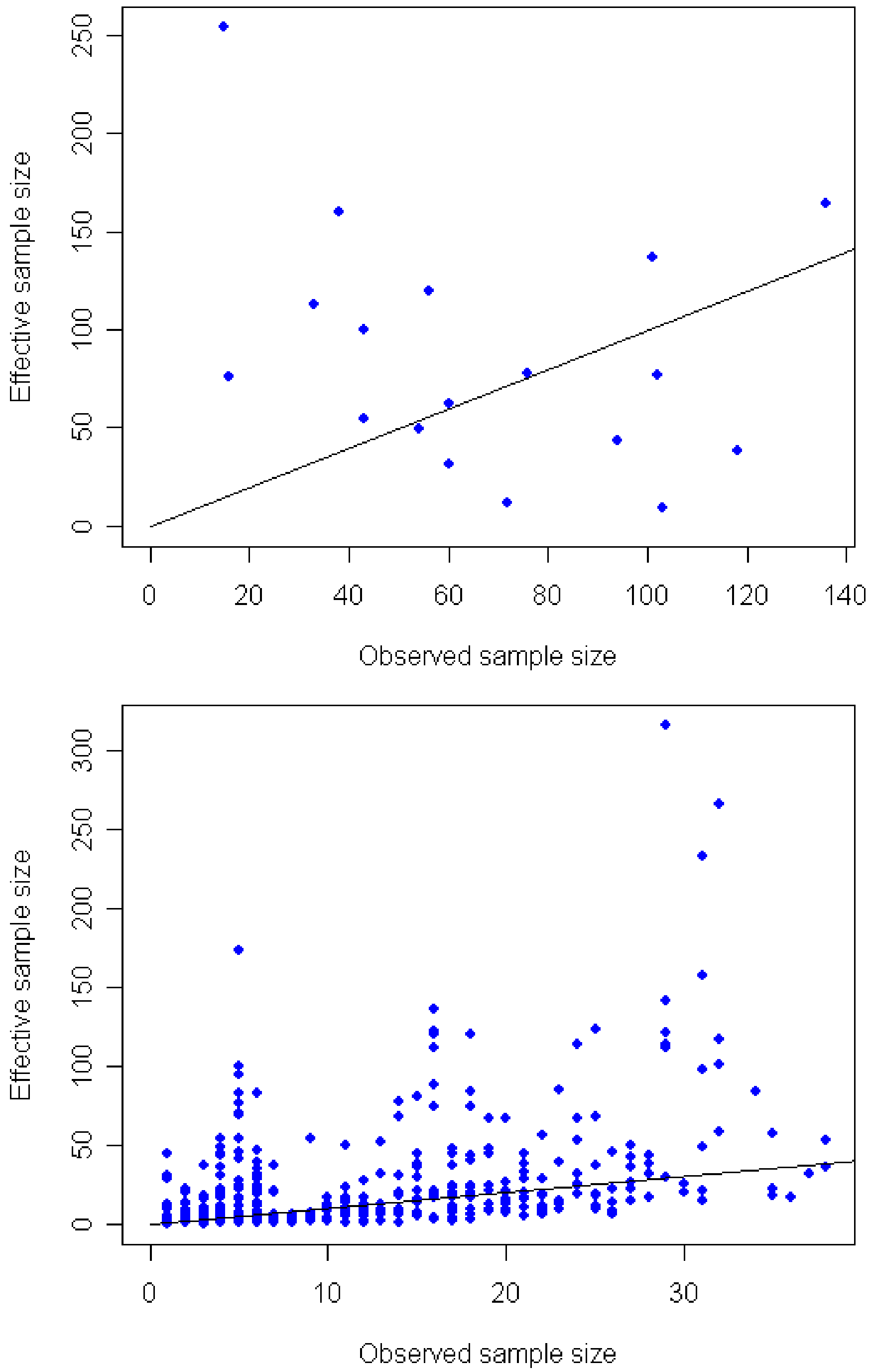



Figure 29. Effective vs. input sample sizes for the Canadian fishery length compositions (top panel) and conditional age at length compositions (bottom panel).

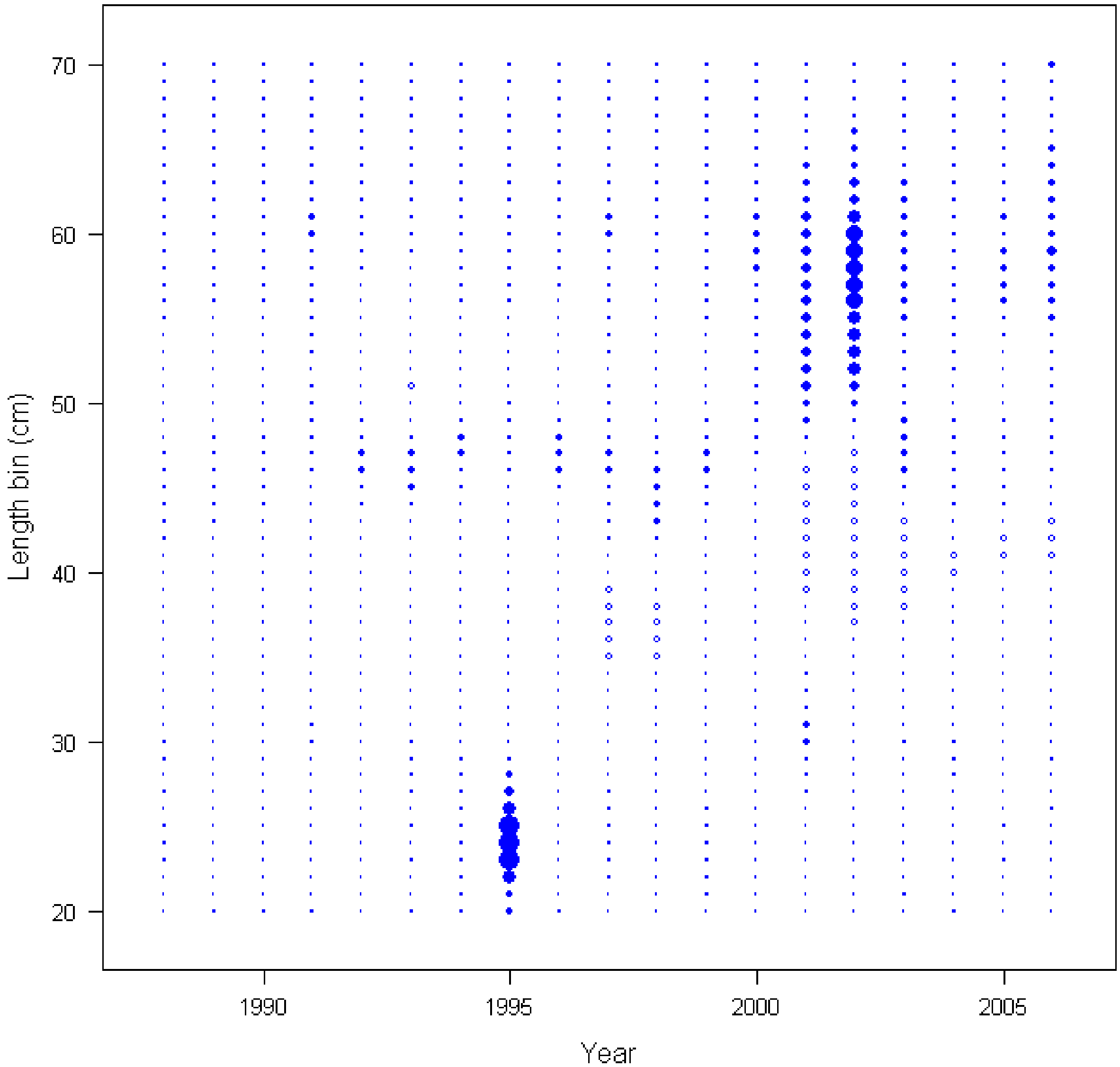



Figure 30. Pearson residuals of model fits to the Canadian length composition data.

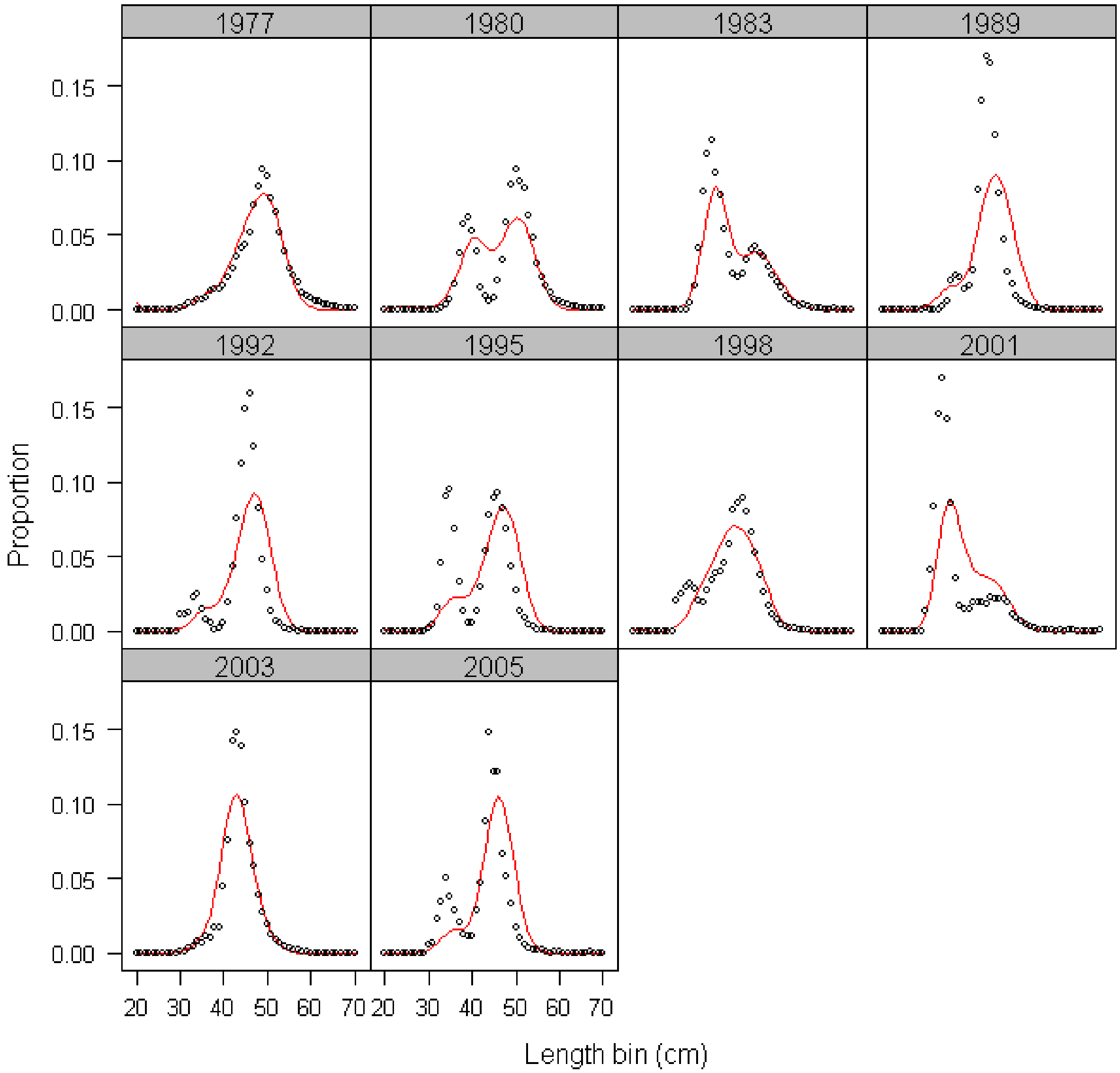



Figure 31. Predicted fits to the observed acoustic survey length composition data.

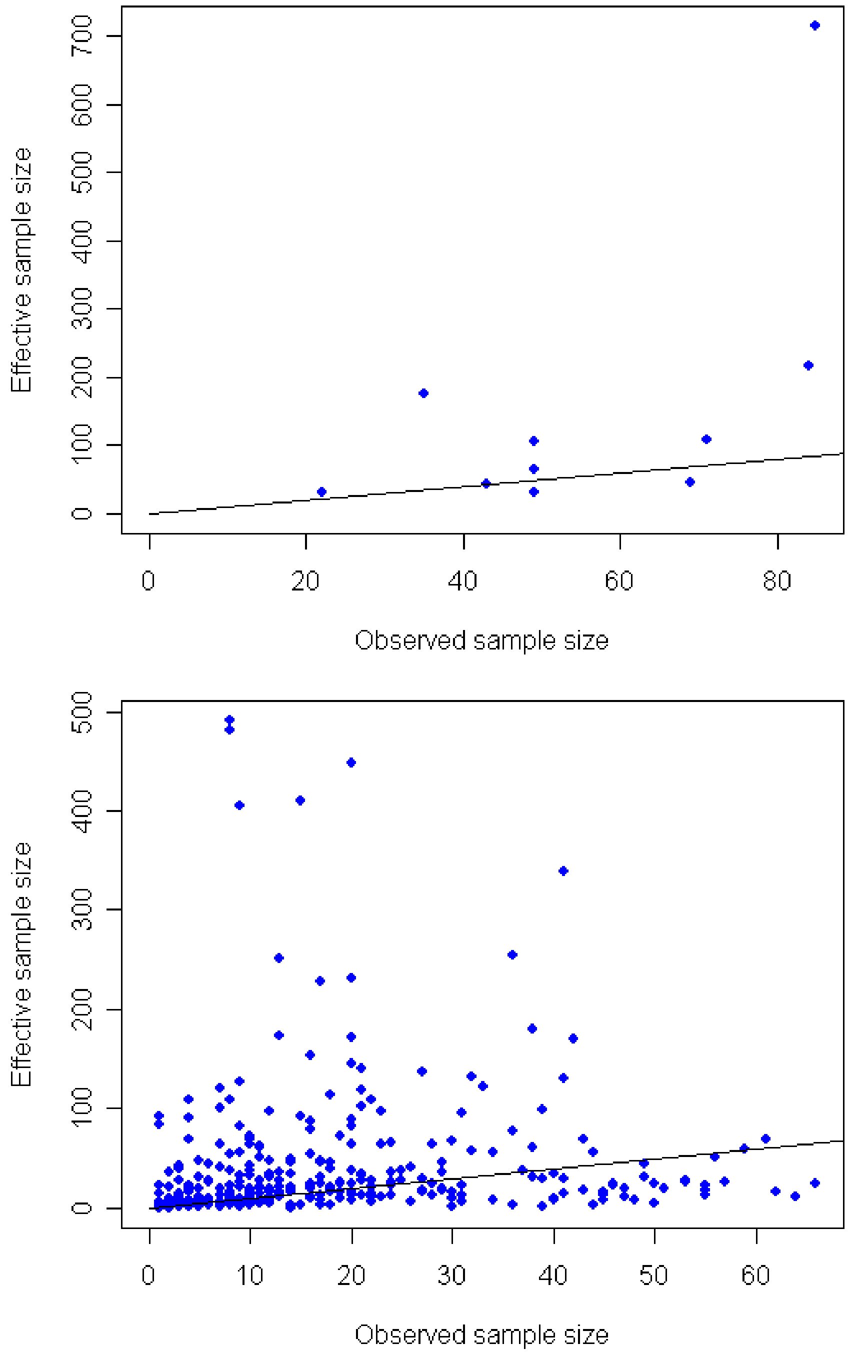



Figure 32. Effective vs. input sample sizes for the acoustic survey length compositions (top panel) and conditional age at length compositions (bottom panel).

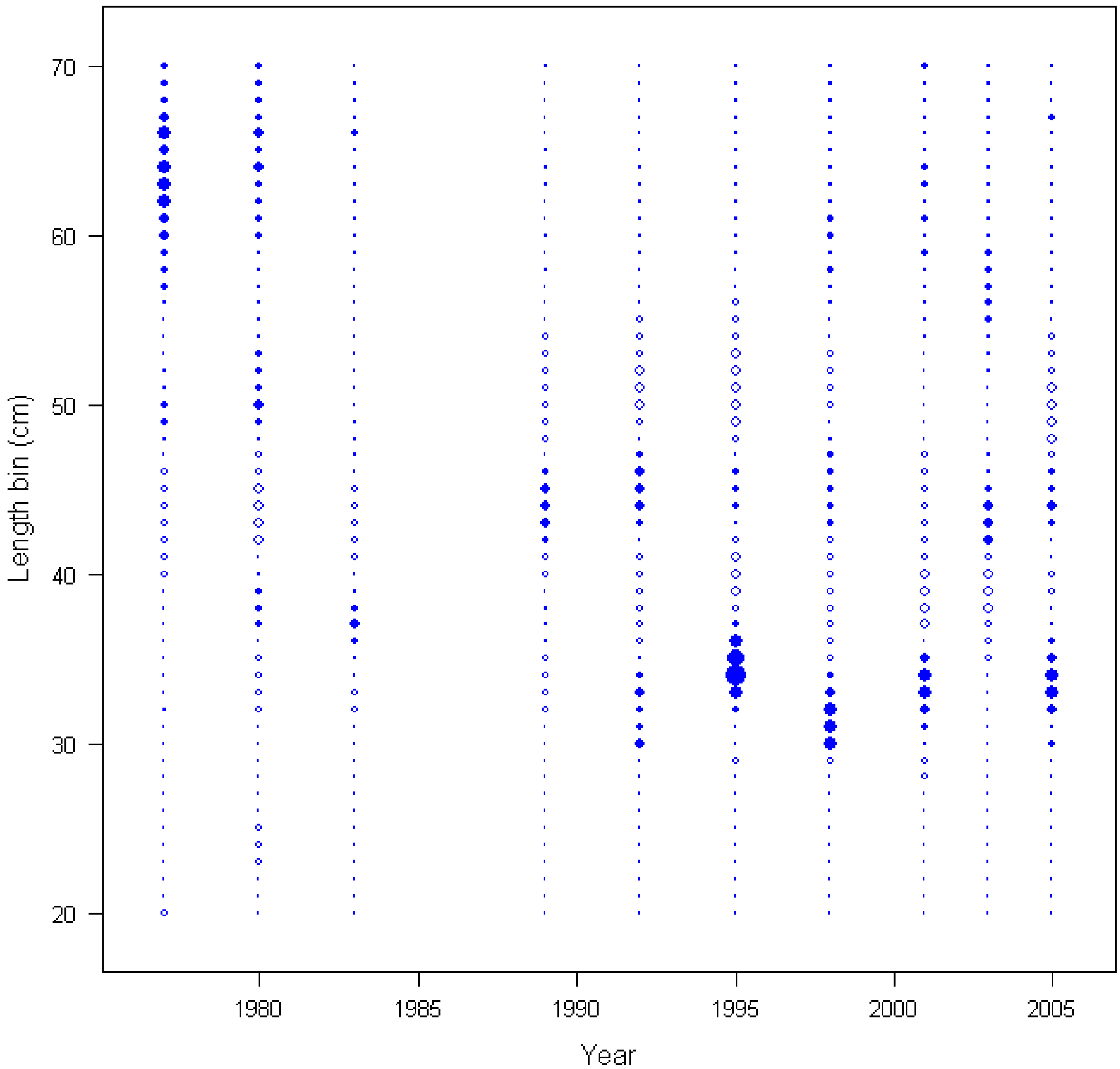



Figure 33. Pearson residuals of model fits to the acoustic survey length composition data.

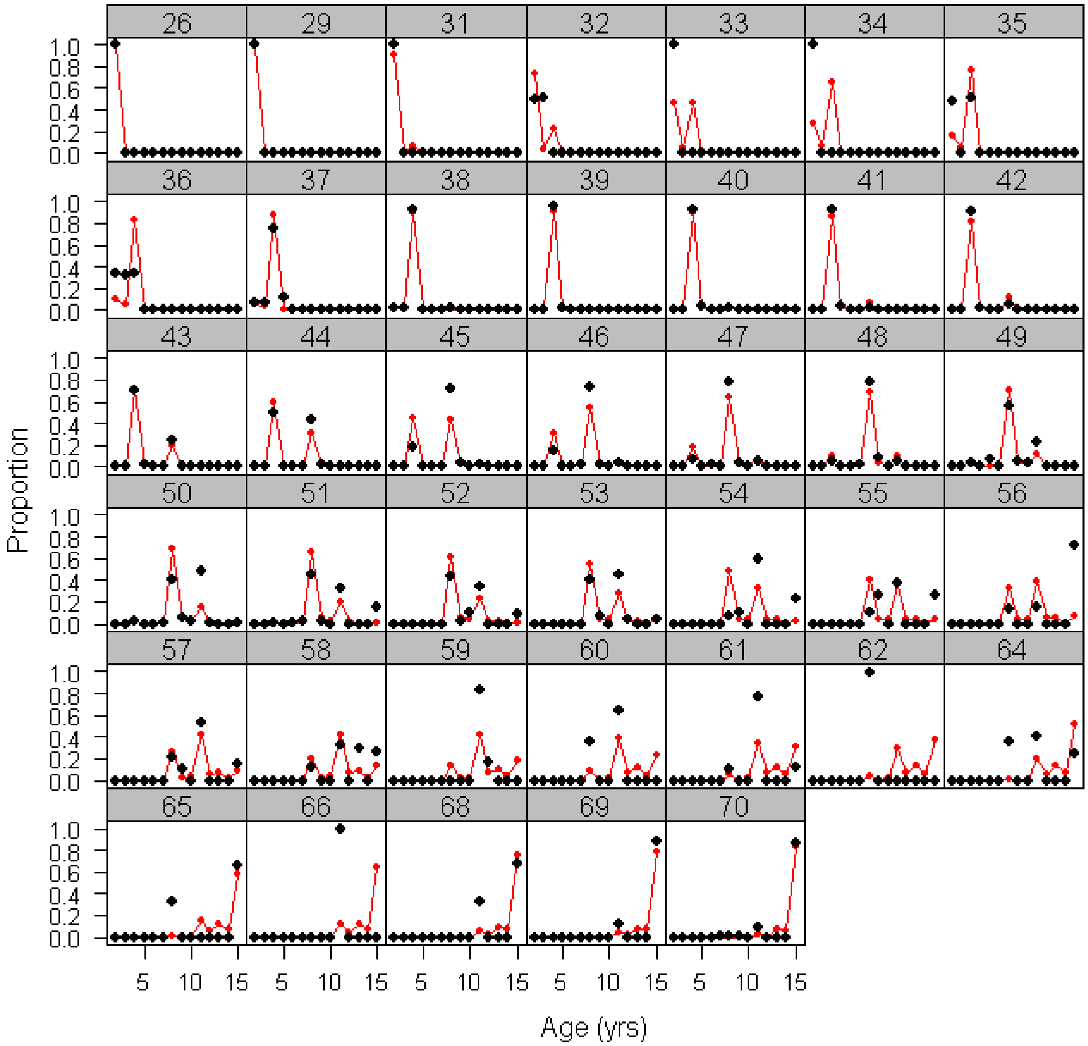



Figure 34. Model fits to the observed 1988 U.S. fishery conditional age at length data .

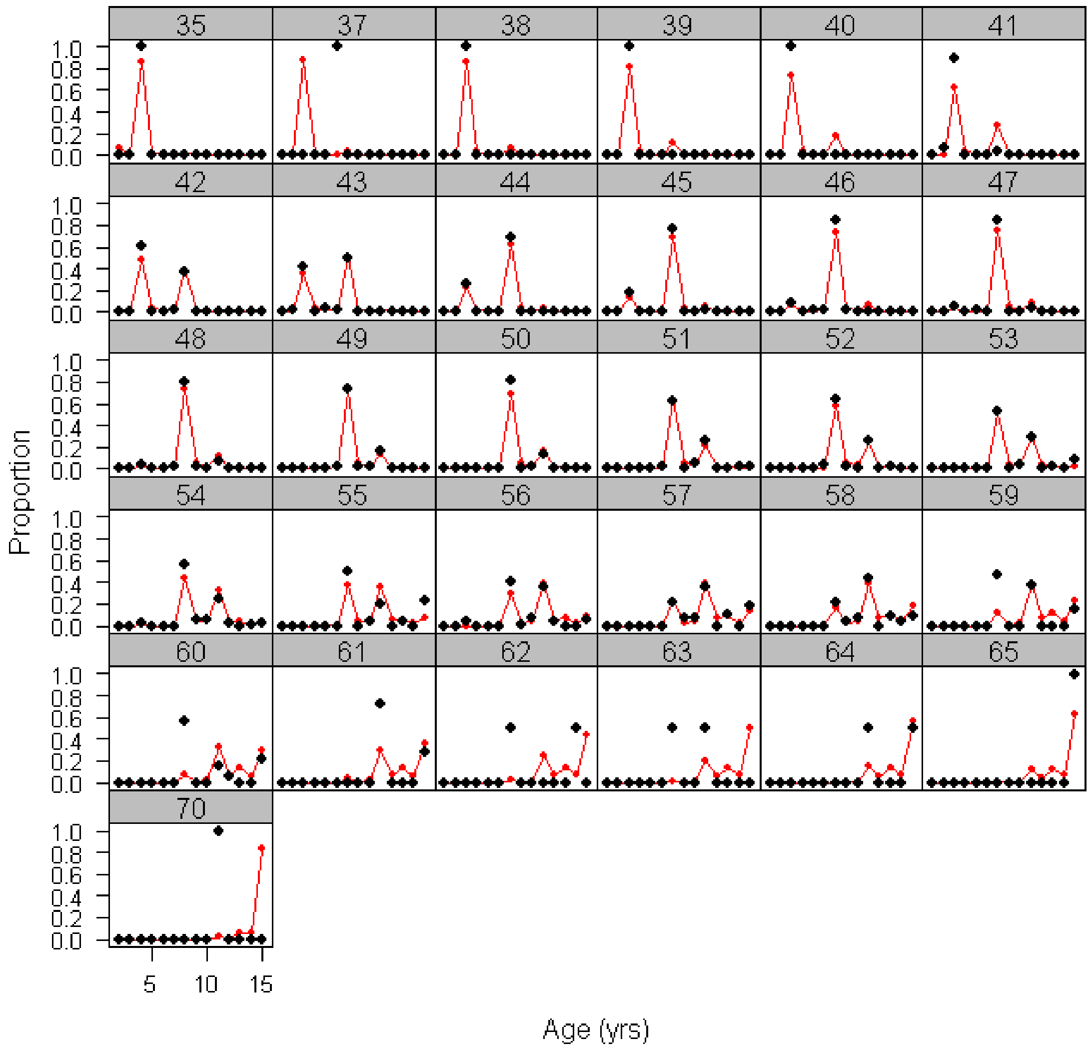



Figure 35. Model fits to the observed 1988 Canadian fishery conditional age at length data .

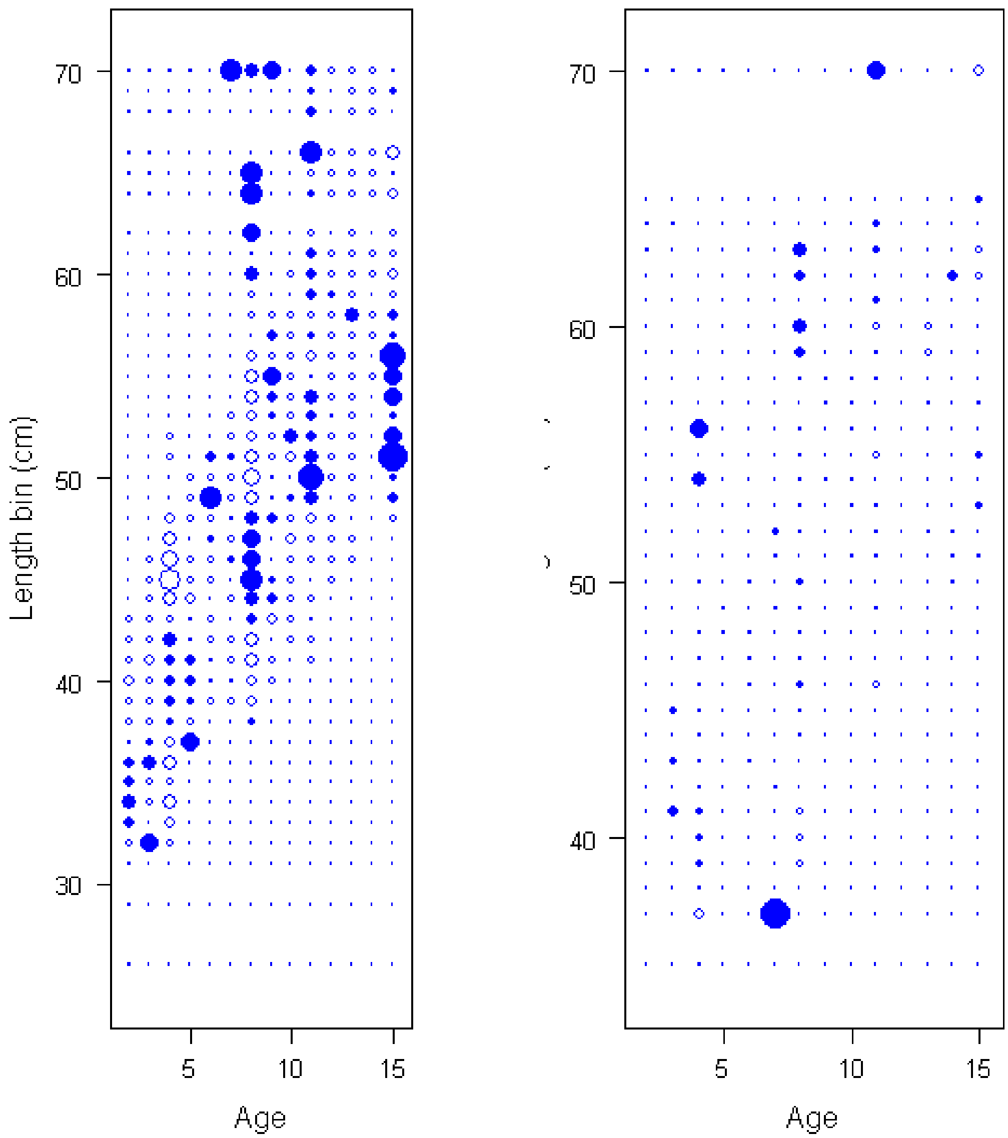



Figure 36. Pearson residuals of model fits to the 1988 U.S. fishery (left) and Canadian (right) conditional age at length data .

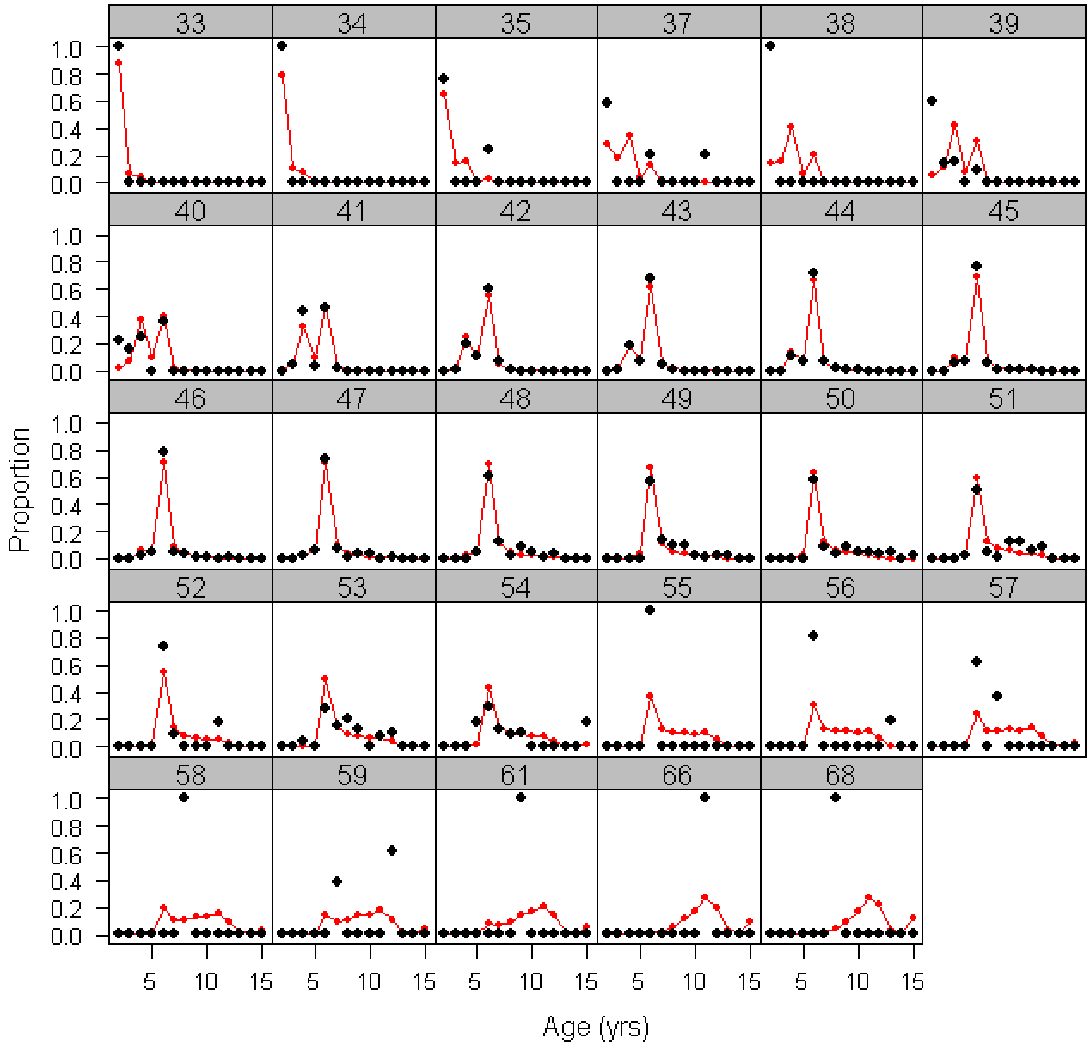



Figure 37. Model fits to the observed 2005 U.S. fishery conditional age at length data .

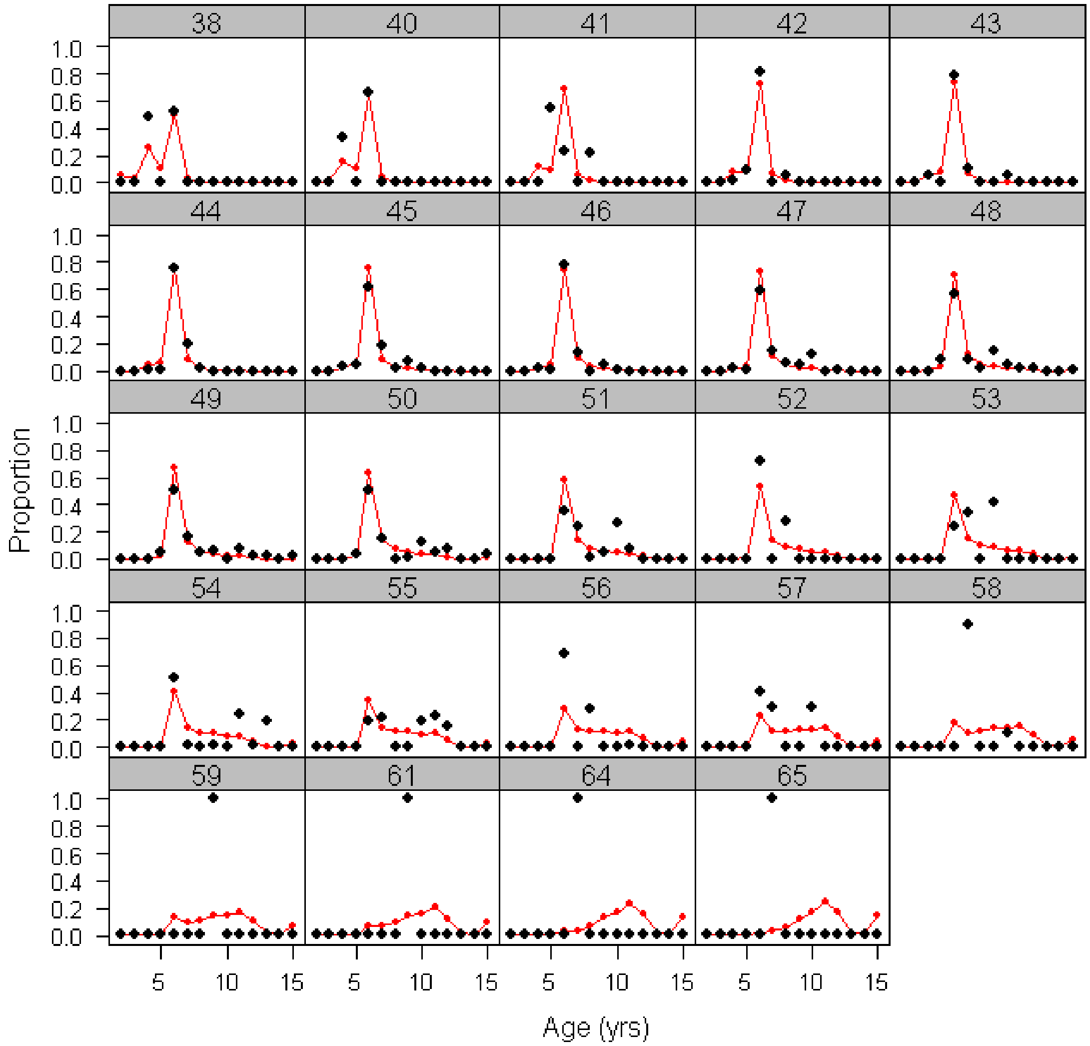



Figure 38. Model fits to the observed 2005 Canadian fishery conditional age at length data .

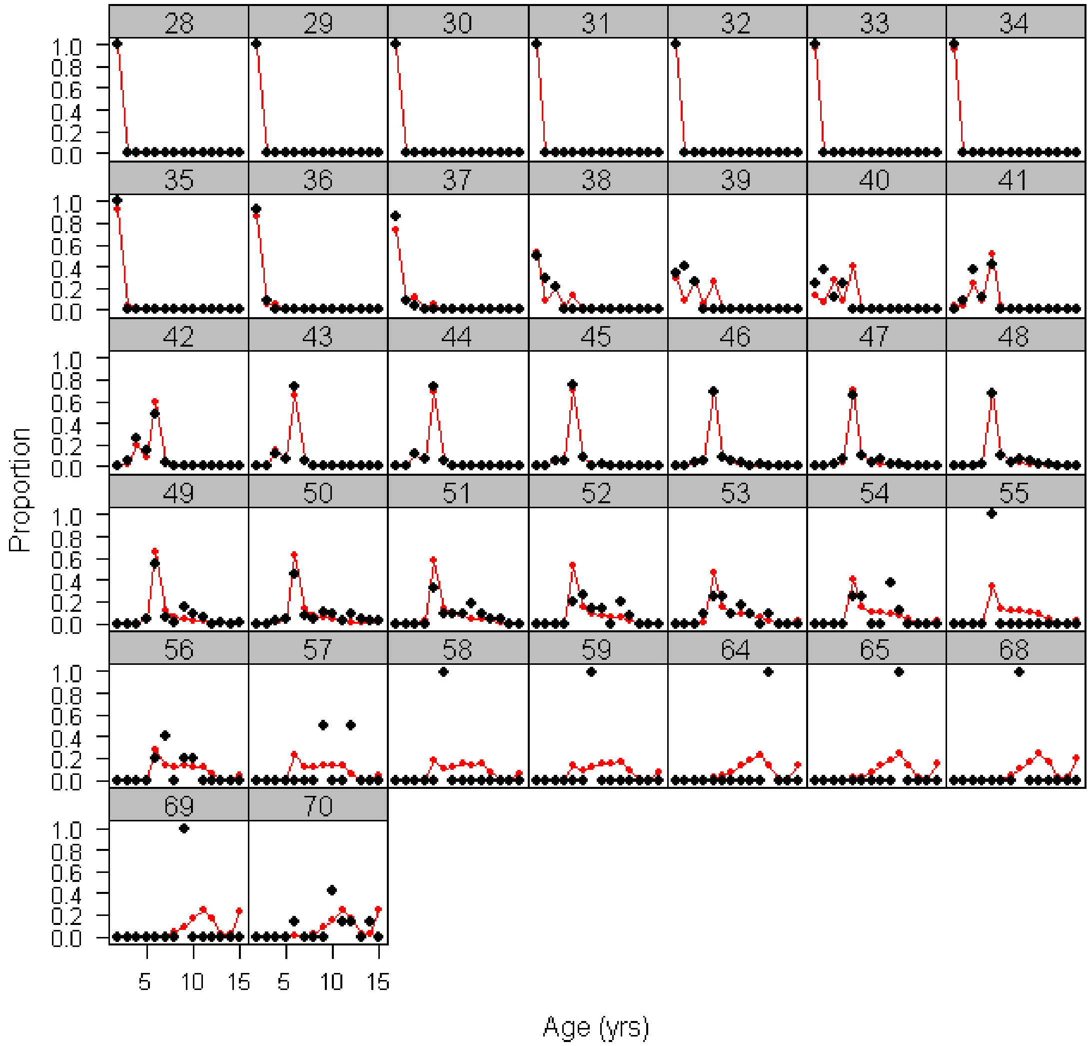



Figure 39. Model fits to the observed 2005 acoustic survey conditional age at length data .

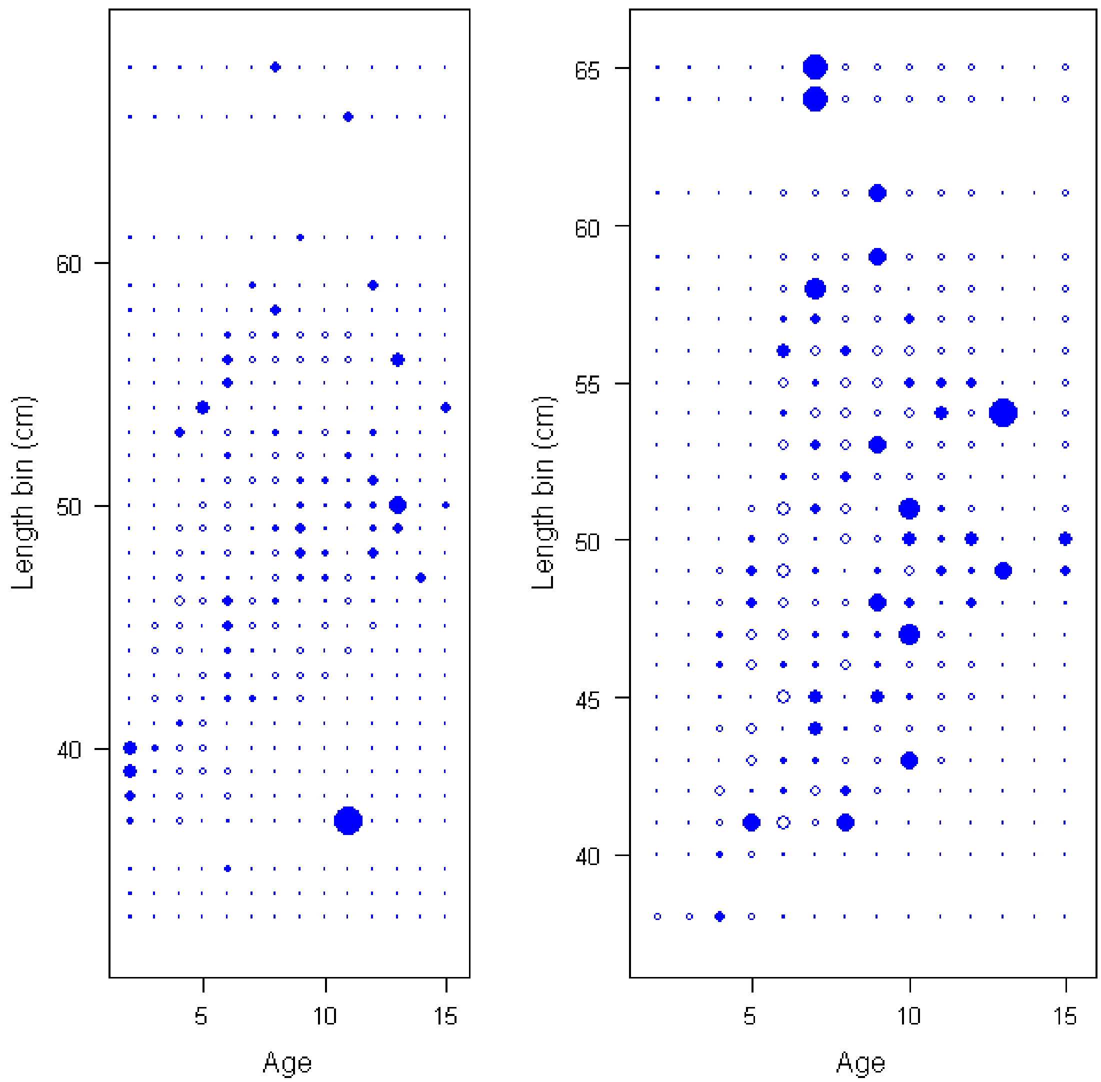



Figure 40. Pearson residuals of model fits to the 2005 U.S. fishery (left) and Canadian (right) conditional age at length data .

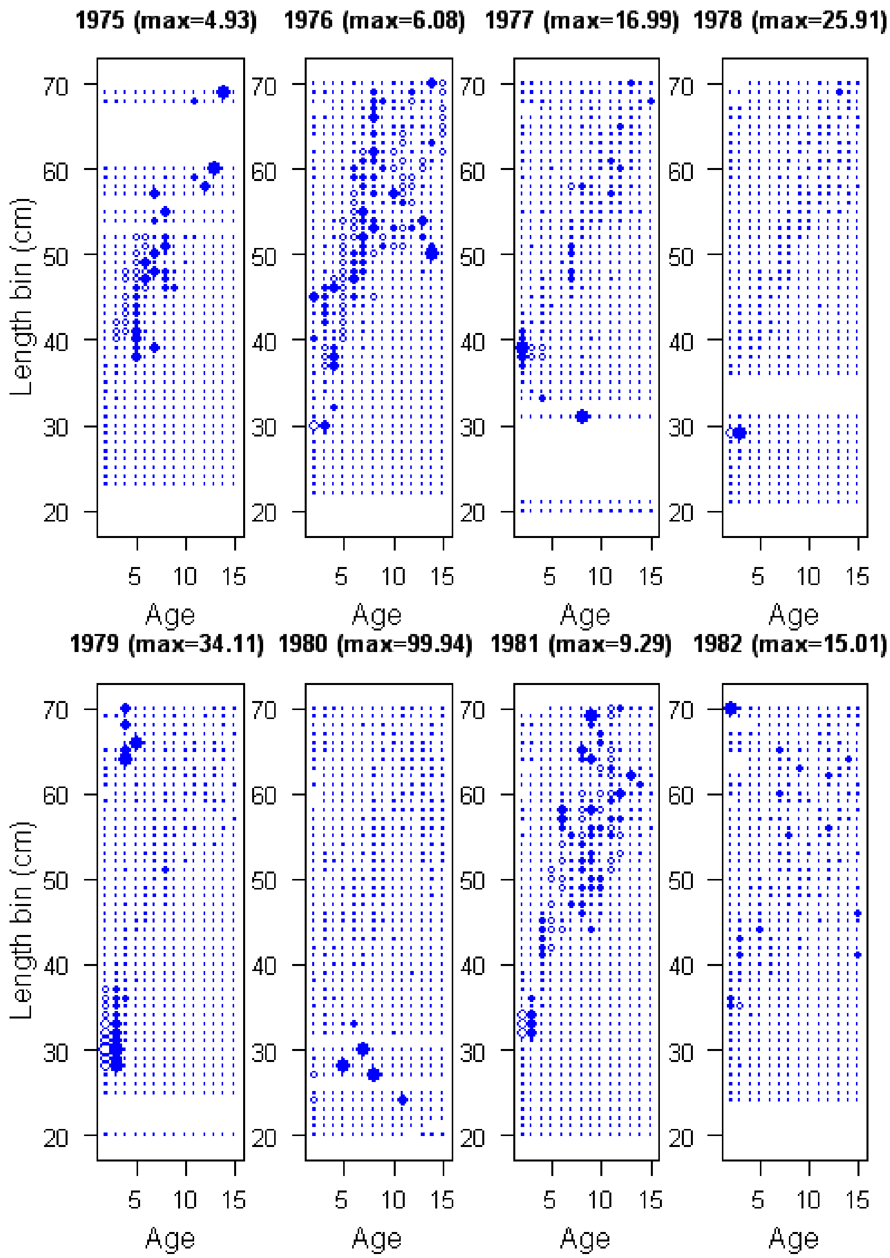



Figure 41. Standardized Pearson age at length residuals for the US fleet. Open circles Indicate negative residuals, filled circles indicate positive residuals.

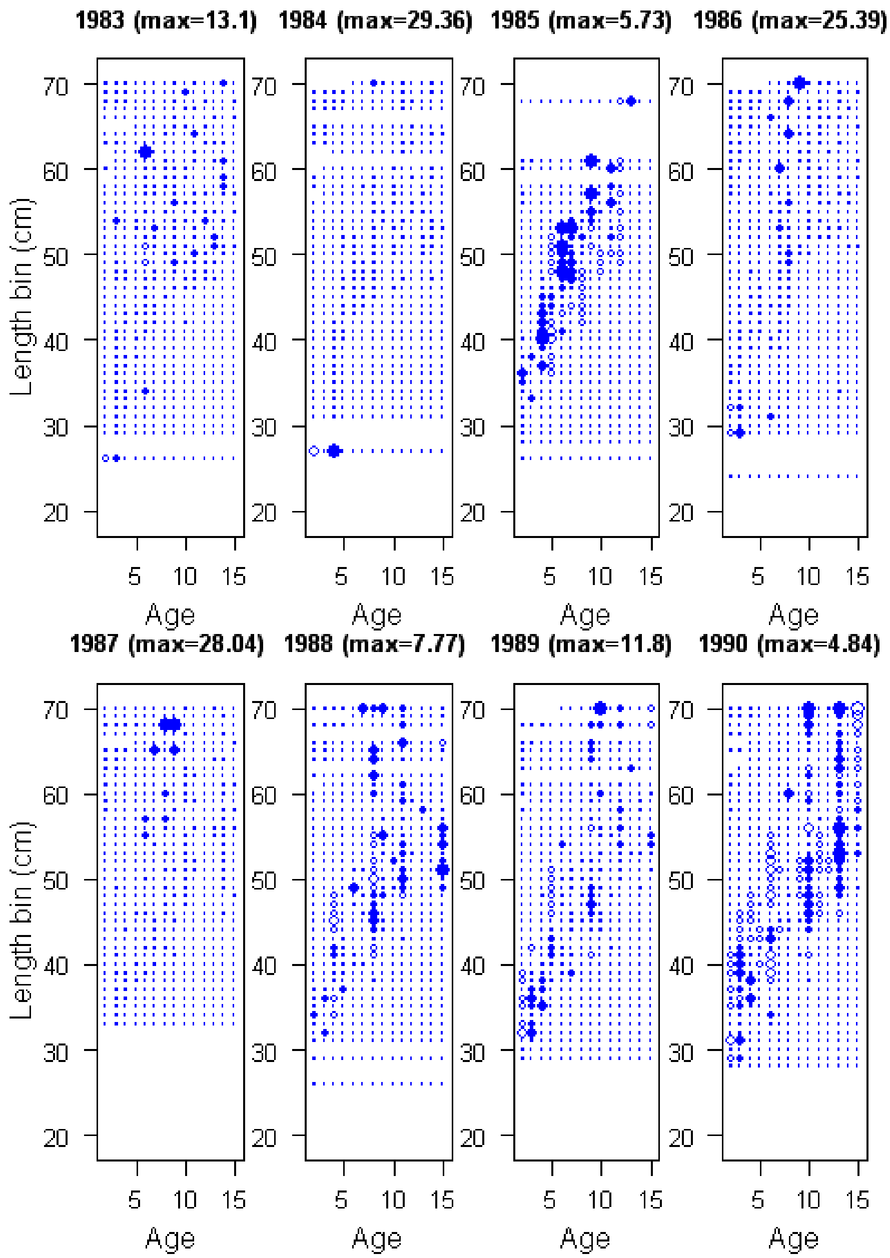



Figure 41. Continued.

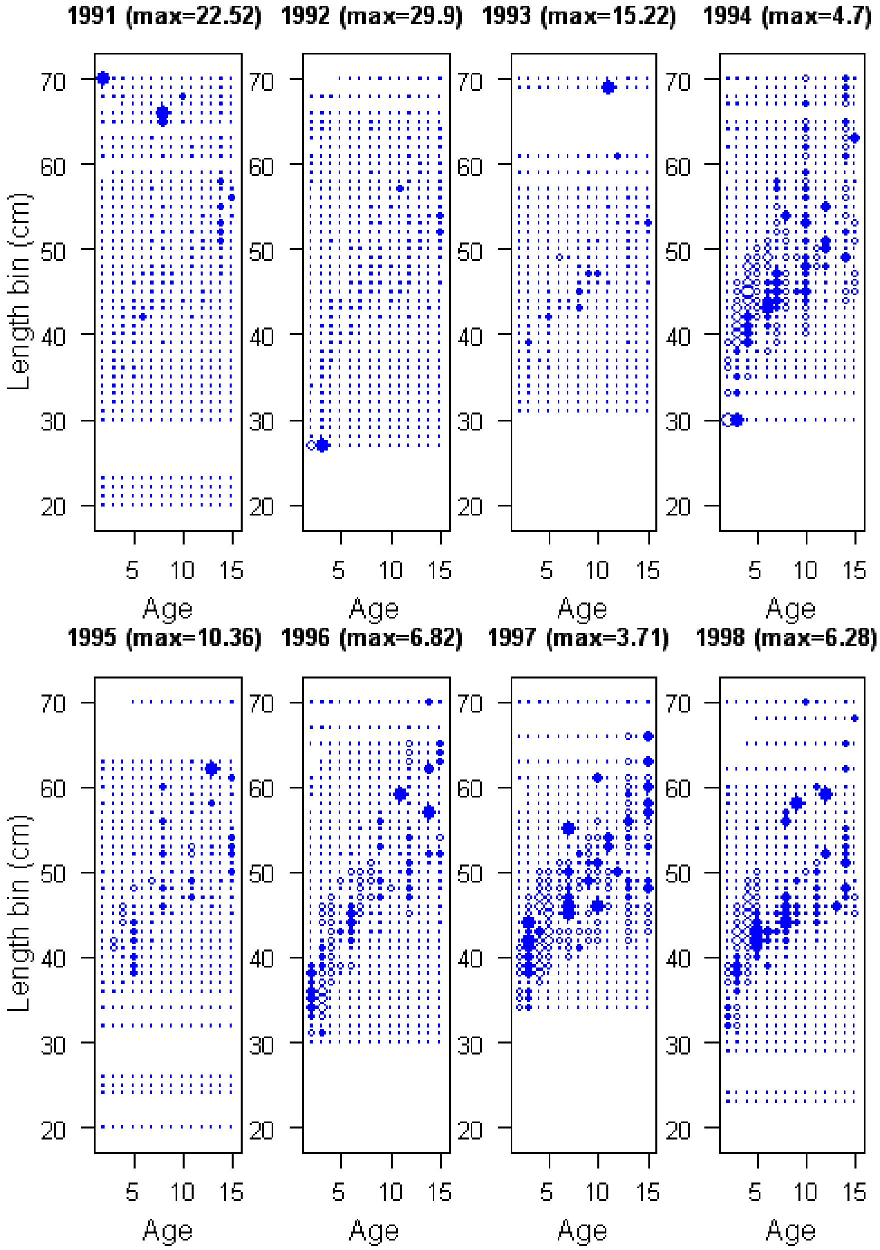



Figure 41. Continued.

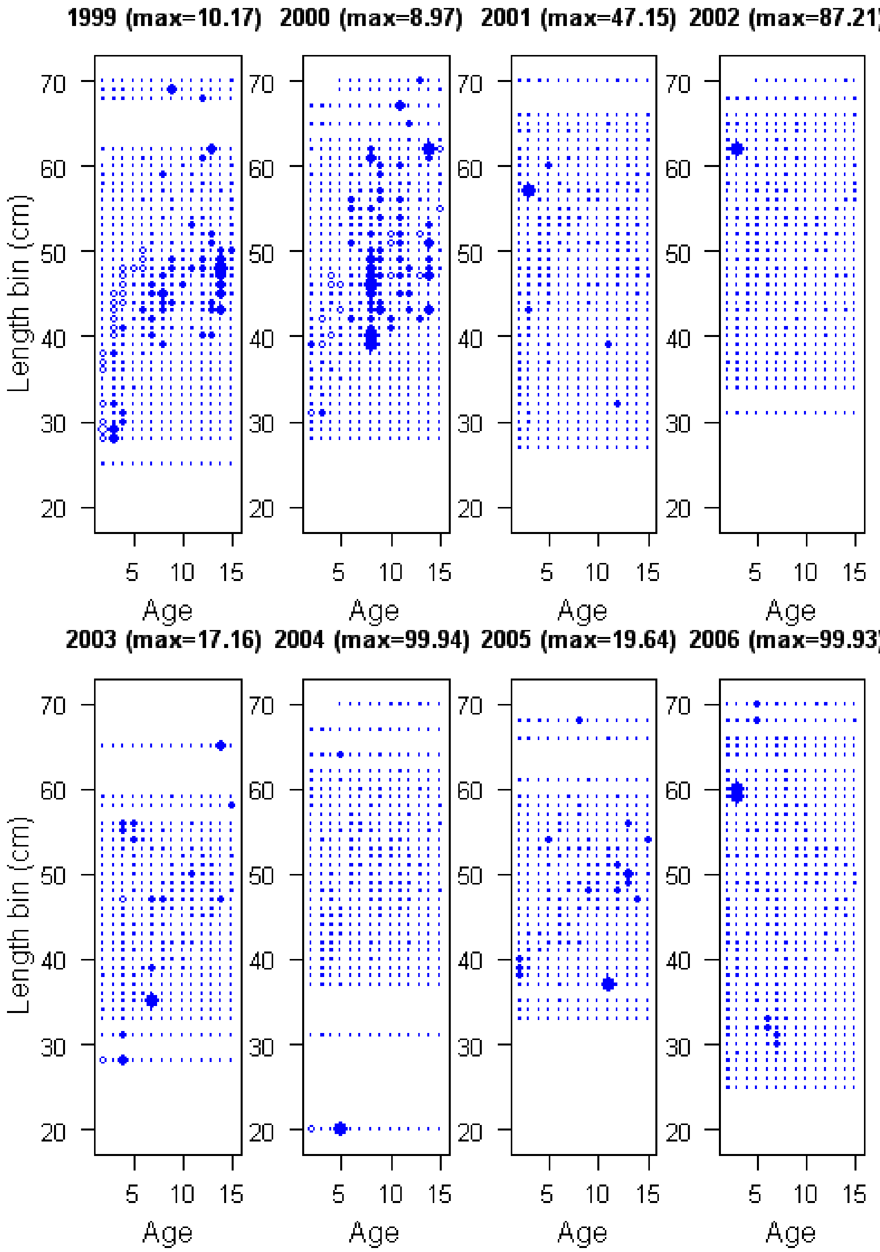



Figure 41. Continued.

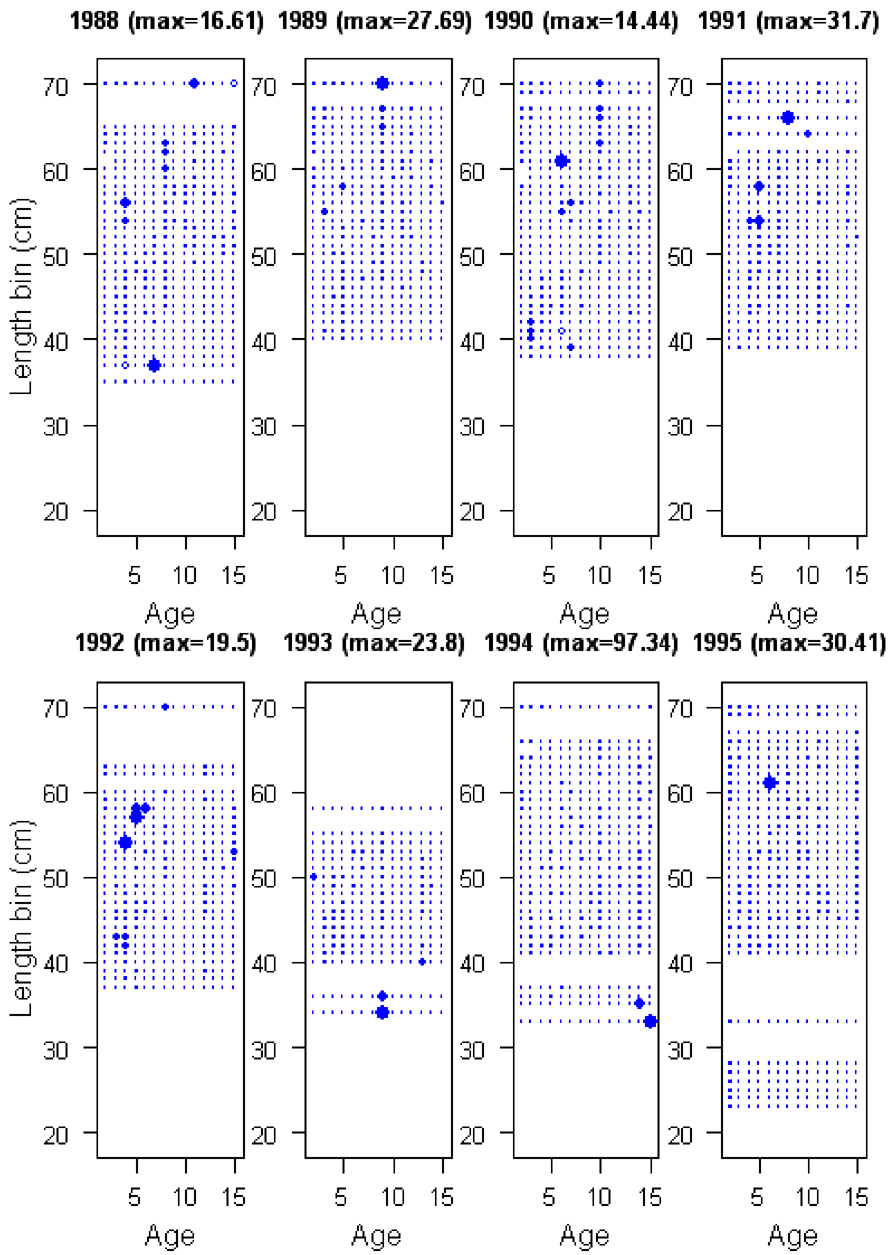



Figure 41. Standardized Pearson age at length residuals for the Canadian fleet. Open circles Indicate negative residuals, filled circles indicate positive residuals.

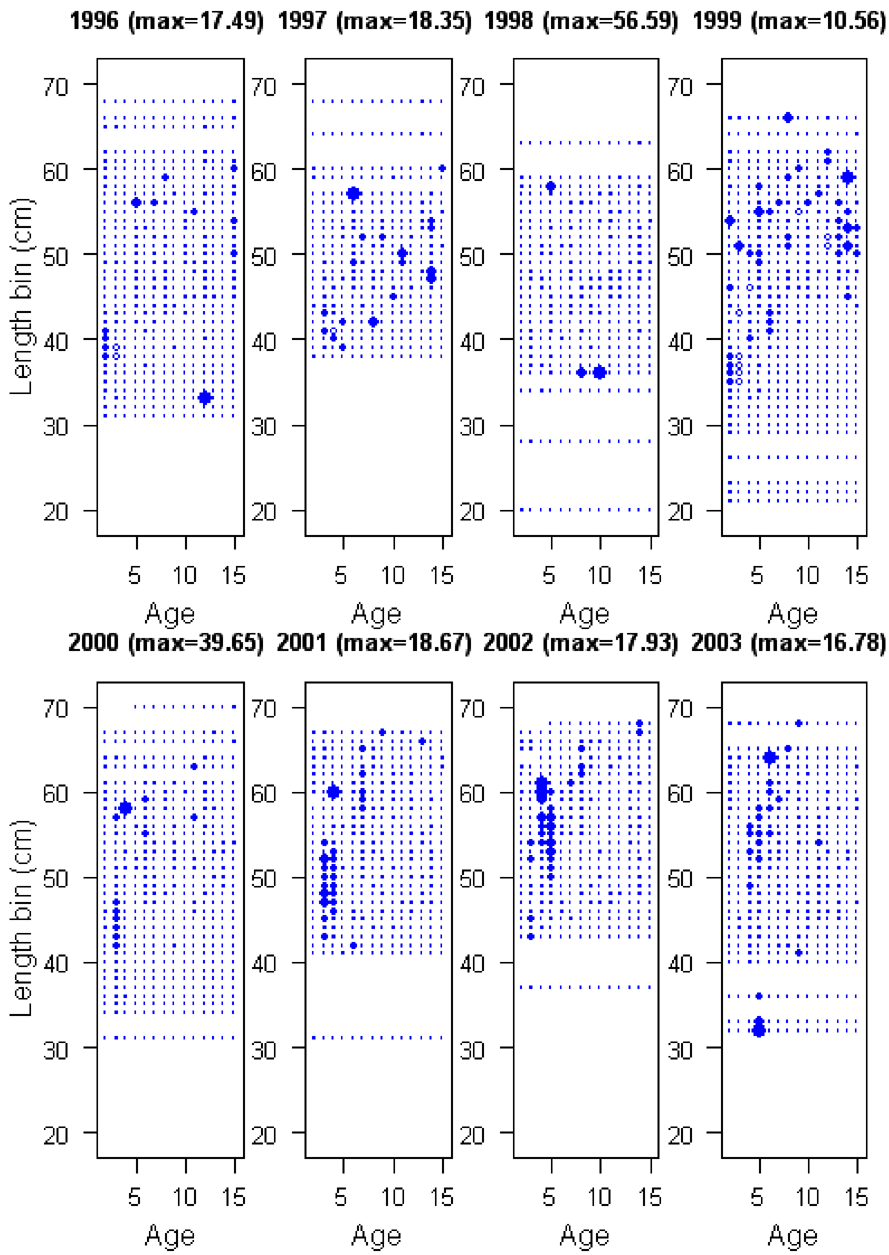



Figure 41. Continued.

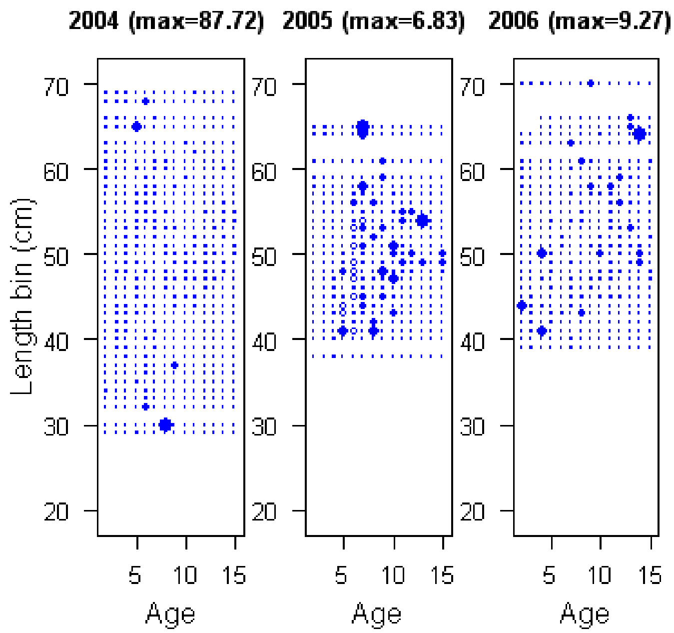



Figure 41. Continued.

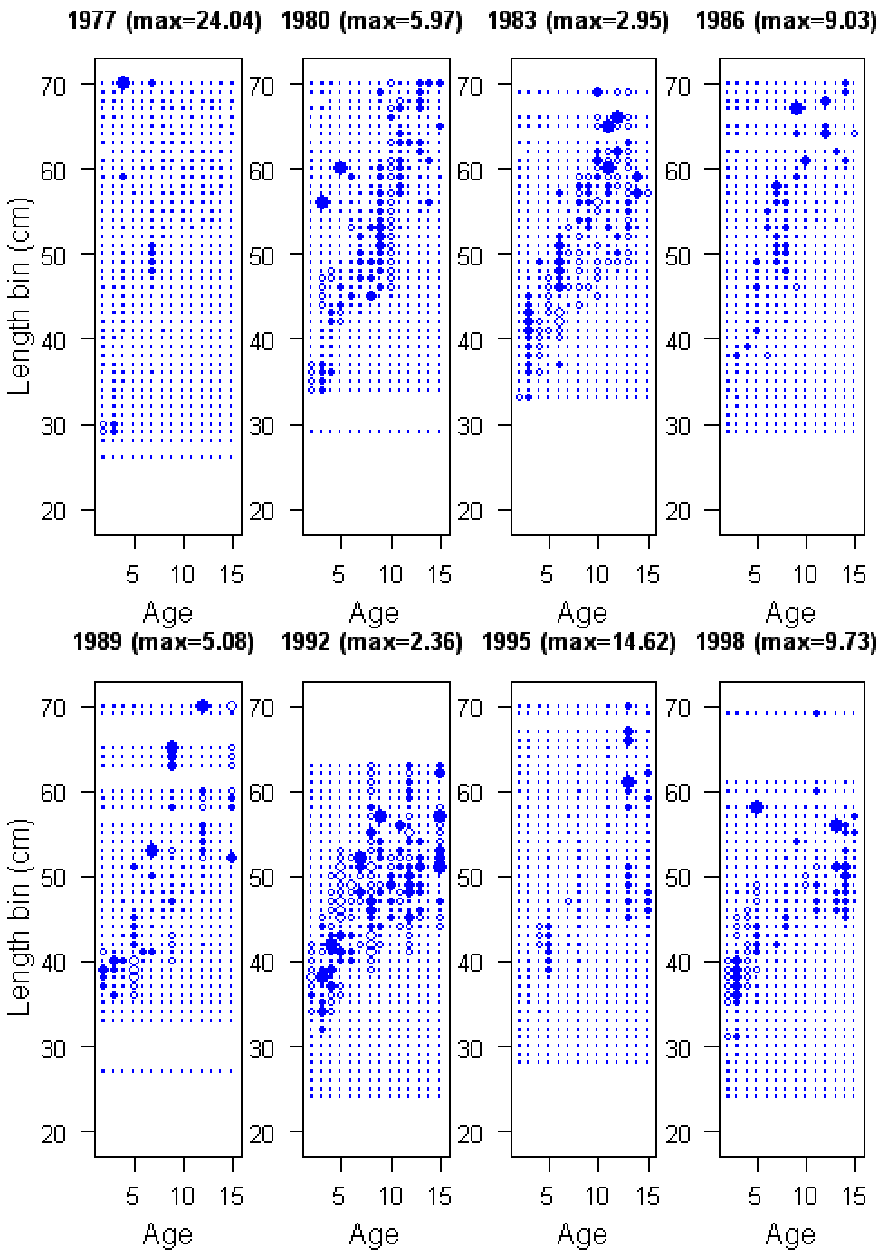



Figure 41. Standardized Pearson age at length residuals for the Acoustic survey. Open circles Indicate negative residuals, filled circles indicate positive residuals.

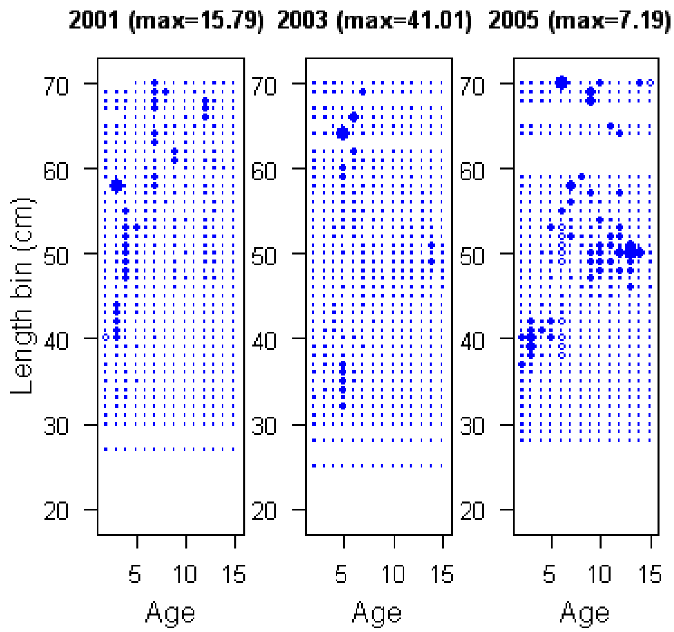



Figure 41. Continued.

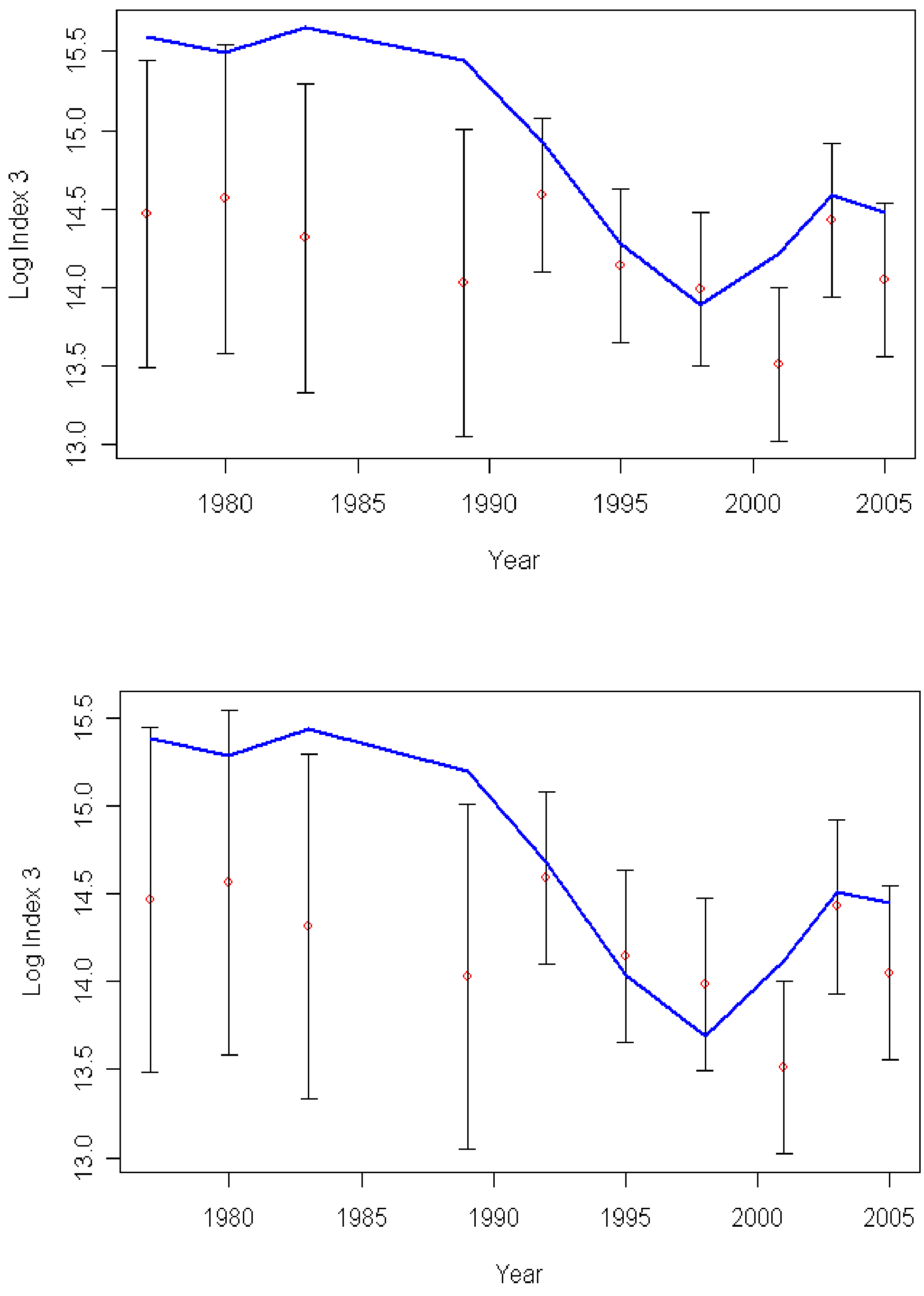



Figure 42. Predicted fit of acoustic survey biomass to the observed time series for the base (top) and alternative (bottom) models. Value are shown on a logarithmic scale.

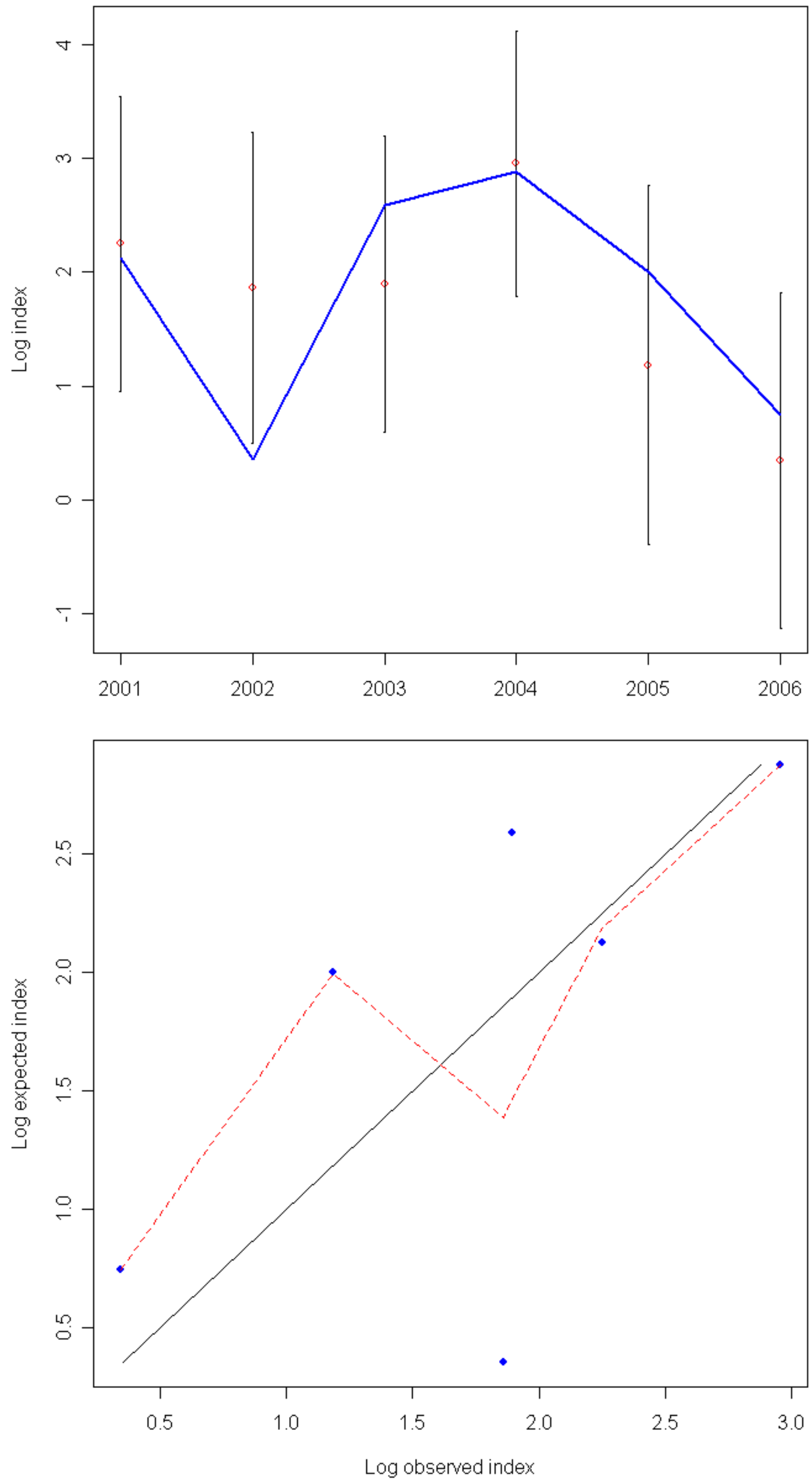



Figure 43. Predicted fit of the Coast-wide pre-recruit hake survey to the observed time series, 2001-2006. Value are shown on a logarithmic scale.

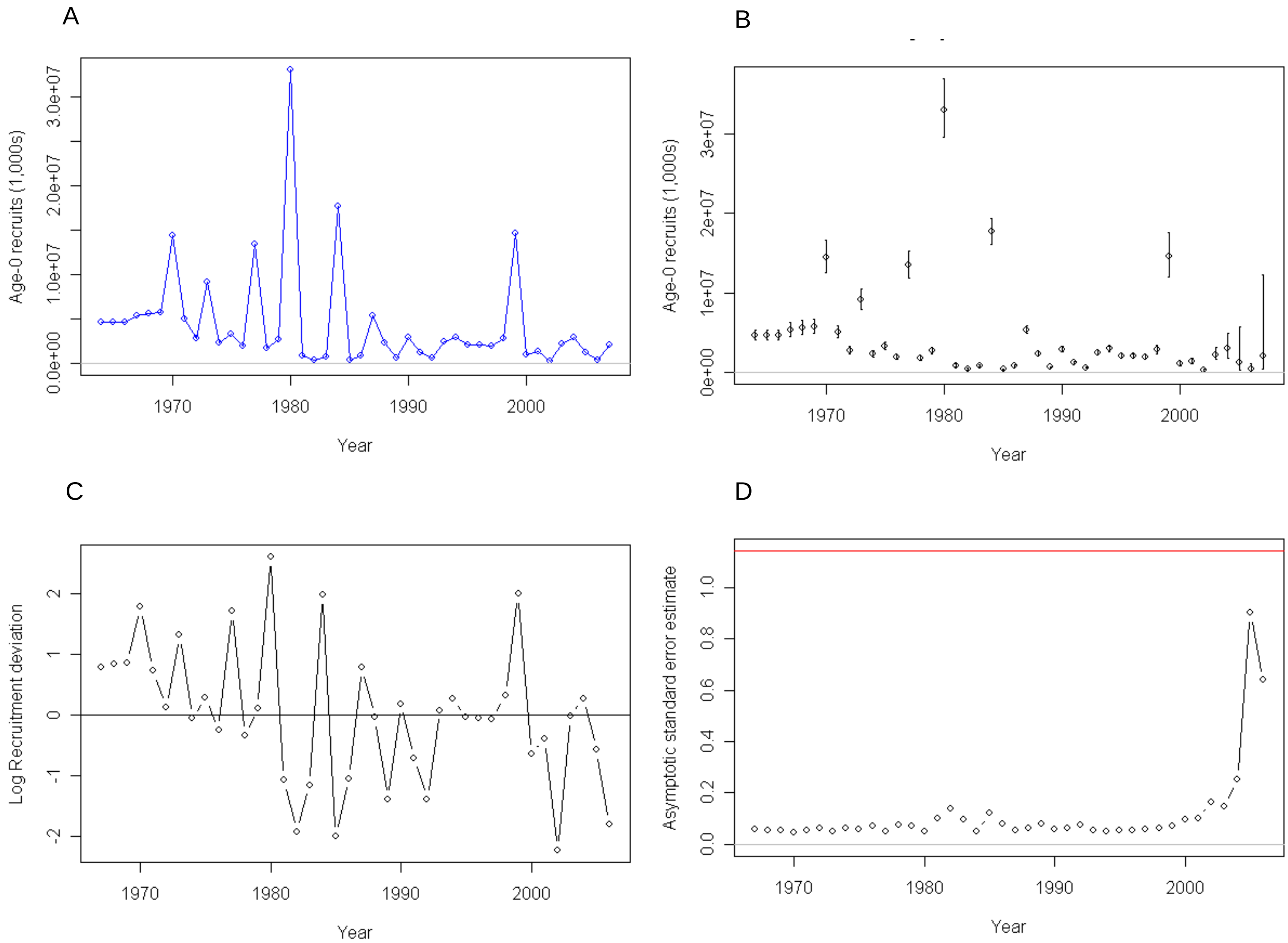



Figure 44. Estimates of Pacific hake recruitment (A), recruitment uncertainty (B), recruitment deviations (C) and asymptotic standard errors (D) from base SS2 model results. Recruitments were estimated from 1967-2006, but 2007 was taken from the S-R curve.

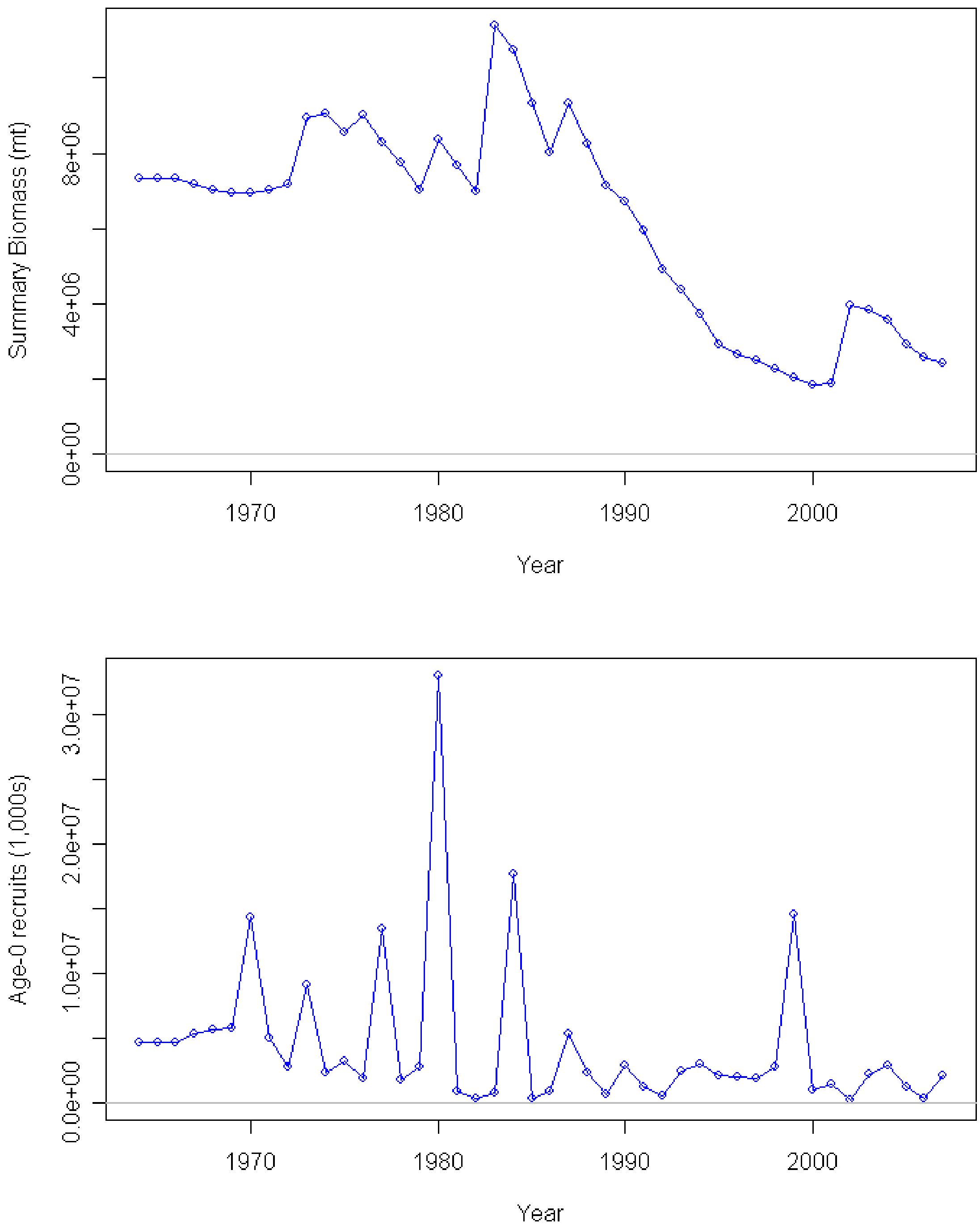



Figure 45. Estimated time series of Pacific hake summary biomass (age 3+) and recruitment from the base SS2 model.

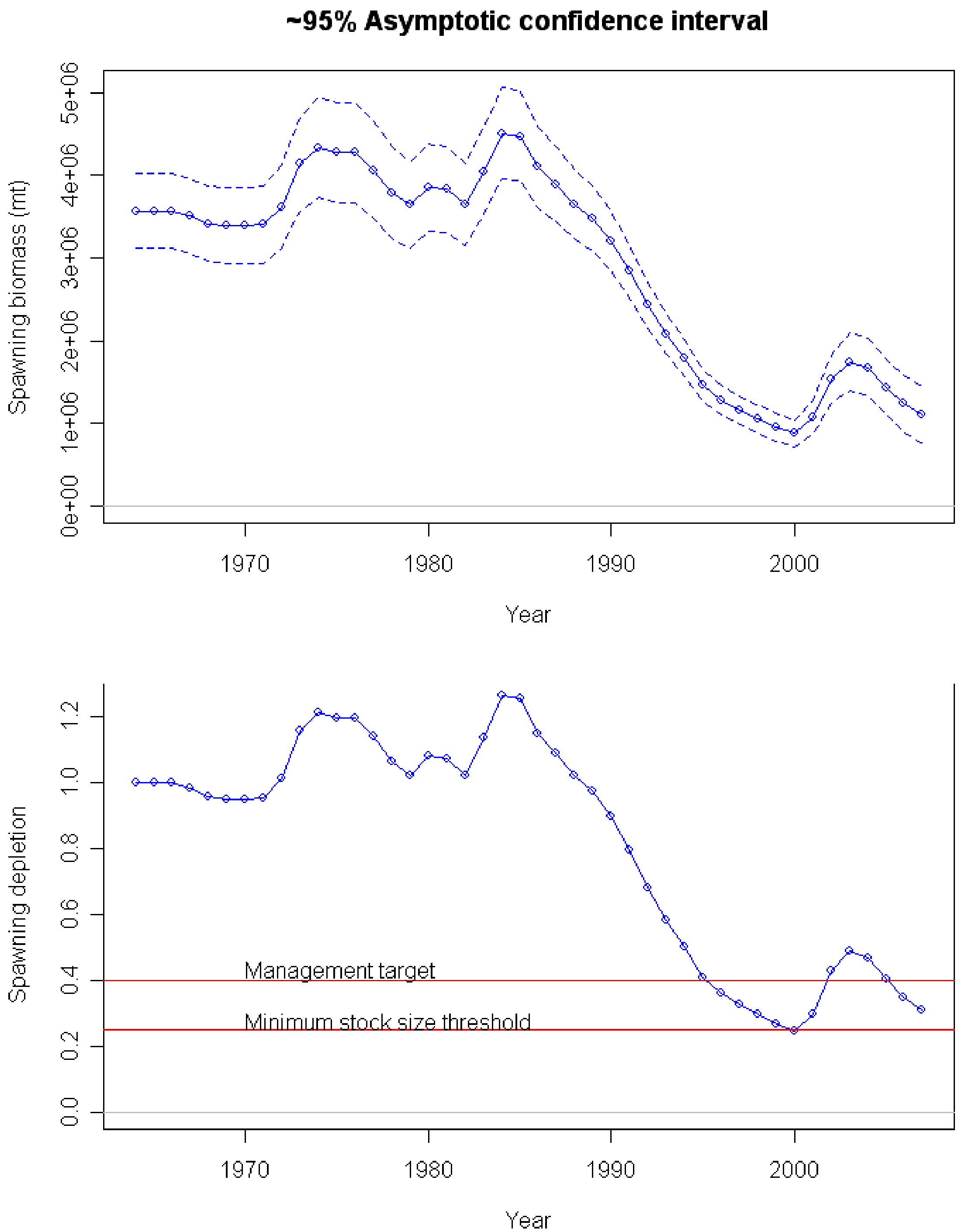



Figure 46. Estimated time series of Pacific hake spawning biomass and spawning depletion (fraction of unfished biomass) from the base SS2 model.

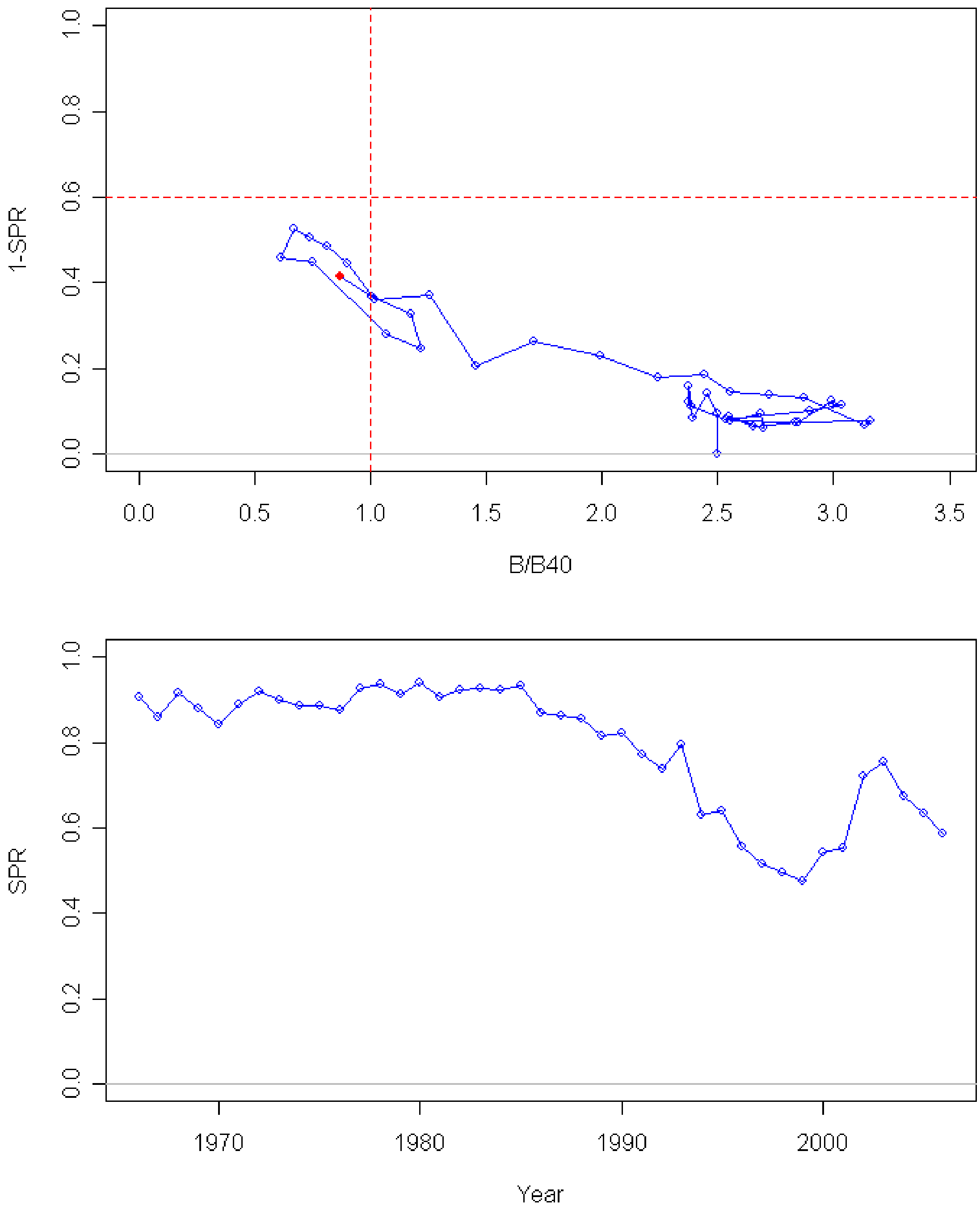



Figure 47. Estimated time series of Pacific hake spawning potential ratio (SPR) and fishery performance relative to reference point targets from the base SS2 model. Current (2006) performance relative to targets is shown as solid dot.

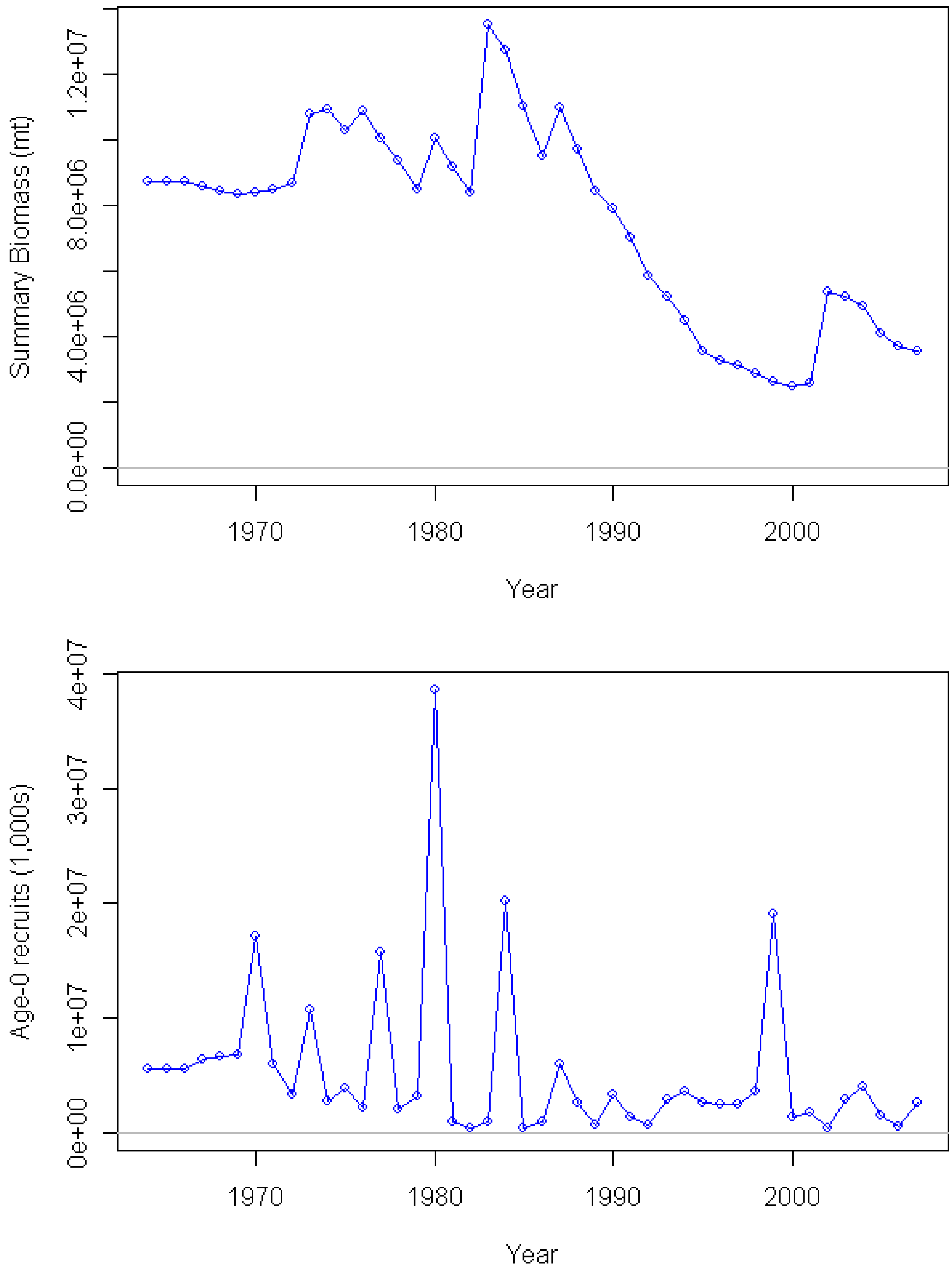



Figure 48. Estimated time series of Pacific hake summary biomass (age 3+) and recruitment from the alternative SS2 model (h=0.75 with q prior).

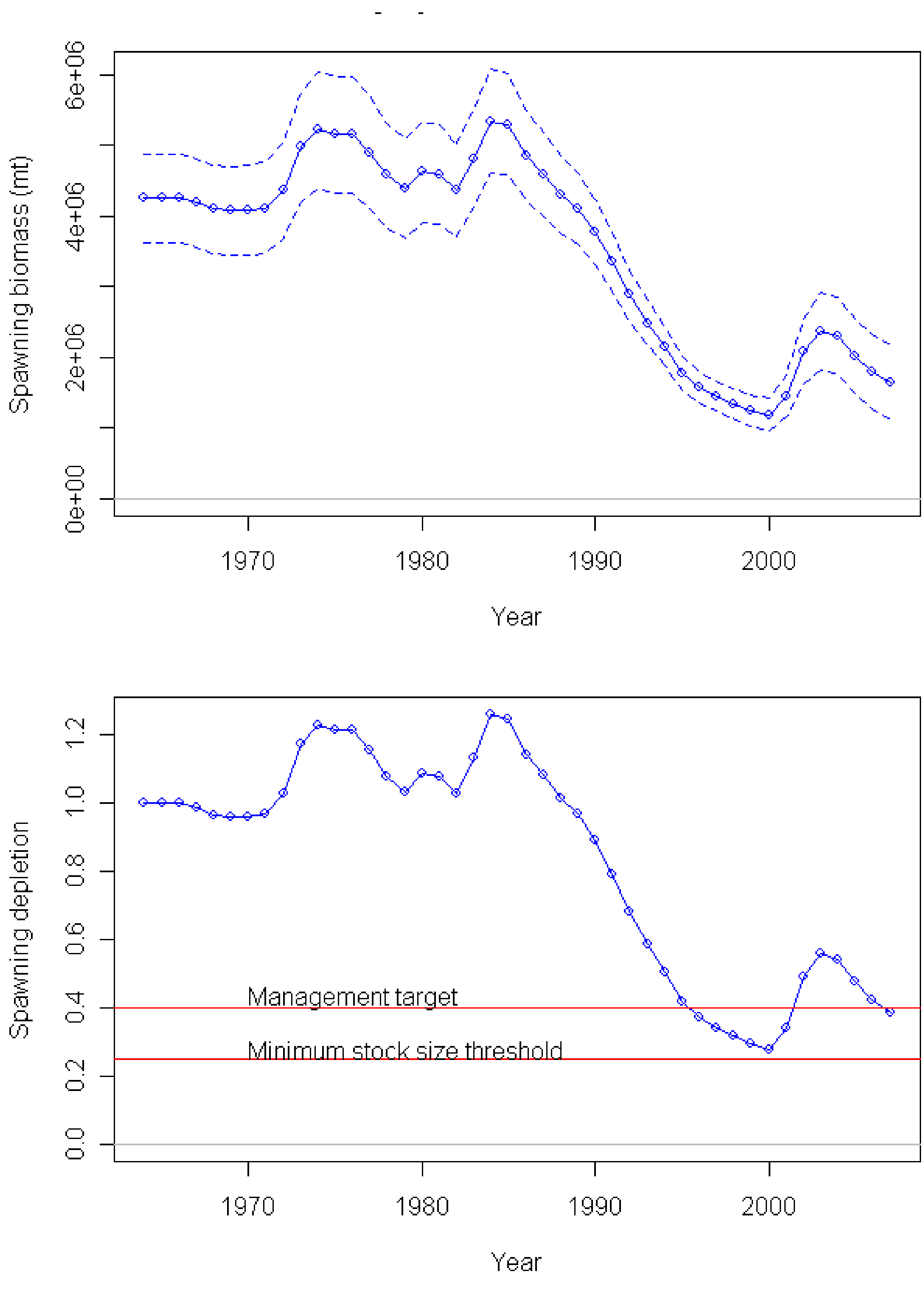



Figure 49. Estimated time series of Pacific hake spawning biomass and spawning depletion (fraction of unfished biomass) from the alternative SS2 model (h=0.75 with q prior).

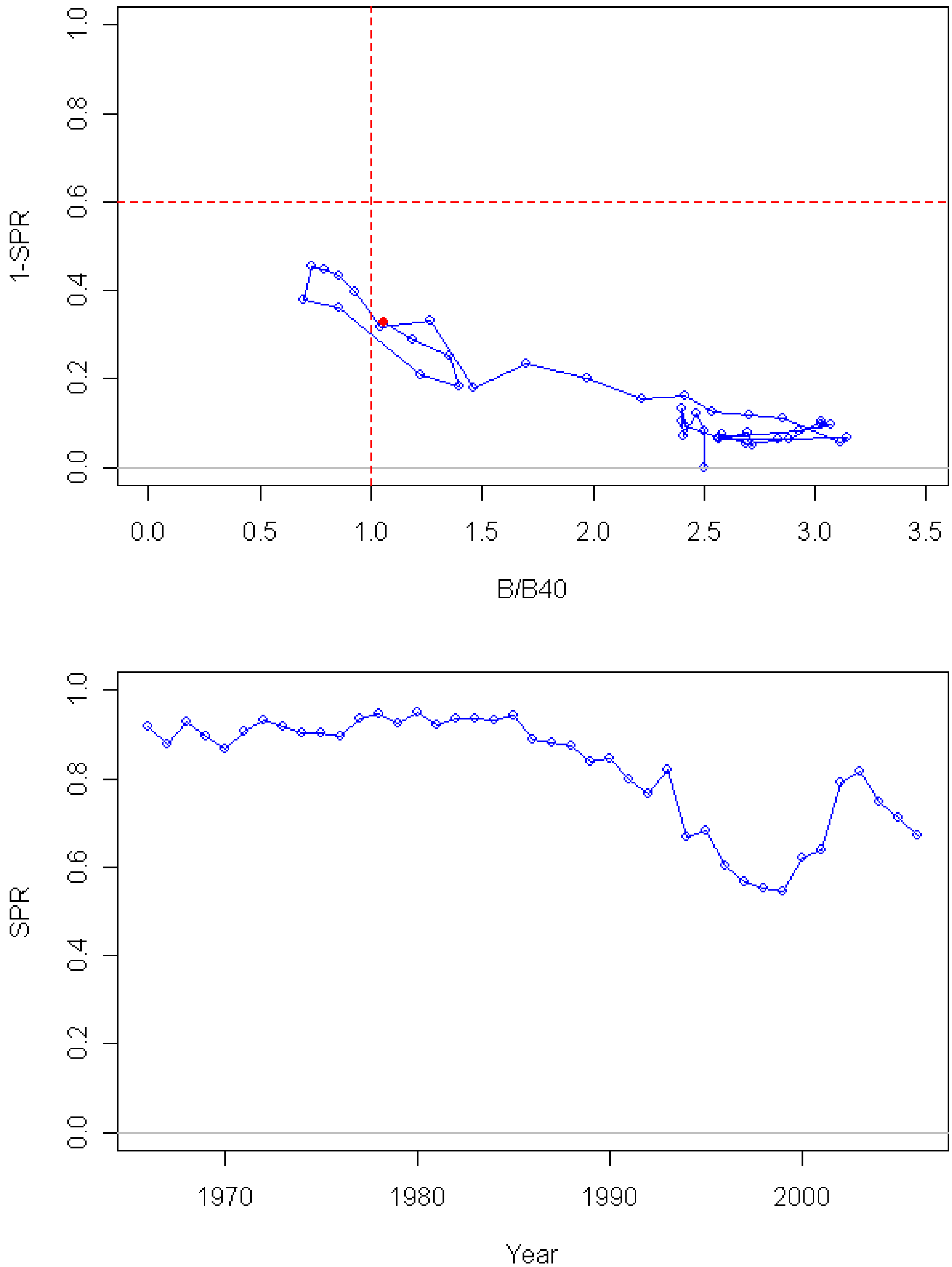



Figure 50. Estimated time series of Pacific hake spawning potential ratio (SPR) and fishery performance relative to reference point targets from the alternative SS2 Model (h=0.75 with q prior).

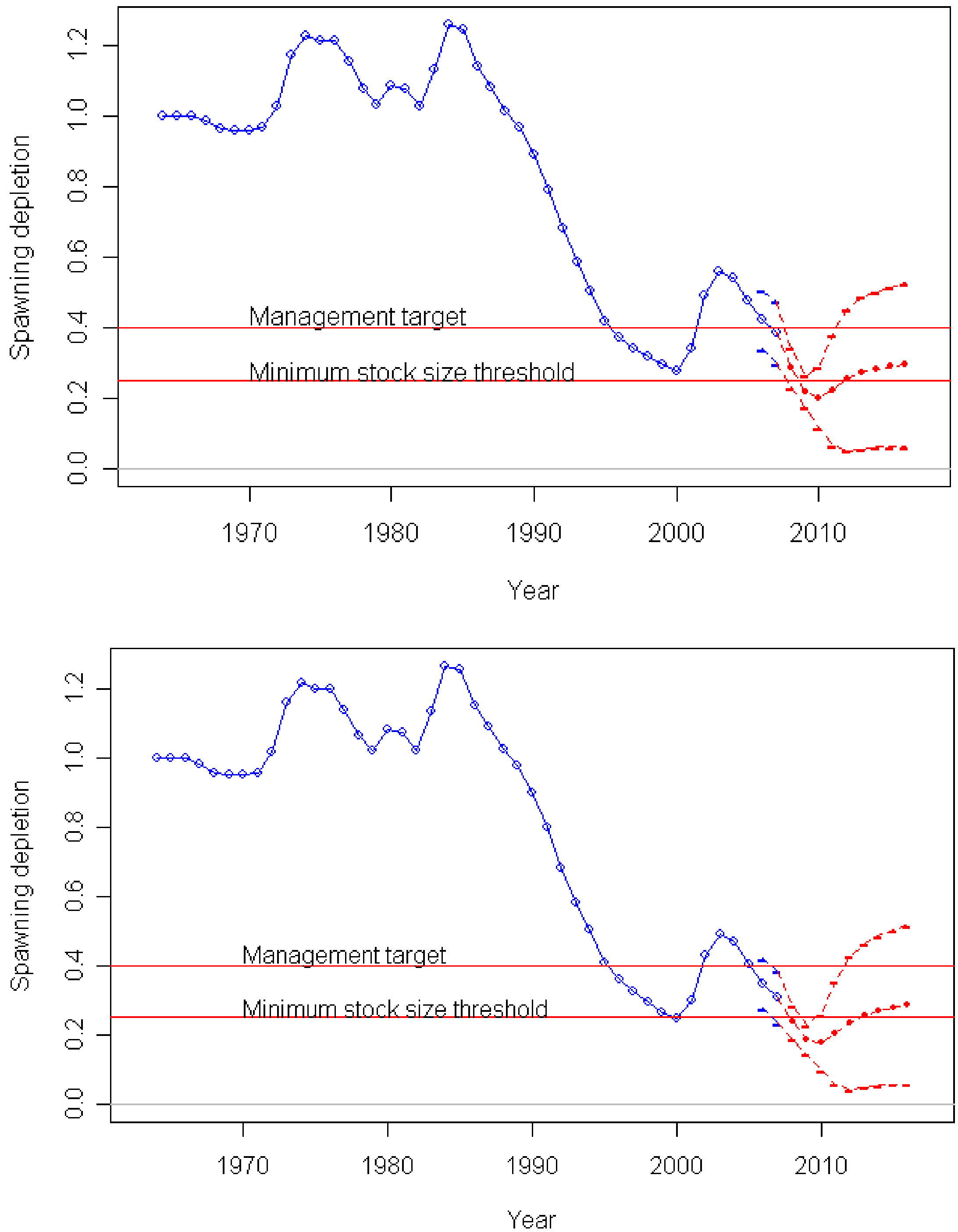



Figure 51. Ten year projections showing spawning depletion through 2017 from full utilization of optimum yield in the future for the base (top panel) and alternative (bottom panel) SS2 models.

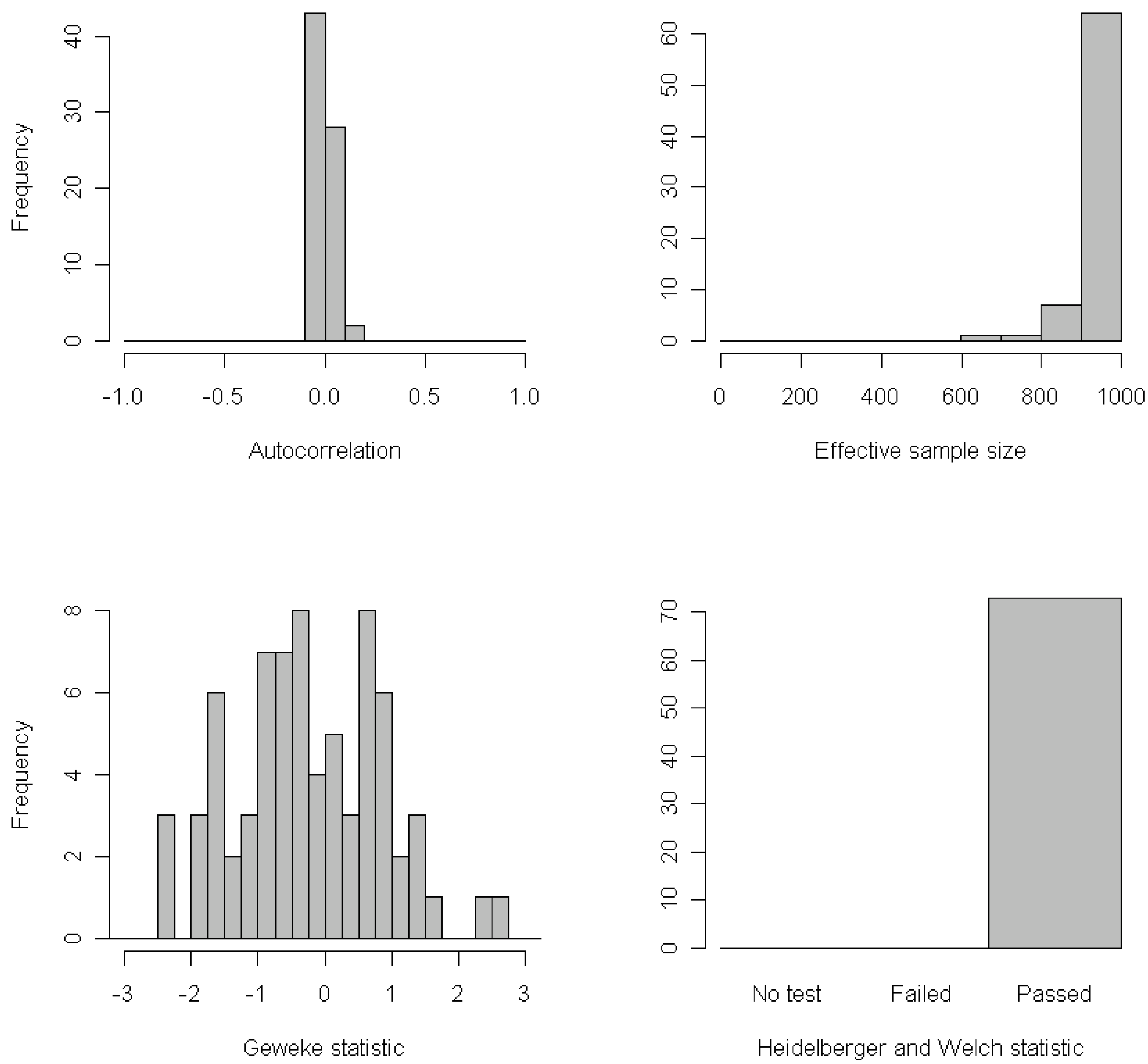



Figure 52. Summary of convergence criteria for all estimated model parameters.

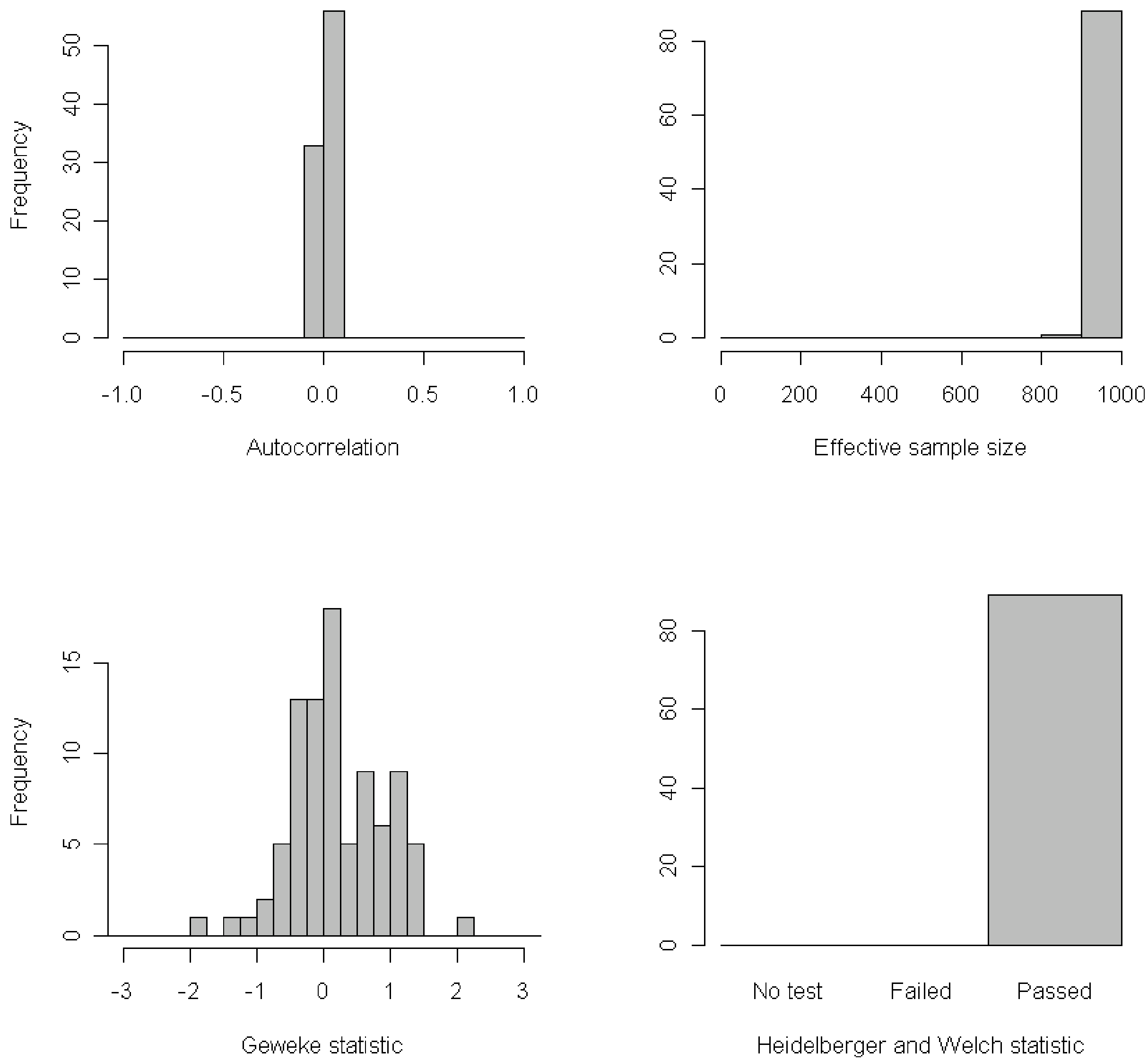



Figure 53. Summary of convergence criteria for the derived variables such as spawning biomass and recruitment time-series'.

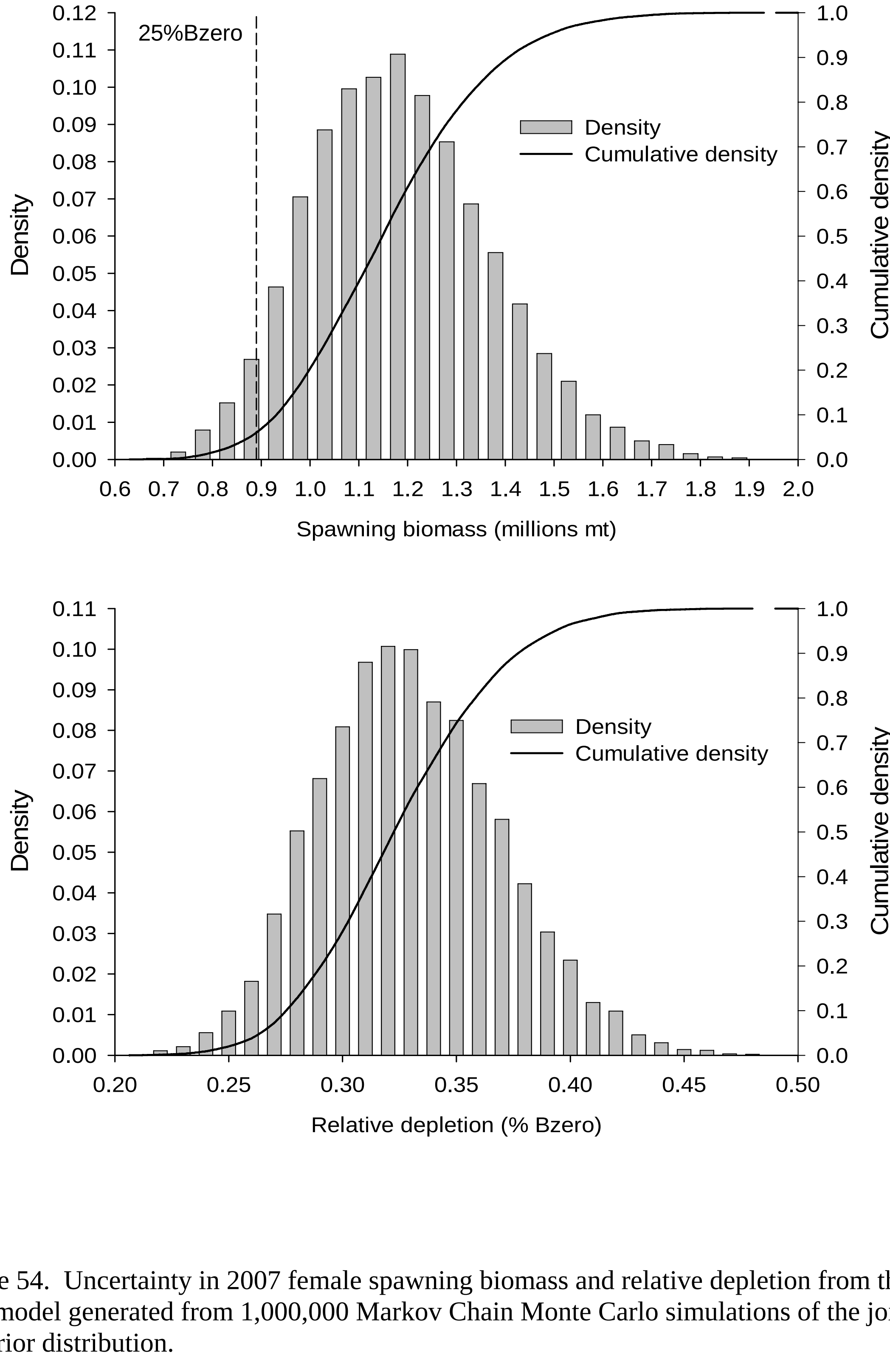



Figure 54. Uncertainty in 2007 female spawning biomass and relative depletion from the base model generated from 1,000,000 Markov Chain Monte Carlo simulations of the joint posterior distribution.

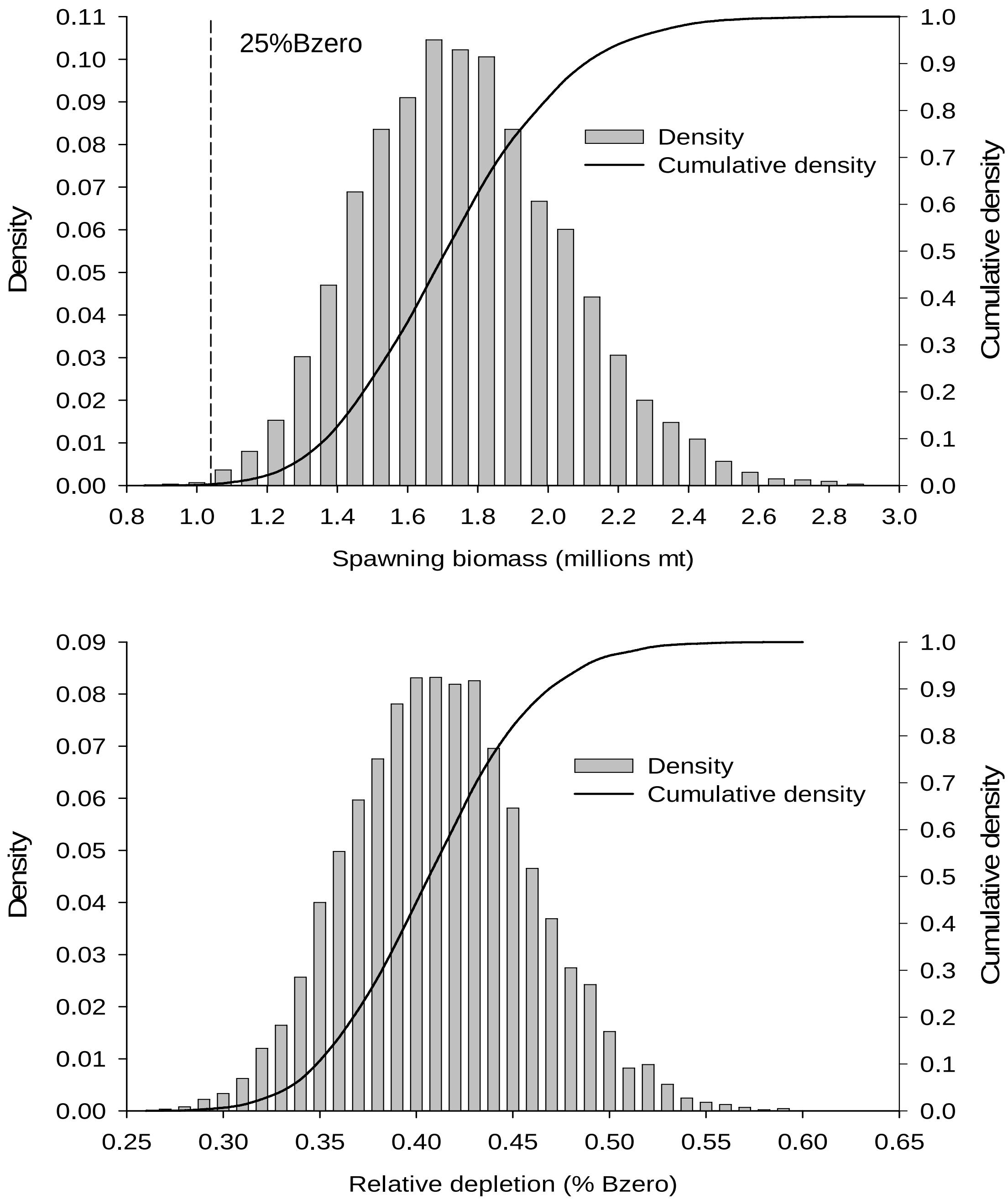



Figure 55. Uncertainty in 2007 female spawning biomass and relative depletion from the alternative model generated from 1,000,000 Markov Chain Monte Carlo simulations of the joint posterior distribution.

# APPENDIX 1: SS2 *.CTL AND *.DAT FILES

1966 #_styr
2006 #_endyr
1 #_nseas
12 #_months/season
1 #_spawn_seas
2 #_Nfleet
2 #_Nsurv
fishery1%fishery2%survey1%survey2
0.5 0.5 0.5 0.0001 #_surveytiming_in_season
1 #_Ngenders
15 #_Nages
0 0 #_init_equil_catch_for_each_fishery
#_catch_biomass(mtons):_columns_are_fisheries,_rows_are_year*season

| | | | |
|---|---|---|---|
| 137000 | 700 | # | 1966 |
| 177662 | 36713 | # | 1967 |
| 60819 | 61361 | # | 1968 |
| 86280 | 93851 | # | 1969 |
| 159575 | 75009 | # | 1970 |
| 127913 | 26699 | # | 1971 |
| 74133 | 43413 | # | 1972 |
| 147513 | 15126 | # | 1973 |
| 194109 | 17150 | # | 1974 |
| 205656 | 15704 | # | 1975 |
| 231549 | 5972 | # | 1976 |
| 127502 | 5191 | # | 1977 |
| 98372 | 5267 | # | 1978 |
| 124680 | 12435 | # | 1979 |
| 72352 | 17584 | # | 1980 |
| 114760 | 24361 | # | 1981 |
| 75577 | 32157 | # | 1982 |
| 73150 | 40774 | # | 1983 |
| 96332 | 42109 | # | 1984 |
| 85439 | 24962 | # | 1985 |
| 154964 | 55653 | # | 1986 |
| 160448 | 73699 | # | 1987 |
| 160698 | 88106 | # | 1988 |
| 210996 | 94920 | # | 1989 |
| 183800 | 75992 | # | 1990 |
| 217505 | 89753 | # | 1991 |
| 208576 | 88334 | # | 1992 |
| 141222 | 58213 | # | 1993 |
| 252729 | 108800 | # | 1994 |
| 177589 | 72181 | # | 1995 |
| 212901 | 93174 | # | 1996 |
| 233423 | 91792 | # | 1997 |
| 232817 | 87802 | # | 1998 |
| 224522 | 87333 | # | 1999 |
| 208418 | 22402 | # | 2000 |
| 182377 | 53585 | # | 2001 |
| 132115 | 50796 | # | 2002 |
| 143492 | 62090 | # | 2003 |
| 210487 | 124185 | # | 2004 |
| 249109 | 100462 | # | 2005 |
| 266139 | 93726 | # | 2006 |

16 #_N_cpue_and_surveyabundance_observations
#_year seas index obs se(log)
1977 1 3 1915000 0.5
1980 1 3 2115000 0.5
1983 1 3 1647000 0.5
1989 1 3 1238000 0.5
1992 1 3 2169000 0.25
1995 1 3 1385000 0.25
1998 1 3 1185000 0.25
2001 1 3 737000 0.25
2003 1 3 1840000 0.25
#2005 1 3 1073563 0.25
2005 1 3 1265000 0.25
2001 1 4 9.490 0.462
2002 1 4 6.429 0.498

2003 1 4 6.648 0.465
2004 1 4 19.228 0.394
2005 1 4 3.271 0.604
2006 1 4 1.411 0.553

2 #_discard_type
0 #_N_discard_obs

0 #_N_meanbodywt_obs

-1 #_comp_tail_compression
0.0001 #_add_to_comp
51 #_N_LengthBins
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70
61 #_N_Length_obs
#Yr Seas Flt/Svy Gender Part Nsamp datavector(female-male)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1975 | 1 | 1 | 0 | 0 | 13 | 0.0000 | 0.0000 | 0.0000 | 0.1310 | 0.4138 | 0.4138 |
| | 0.6101 | 0.6101 | 0.3291 | 0.7411 | 1.5447 | 0.9566 | 4.6455 | 4.0107 | 4.1898 | 5.3717 | 3.0869 |
| | 2.8926 | 2.0167 | 1.0373 | 4.3164 | 4.0849 | 7.0859 | 7.4219 | 7.1653 | 7.1658 | 4.9095 | 4.0224 |
| | 5.0698 | 2.3889 | 3.2625 | 1.2916 | 3.4063 | 0.0000 | 1.1843 | 1.0342 | 0.3465 | 0.4138 | 0.8734 |
| | 0.9032 | 0.3465 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1310 | 0.1742 |
| | 0.0000 | | | | | | | | | | |
| 1976 | 1 | 1 | 0 | 0 | 249 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0016 | 0.0000 | 0.0056 | 0.0033 | 0.0383 | 0.0461 | 0.0619 | 0.0983 | 0.2605 | 0.2710 | 0.4635 |
| | 0.5851 | 0.9688 | 1.7104 | 2.6494 | 3.7108 | 5.1325 | 5.6852 | 6.3574 | 6.5997 | 6.6614 | 6.7014 |
| | 6.7809 | 6.7467 | 6.3412 | 6.0203 | 5.7434 | 5.0318 | 4.0850 | 2.9869 | 2.1415 | 1.3175 | 1.1743 |
| | 0.7971 | 0.5916 | 0.4178 | 0.3714 | 0.2021 | 0.3217 | 0.1198 | 0.0626 | 0.1229 | 0.0766 | 0.0428 |
| | 0.4921 | | | | | | | | | | |
| 1977 | 1 | 1 | 0 | 0 | 1071 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0018 | 0.0134 | 0.0376 | 0.0706 | 0.1661 |
| | 0.4152 | 0.6903 | 1.1624 | 1.8450 | 2.7529 | 4.3062 | 5.5899 | 5.8003 | 7.0414 | 7.6587 | 8.0144 |
| | 8.2014 | 8.0120 | 7.8118 | 7.2003 | 6.2315 | 4.7967 | 3.7873 | 2.7235 | 1.7045 | 1.2366 | 0.8199 |
| | 0.5163 | 0.3222 | 0.2985 | 0.1799 | 0.1885 | 0.1195 | 0.0886 | 0.0573 | 0.0324 | 0.0296 | 0.0462 |
| | 0.0296 | | | | | | | | | | |
| 1978 | 1 | 1 | 0 | 0 | 1135 | 0.0000 | 0.0137 | 0.0335 | 0.0204 | 0.0187 | 0.0129 |
| | 0.0269 | 0.0195 | 0.0268 | 0.0177 | 0.0119 | 0.0196 | 0.0000 | 0.0052 | 0.0068 | 0.0000 | 0.0232 |
| | 0.0374 | 0.1341 | 0.4019 | 1.1005 | 1.8736 | 3.2463 | 4.8921 | 6.2182 | 7.2486 | 8.1810 | 8.5122 |
| | 8.8032 | 8.7842 | 8.3771 | 7.6130 | 6.8721 | 5.5053 | 3.9908 | 2.9505 | 1.7999 | 1.1040 | 0.6053 |
| | 0.4234 | 0.2603 | 0.2115 | 0.1333 | 0.0826 | 0.1005 | 0.0837 | 0.0252 | 0.0539 | 0.0204 | 0.0118 |
| | 0.0858 | | | | | | | | | | |
| 1979 | 1 | 1 | 0 | 0 | 1539 | 0.0037 | 0.0097 | 0.0000 | 0.0000 | 0.0045 | 0.0116 |
| | 0.0377 | 0.1272 | 0.2419 | 0.3627 | 0.6064 | 0.9330 | 1.0785 | 1.2116 | 1.3609 | 1.1767 | 1.0738 |
| | 0.9737 | 0.8697 | 0.7638 | 1.0134 | 1.2884 | 2.1901 | 3.1243 | 4.4482 | 5.5505 | 6.5905 | 7.3083 |
| | 7.4803 | 7.3508 | 7.1915 | 6.8207 | 6.1776 | 5.2697 | 4.4570 | 3.4610 | 2.5085 | 1.9857 | 1.3847 |
| | 1.0024 | 0.6851 | 0.4921 | 0.3971 | 0.2037 | 0.1600 | 0.1547 | 0.1172 | 0.0869 | 0.0479 | 0.0772 |
| | 0.1275 | | | | | | | | | | |
| 1980 | 1 | 1 | 0 | 0 | 811 | 0.0091 | 0.0023 | 0.0015 | 0.0000 | 0.0073 | 0.0000 |
| | 0.0000 | 0.0087 | 0.0126 | 0.0458 | 0.0204 | 0.0433 | 0.1149 | 0.2228 | 0.5250 | 0.7315 | 1.2779 |
| | 2.1458 | 3.0350 | 3.7493 | 4.1531 | 4.0760 | 4.3104 | 4.0557 | 4.3473 | 4.6273 | 5.0774 | 5.6263 |
| | 5.8858 | 6.0686 | 5.8665 | 5.5856 | 5.4307 | 5.0389 | 4.3970 | 3.5729 | 2.4554 | 2.0179 | 1.4813 |
| | 1.1084 | 0.7881 | 0.5016 | 0.3861 | 0.4173 | 0.1653 | 0.1672 | 0.1005 | 0.0862 | 0.0783 | 0.0779 |
| | 0.0960 | | | | | | | | | | |
| 1981 | 1 | 1 | 0 | 0 | 1093 | 0.0800 | 0.1084 | 0.3599 | 0.7080 | 0.9938 | 1.3236 |
| | 1.4714 | 1.4205 | 1.1953 | 0.9210 | 0.5505 | 0.3604 | 0.3151 | 0.1801 | 0.1889 | 0.2756 | 0.5729 |
| | 0.9527 | 1.7359 | 2.9281 | 4.0255 | 5.0184 | 5.6197 | 6.0028 | 6.2402 | 6.2228 | 6.0960 | 5.8936 |
| | 5.4876 | 5.3678 | 5.1780 | 4.8316 | 4.1992 | 3.4228 | 2.5465 | 1.9163 | 1.4854 | 1.0655 | 0.5759 |
| | 0.4974 | 0.3794 | 0.2661 | 0.1841 | 0.1667 | 0.1191 | 0.0804 | 0.0909 | 0.0528 | 0.0518 | 0.0368 |
| | 0.2368 | | | | | | | | | | |
| 1982 | 1 | 1 | 0 | 0 | 1142 | 0.0012 | 0.0006 | 0.0006 | 0.0069 | 0.0278 | 0.0623 |
| | 0.1581 | 0.3195 | 0.4785 | 0.7517 | 1.1521 | 1.7236 | 2.2861 | 2.4465 | 2.4854 | 2.2689 | 2.0172 |
| | 1.5572 | 1.1535 | 1.1139 | 1.6668 | 2.6606 | 3.7590 | 4.8387 | 5.2255 | 5.3355 | 5.4254 | 5.3001 |
| | 5.2641 | 5.1765 | 5.0040 | 4.8301 | 4.5324 | 4.1043 | 3.5769 | 3.1039 | 2.2985 | 1.8991 | 1.4468 |
| | 1.2094 | 0.8385 | 0.6099 | 0.4744 | 0.3877 | 0.2877 | 0.1802 | 0.1433 | 0.1309 | 0.0730 | 0.0768 |
| | 0.1282 | | | | | | | | | | |
| 1983 | 1 | 1 | 0 | 0 | 1069 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0019 |
| | 0.0039 | 0.0049 | 0.0079 | 0.0489 | 0.1747 | 0.4093 | 0.9641 | 1.9860 | 3.0671 | 3.7988 | 4.5641 |
| | 5.0988 | 5.4378 | 5.5811 | 5.4899 | 5.2058 | 4.8753 | 4.4715 | 4.3545 | 4.5081 | 4.6308 | 4.5736 |
| | 4.3279 | 4.1003 | 3.7933 | 3.3540 | 3.0048 | 2.5516 | 2.1759 | 1.7089 | 1.3795 | 0.9958 | 0.7211 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.5140 | 0.4447 | 0.4355 | 0.3254 | 0.2806 | 0.1772 | 0.1214 | 0.0937 | 0.0720 | 0.0499 | 0.0400 |
| | 0.0738 | | | | | | | | | | |
| 1984 | 1 | 1 | 0 | 0 | 2035 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0105 | 0.0637 | 0.2676 | 0.8974 | 2.4412 |
| | 4.6053 | 7.0343 | 8.2610 | 8.8066 | 8.8926 | 8.7328 | 8.0202 | 6.4816 | 5.1629 | 4.8620 | 4.4832 |
| | 4.1105 | 3.7143 | 3.0779 | 2.4524 | 1.9414 | 1.4921 | 1.0246 | 0.7090 | 0.4861 | 0.3571 | 0.2395 |
| | 0.2084 | 0.1822 | 0.1480 | 0.1098 | 0.1142 | 0.0654 | 0.0783 | 0.0392 | 0.0748 | 0.0613 | 0.0518 |
| | 0.2390 | | | | | | | | | | |
| 1985 | 1 | 1 | 0 | 0 | 2061 | 0.0087 | 0.0274 | 0.0648 | 0.1319 | 0.2167 | 0.3147 |
| | 0.4723 | 0.5712 | 0.7749 | 0.8416 | 0.8311 | 0.7368 | 0.6614 | 0.4257 | 0.2871 | 0.2003 | 0.2466 |
| | 0.5571 | 1.2729 | 2.9829 | 5.8356 | 7.8579 | 8.7403 | 9.0648 | 8.9656 | 8.5779 | 7.5892 | 6.4114 |
| | 5.4273 | 4.5509 | 3.8589 | 2.9729 | 2.3139 | 1.7167 | 1.2206 | 0.8974 | 0.6230 | 0.3798 | 0.2779 |
| | 0.1994 | 0.1635 | 0.1281 | 0.0756 | 0.1044 | 0.0668 | 0.0528 | 0.0551 | 0.0356 | 0.0388 | 0.0281 |
| | 0.1439 | | | | | | | | | | |
| 1986 | 1 | 1 | 0 | 0 | 3878 | 0.0000 | 0.0016 | 0.0013 | 0.0000 | 0.0013 | 0.0028 |
| | 0.0096 | 0.0200 | 0.0693 | 0.1515 | 0.3138 | 0.5911 | 1.1404 | 2.1111 | 3.2822 | 3.7332 | 3.8731 |
| | 3.7860 | 3.3537 | 2.7946 | 3.0905 | 5.3259 | 7.2056 | 8.0638 | 8.2040 | 8.0180 | 7.5393 | 6.3690 |
| | 4.9986 | 3.8386 | 3.0525 | 2.3423 | 1.8172 | 1.3727 | 1.0227 | 0.6270 | 0.4857 | 0.3479 | 0.2423 |
| | 0.1877 | 0.1401 | 0.1158 | 0.0973 | 0.0599 | 0.0422 | 0.0187 | 0.0227 | 0.0287 | 0.0125 | 0.0215 |
| | 0.0526 | | | | | | | | | | |
| 1987 | 1 | 1 | 0 | 0 | 3406 | 0.0007 | 0.0003 | 0.0003 | 0.0034 | 0.0017 | 0.0011 |
| | 0.0010 | 0.0046 | 0.0057 | 0.0063 | 0.0188 | 0.0204 | 0.0694 | 0.2387 | 0.6284 | 1.1515 | 2.2635 |
| | 4.1013 | 5.6298 | 6.4771 | 6.8780 | 6.9840 | 7.1824 | 7.5291 | 7.5888 | 7.4579 | 7.1477 | 6.4886 |
| | 5.4910 | 4.4749 | 3.4480 | 2.5218 | 1.8452 | 1.3414 | 0.9380 | 0.5999 | 0.3987 | 0.3065 | 0.1802 |
| | 0.1242 | 0.0990 | 0.0605 | 0.0629 | 0.0346 | 0.0404 | 0.0319 | 0.0267 | 0.0229 | 0.0186 | 0.0088 |
| | 0.0434 | | | | | | | | | | |
| 1988 | 1 | 1 | 0 | 0 | 3035 | 0.0007 | 0.0000 | 0.0000 | 0.0000 | 0.0017 | 0.0093 |
| | 0.0120 | 0.0258 | 0.0340 | 0.0449 | 0.0486 | 0.0299 | 0.0550 | 0.0644 | 0.1627 | 0.3887 | 0.8553 |
| | 1.5375 | 3.2362 | 5.6799 | 7.6535 | 8.5678 | 8.8030 | 8.8150 | 8.6617 | 8.3324 | 8.0693 | 7.2917 |
| | 6.1416 | 4.5565 | 3.2785 | 2.2118 | 1.6226 | 1.0448 | 0.8112 | 0.4643 | 0.3538 | 0.2647 | 0.2094 |
| | 0.1601 | 0.0876 | 0.0695 | 0.0400 | 0.0650 | 0.0289 | 0.0369 | 0.0335 | 0.0233 | 0.0179 | 0.0229 |
| | 0.0740 | | | | | | | | | | |
| 1989 | 1 | 1 | 0 | 0 | 2581 | 0.0005 | 0.0067 | 0.0011 | 0.0040 | 0.0045 | 0.0000 |
| | 0.0043 | 0.0110 | 0.0275 | 0.1121 | 0.3024 | 0.6741 | 1.0166 | 1.2433 | 1.2873 | 1.1719 | 1.1842 |
| | 1.3513 | 1.8609 | 3.2026 | 5.4862 | 7.6096 | 8.4166 | 8.5480 | 8.5158 | 8.3558 | 8.1199 | 7.4837 |
| | 6.5009 | 5.1206 | 3.5657 | 2.4235 | 1.8394 | 1.2021 | 0.9268 | 0.6719 | 0.4551 | 0.2600 | 0.2193 |
| | 0.2046 | 0.1429 | 0.0997 | 0.0843 | 0.0574 | 0.0486 | 0.0286 | 0.0164 | 0.0259 | 0.0302 | 0.0163 |
| | 0.0577 | | | | | | | | | | |
| 1990 | 1 | 1 | 0 | 0 | 2039 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0011 | 0.0165 | 0.0335 | 0.0560 | 0.1147 | 0.2150 | 0.3131 | 0.6847 | 1.0370 | 1.6040 |
| | 2.5415 | 3.9025 | 5.3464 | 6.1623 | 6.6671 | 7.1218 | 7.7462 | 7.9435 | 8.0196 | 7.9224 | 7.6186 |
| | 6.9470 | 5.6783 | 3.7969 | 2.7834 | 1.6893 | 1.1798 | 0.7962 | 0.5256 | 0.3690 | 0.2677 | 0.2133 |
| | 0.1416 | 0.0824 | 0.0778 | 0.0709 | 0.0621 | 0.0564 | 0.0224 | 0.0350 | 0.0320 | 0.0178 | 0.0174 |
| | 0.0702 | | | | | | | | | | |
| 1991 | 1 | 1 | 0 | 0 | 817 | 0.0253 | 0.0066 | 0.0046 | 0.0095 | 0.0000 | 0.0000 |
| | 0.0037 | 0.0188 | 0.0188 | 0.0064 | 0.0447 | 0.1253 | 0.2715 | 0.4231 | 0.8148 | 1.2033 | 2.0136 |
| | 2.9728 | 3.5959 | 4.2063 | 4.7795 | 5.9500 | 6.1653 | 6.8269 | 8.1632 | 8.4062 | 8.7522 | 7.8287 |
| | 6.3656 | 4.8131 | 3.4933 | 2.4196 | 1.6501 | 1.3979 | 1.2589 | 1.1846 | 1.1067 | 0.9981 | 0.8329 |
| | 0.6915 | 0.3356 | 0.2210 | 0.1430 | 0.1272 | 0.0789 | 0.0680 | 0.0615 | 0.0107 | 0.0326 | 0.0170 |
| | 0.0554 | | | | | | | | | | |
| 1992 | 1 | 1 | 0 | 0 | 836 | 0.0281 | 0.0667 | 0.0757 | 0.0833 | 0.0847 | 0.0681 |
| | 0.0818 | 0.0962 | 0.1170 | 0.1903 | 0.2537 | 0.4457 | 0.6030 | 0.7764 | 1.1068 | 1.3336 | 1.8384 |
| | 2.0298 | 1.6095 | 1.8875 | 3.7787 | 5.8426 | 7.3393 | 8.9692 | 10.0915 | 10.2542 | 9.9512 | 9.4832 |
| | 7.3533 | 5.4802 | 3.2085 | 1.8284 | 1.2047 | 0.7084 | 0.4253 | 0.3018 | 0.2260 | 0.1613 | 0.1262 |
| | 0.0848 | 0.0840 | 0.0563 | 0.0546 | 0.0267 | 0.0317 | 0.0166 | 0.0102 | 0.0082 | 0.0162 | 0.0065 |
| | 0.0938 | | | | | | | | | | |
| 1993 | 1 | 1 | 0 | 0 | 442 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0070 | 0.0000 | 0.0000 | 0.0082 | 0.1118 | 0.0949 | 0.4661 | 1.0299 | 1.9220 | 3.7253 |
| | 4.5722 | 6.2424 | 6.2361 | 5.8973 | 5.3501 | 5.8937 | 7.2187 | 8.3169 | 8.6226 | 8.8043 | 7.5067 |
| | 7.1225 | 4.6537 | 2.7273 | 1.3580 | 0.5706 | 0.4606 | 0.3049 | 0.2458 | 0.1720 | 0.1125 | 0.0270 |
| | 0.0518 | 0.0266 | 0.0349 | 0.0235 | 0.0061 | 0.0025 | 0.0025 | 0.0047 | 0.0000 | 0.0576 | 0.0000 |
| | 0.0085 | | | | | | | | | | |
| 1994 | 1 | 1 | 0 | 0 | 649 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0015 | 0.0141 | 0.0015 | 0.0170 | 0.0052 | 0.0191 | 0.0819 | 0.1821 | 0.6538 |
| | 1.5734 | 3.1216 | 4.4610 | 5.8132 | 6.9431 | 7.4792 | 8.1627 | 8.4792 | 9.3948 | 9.4855 | 8.9230 |
| | 7.8291 | 5.9172 | 4.1409 | 2.6141 | 1.4632 | 1.0154 | 0.6571 | 0.4624 | 0.2675 | 0.1930 | 0.1728 |
| | 0.1298 | 0.1028 | 0.0608 | 0.0196 | 0.0257 | 0.0226 | 0.0176 | 0.0132 | 0.0044 | 0.0019 | 0.0104 |
| | 0.0457 | | | | | | | | | | |
| 1995 | 1 | 1 | 0 | 0 | 470 | 0.1038 | 0.0228 | 0.0198 | 0.0284 | 0.0357 | 0.0357 |
| | 0.0357 | 0.0198 | 0.0000 | 0.0000 | 0.0091 | 0.0078 | 0.0571 | 0.0912 | 0.1238 | 0.1013 | 0.2443 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2585 | 0.5044 | 1.1955 | 2.3724 | 4.4641 | 6.6707 | 9.0914 | 10.4171 | 10.4798 | 10.8746 | 9.6864 |
| | 8.4629 | 6.6830 | 5.2642 | 3.6818 | 2.8972 | 1.8339 | 1.2249 | 0.8681 | 0.5701 | 0.5399 | 0.2679 |
| | 0.2461 | 0.1648 | 0.1209 | 0.0787 | 0.0556 | 0.0218 | 0.0338 | 0.0073 | 0.0208 | 0.0036 | 0.0000 |
| | 0.0018 | | | | | | | | | | |
| 1996 | 1 | 1 | 0 | 0 | 557 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0151 | 0.0148 | 0.0575 | 0.0624 | 0.3453 | 0.9726 | 1.5831 | 3.0203 | 3.8219 | 4.7231 | 4.1074 |
| | 3.4972 | 3.3323 | 3.8879 | 4.0162 | 4.3223 | 4.5049 | 5.8851 | 7.4956 | 8.5752 | 8.2382 | 7.4850 |
| | 6.1778 | 4.4124 | 3.4555 | 2.1185 | 1.4007 | 0.7752 | 0.5304 | 0.3100 | 0.2074 | 0.2374 | 0.1246 |
| | 0.0495 | 0.0525 | 0.0369 | 0.0385 | 0.0192 | 0.0183 | 0.0234 | 0.0000 | 0.0000 | 0.0104 | 0.0000 |
| | 0.0381 | | | | | | | | | | |
| 1997 | 1 | 1 | 0 | 0 | 681 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0054 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0004 | 0.0129 | 0.0242 | 0.0621 | 0.1670 | 0.5697 | 1.1618 |
| | 2.5034 | 4.2684 | 6.5930 | 9.1337 | 10.3301 | 10.9611 | 10.6951 | 9.1385 | 8.2452 | 6.7816 | 5.6553 |
| | 4.4197 | 3.4122 | 2.0201 | 1.2148 | 0.7188 | 0.4538 | 0.3833 | 0.2249 | 0.2018 | 0.0783 | 0.1077 |
| | 0.0375 | 0.0815 | 0.0931 | 0.1300 | 0.0086 | 0.0097 | 0.0081 | 0.0552 | 0.0051 | 0.0000 | 0.0129 |
| | 0.0138 | | | | | | | | | | |
| 1998 | 1 | 1 | 0 | 0 | 803 | 0.0000 | 0.0019 | 0.0000 | 0.0356 | 0.0312 | 0.0000 |
| | 0.0000 | 0.0018 | 0.0050 | 0.0307 | 0.1578 | 0.5719 | 1.1926 | 1.8658 | 1.8962 | 2.1940 | 3.1873 |
| | 4.9169 | 5.9828 | 6.3878 | 6.7259 | 7.5506 | 8.9308 | 9.1918 | 8.9787 | 7.9720 | 6.5252 | 5.1066 |
| | 3.8389 | 2.3801 | 1.5499 | 0.8679 | 0.5270 | 0.3689 | 0.2026 | 0.1499 | 0.1612 | 0.1050 | 0.0570 |
| | 0.0861 | 0.0879 | 0.0039 | 0.0120 | 0.0034 | 0.0132 | 0.0171 | 0.0161 | 0.0014 | 0.0454 | 0.0000 |
| | 0.0642 | | | | | | | | | | |
| 1999 | 1 | 1 | 0 | 0 | 2268 | 0.0028 | 0.0000 | 0.0000 | 0.0030 | 0.0088 | 0.0298 |
| | 0.0088 | 0.0562 | 0.1532 | 0.3180 | 0.7684 | 1.1024 | 1.6890 | 2.4598 | 3.4549 | 4.0658 | 5.0615 |
| | 5.8249 | 6.6752 | 6.3233 | 6.6134 | 6.1512 | 6.1289 | 6.7057 | 6.9914 | 7.0649 | 6.3137 | 4.8892 |
| | 3.6905 | 2.3132 | 1.5526 | 1.0083 | 0.7842 | 0.4498 | 0.3077 | 0.1635 | 0.1629 | 0.1472 | 0.0544 |
| | 0.1511 | 0.0529 | 0.0800 | 0.0497 | 0.0106 | 0.0125 | 0.0187 | 0.0165 | 0.0089 | 0.0198 | 0.0152 |
| | 0.0657 | | | | | | | | | | |
| 2000 | 1 | 1 | 0 | 0 | 2199 | 0.0008 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0049 |
| | 0.0230 | 0.0779 | 0.1520 | 0.3576 | 0.3585 | 0.3253 | 0.2198 | 0.2314 | 0.2139 | 0.3953 | 0.6127 |
| | 1.1692 | 1.9467 | 2.6461 | 4.1004 | 4.7630 | 5.8897 | 6.8340 | 8.3000 | 9.5471 | 9.8429 | 9.2381 |
| | 8.5885 | 6.6670 | 5.2995 | 3.7409 | 2.5171 | 1.7399 | 1.2479 | 0.7236 | 0.4943 | 0.5228 | 0.3619 |
| | 0.2084 | 0.1557 | 0.1254 | 0.0844 | 0.0832 | 0.0432 | 0.0291 | 0.0261 | 0.0251 | 0.0104 | 0.0289 |
| | 0.0260 | | | | | | | | | | |
| 2001 | 1 | 1 | 0 | 0 | 2239 | 0.0040 | 0.0047 | 0.0000 | 0.0142 | 0.0049 | 0.0144 |
| | 0.0049 | 0.0450 | 0.0368 | 0.1065 | 0.2524 | 0.5181 | 0.7379 | 1.0920 | 1.5401 | 2.4071 | 3.1572 |
| | 3.3718 | 3.3389 | 3.6980 | 4.1295 | 4.9045 | 5.9444 | 6.3796 | 6.9969 | 7.3855 | 8.0234 | 8.2212 |
| | 7.5621 | 5.8676 | 4.3308 | 3.3034 | 2.0719 | 1.5149 | 0.9362 | 0.6821 | 0.4124 | 0.2491 | 0.1603 |
| | 0.1745 | 0.1023 | 0.0504 | 0.0731 | 0.0517 | 0.0206 | 0.0268 | 0.0330 | 0.0073 | 0.0166 | 0.0030 |
| | 0.0161 | | | | | | | | | | |
| 2002 | 1 | 1 | 0 | 0 | 1821 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0153 |
| | 0.0000 | 0.0005 | 0.0005 | 0.0009 | 0.0349 | 0.0455 | 0.0237 | 0.0205 | 0.1192 | 0.3983 | 0.9800 |
| | 2.6734 | 5.4078 | 8.8163 | 10.7909 | 12.1021 | 11.2284 | 9.1867 | 6.7869 | 5.1606 | 4.4545 | 3.5139 |
| | 3.1230 | 2.9931 | 2.6154 | 2.2683 | 1.8634 | 1.5485 | 1.1389 | 0.7967 | 0.4894 | 0.3872 | 0.2213 |
| | 0.1985 | 0.1627 | 0.1216 | 0.0636 | 0.0584 | 0.0544 | 0.0301 | 0.0271 | 0.0061 | 0.0231 | 0.0117 |
| | 0.0366 | | | | | | | | | | |
| 2003 | 1 | 1 | 0 | 0 | 1915 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0300 | 0.0000 | 0.0000 | 0.0387 | 0.0022 | 0.0769 | 0.0808 | 0.1733 | 0.9888 |
| | 2.3873 | 4.6812 | 8.0242 | 11.1703 | 11.9985 | 12.9450 | 12.6406 | 10.5481 | 8.0278 | 5.3379 | 3.5339 |
| | 2.3350 | 1.6809 | 1.1599 | 0.7129 | 0.4354 | 0.2866 | 0.2158 | 0.1281 | 0.1050 | 0.0474 | 0.0597 |
| | 0.0310 | 0.0171 | 0.0142 | 0.0162 | 0.0138 | 0.0066 | 0.0076 | 0.0093 | 0.0099 | 0.0000 | 0.0080 |
| | 0.0143 | | | | | | | | | | |
| 2004 | 1 | 1 | 0 | 0 | 2797 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0007 | 0.0016 | 0.0038 | 0.0089 | 0.0000 | 0.0000 | 0.0081 | 0.0131 | 0.0296 |
| | 0.1831 | 0.6135 | 1.4590 | 3.7500 | 7.0232 | 11.1220 | 14.3372 | 15.4579 | 14.7871 | 10.8375 | 7.4020 |
| | 4.8577 | 2.7464 | 1.7989 | 1.2653 | 0.6564 | 0.3878 | 0.2692 | 0.2233 | 0.2484 | 0.0934 | 0.0338 |
| | 0.0283 | 0.0757 | 0.0703 | 0.0158 | 0.0102 | 0.0581 | 0.0045 | 0.0151 | 0.0173 | 0.0045 | 0.0044 |
| | 0.0767 | | | | | | | | | | |
| 2005 | 1 | 1 | 0 | 0 | 3064 | 0.0039 | 0.0031 | 0.0026 | 0.0020 | 0.0000 | 0.0023 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0030 | 0.0024 | 0.0063 | 0.0239 | 0.0509 | 0.0915 | 0.1204 | 0.1841 |
| | 0.4387 | 0.5751 | 0.6107 | 1.1091 | 2.4939 | 6.2652 | 12.8750 | 18.8037 | 19.4426 | 15.5383 | 9.6723 |
| | 5.1798 | 2.7770 | 1.4521 | 0.8477 | 0.4493 | 0.3130 | 0.1687 | 0.1364 | 0.0896 | 0.0711 | 0.0473 |
| | 0.0281 | 0.0267 | 0.0180 | 0.0129 | 0.0096 | 0.0076 | 0.0067 | 0.0072 | 0.0038 | 0.0045 | 0.0044 |
| | 0.0175 | | | | | | | | | | |
| 2006 | 1 | 1 | 0 | 0 | 2824 | 0.0080 | 0.0112 | 0.0136 | 0.0303 | 0.0380 | 0.0436 |
| | 0.0995 | 0.0849 | 0.1161 | 0.1820 | 0.3199 | 0.3412 | 0.4424 | 0.6127 | 0.5952 | 0.4830 | 0.5777 |
| | 0.8092 | 1.1048 | 1.9977 | 3.4644 | 4.1244 | 5.3737 | 8.2206 | 12.9583 | 15.6928 | 15.2216 | 11.1138 |
| | 7.0618 | 4.1189 | 1.9392 | 1.1155 | 0.5196 | 0.2754 | 0.1379 | 0.1278 | 0.0776 | 0.1017 | 0.0682 |
| | 0.0344 | 0.0414 | 0.0425 | 0.0251 | 0.0278 | 0.0354 | 0.0148 | 0.0260 | 0.0123 | 0.0161 | 0.0074 |
| | 0.0926 | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 | 1 | 2 | 0 | 0 | 38 | 0.0000 | 0.0000 | 0.0000 | 0.0015 | 0.0042 | 0.0013 |
| | 0.0000 | 0.0012 | 0.0000 | 0.0026 | 0.0047 | 0.0016 | 0.0109 | 0.0287 | 0.0347 | 0.1011 | 0.1622 |
| | 0.2725 | 0.4999 | 0.8217 | 1.6591 | 3.0254 | 5.2973 | 7.5743 | 9.8487 | 11.8018 | 11.9507 | 10.6459 |
| | 8.8695 | 6.9198 | 5.2416 | 4.0676 | 3.0620 | 2.1469 | 1.6566 | 1.2806 | 0.8882 | 0.6213 | 0.4338 |
| | 0.3289 | 0.2480 | 0.1422 | 0.0926 | 0.0926 | 0.0635 | 0.0281 | 0.0175 | 0.0131 | 0.0143 | 0.0048 |
| | 0.0143 | | | | | | | | | | |
| 1989 | 1 | 2 | 0 | 0 | 43 | 0.0040 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0008 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0079 | 0.0039 | 0.0013 | 0.0116 |
| | 0.0234 | 0.0729 | 0.1029 | 0.3302 | 1.1841 | 3.6208 | 7.3076 | 11.0626 | 13.9101 | 14.3775 | 12.2475 |
| | 10.0729 | 7.4976 | 5.3460 | 3.8031 | 2.5146 | 1.9580 | 1.3638 | 0.8697 | 0.6090 | 0.4848 | 0.2969 |
| | 0.2583 | 0.2076 | 0.1215 | 0.0985 | 0.0644 | 0.0415 | 0.0313 | 0.0347 | 0.0133 | 0.0026 | 0.0093 |
| | 0.0314 | | | | | | | | | | |
| 1990 | 1 | 2 | 0 | 0 | 33 | 0.0025 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0146 | 0.0089 | 0.0665 |
| | 0.0878 | 0.1169 | 0.2445 | 0.6916 | 0.8924 | 1.9520 | 4.6396 | 8.2469 | 13.1450 | 15.1195 | 14.6946 |
| | 12.1628 | 8.7682 | 6.0184 | 3.8082 | 2.6119 | 1.7409 | 1.1643 | 0.8935 | 0.7293 | 0.4191 | 0.3702 |
| | 0.2793 | 0.2472 | 0.1841 | 0.1927 | 0.1571 | 0.0847 | 0.0648 | 0.0653 | 0.0228 | 0.0194 | 0.0370 |
| | 0.0351 | | | | | | | | | | |
| 1991 | 1 | 2 | 0 | 0 | 56 | 0.0020 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0031 | 0.0100 | 0.0000 | 0.0033 | 0.0073 | 0.0033 | 0.0288 |
| | 0.0615 | 0.1335 | 0.1961 | 0.2554 | 0.5079 | 0.7854 | 1.3650 | 3.2862 | 6.6629 | 11.0345 | 14.2636 |
| | 15.4089 | 13.1927 | 9.9821 | 7.0393 | 4.8797 | 3.3430 | 2.1798 | 1.4970 | 1.0171 | 0.7579 | 0.5609 |
| | 0.3871 | 0.3152 | 0.2666 | 0.1598 | 0.1119 | 0.0769 | 0.0668 | 0.0524 | 0.0185 | 0.0272 | 0.0168 |
| | 0.0327 | | | | | | | | | | |
| 1992 | 1 | 2 | 0 | 0 | 60 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0015 | 0.0000 | 0.0000 | 0.0000 | 0.0017 | 0.0017 |
| | 0.0070 | 0.0113 | 0.0170 | 0.1428 | 0.4641 | 1.4115 | 3.5680 | 7.2311 | 11.7795 | 16.0994 | 16.7776 |
| | 14.5902 | 10.6207 | 6.6180 | 3.9245 | 2.3324 | 1.3938 | 0.8834 | 0.5575 | 0.3640 | 0.2610 | 0.2263 |
| | 0.1462 | 0.1277 | 0.1166 | 0.0871 | 0.0495 | 0.0532 | 0.0353 | 0.0125 | 0.0261 | 0.0057 | 0.0117 |
| | 0.0424 | | | | | | | | | | |
| 1993 | 1 | 2 | 0 | 0 | 60 | 0.0102 | 0.0000 | 0.0000 | 0.0017 | 0.0000 | 0.0014 |
| | 0.0000 | 0.0014 | 0.0103 | 0.0061 | 0.0079 | 0.0053 | 0.0019 | 0.0014 | 0.0039 | 0.0054 | 0.0045 |
| | 0.0070 | 0.0187 | 0.0581 | 0.2378 | 0.6761 | 1.7934 | 4.2474 | 9.5096 | 15.5218 | 19.1337 | 17.8105 |
| | 12.9661 | 7.8210 | 4.2887 | 2.2775 | 1.3447 | 0.7572 | 0.4675 | 0.3220 | 0.2047 | 0.1464 | 0.1057 |
| | 0.0596 | 0.0460 | 0.0213 | 0.0202 | 0.0200 | 0.0028 | 0.0151 | 0.0076 | 0.0100 | 0.0072 | 0.0031 |
| | 0.0103 | | | | | | | | | | |
| 1994 | 1 | 2 | 0 | 0 | 76 | 0.0391 | 0.0037 | 0.0033 | 0.0034 | 0.0025 | 0.0051 |
| | 0.0019 | 0.0009 | 0.0027 | 0.0026 | 0.0015 | 0.0000 | 0.0017 | 0.0023 | 0.0013 | 0.0090 | 0.0121 |
| | 0.0202 | 0.0211 | 0.0403 | 0.1377 | 0.3263 | 0.7286 | 1.8425 | 4.1592 | 8.2000 | 13.3817 | 16.8869 |
| | 16.0807 | 12.8616 | 9.0190 | 5.6153 | 3.4957 | 2.2325 | 1.5106 | 0.9776 | 0.6701 | 0.4595 | 0.3314 |
| | 0.2424 | 0.1778 | 0.1279 | 0.0899 | 0.0687 | 0.0405 | 0.0392 | 0.0236 | 0.0318 | 0.0200 | 0.0084 |
| | 0.0378 | | | | | | | | | | |
| 1995 | 1 | 2 | 0 | 0 | 43 | 0.5433 | 0.5663 | 1.5444 | 2.8853 | 2.8406 | 3.0367 |
| | 2.0194 | 1.2639 | 0.6258 | 0.1966 | 0.0873 | 0.0440 | 0.0292 | 0.0483 | 0.0254 | 0.0278 | 0.0167 |
| | 0.0000 | 0.0000 | 0.0034 | 0.0068 | 0.0722 | 0.2495 | 0.9728 | 2.6665 | 5.3574 | 9.1578 | 12.8613 |
| | 14.7039 | 12.3917 | 9.3775 | 5.8628 | 3.5750 | 2.4331 | 1.2689 | 0.9287 | 0.6043 | 0.4867 | 0.3577 |
| | 0.3214 | 0.1383 | 0.1170 | 0.0715 | 0.0482 | 0.0518 | 0.0412 | 0.0355 | 0.0100 | 0.0000 | 0.0113 |
| | 0.0151 | | | | | | | | | | |
| 1996 | 1 | 2 | 0 | 0 | 54 | 0.0024 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0069 | 0.0168 | 0.0622 | 0.1235 | 0.2794 | 0.4614 | 0.8566 | 1.3516 |
| | 1.9391 | 2.2300 | 2.0055 | 1.5635 | 1.2560 | 1.4221 | 2.7105 | 5.4517 | 10.2072 | 14.0882 | 15.4694 |
| | 13.5617 | 9.5714 | 6.3589 | 3.5570 | 2.0126 | 1.1256 | 0.7121 | 0.4531 | 0.2665 | 0.2264 | 0.1552 |
| | 0.0981 | 0.0831 | 0.0799 | 0.0618 | 0.0397 | 0.0297 | 0.0245 | 0.0246 | 0.0090 | 0.0115 | 0.0090 |
| | 0.0244 | | | | | | | | | | |
| 1997 | 1 | 2 | 0 | 0 | 102 | 0.0000 | 0.0000 | 0.0045 | 0.0045 | 0.0175 | 0.0095 |
| | 0.0180 | 0.0283 | 0.0240 | 0.0361 | 0.0300 | 0.0346 | 0.0303 | 0.0320 | 0.0191 | 0.0136 | 0.0307 |
| | 0.1000 | 0.2532 | 0.9009 | 2.1714 | 3.9752 | 6.0868 | 7.3180 | 8.2774 | 8.8846 | 10.3676 | 10.7128 |
| | 10.2442 | 8.6087 | 6.4056 | 4.5583 | 3.0897 | 2.2322 | 1.5336 | 1.0943 | 0.7586 | 0.6056 | 0.3728 |
| | 0.2314 | 0.2456 | 0.1737 | 0.1118 | 0.0810 | 0.0760 | 0.0483 | 0.0550 | 0.0183 | 0.0299 | 0.0052 |
| | 0.0394 | | | | | | | | | | |
| 1998 | 1 | 2 | 0 | 0 | 94 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0291 | 0.0055 | 0.0152 | 0.0201 | 0.0309 | 0.0786 | 0.2148 |
| | 0.4806 | 0.9896 | 1.9114 | 3.1067 | 4.6458 | 7.7507 | 10.9445 | 13.0675 | 13.7215 | 12.3742 | 9.4706 |
| | 6.3908 | 4.2349 | 2.5262 | 1.4915 | 0.9287 | 0.5946 | 0.3971 | 0.2716 | 0.2143 | 0.1214 | 0.1003 |
| | 0.0878 | 0.0475 | 0.0406 | 0.0232 | 0.0258 | 0.0235 | 0.0122 | 0.0057 | 0.0036 | 0.0029 | 0.0049 |
| | 0.0093 | | | | | | | | | | |
| 1999 | 1 | 2 | 0 | 0 | 136 | 0.0000 | 0.0140 | 0.0037 | 0.0090 | 0.0010 | 0.0034 |
| | 0.0066 | 0.0057 | 0.0316 | 0.0521 | 0.1189 | 0.3614 | 0.7028 | 1.1060 | 1.7214 | 1.9452 | 2.0639 |
| | 2.0924 | 2.2368 | 2.8403 | 3.0093 | 3.6328 | 4.6785 | 6.2507 | 8.1427 | 10.3291 | 10.9685 | 10.3095 |
| | 8.5619 | 6.2326 | 3.9248 | 2.8442 | 1.7230 | 1.1824 | 0.7861 | 0.5753 | 0.4115 | 0.2814 | 0.1936 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.1657 | 0.0846 | 0.1275 | 0.0871 | 0.0396 | 0.0642 | 0.0204 | 0.0157 | 0.0201 | 0.0028 | 0.0078 |
| | 0.0104 | | | | | | | | | | |
| 2000 | 1 | 2 | 0 | 0 | 16 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0002 | 0.0115 | 0.0269 | 0.0783 | 0.2229 | 0.5715 | 0.8796 |
| | 1.3716 | 1.4679 | 1.9613 | 2.4665 | 3.4212 | 4.4835 | 5.4263 | 6.1167 | 6.3849 | 7.2244 | 8.1919 |
| | 8.6751 | 8.1729 | 7.9389 | 6.0299 | 4.6940 | 3.5788 | 2.7613 | 1.9144 | 1.6095 | 1.1091 | 0.8607 |
| | 0.6031 | 0.4619 | 0.4388 | 0.2513 | 0.2007 | 0.1381 | 0.0794 | 0.0489 | 0.0472 | 0.0230 | 0.0196 |
| | 0.0364 | | | | | | | | | | |
| 2001 | 1 | 2 | 0 | 0 | 72 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0095 | 0.0067 | 0.0587 | 0.2057 | 0.2672 | 0.2541 | 0.2360 | 0.2768 | 0.1680 | 0.1071 |
| | 0.0729 | 0.0268 | 0.0359 | 0.0413 | 0.0228 | 0.1328 | 0.3029 | 0.7079 | 1.4757 | 3.0338 | 5.7325 |
| | 8.9079 | 11.2086 | 12.8480 | 11.8996 | 10.4744 | 8.4391 | 6.5580 | 4.7269 | 3.5529 | 2.5374 | 1.8422 |
| | 1.1844 | 0.7793 | 0.5817 | 0.3953 | 0.2782 | 0.2220 | 0.1321 | 0.1047 | 0.0273 | 0.0319 | 0.0287 |
| | 0.0642 | | | | | | | | | | |
| 2002 | 1 | 2 | 0 | 0 | 103 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0116 | 0.0168 | 0.0046 | 0.0046 | 0.0049 |
| | 0.0295 | 0.0076 | 0.0620 | 0.0081 | 0.0366 | 0.1599 | 0.2942 | 0.4882 | 1.1396 | 1.3920 | 2.5956 |
| | 4.8810 | 7.4663 | 10.1087 | 12.5335 | 12.7077 | 11.0521 | 8.9671 | 6.8943 | 5.5104 | 4.3519 | 2.7694 |
| | 1.8741 | 1.5376 | 1.1212 | 0.6999 | 0.4071 | 0.2684 | 0.1780 | 0.1428 | 0.0868 | 0.0675 | 0.0483 |
| | 0.0700 | | | | | | | | | | |
| 2003 | 1 | 2 | 0 | 0 | 118 | 0.0000 | 0.0078 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0091 | 0.0000 | 0.0376 | 0.0168 | 0.0530 | 0.0391 | 0.0327 |
| | 0.0427 | 0.0346 | 0.0000 | 0.2505 | 1.1718 | 2.9946 | 5.7363 | 9.9890 | 11.3838 | 12.8838 | 11.9749 |
| | 10.6071 | 9.6759 | 6.2904 | 4.3829 | 3.3957 | 2.1501 | 1.5351 | 1.2581 | 1.0889 | 0.6767 | 0.5597 |
| | 0.3709 | 0.3422 | 0.3288 | 0.1696 | 0.2269 | 0.0750 | 0.0465 | 0.0194 | 0.0403 | 0.0334 | 0.0069 |
| | 0.0614 | | | | | | | | | | |
| 2004 | 1 | 2 | 0 | 0 | 101 | 0.0021 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0022 | 0.0021 | 0.0056 | 0.0015 | 0.0062 | 0.0079 | 0.0102 | 0.0059 | 0.0287 |
| | 0.0284 | 0.0883 | 0.2258 | 0.6649 | 1.9245 | 4.8011 | 9.4218 | 13.3395 | 15.5264 | 14.0944 | 11.8361 |
| | 9.0958 | 6.2083 | 4.1077 | 2.6686 | 1.7630 | 1.1389 | 0.7698 | 0.6081 | 0.4042 | 0.3224 | 0.2523 |
| | 0.1392 | 0.1278 | 0.0905 | 0.0712 | 0.0548 | 0.0269 | 0.0236 | 0.0117 | 0.0218 | 0.0183 | 0.0096 |
| | 0.0419 | | | | | | | | | | |
| 2005 | 1 | 2 | 0 | 0 | 130 | 0.0000 | 0.0000 | 0.0000 | 0.0010 | 0.0000 | 0.0030 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0043 | 0.0021 | 0.0072 |
| | 0.0201 | 0.0402 | 0.0701 | 0.2991 | 0.5674 | 2.2474 | 5.5402 | 9.6405 | 13.5221 | 15.5204 | 14.7159 |
| | 11.1222 | 8.5734 | 6.1017 | 3.7296 | 2.3164 | 1.4919 | 1.1319 | 0.7689 | 0.6852 | 0.5564 | 0.3588 |
| | 0.2161 | 0.1146 | 0.2099 | 0.0687 | 0.0986 | 0.0455 | 0.0433 | 0.0322 | 0.0013 | 0.0181 | 0.0074 |
| | 0.1072 | | | | | | | | | | |
| 2006 | 1 | 2 | 0 | 0 | 136 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0430 | 0.0006 | 0.0000 | 0.0204 | 0.0011 | 0.0000 | 0.0273 | 0.0364 | 0.0360 | 0.0025 | 0.0017 |
| | 0.0435 | 0.0119 | 0.1024 | 0.1601 | 0.5107 | 1.2618 | 2.7040 | 5.0533 | 8.4006 | 11.8521 | 14.1337 |
| | 13.0027 | 11.9276 | 8.6126 | 6.3217 | 4.1324 | 2.7241 | 2.1604 | 1.5860 | 1.0035 | 0.9456 | 0.6311 |
| | 0.7092 | 0.4058 | 0.2925 | 0.2235 | 0.1914 | 0.1281 | 0.1315 | 0.1141 | 0.0468 | 0.0870 | 0.0301 |
| | 0.1892 | | | | | | | | | | |
| 1977 | 1 | 3 | 0 | 0 | 85 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0762 | 0.1870 | 0.4156 | 0.4018 | 0.6304 | 0.6719 | 0.8313 |
| | 1.2122 | 1.3716 | 1.3716 | 1.5932 | 2.1543 | 2.7847 | 3.6021 | 4.1009 | 4.3918 | 5.1676 | 6.9825 |
| | 8.2433 | 9.4417 | 8.9983 | 7.4397 | 6.5738 | 5.2092 | 3.8930 | 2.7847 | 2.2582 | 1.7872 | 1.1153 |
| | 0.8728 | 0.7551 | 0.5819 | 0.5611 | 0.3671 | 0.3117 | 0.1940 | 0.2078 | 0.1316 | 0.0485 | 0.0554 |
| | 0.0554 | | | | | | | | | | |
| 1980 | 1 | 3 | 0 | 0 | 49 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0241 | 0.0000 | 0.0241 | 0.0723 | 0.3135 | 0.6872 | 1.7483 |
| | 3.7618 | 5.6909 | 6.1249 | 5.2689 | 3.8582 | 1.5192 | 0.8922 | 0.5426 | 0.7596 | 1.9050 | 3.2433 |
| | 5.8235 | 8.3193 | 9.2838 | 8.5483 | 8.1022 | 6.2937 | 4.7263 | 3.0625 | 2.0979 | 1.5915 | 1.0851 |
| | 0.6872 | 0.6028 | 0.4943 | 0.2773 | 0.1688 | 0.2411 | 0.1206 | 0.1326 | 0.1206 | 0.1085 | 0.0603 |
| | 0.0603 | | | | | | | | | | |
| 1983 | 1 | 3 | 0 | 0 | 35 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0232 | 0.0116 | 0.0348 | 0.4295 | 1.6369 | 4.1560 | 7.8941 |
| | 10.5410 | 11.4465 | 9.2408 | 7.7084 | 5.4678 | 3.6568 | 2.4611 | 2.1477 | 2.4611 | 3.3666 | 4.0051 |
| | 4.2141 | 3.8542 | 3.5407 | 2.8326 | 2.2638 | 1.8923 | 1.4511 | 0.8591 | 0.7198 | 0.4644 | 0.2786 |
| | 0.3367 | 0.1741 | 0.1393 | 0.0929 | 0.0580 | 0.0116 | 0.0116 | 0.0580 | 0.0116 | 0.0116 | 0.0232 |
| | 0.0000 | | | | | | | | | | |
| 1989 | 1 | 3 | 0 | 0 | 22 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0534 | 0.0356 | 0.0000 | 0.0356 | 0.1956 | 0.5513 | 1.9029 |
| | 2.2230 | 2.1697 | 1.3694 | 1.5472 | 2.6143 | 7.9673 | 13.8182 | 16.6993 | 16.3258 | 11.4885 | 7.7361 |
| | 4.6239 | 2.4898 | 1.6895 | 0.9248 | 0.5513 | 0.3557 | 0.2668 | 0.1601 | 0.1067 | 0.0178 | 0.1423 |
| | 0.0000 | 0.0178 | 0.0000 | 0.0000 | 0.0178 | 0.0178 | 0.0356 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0178 | | | | | | | | | | |
| 1992 | 1 | 3 | 0 | 0 | 43 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.9966 | 1.0747 | 1.1451 | 2.0523 | 2.2678 | 1.3747 | 0.7046 |

```
        0.4705  0.1384  0.2064  0.5554  1.7227  3.9070  6.9265  10.1668 13.5941 14.4537 11.2977
        7.4794  4.4176  2.5313  1.2286  0.5984  0.4789  0.2226  0.1257  0.1510  0.0318  0.0608
        0.0354  0.0260  0.0126  0.0029  0.0043  0.0014  0.0000  0.0000  0.0000  0.0000  0.0000
        0.0000
1995    1       3       0       0       69      0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
        0.0000  0.0000  0.0000  0.0000  0.2414  0.3534  1.4379  4.0874  8.1213  8.5327  6.1473
        2.9749  1.2684  0.5451  0.5222  1.2059  2.6843  4.8278  6.9954  8.0774  8.3294  7.4855
        6.1477  3.8777  2.5148  1.2530  0.8335  0.3644  0.2652  0.1357  0.0966  0.0656  0.0532
        0.0414  0.0348  0.0181  0.0073  0.0056  0.0032  0.0024  0.0091  0.0226  0.0176  0.0037
        0.0037
1998    1       3       0       0       84      0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
        0.0000  0.0000  0.0000  0.0000  1.9111  2.3583  2.7987  2.9771  2.6344  1.9192  1.7780
        2.5431  3.2512  3.6925  3.7927  4.3047  5.4560  7.6075  8.0688  8.4396  7.5478  6.2551
        4.9928  3.5322  2.5057  1.6519  1.0415  0.7464  0.4515  0.3132  0.2538  0.1641  0.1156
        0.0562  0.0557  0.0423  0.0236  0.0210  0.0125  0.0035  0.0053  0.0059  0.0084  0.0061
        0.0135
2001    1       3       0       0       49      0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
        0.0000  0.0000  0.0000  0.0000  1.3525  4.1216  8.3658  14.6019 16.9774 14.2018 8.5876
        3.5231  1.6717  1.4485  1.5298  1.9460  1.9285  1.9610  1.8787  2.2680  2.1509  2.2040
        2.1926  1.9429  1.1800  0.8779  0.6301  0.4768  0.3006  0.2136  0.1543  0.1206  0.0551
        0.0789  0.0185  0.0621  0.0381  0.0841  0.0565  0.0314  0.0243  0.0261  0.0014  0.0354
        0.0687
2003    1       3       0       0       71      0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
        0.0000  0.0000  0.0000  0.0000  0.0944  0.1537  0.3314  0.4047  0.7614  0.6356  1.1926
        1.0760  1.7630  1.7640  4.4833  7.5862  14.3289 14.8713 13.9081 10.0821 7.4014  5.8903
        3.9399  2.7178  1.9627  1.3133  0.9244  0.6519  0.4871  0.3781  0.2422  0.1693  0.1103
        0.1016  0.0309  0.0101  0.0184  0.0231  0.0085  0.0160  0.0057  0.0028  0.0028  0.0046
        0.0249
2005    1       3       0       0       49      0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
        0.0000  0.0000  0.0000  0.0000  0.5764  0.6518  2.2930  3.3930  4.9816  3.7852  2.8587
        2.0472  1.2751  1.0973  1.1591  2.8742  4.7100  8.8084  14.7650 12.1110 12.1030 6.6716
        5.1654  3.3105  1.6901  1.0512  0.6182  0.3690  0.1856  0.1908  0.1801  0.0734  0.0314
        0.0457  0.0478  0.0314  0.0335  0.0175  0.0161  0.0124  0.0118  0.0879  0.0000  0.0000
        0.0131

14 #_N_age_bins
 2 3 4 5 6 7 8 9 10 11 12 13 14 15
1 #_N_ageerror_definitions
0.5     1.5     2.5     3.5     4.5     5.5     6.5     7.5     8.5     9.5     10.5    11.5
        12.5    13.5    14.5    15.5
0.000001 0.0001 0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001  0.0001
        0.0001  0.0001  0.0001  0.0001
#0.0000001      0.0000001 0.0000001 0.0000001 0.0000001 0.0000001 0.0000001 0.0000001 0.0000001 0.0000001 0.0000001
        0.0000001 0.0000001 0.0000001 0.0000001 0.0000001

2283 #_N_Agecomp_obs
# Yr Seas Flt/Svy Gender Part Ageerr Lbin_lo Lbin_hi Nsamp datavector(female-male)
1973    1       1       0       0       1       1       51      60      0.00000 0.25999 0.04498
        0.10099 0.18700 0.11699 0.10699 0.10001 0.04801 0.02098 0.00903 0.00502 0.00000 0.00000
1974    1       1       0       0       1       1       51      60      0.00439 0.00331 0.50658
        0.06924 0.11978 0.14944 0.08681 0.03846 0.01208 0.00550 0.00331 0.00111 0.00000 0.00000
1975    1       1       0       0       1       4       4       1       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       5       5       1       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       6       6       1       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       7       7       2       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       8       8       2       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       9       9       1       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       10      10      3       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       11      11      5       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
1975    1       1       0       0       1       12      12      3       100.0000 0.0000 0.0000
        0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000  0.0000
```

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1975 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 5 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 2 | 94.0517 | 5.9483 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 4 | 95.9144 | 4.0856 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 4 | 93.3344 | 6.6656 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 5 | 70.3671 | 29.6329 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 5 | 68.2976 | 31.7024 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 3 | 28.0522 | 15.6902 | 0.0000 |
| | 56.2576 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 2 | 0.0000 | 37.1985 | 0.0000 |
| | 50.0000 | 0.0000 | 12.8015 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 6 | 0.0000 | 0.0000 | 23.8065 |
| | 74.4685 | 1.7249 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 94.6658 | 5.3342 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 9 | 0.0000 | 0.0000 | 19.3168 |
| | 80.6832 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 9 | 0.0000 | 0.0000 | 9.2807 |
| | 85.5284 | 0.0000 | 5.1909 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 10 | 0.0000 | 0.0000 | 7.0029 |
| | 84.8703 | 7.0029 | 0.0000 | 1.1240 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 77.8311 | 16.8185 | 2.6752 | 2.6752 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 9 | 0.0000 | 0.0000 | 7.0051 |
| | 72.2056 | 0.0000 | 2.8446 | 10.9396 | 7.0051 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 28.1288 | 53.1793 | 2.5515 | 16.1404 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 31.0378 | 0.0000 | 41.6159 | 21.4534 | 5.8928 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 4.8178 | 78.2151 | 13.3559 | 0.0000 | 0.0000 | 3.6112 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 9.9887 | 0.0000 | 70.1459 | 19.8654 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 28.7065 | 0.0000 | 5.3602 | 58.2321 | 7.7012 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 27.6850 | 46.4223 | 4.2596 | 16.0317 | 5.6014 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 73.5368 | 26.4632 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 10.7028 | 89.2972 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 21.4858 | 0.0000 | 0.0000 | 78.5142 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1975 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 3 | 3 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 4 | 4 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1976 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 5 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 4 | 97.7960 | 2.2040 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 4 | 43.8099 | 56.1901 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 6 | 95.5825 | 4.4175 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 8 | 76.7567 | 18.4825 | 4.7609 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 9 | 83.9321 | 16.0679 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 10 | 46.8326 | 53.1674 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 7 | 21.1327 | 78.8673 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 13 | 28.6504 | 71.3496 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 23 | 7.3862 | 67.0779 | 24.4526 |
| | 1.0833 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 26 | 4.3779 | 63.4472 | 31.9532 |
| | 0.0000 | 0.2217 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 45 | 6.0606 | 70.0659 | 22.3420 |
| | 1.0983 | 0.1712 | 0.2619 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 58 | 5.7384 | 73.4517 | 16.4006 |
| | 2.2534 | 2.0180 | 0.1380 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 53 | 0.2413 | 68.3268 | 20.0115 |
| | 4.7414 | 5.5814 | 1.0976 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 55 | 0.3227 | 71.2757 | 13.9827 |
| | 1.3467 | 10.8578 | 2.2144 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 56 | 0.5693 | 55.2655 | 22.0991 |
| | 4.6384 | 14.5621 | 2.1280 | 0.7376 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 54 | 0.0000 | 39.2864 | 16.6332 |
| | 7.8940 | 29.4872 | 6.6992 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 47 | 0.9784 | 26.3184 | 12.2003 |
| | 5.6000 | 46.3883 | 8.5146 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 47 | 0.0000 | 10.9275 | 29.5591 |
| | 5.3167 | 41.7652 | 11.3236 | 1.1080 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 39 | 0.0000 | 2.1858 | 1.9251 |
| | 5.1130 | 73.7158 | 11.4959 | 4.1530 | 1.4115 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 42 | 0.0000 | 2.0295 | 3.1365 |
| | 4.8578 | 58.6207 | 25.8779 | 3.4834 | 0.8045 | 0.6164 | 0.0000 | 0.2866 | 0.2866 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 44 | 0.0000 | 0.0000 | 1.0698 |
| | 1.1458 | 63.8017 | 23.0548 | 6.9754 | 3.6944 | 0.2582 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 57 | 0.0000 | 0.0000 | 0.0000 |
| | 3.3948 | 56.7487 | 21.7595 | 2.2945 | 5.9717 | 3.1858 | 1.4822 | 0.6462 | 0.0000 | 4.5167 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 62 | 0.0000 | 0.3791 | 0.0000 |
| | 2.0588 | 37.3613 | 27.6379 | 11.1598 | 17.0640 | 1.4028 | 0.0077 | 0.8297 | 0.2036 | 1.8954 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 60 | 0.0000 | 0.0000 | 0.7657 |
| | 0.9368 | 26.2805 | 38.6238 | 10.8890 | 5.4954 | 8.2739 | 5.5776 | 0.2439 | 2.9134 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 69 | 0.0000 | 0.0000 | 0.0000 |
| | 3.3871 | 14.7311 | 19.6219 | 29.8552 | 10.3788 | 16.4266 | 0.1283 | 5.4709 | 0.0000 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 64 | 0.0000 | 0.0000 | 0.3421 |
| | 0.0000 | 11.0217 | 21.8405 | 26.2875 | 17.6601 | 7.6358 | 4.2391 | 4.1915 | 6.4957 | 0.2861 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 58 | 0.0000 | 0.0000 | 0.0000 |
| | 0.2708 | 13.0015 | 39.1557 | 17.7728 | 14.3922 | 8.3931 | 5.1437 | 1.5169 | 0.3533 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 67 | 0.0000 | 0.0000 | 0.0000 |
| | 0.6980 | 10.6328 | 18.9382 | 17.5666 | 17.2477 | 12.6425 | 20.0793 | 1.2431 | 0.4759 | 0.0000 | 0.4759 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 65 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.3902 | 15.4987 | 25.0662 | 12.3064 | 32.5292 | 3.8356 | 3.0498 | 2.3239 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 62 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 7.9191 | 24.4537 | 21.6249 | 24.2027 | 12.1828 | 3.7566 | 0.7874 | 4.2232 | 0.8497 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 57 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 14.5499 | 16.1500 | 24.2507 | 17.2322 | 15.1879 | 5.6006 | 2.4368 | 2.7291 | 0.0000 | 1.8627 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 56 | 0.0000 | 0.0000 | 0.0000 |
| | 0.3698 | 14.7860 | 11.5339 | 15.1401 | 33.5873 | 7.2072 | 9.6345 | 7.0728 | 0.0000 | 0.6684 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 48 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.8084 | 16.6353 | 25.7895 | 26.2363 | 12.6774 | 8.0682 | 5.7936 | 0.2729 | 2.7183 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 45 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.8540 | 1.2137 | 34.6234 | 20.3965 | 5.2532 | 15.8921 | 11.0806 | 4.4300 | 1.2565 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1976 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 30 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.6786 | 3.9711 | 15.3690 | 25.3344 | 15.7209 | 8.2153 | 7.5612 | 10.1405 | 9.0090 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 36 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 5.9087 | 28.1231 | 20.8982 | 24.0840 | 10.9702 | 8.1064 | 1.7668 | 0.1426 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 33 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 3.7865 | 6.7746 | 16.2949 | 21.6834 | 23.2934 | 16.2259 | 11.0570 | 0.8844 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 33 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 4.9150 | 31.3628 | 9.8847 | 17.9954 | 13.4229 | 18.5724 | 3.8469 | 0.0000 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 33 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 2.0002 | 20.7350 | 8.4514 | 24.7553 | 27.2844 | 11.0622 | 4.2534 | 0.8532 | 0.6049 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.3655 | 13.8929 | 27.3256 | 20.1634 | 16.1174 | 1.6081 | 11.2454 | 3.2539 | 5.0279 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 25 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 12.2001 | 10.0776 | 15.2984 | 18.0650 | 38.0500 | 2.9465 | 3.3623 | 0.0000 |
| 1976 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 71 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.6090 | 0.1009 | 3.0129 | 10.8672 | 22.9649 | 17.3907 | 21.8658 | 7.5526 | 13.3343 | 2.3018 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 2 | 82.9880 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 17.0120 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 4 | 45.3659 | 6.9065 | 47.7276 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 5 | 56.6159 | 43.3841 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 12 | 92.2371 | 7.7629 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 28 | 81.2489 | 11.9260 | 6.5982 |
| | 0.0000 | 0.0000 | 0.0000 | 0.2270 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 56 | 77.7231 | 12.8647 | 9.4122 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 71 | 81.4173 | 5.6653 | 12.4739 |
| | 0.0000 | 0.0000 | 0.1492 | 0.2943 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 99 | 73.3349 | 10.3069 | 16.1720 |
| | 0.1117 | 0.0744 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 114 | 16.4360 | 22.1488 | 59.3424 |
| | 1.7339 | 0.0000 | 0.1569 | 0.0000 | 0.1819 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 146 | 9.2255 | 15.9035 | 69.4831 |
| | 2.6438 | 0.7687 | 1.9086 | 0.0668 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 141 | 0.6195 | 14.7629 | 72.1790 |
| | 5.7738 | 3.1643 | 3.5005 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 160 | 0.3242 | 7.1591 | 72.5376 |
| | 9.4246 | 4.8971 | 5.0064 | 0.5703 | 0.0000 | 0.0000 | 0.0806 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 160 | 0.0000 | 3.2658 | 68.7676 |
| | 12.5367 | 5.4345 | 9.1482 | 0.8472 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 147 | 0.0000 | 4.8424 | 54.7204 |
| | 5.9414 | 11.5271 | 21.7455 | 0.8584 | 0.3648 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 142 | 0.0000 | 0.2494 | 44.3487 |
| | 10.9689 | 11.0646 | 25.7662 | 6.1457 | 0.8211 | 0.6354 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 132 | 0.0000 | 0.6012 | 31.3953 |
| | 6.1256 | 10.9794 | 44.1143 | 4.7314 | 0.5953 | 0.3177 | 1.1399 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 128 | 0.0000 | 0.2299 | 14.2010 |
| | 5.4263 | 15.2649 | 59.9647 | 3.9293 | 0.4268 | 0.3848 | 0.1724 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 136 | 0.0000 | 0.0000 | 7.9310 |
| | 5.9277 | 21.5934 | 49.9216 | 7.7696 | 3.5785 | 2.7260 | 0.5523 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 123 | 0.0000 | 0.0000 | 4.1411 |
| | 3.9877 | 15.8156 | 59.9814 | 9.5119 | 4.8576 | 0.1438 | 0.8082 | 0.5893 | 0.1635 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 135 | 0.0000 | 0.1234 | 2.8113 |
| | 1.4858 | 13.2941 | 58.7713 | 10.1174 | 6.5536 | 6.0846 | 0.3534 | 0.0721 | 0.3331 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 140 | 0.0000 | 0.0000 | 0.2559 |
| | 2.7541 | 10.8073 | 49.4598 | 18.4086 | 10.2561 | 6.2171 | 1.5742 | 0.1149 | 0.1520 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 146 | 0.0000 | 0.0000 | 0.9874 |
| | 0.4331 | 7.0031 | 47.7984 | 24.5164 | 9.7240 | 6.9744 | 1.8871 | 0.4628 | 0.2133 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 147 | 0.0000 | 0.0000 | 0.0000 |
| | 0.1185 | 2.4314 | 38.3218 | 17.8767 | 22.0905 | 10.3715 | 5.5349 | 3.2546 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 161 | 0.1913 | 0.0000 | 0.3858 |
| | 0.2173 | 4.2066 | 23.4200 | 19.2493 | 20.4471 | 13.7526 | 10.0091 | 4.6525 | 2.4618 | 1.0066 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 139 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 3.0252 | 22.1477 | 19.4925 | 22.8892 | 13.6802 | 10.8272 | 6.6941 | 1.2439 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1977 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 131 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.0490 | 16.7450 | 20.9951 | 19.1942 | 12.0354 | 20.6506 | 8.1388 | 1.0497 | 0.0000 | 0.1421 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 94 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.2696 | 5.7308 | 33.7677 | 19.5312 | 11.2809 | 11.8543 | 11.6093 | 4.3514 | 0.2984 | 0.3065 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 95 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.2665 | 12.8299 | 11.4637 | 29.8325 | 13.8010 | 13.1680 | 14.8108 | 2.8738 | 0.6274 | 0.3266 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 73 | 0.0000 | 0.0000 | 0.0000 |
| | 0.5475 | 0.5475 | 17.7256 | 2.3572 | 14.0544 | 19.7261 | 20.1293 | 19.8637 | 4.1806 | 0.8680 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 60 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.5468 | 4.9916 | 5.9445 | 15.8735 | 26.9359 | 36.4313 | 2.2429 | 4.9156 | 1.0530 | 1.0649 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 52 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 2.4184 | 5.1171 | 14.1831 | 25.5692 | 32.0752 | 7.2869 | 12.4864 | 0.8638 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 46 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.7250 | 5.3723 | 8.2086 | 24.4120 | 21.1603 | 20.3670 | 12.8727 | 6.1472 | 0.0000 | 0.7348 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 42 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 8.2443 | 2.2163 | 7.6727 | 22.6185 | 30.3151 | 19.2876 | 6.0596 | 3.5858 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 23 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.0454 | 15.0771 | 12.1072 | 8.4822 | 15.6341 | 36.6320 | 11.0221 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 1.1405 | 23.7013 | 9.6254 | 10.3692 | 37.4895 | 17.6742 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 3.6467 | 25.3825 | 7.7141 | 13.9808 | 19.2942 | 21.8805 | 8.1011 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 18 | 0.0000 | 0.0000 | 0.2475 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 11.5687 | 20.6759 | 2.3019 | 0.0000 | 7.8811 | 10.4428 | 46.8821 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.5902 | 8.2386 | 28.4288 | 15.8384 | 1.9813 | 34.2432 | 9.6795 | 0.0000 | 0.0000 |
| 1977 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 62 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1002 | 12.1790 | 10.3335 | 19.0401 | 38.5546 | 12.1864 | 7.6061 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 3 | 3 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 4 | 4 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 10 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 10 | 98.9750 | 1.0250 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 9 | 98.3490 | 1.6510 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 14 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 7 | 58.8246 | 41.1754 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 4 | 86.2655 | 13.7345 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 2 | 97.5982 | 2.4018 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 3 | 70.5236 | 29.4764 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 7 | 46.1926 | 53.8074 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 17 | 0.0000 | 74.2069 | 23.0689 |
| | 1.9590 | 0.0000 | 0.0000 | 0.7652 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 51 | 0.0000 | 60.8946 | 20.3482 |
| | 18.5923 | 0.1649 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 88 | 0.0000 | 51.2769 | 24.2535 |
| | 23.6698 | 0.7998 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 129 | 0.0000 | 41.0592 | 19.3237 |
| | 34.1030 | 5.5142 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 176 | 0.0000 | 34.2083 | 20.1949 |
| | 41.1195 | 4.2760 | 0.2014 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 171 | 0.0000 | 20.0304 | 22.6900 |
| | 51.0418 | 4.5108 | 0.6021 | 1.1249 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 158 | 0.0000 | 14.3774 | 19.2885 |
| | 56.4600 | 6.1994 | 2.3597 | 0.7128 | 0.0000 | 0.0000 | 0.6022 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 165 | 0.0000 | 4.2908 | 12.5674 |
| | 66.1397 | 12.2751 | 2.8114 | 1.9156 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1978 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 148 | 0.0000 | 1.3330 | 8.5730 |
| | 62.2963 | 8.2001 | 9.3331 | 8.8240 | 0.4230 | 1.0176 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 144 | 0.0000 | 0.6368 | 5.9131 |
| | 51.7811 | 10.4093 | 12.2047 | 18.3740 | 0.6809 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 154 | 0.0000 | 0.0000 | 1.4291 |
| | 42.1601 | 8.1269 | 21.5714 | 26.3262 | 0.0320 | 0.1693 | 0.1850 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 143 | 0.0000 | 0.0000 | 0.7408 |
| | 30.0068 | 6.6298 | 20.6821 | 37.8254 | 3.4003 | 0.7147 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 147 | 0.0000 | 0.0000 | 0.0210 |
| | 17.7822 | 5.1822 | 24.6946 | 43.1725 | 6.1325 | 3.0150 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 156 | 0.0000 | 0.0000 | 0.5226 |
| | 6.7014 | 4.9582 | 26.0819 | 50.1408 | 8.5370 | 1.4712 | 1.0363 | 0.4169 | 0.1337 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 184 | 0.0000 | 0.0000 | 0.0000 |
| | 8.4375 | 3.7199 | 19.4815 | 49.2595 | 13.1139 | 2.6051 | 2.7507 | 0.6320 | 0.0000 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 178 | 0.0000 | 0.0000 | 0.0000 |
| | 2.1094 | 1.2381 | 14.2679 | 53.1940 | 12.7013 | 9.7158 | 5.5027 | 1.0466 | 0.2242 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 186 | 0.0000 | 0.0000 | 0.0000 |
| | 0.6479 | 1.2373 | 10.6758 | 42.2168 | 19.2058 | 19.6519 | 5.0413 | 1.2176 | 0.1056 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 176 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.4133 | 5.8335 | 44.4928 | 15.1620 | 17.4728 | 7.7444 | 4.2682 | 4.6131 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 156 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0985 | 0.7436 | 3.4055 | 37.8339 | 21.0622 | 18.3756 | 11.9138 | 2.2365 | 1.2134 | 3.1171 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 115 | 0.0000 | 0.0000 | 0.0000 |
| | 0.2417 | 0.7999 | 5.7688 | 27.2762 | 22.7972 | 17.3709 | 17.1460 | 7.3108 | 0.1622 | 1.1262 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 103 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.3067 | 29.2208 | 25.3050 | 11.5186 | 18.2952 | 5.8494 | 6.6573 | 0.2396 | 1.6075 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 60 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 11.8699 | 29.6259 | 21.7768 | 13.5358 | 5.1605 | 16.8897 | 0.8441 | 0.2973 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 60 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.1535 | 19.9717 | 16.4503 | 26.9830 | 24.9810 | 2.6530 | 0.5189 | 6.7660 | 0.5225 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 45 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 31.9748 | 15.2065 | 14.0015 | 18.2134 | 12.7340 | 6.0837 | 1.7861 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 41 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 17.1970 | 22.0545 | 17.6622 | 18.2999 | 2.4744 | 18.9506 | 3.3614 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 16.2285 | 21.2574 | 28.3578 | 17.7912 | 3.1864 | 8.3541 | 4.8246 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 26 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 21.4406 | 5.9732 | 38.6484 | 18.1391 | 11.3181 | 4.4806 | 0.0000 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 38.5317 | 3.0573 | 6.0480 | 29.0638 | 12.0131 | 1.7471 | 0.7029 | 8.8361 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 27.5601 | 21.9506 | 2.0744 | 11.6092 | 12.8396 | 9.5603 | 0.0000 | 14.4059 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 12.0434 | 5.9918 | 15.8819 | 52.8239 | 10.2369 | 0.0000 | 3.0222 | 0.0000 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 13.2756 | 0.0000 | 0.0000 | 76.7316 | 0.9819 | 1.8313 | 3.1307 | 4.0489 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.4655 | 11.2512 | 9.2090 | 1.0001 | 56.8408 | 16.2329 | 3.0005 |
| 1978 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 60 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 1.0959 | 3.3073 | 11.7625 | 32.7537 | 12.1348 | 16.0179 | 15.9347 | 6.9931 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 4 | 37.4549 | 62.5451 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 10 | 56.4297 | 43.5703 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 21 | 37.7220 | 62.2780 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 27 | 50.9072 | 48.0541 | 1.0387 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 30 | 48.6310 | 50.3018 | 1.0672 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 46 | 43.1019 | 56.3326 | 0.5654 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1979 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 33 | 50.6294 | 41.7595 | 7.6111 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 24 | 22.0489 | 74.5477 | 3.4035 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 17 | 1.7270 | 66.9432 | 31.3299 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 19 | 9.8575 | 77.9602 | 12.1823 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 12 | 22.6630 | 49.7456 | 26.0477 |
| | 1.5437 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 11 | 3.6569 | 85.8906 | 10.4524 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 17 | 4.5028 | 54.0578 | 41.0475 |
| | 0.3919 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 25 | 0.0000 | 15.2136 | 84.1714 |
| | 0.0000 | 0.6149 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 36 | 0.0000 | 6.8053 | 81.8263 |
| | 4.8729 | 6.4955 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 44 | 0.0000 | 3.8878 | 69.5035 |
| | 8.4962 | 18.1126 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 65 | 0.0000 | 5.5350 | 38.5584 |
| | 28.4802 | 24.0820 | 1.3265 | 1.8331 | 0.0000 | 0.0000 | 0.1849 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 72 | 0.0000 | 0.0000 | 26.3971 |
| | 20.3836 | 47.2403 | 2.0032 | 3.9758 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 74 | 0.0000 | 0.0000 | 14.6988 |
| | 11.3878 | 63.7733 | 3.7284 | 5.3364 | 1.0753 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 84 | 0.0000 | 0.0000 | 19.1513 |
| | 13.8647 | 51.5776 | 2.5131 | 9.6805 | 3.2129 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 83 | 0.0000 | 0.0000 | 4.4667 |
| | 10.5735 | 52.4512 | 10.4265 | 15.9740 | 5.9515 | 0.1566 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 76 | 0.0000 | 0.0000 | 4.0555 |
| | 7.3365 | 50.8283 | 7.5392 | 23.4677 | 6.4728 | 0.2999 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 83 | 0.0000 | 0.0000 | 1.8055 |
| | 0.4565 | 31.9742 | 20.9162 | 28.9325 | 13.4488 | 2.4662 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 89 | 0.0000 | 0.0000 | 1.7266 |
| | 0.0370 | 25.2759 | 17.1383 | 38.8252 | 15.4785 | 1.0318 | 0.4868 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 85 | 0.0000 | 0.0000 | 0.0000 |
| | 1.4664 | 19.2499 | 12.1375 | 31.3405 | 24.2688 | 9.7544 | 0.3681 | 1.4144 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 86 | 0.0000 | 0.0000 | 0.0000 |
| | 1.8524 | 24.5045 | 14.2241 | 29.3112 | 23.1349 | 5.3064 | 1.5195 | 0.1469 | 0.0000 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 78 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0462 | 5.5764 | 10.5366 | 38.2895 | 32.8987 | 3.7230 | 7.4132 | 0.1555 | 1.3609 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 70 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 6.4035 | 11.7156 | 29.4469 | 41.2412 | 6.2188 | 4.3501 | 0.0000 | 0.6240 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 66 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 7.4133 | 8.3199 | 24.8693 | 28.7462 | 13.9441 | 11.4646 | 3.0692 | 0.0394 | 2.1338 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 58 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.6318 | 11.5198 | 10.7464 | 48.4410 | 12.6860 | 9.3651 | 2.1449 | 0.1687 | 0.0000 | 2.2964 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 41 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.9299 | 6.3921 | 9.4858 | 49.0281 | 21.0317 | 2.8837 | 2.0813 | 6.1674 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 47 | 0.0000 | 0.0000 | 0.0000 |
| | 3.3877 | 3.7358 | 2.1002 | 21.4652 | 18.3884 | 10.2626 | 6.6324 | 22.4429 | 4.6302 | 6.9545 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.2984 | 0.0000 | 12.0910 | 26.7106 | 17.3922 | 27.6139 | 12.3790 | 2.5149 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 26 | 0.0000 | 0.0000 | 0.0000 |
| | 2.6431 | 0.0000 | 0.0000 | 4.0869 | 32.1972 | 14.7386 | 31.3907 | 8.8480 | 0.3074 | 0.0000 | 5.7881 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 7.7284 | 17.7831 | 45.4167 | 16.5623 | 0.3584 | 12.1511 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 16.2501 | 40.0104 | 12.0289 | 19.8775 | 0.0000 | 11.8331 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 8 | 0.0000 | 0.0000 | 17.0985 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 19.6632 | 41.1278 | 0.0000 | 5.3357 | 0.0000 | 16.5493 | 0.2255 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 13 | 0.0000 | 0.0000 | 5.3702 |
| | 0.0000 | 0.0000 | 0.0000 | 9.5997 | 13.4674 | 25.6850 | 18.4811 | 11.4694 | 10.4535 | 5.4737 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 13.6427 | 0.0000 | 0.0000 | 0.0000 | 2.2006 | 2.4067 | 59.3447 | 9.4986 | 12.9067 | 0.0000 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 67.0219 | 19.3341 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 13.6441 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 8 | 0.0000 | 0.0000 | 7.9528 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 5.6338 | 65.6897 | 14.5545 | 0.0000 | 0.0000 | 4.3762 | 1.7930 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1979 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 37.7964 | 0.0000 | 12.2037 | 0.0000 |
| 1979 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 16 | 0.0000 | 0.0000 | 6.4763 |
| | 0.0000 | 0.0000 | 0.0000 | 0.1076 | 0.0000 | 8.1230 | 20.5851 | 4.0649 | 16.5860 | 15.5592 | 28.4979 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 3 | 3 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 4 | 4 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 2 | 48.6287 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 51.3713 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 3 | 0.0000 | 90.9031 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 9.0969 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 4 | 0.0000 | 85.2727 | 0.0000 |
| | 3.1730 | 11.5543 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 9 | 5.0945 | 94.6274 | 0.2781 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 19 | 42.2098 | 57.5786 | 0.2116 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 38 | 0.2384 | 91.9161 | 7.8455 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 66 | 0.0000 | 98.6346 | 1.3654 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 74 | 7.4359 | 89.6295 | 2.9346 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 84 | 0.0000 | 94.7616 | 4.4731 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.7654 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 89 | 0.0000 | 81.5264 | 13.9646 |
| | 0.4763 | 1.1188 | 2.9139 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 83 | 0.0000 | 88.8257 | 7.2840 |
| | 2.1929 | 0.2252 | 1.4722 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 93 | 0.4081 | 57.6571 | 37.5236 |
| | 3.1275 | 0.1565 | 1.1272 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 88 | 0.0000 | 55.4872 | 16.0974 |
| | 8.1475 | 8.8696 | 7.5864 | 2.7762 | 0.0000 | 1.0356 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 100 | 0.0000 | 44.4977 | 12.9589 |
| | 18.9812 | 8.0987 | 9.9118 | 4.9173 | 0.3506 | 0.2839 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 111 | 0.0000 | 27.9088 | 5.2943 |
| | 33.8362 | 13.7390 | 12.3223 | 3.3534 | 3.1531 | 0.2043 | 0.1815 | 0.0071 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 114 | 0.0000 | 12.5535 | 8.8142 |
| | 30.6808 | 21.2714 | 17.9931 | 5.4085 | 3.2786 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 96 | 0.0000 | 1.8410 | 4.4095 |
| | 22.7725 | 22.2881 | 36.4027 | 3.6013 | 6.2571 | 2.3669 | 0.0610 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 90 | 0.0000 | 0.0000 | 3.4369 |
| | 9.6124 | 18.4343 | 39.2499 | 12.4947 | 10.5384 | 4.9934 | 0.9822 | 0.0000 | 0.0000 | 0.2578 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 85 | 0.0000 | 0.4576 | 1.3147 |
| | 17.1273 | 20.3037 | 24.6464 | 10.8454 | 18.1444 | 5.8858 | 1.2514 | 0.0000 | 0.0000 | 0.0233 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 90 | 0.0000 | 0.0000 | 0.0000 |
| | 5.9136 | 13.3633 | 39.8685 | 12.2295 | 17.2727 | 8.9396 | 1.0726 | 0.2696 | 0.6777 | 0.3928 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 87 | 0.0000 | 1.3266 | 0.0000 |
| | 2.8802 | 11.0404 | 28.3622 | 11.8162 | 29.0913 | 11.7644 | 0.6189 | 1.8765 | 0.8707 | 0.3525 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 92 | 0.0000 | 1.2676 | 1.4202 |
| | 1.7054 | 4.8358 | 21.0876 | 21.3745 | 26.6807 | 12.4655 | 5.1797 | 1.4843 | 2.0392 | 0.0048 | 0.4548 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 94 | 0.0000 | 0.8256 | 0.0000 |
| | 0.0399 | 3.7952 | 47.7201 | 13.6294 | 11.5466 | 15.1674 | 3.5725 | 0.9214 | 1.4817 | 0.0000 | 1.3002 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 105 | 0.0000 | 0.0000 | 0.0000 |
| | 2.6990 | 1.7207 | 21.2313 | 19.8732 | 20.3707 | 22.5670 | 5.8453 | 3.1737 | 1.0615 | 0.4979 | 0.9596 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 102 | 0.0000 | 0.0000 | 0.0000 |
| | 1.2687 | 2.3019 | 27.4757 | 9.1708 | 23.8392 | 21.2979 | 8.1179 | 3.1566 | 2.9142 | 0.1166 | 0.3405 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 102 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.2532 | 7.5417 | 9.7044 | 34.6656 | 21.0506 | 13.1736 | 2.8780 | 3.7439 | 2.3504 | 3.6386 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 102 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.7164 | 35.0095 | 16.3949 | 19.7012 | 16.9026 | 1.2360 | 3.2035 | 4.4931 | 1.0150 | 1.3278 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 88 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 5.4797 | 13.8540 | 7.9478 | 39.6788 | 16.8573 | 7.3679 | 4.1428 | 2.0821 | 2.5895 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 52 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 9.3405 | 6.9539 | 12.3348 | 56.8865 | 5.0456 | 2.8647 | 1.8415 | 2.2197 | 2.5128 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 60 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.1554 | 0.8296 | 1.4621 | 6.7293 | 34.6049 | 26.5221 | 19.9466 | 8.1721 | 0.0000 | 1.5779 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 39 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0121 | 2.1368 | 1.8770 | 22.7806 | 7.6152 | 57.2506 | 8.1670 | 0.0000 | 0.1606 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.4970 | 5.8963 | 2.8093 | 27.9958 | 8.0111 | 2.7548 | 18.6132 | 13.5920 | 18.8305 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 25 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 28.9487 | 6.4452 | 17.0357 | 20.9010 | 12.2106 | 3.8174 | 9.6419 | 0.9994 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 26 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 2.3335 | 2.6961 | 18.9152 | 19.0996 | 20.5074 | 12.5063 | 10.5755 | 10.1536 | 3.2130 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 19 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 40.7660 | 16.5690 | 3.0644 | 14.2193 | 25.3813 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.3972 | 58.0744 | 0.0000 | 15.6373 | 23.8911 | 0.0000 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 16.1640 | 50.9516 | 6.8931 | 22.0555 | 0.0000 | 3.9061 | 0.0297 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 5.0794 | 0.0000 | 18.1303 | 18.1080 | 0.0000 | 12.4880 | 3.0087 | 43.1856 | 0.0000 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0735 | 23.6016 | 35.1162 | 0.0000 | 0.0000 | 0.0000 | 40.2087 |
| 1980 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4581 | 0.0000 | 28.1292 | 56.5101 | 0.0000 | 2.7448 | 12.1578 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 5 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 9 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 3 | 3 | 13 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 4 | 4 | 23 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 25 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 29 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 40 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 34 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 22 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 21 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 16 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 12 | 94.1489 | 5.8511 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 6 | 38.2230 | 61.7770 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 9 | 33.8614 | 66.1386 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 12 | 1.7329 | 97.2736 | 0.9935 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 16 | 27.5861 | 46.9726 | 25.4413 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 28 | 12.8881 | 55.6901 | 31.0864 |
| | 0.3355 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 49 | 10.8798 | 24.9356 | 64.1845 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 59 | 3.4170 | 15.8602 | 80.7228 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 78 | 0.8869 | 15.5085 | 83.6046 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 94 | 0.1186 | 9.8116 | 89.3495 |
| | 0.7203 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 84 | 0.0000 | 3.6354 | 95.9503 |
| | 0.4143 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 85 | 0.0000 | 1.0779 | 98.1307 |
| | 0.6339 | 0.1575 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 88 | 0.0000 | 0.6993 | 95.0383 |
| | 1.9293 | 2.3330 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 101 | 0.0000 | 0.9004 | 91.4056 |
| | 2.9971 | 1.4665 | 1.2684 | 0.1582 | 1.8036 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 101 | 0.0000 | 0.0000 | 83.8204 |
| | 4.6664 | 9.6795 | 0.1385 | 1.6952 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 107 | 0.0000 | 0.0000 | 61.6047 |
| | 8.1335 | 7.9404 | 3.2465 | 15.6315 | 0.2699 | 2.6072 | 0.5663 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 114 | 0.0000 | 0.0000 | 39.2556 |
| | 4.4370 | 14.5936 | 11.5599 | 23.8495 | 3.1361 | 2.4981 | 0.6702 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 122 | 0.0000 | 0.0000 | 22.0472 |
| | 6.5778 | 14.8068 | 13.2376 | 26.7541 | 6.0124 | 6.1018 | 4.1646 | 0.0000 | 0.2978 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 122 | 0.0000 | 0.0000 | 10.1189 |
| | 6.3685 | 8.0832 | 12.6932 | 34.4634 | 12.6683 | 10.4075 | 5.1971 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 105 | 0.0000 | 0.0000 | 6.1426 |
| | 0.3342 | 9.6340 | 15.2238 | 27.9564 | 13.6163 | 16.3522 | 10.7404 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 113 | 0.0000 | 0.0000 | 0.1919 |
| | 0.1387 | 10.4877 | 14.8255 | 44.5625 | 10.1516 | 13.1920 | 5.0023 | 1.3708 | 0.0769 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 107 | 0.0000 | 0.0000 | 0.0000 |
| | 0.5156 | 4.4997 | 11.5439 | 42.7883 | 21.0876 | 7.9721 | 10.7050 | 0.8501 | 0.0377 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 116 | 0.0000 | 0.0000 | 0.0000 |
| | 0.5355 | 6.2752 | 7.8308 | 35.2225 | 17.6969 | 6.9920 | 23.7630 | 0.4386 | 0.7099 | 0.5356 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 96 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.0550 | 11.4248 | 44.3976 | 9.8853 | 13.9048 | 16.7798 | 1.6998 | 0.0000 | 0.1198 | 0.7332 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 80 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 3.1439 | 13.3813 | 12.2466 | 15.5499 | 17.0550 | 36.6969 | 0.7187 | 0.1860 | 1.0217 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 65 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 9.1529 | 1.1279 | 21.0040 | 18.0610 | 31.0203 | 15.6254 | 2.2255 | 0.2188 | 0.0000 | 1.5641 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 56 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 12.1190 | 0.0000 | 6.2235 | 1.8690 | 7.0319 | 48.9987 | 18.3078 | 4.3469 | 1.0865 | 0.0167 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 39 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 11.6065 | 0.0000 | 10.1695 | 33.9137 | 4.1554 | 26.8407 | 2.9517 | 6.5072 | 3.5984 | 0.2569 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 34 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.0849 | 0.6052 | 20.5654 | 9.7394 | 9.0427 | 53.8155 | 1.7940 | 2.9225 | 0.0000 | 0.4303 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 36 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.5406 | 0.0000 | 4.7108 | 6.0604 | 2.5295 | 13.4537 | 54.2586 | 8.9983 | 2.5648 | 4.8834 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 30 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 13.4455 | 5.6128 | 8.8575 | 51.5736 | 6.7607 | 2.4209 | 11.1768 | 0.1522 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 1.3812 | 3.7989 | 19.0748 | 21.1406 | 15.3170 | 36.3729 | 0.0000 | 2.9145 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 2.9910 | 0.1495 | 0.0000 | 90.5396 | 0.7718 | 2.4062 | 2.5088 | 0.6332 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 24.6494 | 37.0664 | 9.9647 | 19.0099 | 7.7834 | 0.9554 | 0.0000 | 0.5707 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 64.5473 | 0.0000 | 0.6646 | 2.6846 | 31.7632 | 0.0190 | 0.3213 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 1.4485 | 1.3736 | 41.1394 | 49.6614 | 5.7853 | 0.5919 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 70.2031 | 22.9640 | 3.1021 | 3.7308 | 0.0000 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 29.3855 | 0.0000 | 59.6623 | 0.0000 | 0.0000 | 0.0000 | 10.9522 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 97.2362 | 0.0000 | 0.4102 | 0.0000 | 1.2558 | 1.0977 | 0.0000 |
| 1981 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 12.0478 | 52.5152 | 20.6271 | 5.3696 | 9.4404 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 5 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 11 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 9 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 12 | 97.9904 | 2.0096 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 18 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 37 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 38 | 98.9879 | 1.0121 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 52 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 62 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 66 | 98.5704 | 0.6063 | 0.8233 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 62 | 98.4006 | 0.4470 | 1.1525 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 55 | 94.3115 | 5.6885 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 59 | 78.4510 | 18.0130 | 0.0000 |
| | 3.5359 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 48 | 62.3397 | 31.7648 | 2.0087 |
| | 3.8868 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 50 | 46.9875 | 37.3804 | 5.9354 |
| | 8.0123 | 1.6844 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 62 | 9.9694 | 23.7130 | 6.2402 |
| | 58.7764 | 1.3010 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 66 | 2.2336 | 20.2780 | 17.4804 |
| | 55.6042 | 3.7715 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.6322 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 86 | 0.5766 | 9.5805 | 5.5073 |
| | 78.7020 | 4.9504 | 0.0000 | 0.0000 | 0.6831 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 94 | 0.0000 | 5.2427 | 3.3467 |
| | 85.2920 | 3.9317 | 0.5515 | 0.0000 | 1.6355 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 99 | 0.0000 | 0.7352 | 2.1970 |
| | 92.6498 | 3.8144 | 0.6036 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 100 | 0.0000 | 0.6469 | 3.2197 |
| | 89.4656 | 3.8542 | 0.8166 | 0.6410 | 0.6986 | 0.0000 | 0.3787 | 0.0000 | 0.0000 | 0.0000 | 0.2786 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 99 | 0.0000 | 0.0000 | 0.7499 |
| | 82.0131 | 6.9586 | 2.5486 | 1.4822 | 4.5580 | 0.6270 | 0.0000 | 0.3946 | 0.0000 | 0.0000 | 0.6680 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 103 | 0.0000 | 0.0000 | 0.3788 |
| | 77.9100 | 7.9181 | 3.6832 | 3.5066 | 6.6033 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 111 | 0.0000 | 0.0000 | 0.0000 |
| | 46.9972 | 16.5576 | 8.2504 | 6.2780 | 16.8904 | 2.4074 | 2.6189 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 116 | 0.0000 | 0.0000 | 1.3613 |
| | 47.8803 | 10.2615 | 9.9402 | 9.5507 | 17.5775 | 0.3960 | 1.4957 | 0.9236 | 0.0000 | 0.0000 | 0.6133 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 101 | 0.0000 | 0.0000 | 0.0000 |
| | 34.7691 | 7.4641 | 13.8050 | 7.6648 | 23.3964 | 5.5656 | 1.2368 | 6.0981 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 112 | 0.0000 | 0.0000 | 0.0000 |
| | 16.5933 | 3.5340 | 15.2245 | 11.8911 | 27.6656 | 7.5737 | 5.4478 | 11.6595 | 0.4107 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 100 | 0.0000 | 0.0000 | 0.0000 |
| | 11.5466 | 3.8546 | 10.6115 | 13.6971 | 29.2288 | 6.0096 | 4.8190 | 18.4538 | 1.7790 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 106 | 0.0000 | 0.0000 | 0.0000 |
| | 4.4072 | 0.5484 | 13.8186 | 17.3717 | 32.8207 | 10.7374 | 6.9145 | 10.5590 | 0.6058 | 0.5274 | 1.6894 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 104 | 0.0000 | 0.0000 | 0.0000 |
| | 3.7007 | 2.0055 | 11.5943 | 5.7285 | 34.3375 | 10.2167 | 8.0253 | 23.8216 | 0.0000 | 0.0000 | 0.5700 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 86 | 0.0000 | 0.0000 | 0.0000 |
| | 0.7740 | 0.6679 | 5.0666 | 23.4578 | 29.0983 | 5.1988 | 14.0409 | 19.5953 | 1.6955 | 0.0000 | 0.4049 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 85 | 0.0000 | 0.0000 | 0.0000 |
| | 0.6837 | 1.3018 | 5.5782 | 8.0935 | 24.7073 | 3.6967 | 5.7182 | 48.3121 | 0.8577 | 0.5244 | 0.5265 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 81 | 0.0000 | 0.0000 | 0.0000 |
| | 0.5976 | 3.5871 | 13.0628 | 4.2651 | 28.0879 | 4.7963 | 20.3296 | 18.5667 | 5.0823 | 1.6247 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 48 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 4.1946 | 5.3389 | 25.7048 | 8.2842 | 26.3270 | 20.5459 | 5.2781 | 0.0000 | 4.3264 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 53 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 8.1501 | 8.7201 | 36.1601 | 12.1317 | 9.8521 | 21.8858 | 0.3130 | 1.6155 | 1.1717 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 37 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 9.9974 | 0.2466 | 44.1838 | 7.6383 | 4.9558 | 25.8561 | 0.0000 | 4.5958 | 2.5263 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.5550 | 7.1392 | 24.9344 | 0.0000 | 14.6880 | 41.7864 | 0.0000 | 0.0000 | 9.8970 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 17.0232 | 1.3540 | 2.9755 | 68.8525 | 9.7948 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 21 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.5939 | 2.2983 | 61.0117 | 3.1181 | 5.4055 | 7.5778 | 15.7641 | 3.2306 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 21 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.7819 | 7.1157 | 9.2623 | 0.0000 | 4.3341 | 52.9252 | 4.5995 | 16.1694 | 3.8119 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 6.6512 | 0.0000 | 32.6097 | 0.0000 | 4.5417 | 48.9098 | 7.2876 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.2843 | 7.9569 | 50.3492 | 30.1938 | 9.2158 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 6.2427 | 0.0000 | 43.7270 | 50.0303 | 0.0000 | 0.0000 | 0.0000 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.6185 | 0.0000 | 0.0000 | 87.4692 | 0.0000 | 0.0000 | 10.9124 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 25.8082 | 50.7283 | 0.0000 | 16.3325 | 7.1310 |
| 1982 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 14 | 5.6776 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.2189 | 9.8107 | 39.2829 | 6.0371 | 17.4085 | 20.5644 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 6 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 10 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 11 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 23 | 0.0000 | 97.5478 | 2.4522 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 23 | 0.0000 | 95.9864 | 4.0136 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 35 | 0.0000 | 94.8162 | 4.0641 |
| | 0.0000 | 1.1197 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 39 | 0.0000 | 99.2795 | 0.7205 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 51 | 0.0000 | 95.7910 | 4.2090 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 55 | 0.0000 | 92.6787 | 7.3213 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 62 | 0.0000 | 90.7181 | 8.4097 |
| | 0.8722 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 58 | 0.0000 | 90.5170 | 8.1957 |
| | 1.2873 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 62 | 0.0000 | 84.7834 | 9.7092 |
| | 2.8952 | 2.6122 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 69 | 0.0000 | 76.4043 | 12.0019 |
| | 2.2435 | 9.3503 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 77 | 0.0000 | 60.1477 | 17.2718 |
| | 1.2158 | 19.3830 | 1.5990 | 0.0000 | 0.0000 | 0.3827 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 72 | 0.0000 | 41.0145 | 14.5683 |
| | 10.5069 | 32.3868 | 1.5234 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 69 | 0.0000 | 23.2105 | 9.9221 |
| | 10.6123 | 50.9668 | 5.1893 | 0.0000 | 0.0361 | 0.0630 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 69 | 0.0000 | 11.0450 | 2.3200 |
| | 4.6987 | 73.7100 | 3.2607 | 4.3030 | 0.5759 | 0.0315 | 0.0550 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 75 | 0.0000 | 1.5427 | 0.7439 |
| | 3.3269 | 79.0185 | 4.7000 | 2.3639 | 3.2155 | 4.1992 | 0.8893 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 74 | 0.0000 | 2.5471 | 2.7064 |
| | 4.1431 | 72.1073 | 9.7005 | 2.3012 | 0.3373 | 4.1848 | 0.7059 | 0.7256 | 0.5408 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 70 | 0.0000 | 2.7818 | 1.5088 |
| | 3.5878 | 64.3051 | 10.5212 | 3.7663 | 6.9575 | 3.7893 | 1.1962 | 1.3231 | 0.2629 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 69 | 0.0000 | 1.6271 | 0.0000 |
| | 1.8599 | 41.6911 | 6.8924 | 5.8083 | 16.0416 | 16.3715 | 3.7918 | 2.8433 | 3.0731 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 71 | 0.0000 | 0.0000 | 0.0000 |
| | 1.1830 | 45.9298 | 8.1839 | 11.4912 | 11.9391 | 9.8159 | 7.6836 | 3.5098 | 0.0000 | 0.2638 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 59 | 0.0000 | 0.0000 | 0.0000 |
| | 0.3797 | 25.3145 | 10.8359 | 11.5253 | 10.7074 | 23.0377 | 0.6550 | 0.8205 | 14.8267 | 0.4741 | 1.4231 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 66 | 0.0000 | 0.0000 | 0.0000 |
| | 0.6805 | 36.1631 | 11.5615 | 7.3976 | 15.6277 | 11.3089 | 5.5881 | 1.2734 | 10.3993 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 66 | 0.0000 | 0.0000 | 0.0000 |
| | 0.8689 | 16.8735 | 25.4494 | 13.9941 | 11.4711 | 18.7969 | 7.4435 | 0.6932 | 4.4094 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 61 | 0.0000 | 0.4272 | 0.0000 |
| | 0.5981 | 5.8048 | 5.7328 | 10.1190 | 10.4327 | 35.1549 | 3.8242 | 22.2095 | 3.6126 | 2.0840 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 57 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 12.7828 | 1.8710 | 15.0597 | 9.4654 | 30.2074 | 8.1324 | 11.3522 | 9.0331 | 0.0000 | 2.0960 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 44 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 6.7639 | 1.3306 | 11.6097 | 22.8571 | 38.6396 | 12.6023 | 5.4708 | 0.7258 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 32 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.2981 | 6.5382 | 4.4551 | 11.4930 | 35.6330 | 15.4808 | 10.4283 | 4.0303 | 4.3750 | 2.2682 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 32 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.5859 | 3.5385 | 13.8379 | 17.5078 | 25.5945 | 7.1871 | 8.4378 | 12.9156 | 8.3949 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 3.1067 | 0.0000 | 8.6783 | 22.4567 | 40.0804 | 6.4602 | 3.0897 | 3.1106 | 13.0174 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.8142 | 6.4691 | 8.7743 | 21.8172 | 45.5021 | 4.7278 | 0.9261 | 9.8811 | 0.0000 | 0.0881 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 7.3012 | 0.0000 | 19.8526 | 11.5785 | 1.5874 | 34.2770 | 23.9713 | 1.4318 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 27.8276 | 0.0000 | 0.0000 | 3.9966 | 25.9397 | 21.8071 | 10.0854 | 10.3435 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 7.6942 | 8.6178 | 30.1768 | 45.6177 | 7.8935 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 10.9423 | 0.0000 | 32.8370 | 49.9380 | 0.0000 | 6.2828 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 7.2145 | 61.4945 | 0.0000 | 31.2910 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 5.6758 | 0.0000 | 6.6186 | 0.0000 | 78.4857 | 0.0000 | 9.2200 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 54.9134 | 23.8862 | 10.5067 | 10.6937 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 17.4201 | 15.2732 | 0.0000 | 35.0731 | 19.2894 | 0.0000 | 12.9441 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.9721 | 9.9753 | 31.8084 | 3.9705 | 8.5778 | 36.5148 | 7.1812 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 3 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 2 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 6 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 12 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 25 | 0.0000 | 3.2983 | 96.7017 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 41 | 0.0000 | 1.9622 | 98.0378 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 72 | 0.0000 | 1.6140 | 97.3894 |
| | 0.8964 | 0.1001 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 112 | 0.0000 | 2.1496 | 95.6482 |
| | 2.2021 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 121 | 0.0000 | 0.9496 | 94.7333 |
| | 4.3171 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 135 | 0.0000 | 1.2447 | 93.6581 |
| | 4.8753 | 0.0000 | 0.2220 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 125 | 0.0000 | 0.0000 | 94.6344 |
| | 3.5122 | 0.8290 | 1.0244 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 112 | 0.0000 | 0.0000 | 85.8425 |
| | 8.8225 | 2.1728 | 3.1623 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 93 | 0.0000 | 0.0000 | 76.1002 |
| | 7.5489 | 8.0232 | 8.3276 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 82 | 0.0000 | 0.0000 | 58.8511 |
| | 5.9328 | 8.2557 | 24.7285 | 2.2319 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 83 | 0.0000 | 0.0000 | 28.5562 |
| | 10.3480 | 17.0380 | 39.9494 | 3.0863 | 0.0000 | 1.0221 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 74 | 0.0000 | 0.0000 | 13.9624 |
| | 9.7794 | 21.4070 | 46.5562 | 2.8905 | 1.1703 | 0.0000 | 2.4039 | 0.0000 | 0.0000 | 1.8303 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1984 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 67 | 0.0000 | 0.0000 | 4.8885 |
| | 2.4817 | 22.9699 | 57.3095 | 7.2801 | 1.3959 | 1.5691 | 2.1053 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 66 | 0.0000 | 0.0000 | 3.9832 |
| | 0.1415 | 10.2103 | 71.3292 | 6.4062 | 4.5686 | 1.1362 | 2.2247 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 50 | 0.0000 | 0.0000 | 2.1882 |
| | 1.1627 | 13.7039 | 45.9393 | 15.9119 | 3.8382 | 6.2286 | 7.5442 | 0.0000 | 3.4830 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 49 | 0.0000 | 0.0000 | 0.0000 |
| | 1.2164 | 8.3546 | 41.9724 | 9.3841 | 7.3439 | 9.8482 | 11.9281 | 0.8791 | 1.9444 | 7.1288 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 43 | 0.0000 | 0.0000 | 0.0000 |
| | 0.5130 | 4.2096 | 40.3123 | 9.1091 | 5.9564 | 4.9541 | 19.4442 | 0.0000 | 9.8918 | 5.6096 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 22.4547 | 17.0781 | 11.6577 | 12.6528 | 15.4162 | 0.0000 | 0.0000 | 11.3360 | 9.4044 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 17.2943 | 5.3151 | 25.9165 | 3.1594 | 41.7931 | 0.0000 | 0.0000 | 6.5216 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 5.8098 | 17.5670 | 26.2206 | 1.0763 | 0.0000 | 24.9662 | 24.3602 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 8.6490 | 9.5849 | 50.6884 | 8.5495 | 22.5282 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 7.2878 | 0.0000 | 9.5434 | 29.5302 | 0.0000 | 0.0000 | 50.1773 | 3.4613 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 70.6928 | 13.1832 | 0.0000 | 11.0028 | 0.0000 | 5.1212 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 25.6315 | 0.0000 | 6.7051 | 35.8468 | 12.3954 | 0.0000 | 19.4211 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 15.4736 | 15.4736 | 0.0000 | 0.0000 | 69.0528 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 96.4659 | 0.0000 | 3.5341 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 59.5023 | 28.9483 | 0.0000 | 11.5494 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 44.8431 | 55.1569 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 47.1264 | 52.8736 | 0.0000 | 0.0000 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 71.7554 | 0.0000 | 0.0000 | 28.2446 | 0.0000 |
| 1984 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 7.3897 | 13.0868 | 0.0000 | 29.3454 | 2.7410 | 3.4597 | 36.8766 | 7.1008 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 3 | 64.3301 | 35.6699 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 2 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 7 | 4.9113 | 33.6362 | 0.0000 |
| | 61.4525 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 16 | 0.0000 | 0.0000 | 21.2589 |
| | 78.7411 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 43 | 0.6274 | 0.1817 | 27.1075 |
| | 69.0188 | 3.0646 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 78 | 0.0000 | 0.0000 | 14.4384 |
| | 76.7545 | 8.8071 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 107 | 0.0000 | 0.0000 | 12.9545 |
| | 83.5932 | 3.4523 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 121 | 0.0000 | 0.0000 | 8.5546 |
| | 88.6021 | 2.5742 | 0.2690 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 124 | 0.0000 | 0.0000 | 3.9961 |
| | 89.7364 | 6.2003 | 0.0672 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 115 | 0.0000 | 0.0000 | 2.3387 |
| | 88.6879 | 6.4600 | 0.9930 | 1.5205 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 101 | 0.0000 | 0.0000 | 1.0296 |
| | 80.0792 | 9.9326 | 4.9880 | 3.9706 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 79 | 0.0000 | 0.0000 | 0.9827 |
| | 61.6474 | 10.3871 | 15.2938 | 11.6891 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 63 | 0.0000 | 0.0000 | 0.0000 |
| | 41.5022 | 24.1526 | 17.8557 | 16.1533 | 0.3363 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 58 | 0.0000 | 0.0000 | 0.0000 |
| | 29.5440 | 16.5183 | 17.8796 | 34.1454 | 1.9127 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 52 | 0.0000 | 0.0000 | 0.0000 |
| | 15.1122 | 13.5739 | 15.4814 | 50.7642 | 4.7016 | 0.0084 | 0.0000 | 0.3583 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 25 | 0.0000 | 0.0000 | 0.0000 |
| | 4.4790 | 24.6862 | 8.7998 | 54.3793 | 0.0000 | 5.1079 | 0.0000 | 2.5479 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 24 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 15.8630 | 66.9781 | 1.3128 | 4.1447 | 11.7015 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 16.1168 | 29.9989 | 38.7397 | 0.0000 | 5.4183 | 9.7263 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 9.0182 | 50.5774 | 20.5277 | 11.5148 | 0.0000 | 8.3619 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 39.8294 | 35.8073 | 18.3288 | 4.8177 | 1.2168 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 14.0538 | 0.0000 | 0.0000 | 67.0945 | 18.8517 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 6.6840 | 93.3160 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 10.4694 | 0.0000 | 51.1219 | 38.4087 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1985 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 5 | 79.8566 | 20.1434 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 8 | 83.6901 | 9.8684 | 0.0000 |
| | 0.0000 | 6.4415 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 19 | 74.7533 | 25.2467 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 22 | 89.5239 | 10.4761 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 49 | 89.2371 | 10.3292 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4337 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 41 | 93.1547 | 6.8453 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 42 | 89.9281 | 10.0719 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 40 | 76.5963 | 20.2151 | 2.2675 |
| | 0.0000 | 0.9210 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 39 | 53.4605 | 36.1108 | 4.3440 |
| | 2.3386 | 3.7462 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 36 | 21.6803 | 20.6794 | 7.9408 |
| | 0.0000 | 48.1011 | 1.5984 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 51 | 9.6723 | 12.4527 | 0.0000 |
| | 4.1529 | 71.8026 | 1.9195 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 85 | 1.4255 | 5.6884 | 4.2855 |
| | 9.6279 | 74.6979 | 4.0753 | 0.1994 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 114 | 0.0000 | 1.6172 | 1.3752 |
| | 6.3261 | 82.6503 | 7.4612 | 0.5700 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 119 | 0.0000 | 0.0000 | 1.3223 |
| | 7.5530 | 83.4591 | 7.3691 | 0.2965 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 110 | 0.0000 | 0.7320 | 0.0000 |
| | 3.8499 | 86.8785 | 6.1391 | 2.0014 | 0.3991 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 113 | 0.0000 | 0.0000 | 0.6440 |
| | 3.8806 | 79.3400 | 9.9877 | 4.3877 | 1.7600 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 105 | 0.0000 | 0.0000 | 0.0000 |
| | 3.9243 | 76.9395 | 9.6030 | 4.6696 | 4.8636 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 100 | 0.0000 | 0.0000 | 0.0000 |
| | 0.4966 | 68.6065 | 11.7330 | 8.6686 | 10.4954 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 83 | 0.0000 | 0.0000 | 0.8714 |
| | 0.5444 | 51.1067 | 17.3212 | 13.1685 | 15.3556 | 0.7044 | 0.9279 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 67 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 41.5502 | 14.6979 | 17.0642 | 23.4513 | 1.8469 | 1.3895 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 77 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 24.5191 | 12.6599 | 19.1573 | 38.1992 | 3.4464 | 1.2981 | 0.0000 | 0.7199 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 59 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 21.6392 | 15.0053 | 8.9895 | 41.7254 | 3.7693 | 3.6423 | 1.4189 | 2.4577 | 0.5267 | 0.8258 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 51 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 8.6797 | 6.4045 | 11.4791 | 42.7597 | 13.7679 | 8.0785 | 5.6347 | 3.1959 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 52 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 13.1925 | 13.7496 | 14.7707 | 29.9679 | 7.4141 | 3.7755 | 7.6056 | 9.5241 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 44 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.6336 | 3.2021 | 3.6180 | 41.1576 | 13.4444 | 20.5030 | 3.5862 | 7.2464 | 0.0000 | 1.6086 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 7.1960 | 9.6880 | 10.1454 | 28.8542 | 18.6082 | 7.9177 | 4.3929 | 13.1976 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 31 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 4.8734 | 26.4515 | 8.0357 | 8.0385 | 21.7640 | 19.9697 | 6.1252 | 4.7419 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 24 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 3.3165 | 0.0000 | 10.9305 | 23.5946 | 10.3422 | 15.5300 | 0.6608 | 32.6068 | 3.0187 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 13.1401 | 10.2176 | 54.2485 | 4.4825 | 17.9113 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 13.3719 | 6.7462 | 24.4385 | 0.0000 | 36.7310 | 0.0000 | 18.7125 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 19.1540 | 0.0000 | 0.0000 | 45.0539 | 33.5117 | 0.0000 | 0.0000 | 2.2805 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 59.7499 | 8.1390 | 0.0000 | 0.0000 | 9.8383 | 0.0000 | 22.2728 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 13.0566 | 28.4455 | 0.0000 | 28.3271 | 30.1708 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.4723 | 33.0795 | 0.0000 | 52.4482 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 28.2930 | 17.9409 | 14.1465 | 26.8878 | 0.0000 | 12.7319 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 38.4089 | 5.6215 | 25.3539 | 0.0000 | 30.6157 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.2497 | 0.0000 | 0.0000 | 0.0000 | 5.2497 | 10.3457 | 15.6332 | 51.8557 | 0.0000 | 11.6660 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 6.0976 | 34.7513 | 0.0000 | 16.6121 | 42.5390 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 14.2360 | 0.0000 | 0.0000 | 14.2360 | 0.0000 | 71.5281 | 0.0000 | 0.0000 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 54.2903 | 0.0000 | 45.7097 |
| 1986 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 25 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.7402 | 40.4089 | 6.7456 | 14.1188 | 14.9227 | 13.2540 | 3.9421 | 5.8676 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 3 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 6 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 16 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 29 | 0.0000 | 98.1283 | 1.8717 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 60 | 0.0000 | 96.1174 | 3.8826 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 79 | 0.0000 | 90.0349 | 7.3710 |
| | 1.1767 | 0.0000 | 1.4175 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 88 | 0.0000 | 91.1857 | 4.7598 |
| | 0.0000 | 1.7440 | 2.3105 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 97 | 0.0000 | 82.5668 | 2.0659 |
| | 0.9359 | 0.0000 | 14.4314 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 104 | 0.0000 | 76.0266 | 3.8518 |
| | 0.0000 | 0.4346 | 18.2850 | 0.2111 | 1.1908 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 112 | 0.0000 | 50.4828 | 1.4985 |
| | 0.8185 | 3.1888 | 41.6599 | 2.3515 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 121 | 0.0000 | 27.4293 | 2.0092 |
| | 1.2266 | 0.7679 | 65.5771 | 2.4130 | 0.0000 | 0.5769 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 117 | 0.0000 | 7.1609 | 4.1659 |
| | 0.4112 | 0.4397 | 82.6755 | 3.5132 | 0.0000 | 1.6336 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 113 | 0.0000 | 1.3157 | 0.3105 |
| | 0.3188 | 1.5064 | 85.7803 | 4.1394 | 2.4675 | 4.1613 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 106 | 0.0000 | 0.1365 | 0.5715 |
| | 1.2739 | 7.3326 | 78.1265 | 7.1840 | 1.2915 | 3.9818 | 0.0000 | 0.0000 | 0.0000 | 0.1018 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 102 | 0.0000 | 0.0000 | 0.0000 |
| | 0.5094 | 0.1591 | 73.5867 | 12.0191 | 1.7214 | 12.0043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 92 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.2076 | 73.5537 | 3.3686 | 3.5945 | 18.2291 | 0.4786 | 0.0000 | 0.0000 | 0.0000 | 0.5677 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 83 | 0.0000 | 0.4022 | 0.0000 |
| | 0.0000 | 1.2110 | 66.7604 | 8.2347 | 1.1395 | 21.0149 | 0.0000 | 0.0000 | 0.0000 | 1.2373 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 59 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.1798 | 56.5002 | 4.2715 | 2.6351 | 31.1788 | 0.9282 | 0.0000 | 0.0000 | 3.3063 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 40 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 34.9739 | 7.7517 | 6.6204 | 36.6074 | 3.5650 | 1.6169 | 0.0000 | 8.8646 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 31 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 36.4833 | 2.6128 | 0.9142 | 50.5027 | 4.0300 | 0.0000 | 0.0000 | 5.4570 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 7.7880 | 3.8474 | 1.6867 | 62.3238 | 0.0000 | 4.5389 | 0.0000 | 19.8152 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 34.1487 | 0.0000 | 0.0000 | 45.5263 | 0.0000 | 0.0000 | 0.0000 | 20.3250 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 15.9635 | 3.5058 | 0.0000 | 0.0000 | 57.7202 | 0.0000 | 0.0000 | 9.2357 | 13.5749 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 9.1305 | 0.0000 | 30.2598 | 14.3467 | 0.0000 | 13.7319 | 16.6179 | 15.9132 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 11.2693 | 0.0000 | 61.9778 | 0.0000 | 17.2858 | 0.0000 | 0.0000 | 0.0000 | 9.4670 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 20.7264 | 20.2344 | 0.0000 | 0.0000 | 0.0000 | 29.5196 | 29.5196 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 77.9273 | 22.0727 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 14.0328 | 0.0000 | 67.1183 | 0.0000 | 0.0000 | 0.0000 | 18.8489 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 27.2156 | 0.0000 | 0.0000 | 0.0000 | 22.0961 | 50.6882 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 43.3014 | 35.4391 | 0.0000 | 3.5748 | 8.6902 | 8.9945 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 24.3006 | 75.6994 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 35.0574 | 0.0000 | 39.2052 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 25.7374 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 43.4906 | 0.0000 | 0.0000 | 0.0000 | 56.5094 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 24.0588 | 43.1656 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 32.7756 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1987 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 16.3926 | 0.0000 | 0.0000 | 59.9522 | 23.6551 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 2 | 49.3047 | 50.6953 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 3 | 47.9261 | 0.0000 | 52.0739 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 3 | 33.9806 | 31.9165 | 34.1030 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 15 | 6.7925 | 6.8787 | 75.3061 |
| | 11.0228 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 56 | 2.1723 | 2.3924 | 93.1697 |
| | 0.0000 | 0.0000 | 0.0000 | 2.2656 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 101 | 0.4201 | 1.3656 | 95.2958 |
| | 2.3197 | 0.0000 | 0.0000 | 0.5988 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 129 | 0.0000 | 0.7022 | 93.0741 |
| | 3.5850 | 0.3544 | 0.4435 | 1.8408 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 141 | 0.0000 | 0.3767 | 92.5575 |
| | 4.1854 | 0.6426 | 0.0000 | 2.2378 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 141 | 0.0000 | 0.1720 | 90.5202 |
| | 2.8664 | 0.1871 | 0.0000 | 5.6962 | 0.5579 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 145 | 0.0000 | 0.0000 | 70.4158 |
| | 3.0278 | 0.4007 | 0.7600 | 24.4605 | 0.0000 | 0.0000 | 0.9351 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 153 | 0.0000 | 0.0000 | 50.6472 |
| | 1.0389 | 0.9212 | 0.8442 | 42.7893 | 2.6975 | 0.0000 | 1.0616 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 152 | 0.0000 | 0.0000 | 18.5628 |
| | 1.2500 | 0.4121 | 1.5135 | 71.7940 | 3.3787 | 0.3518 | 2.7371 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 150 | 0.0000 | 0.0000 | 14.3538 |
| | 1.0310 | 0.2501 | 2.7423 | 74.2662 | 3.0107 | 0.4768 | 3.8692 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 137 | 0.0000 | 0.0000 | 7.4801 |
| | 1.3008 | 1.6306 | 1.3168 | 78.7411 | 3.4739 | 0.0000 | 6.0568 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 123 | 0.0000 | 0.0000 | 4.7561 |
| | 0.3408 | 0.0000 | 2.1412 | 77.9720 | 7.9713 | 1.1722 | 5.2384 | 0.0000 | 0.4080 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 81 | 0.0000 | 0.0000 | 4.2479 |
| | 0.0000 | 6.4888 | 0.3770 | 55.5970 | 4.8394 | 3.9969 | 22.3469 | 0.6900 | 0.0000 | 0.0000 | 1.4160 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 68 | 0.0000 | 0.0000 | 2.1362 |
| | 0.0000 | 0.0000 | 0.7831 | 40.0842 | 5.1174 | 2.4358 | 47.6989 | 0.7359 | 0.0000 | 0.0000 | 1.0086 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 45 | 0.0000 | 0.0000 | 0.5088 |
| | 0.0000 | 1.3222 | 2.3418 | 45.5029 | 2.4559 | 0.0000 | 32.6000 | 0.0000 | 0.0000 | 0.0000 | 15.2684 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 34 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 43.6072 | 2.8107 | 10.7474 | 34.4103 | 0.0000 | 0.0000 | 0.0000 | 8.4243 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 41.2632 | 6.4782 | 0.0000 | 44.9041 | 3.3008 | 0.0000 | 0.0000 | 4.0536 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 7.1332 | 10.5395 | 0.0000 | 58.7733 | 0.0000 | 0.0000 | 0.0000 | 23.5540 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 9.7454 | 26.5794 | 0.0000 | 37.3254 | 0.0000 | 0.0000 | 0.0000 | 26.3498 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 12.9109 | 0.0000 | 0.0000 | 14.3157 | 0.0000 | 0.0000 | 0.0000 | 72.7733 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 21.7848 | 9.6980 | 0.0000 | 52.8390 | 0.0000 | 0.0000 | 0.0000 | 15.6781 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 12.7818 | 0.0000 | 0.0000 | 32.3356 | 0.0000 | 28.6812 | 0.0000 | 26.2013 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 83.0147 | 16.9853 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 36.0329 | 0.0000 | 0.0000 | 63.9671 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 9.7067 | 0.0000 | 0.0000 | 77.6329 | 0.0000 | 0.0000 | 0.0000 | 12.6604 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 35.8339 | 0.0000 | 0.0000 | 39.8693 | 0.0000 | 0.0000 | 0.0000 | 24.2968 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 33.1898 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 66.8102 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 32.2114 | 0.0000 | 0.0000 | 0.0000 | 67.7886 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 11.8259 | 0.0000 | 0.0000 | 0.0000 | 88.1741 |
| 1988 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.6938 | 1.2287 | 1.6696 | 0.0000 | 9.2723 | 0.0000 | 0.0000 | 0.0000 | 86.1356 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 9 | 97.4174 | 2.5826 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 15 | 64.1043 | 35.8957 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 15 | 81.1424 | 18.8576 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 8 | 82.7925 | 17.2075 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 10 | 38.2796 | 33.1207 | 28.5997 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 13 | 35.5929 | 64.4071 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 9 | 17.5138 | 48.8306 | 27.9583 |
| | 5.6973 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 17 | 0.0000 | 24.1292 | 16.9542 |
| | 58.9166 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 40 | 0.0000 | 26.8243 | 7.8609 |
| | 62.4183 | 1.1333 | 1.7632 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 79 | 0.0000 | 9.7324 | 6.0560 |
| | 79.2379 | 3.0442 | 0.0000 | 0.0000 | 1.9295 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 120 | 0.0000 | 3.3641 | 2.4961 |
| | 89.6237 | 2.6904 | 0.3961 | 0.1649 | 1.0535 | 0.2113 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 129 | 0.0000 | 0.6006 | 0.7049 |
| | 89.4514 | 3.8274 | 0.0000 | 0.0000 | 5.2295 | 0.0000 | 0.1861 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 125 | 0.0000 | 0.5319 | 1.0709 |
| | 88.7400 | 0.3393 | 0.0000 | 0.0000 | 9.3179 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 127 | 0.0000 | 0.0000 | 0.2422 |
| | 74.4399 | 0.6471 | 0.7907 | 0.0000 | 22.3372 | 1.3118 | 0.0000 | 0.2310 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 125 | 0.0000 | 0.0000 | 0.0000 |
| | 57.8548 | 0.6671 | 0.8998 | 1.8530 | 35.7317 | 2.6476 | 0.3460 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 130 | 0.0000 | 0.0000 | 0.0000 |
| | 37.5479 | 1.5665 | 1.2881 | 1.1599 | 54.2024 | 3.5063 | 0.2963 | 0.4328 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 133 | 0.0000 | 0.0000 | 0.0000 |
| | 20.7381 | 2.3105 | 0.2847 | 1.0646 | 72.9754 | 2.5274 | 0.0000 | 0.0994 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 118 | 0.0000 | 0.0000 | 0.3832 |
| | 11.4689 | 2.1330 | 0.3524 | 2.0825 | 74.0360 | 2.7625 | 1.7191 | 5.0624 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 98 | 0.0000 | 0.0000 | 0.0000 |
| | 11.9400 | 0.0000 | 1.1722 | 1.2339 | 77.8667 | 3.9550 | 0.0000 | 3.5785 | 0.0000 | 0.2538 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 74 | 0.0000 | 0.0000 | 0.0000 |
| | 5.1102 | 2.4776 | 1.6346 | 2.4771 | 67.8919 | 4.1948 | 1.5683 | 14.6456 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 49 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.9520 | 0.0000 | 68.7447 | 5.3707 | 1.1655 | 21.1990 | 0.0000 | 0.0000 | 2.5680 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 40 | 0.0000 | 0.0000 | 0.0000 |
| | 5.9379 | 0.0000 | 0.0000 | 2.2853 | 70.3585 | 1.4401 | 0.0000 | 19.9782 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 35 | 0.0000 | 0.0000 | 0.0000 |
| | 2.1892 | 0.0000 | 0.0000 | 0.0000 | 54.2439 | 6.6813 | 0.0000 | 28.2517 | 1.6134 | 3.1183 | 3.9022 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 1.7801 | 3.0672 | 0.0000 | 0.0000 | 40.3566 | 2.0244 | 1.7097 | 39.3937 | 0.0000 | 0.0000 | 11.6682 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 38.5749 | 11.0301 | 12.2927 | 7.6330 | 0.0000 | 0.0000 | 30.4693 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 17.1644 | 4.8358 | 3.3034 | 71.9674 | 0.0000 | 0.0000 | 2.7291 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.7933 | 0.0000 | 0.0000 | 49.2067 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 12.6550 | 0.0000 | 0.0000 | 84.1191 | 0.0000 | 3.2259 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 57.5048 | 0.0000 | 0.0000 | 33.9821 | 0.0000 | 8.5131 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 27.9965 | 0.0000 | 17.1511 | 0.0000 | 0.0000 | 54.8524 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 26.8743 | 0.0000 | 0.0000 | 73.1257 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 61.4582 | 38.5418 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 81.0710 | 0.0000 | 0.0000 | 18.9290 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 35.4854 | 15.1459 | 0.0000 | 49.3687 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 23.6416 | 0.0000 | 76.3584 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 6 | 74.4498 | 25.5502 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 5 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 15 | 39.7679 | 60.2321 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 22 | 69.8663 | 30.1337 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 24 | 58.5052 | 41.2060 | 0.0000 |
| | 0.0000 | 0.2888 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 45 | 42.5282 | 54.2964 | 0.4260 |
| | 0.0000 | 2.7494 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 51 | 22.8499 | 75.6424 | 1.5078 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 76 | 28.5334 | 66.0324 | 4.9863 |
| | 0.0000 | 0.4479 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 84 | 6.6429 | 87.6006 | 2.0306 |
| | 0.0000 | 3.6343 | 0.0000 | 0.0000 | 0.0000 | 0.0915 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 94 | 8.1240 | 80.6478 | 8.5557 |
| | 0.0000 | 2.2535 | 0.0000 | 0.0000 | 0.0000 | 0.4189 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 98 | 1.7418 | 89.1505 | 5.8769 |
| | 0.1818 | 2.8646 | 0.0000 | 0.0000 | 0.0000 | 0.1844 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 104 | 0.7436 | 83.9361 | 5.3355 |
| | 0.0000 | 9.3772 | 0.0000 | 0.0000 | 0.0000 | 0.6076 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 95 | 0.0000 | 70.9688 | 8.4012 |
| | 0.9682 | 17.5767 | 0.0000 | 0.0000 | 0.4891 | 1.5961 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 96 | 0.0000 | 40.4456 | 5.0713 |
| | 2.1224 | 47.3206 | 0.5266 | 0.0000 | 0.0000 | 4.5134 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 93 | 0.0000 | 10.5464 | 4.0038 |
| | 0.0000 | 76.3268 | 0.5549 | 0.0000 | 0.0000 | 8.1939 | 0.0000 | 0.0000 | 0.3742 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 91 | 0.0000 | 2.6623 | 4.3916 |
| | 0.0000 | 67.5856 | 0.0000 | 1.1065 | 0.0000 | 24.2539 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 82 | 0.0000 | 1.2109 | 1.3166 |
| | 1.1638 | 60.1754 | 2.5417 | 0.6501 | 1.2363 | 30.8318 | 0.5411 | 0.0000 | 0.3323 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 88 | 0.0000 | 0.0000 | 0.5037 |
| | 0.9924 | 55.9146 | 0.6217 | 0.0000 | 0.0000 | 41.9676 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 82 | 0.0000 | 0.0000 | 0.0000 |
| | 2.0396 | 43.6282 | 1.1237 | 0.0000 | 0.6080 | 50.8622 | 0.0000 | 0.0000 | 1.7384 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 84 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 30.3357 | 1.2149 | 1.3454 | 0.0000 | 61.2557 | 0.0000 | 0.0000 | 5.8483 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 73 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 27.4868 | 1.2105 | 0.0000 | 1.6292 | 58.6335 | 1.1079 | 0.0000 | 8.9645 | 0.0000 | 0.9676 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 72 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 26.3777 | 1.0060 | 0.0000 | 0.0000 | 62.4260 | 2.2647 | 0.0000 | 7.9257 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 74 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 11.7882 | 0.0000 | 0.0000 | 0.0000 | 78.3868 | 0.0000 | 0.0000 | 9.0574 | 0.0000 | 0.7675 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 58 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 3.3758 | 0.0000 | 0.0000 | 0.0000 | 79.7810 | 1.4183 | 0.0000 | 15.4249 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 43 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.7269 | 0.0000 | 0.0000 | 0.0000 | 65.7163 | 0.0000 | 0.0000 | 29.3400 | 0.0000 | 4.2168 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 34 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.7457 | 0.0000 | 0.0000 | 0.0000 | 67.7015 | 0.0000 | 0.0000 | 26.9935 | 0.0000 | 2.5592 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.9625 | 0.0000 | 0.0000 | 0.0000 | 74.0819 | 0.0000 | 0.0000 | 24.9557 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.8944 | 0.0000 | 0.0000 | 0.0000 | 26.0940 | 0.0000 | 0.0000 | 58.0994 | 0.0000 | 12.9122 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1990 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 61.7954 | 5.4345 | 0.0000 | 29.5756 | 0.0000 | 3.1946 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 69.4089 | 4.8251 | 0.0000 | 4.4069 | 0.0000 | 21.3591 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 77.0070 | 0.0000 | 0.0000 | 22.9930 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 4.5790 | 0.0000 | 39.9597 | 0.0000 | 0.0000 | 42.4391 | 0.0000 | 13.0222 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 59.6779 | 0.0000 | 0.0000 | 38.6645 | 0.0000 | 1.6576 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 84.5512 | 0.0000 | 0.0000 | 3.3079 | 0.0000 | 12.1409 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 15.7061 | 0.0000 | 0.0000 | 78.2723 | 0.0000 | 6.0216 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 32.2182 | 0.0000 | 0.0000 | 67.7818 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 39.7351 | 0.0000 | 0.0000 | 60.2649 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 32.1412 | 0.0000 | 0.0000 | 37.9510 | 0.0000 | 29.9079 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0050 | 0.0000 | 0.0000 | 49.9950 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 72.8901 | 0.0000 | 0.0000 | 25.1520 | 0.0000 | 1.9580 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 53.9747 | 0.0000 | 0.0000 | 46.0253 | 0.0000 | 0.0000 |
| 1990 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 35.1996 | 0.0000 | 1.3861 | 56.8876 | 0.0000 | 6.5267 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 3 | 3 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 4 | 4 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 5 | 45.8755 | 54.1245 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 13 | 22.7079 | 77.2921 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 23 | 23.8547 | 64.1375 | 12.0078 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 32 | 14.8478 | 70.4181 | 13.3928 |
| | 1.3413 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 33 | 0.0000 | 71.3779 | 28.0055 |
| | 0.6166 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 39 | 0.0000 | 77.4678 | 22.5322 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 38 | 0.0000 | 70.0557 | 29.9443 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 47 | 0.0000 | 53.7325 | 43.4672 |
| | 2.6014 | 0.0000 | 0.0000 | 0.1989 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 54 | 0.1995 | 34.9188 | 54.7285 |
| | 10.1531 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 63 | 0.0000 | 23.3704 | 63.2448 |
| | 3.1263 | 0.0000 | 9.4313 | 0.0000 | 0.0000 | 0.0000 | 0.8272 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 66 | 0.0000 | 7.0144 | 60.1485 |
| | 7.1450 | 7.0200 | 12.2489 | 0.0000 | 0.0000 | 0.0000 | 6.4231 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 66 | 0.0000 | 4.3115 | 47.7741 |
| | 9.1369 | 2.4553 | 32.9924 | 1.3137 | 0.0000 | 0.0000 | 2.0161 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 62 | 0.0000 | 0.5577 | 32.6432 |
| | 6.8459 | 0.1775 | 49.6695 | 1.6136 | 0.2331 | 0.7777 | 6.5496 | 0.8283 | 0.0000 | 0.1039 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 61 | 0.0000 | 0.1792 | 14.2372 |
| | 3.6810 | 0.0000 | 67.8558 | 0.1048 | 0.0000 | 0.1960 | 12.5834 | 1.1624 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 61 | 0.0000 | 0.0000 | 8.0402 |
| | 6.4853 | 0.3773 | 61.8957 | 7.0249 | 1.0051 | 0.0000 | 14.2529 | 0.9186 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 55 | 0.0000 | 0.0000 | 0.8436 |
| | 2.3421 | 6.8502 | 58.6250 | 1.9811 | 0.6212 | 0.8350 | 23.3137 | 0.6376 | 0.0000 | 3.9505 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 56 | 0.0000 | 0.0000 | 0.3924 |
| | 0.0000 | 0.0000 | 53.2805 | 2.0030 | 0.1970 | 0.0000 | 42.8077 | 0.0000 | 0.0000 | 1.3194 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 49 | 0.0000 | 0.0000 | 0.0000 |
| | 1.8393 | 0.3186 | 46.3029 | 1.7313 | 0.0000 | 0.0000 | 46.0219 | 0.4904 | 0.0000 | 3.2957 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 40 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 18.3955 | 5.1803 | 0.0000 | 0.0000 | 66.0616 | 2.4929 | 0.0000 | 7.8697 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 41.6237 | 0.0000 | 0.0000 | 0.0000 | 39.0709 | 2.9095 | 0.0000 | 16.3958 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 8.0788 | 0.0000 | 0.0000 | 59.7357 | 0.0000 | 0.0000 | 32.1856 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 12.5354 | 0.0000 | 0.0000 | 0.0000 | 18.5285 | 0.0000 | 0.0000 | 68.9361 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 48.0201 | 0.0000 | 0.0000 | 0.0000 | 19.4043 | 11.9351 | 0.0000 | 0.0000 | 20.6406 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 21.4936 | 10.4409 | 0.0000 | 0.0000 | 11.7785 | 0.0000 | 0.0000 | 56.2870 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 18.0284 | 0.0000 | 0.0000 | 0.0000 | 81.9716 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 40.7365 | 0.0000 | 0.0000 | 0.0000 | 4.0266 | 0.0000 | 0.0000 | 14.5005 | 40.7365 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 22.2049 | 0.0000 | 0.0000 | 77.7951 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 56.5367 | 0.0000 | 0.0000 | 43.4633 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 7.4359 | 0.0000 | 0.0000 | 80.6159 | 0.0000 | 0.0000 | 11.9482 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 73.2835 | 0.0000 | 0.0000 | 26.7165 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 35.4399 | 0.0000 | 0.0000 | 0.0000 | 37.6933 | 0.0000 | 0.0000 | 26.8668 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 56.8152 | 0.0000 | 14.3949 | 14.3949 | 0.0000 | 0.0000 | 0.0000 | 14.3949 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 45.8863 | 0.0000 | 0.0000 | 5.5641 | 0.0000 | 0.0000 | 48.5497 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 22.7312 | 0.0000 | 0.0000 | 77.2688 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 63.5060 | 0.0000 | 0.0000 | 0.0000 | 36.4940 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1991 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 9 | 10.6243 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 32.9633 | 0.0000 | 0.0000 | 38.2138 | 18.1986 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 5 | 80.0526 | 19.9474 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 6 | 78.0717 | 21.9283 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 8 | 87.4689 | 12.5311 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 6 | 65.8829 | 34.1171 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 6 | 65.8412 | 34.1588 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 7 | 92.0365 | 7.9635 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 7 | 77.4341 | 22.5659 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 11 | 64.4254 | 33.8068 | 1.7677 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 28 | 21.9802 | 47.4372 | 22.2656 |
| | 8.3170 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 26 | 12.6466 | 34.5625 | 47.3775 |
| | 5.4134 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 61 | 0.1913 | 16.8893 | 55.7853 |
| | 27.1341 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 75 | 0.4866 | 12.9790 | 41.2705 |
| | 42.0436 | 2.9303 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.2900 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 89 | 0.0000 | 14.4253 | 45.5749 |
| | 33.9861 | 2.2032 | 0.0000 | 3.8105 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 105 | 0.0000 | 3.4905 | 47.8637 |
| | 37.7496 | 0.9869 | 0.0000 | 6.6756 | 0.4863 | 0.0000 | 0.0000 | 2.7473 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 108 | 0.0000 | 0.7646 | 28.7053 |
| | 49.5784 | 3.8657 | 1.2981 | 14.1082 | 0.0000 | 0.0000 | 0.0000 | 1.5073 | 0.0000 | 0.1724 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 108 | 0.0000 | 1.0271 | 23.7073 |
| | 38.8246 | 3.2166 | 1.6224 | 27.1034 | 0.5531 | 0.3934 | 0.0000 | 3.5520 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 107 | 0.0000 | 0.3178 | 8.0179 |
| | 33.9183 | 2.2067 | 3.1949 | 43.4160 | 0.7735 | 0.3446 | 0.5874 | 7.2229 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 107 | 0.0000 | 0.2152 | 1.8064 |
| | 22.4610 | 3.9025 | 3.6665 | 46.9674 | 2.4033 | 0.3595 | 1.4145 | 16.1193 | 0.0000 | 0.0000 | 0.6844 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 111 | 0.0000 | 0.0000 | 2.0973 |
| | 16.8221 | 3.1321 | 0.7458 | 54.3894 | 1.2622 | 0.0000 | 0.0000 | 21.2140 | 0.0000 | 0.0000 | 0.3370 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 103 | 0.0000 | 0.0000 | 1.6810 |
| | 8.8064 | 3.2057 | 4.3395 | 52.3270 | 2.0593 | 0.5850 | 0.0000 | 26.9962 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 93 | 0.0000 | 0.0000 | 0.0000 |
| | 10.3069 | 0.4116 | 1.0332 | 58.4063 | 2.1180 | 0.3432 | 0.0000 | 25.4214 | 0.4159 | 0.0000 | 1.5435 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 78 | 0.0000 | 0.0000 | 0.0000 |
| | 6.3232 | 3.1591 | 1.7658 | 49.1488 | 2.3060 | 0.0000 | 0.0000 | 32.3243 | 1.3580 | 0.0000 | 3.6147 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 61 | 0.0000 | 0.0000 | 0.7884 |
| | 0.9574 | 1.0303 | 0.0000 | 43.2842 | 0.3321 | 0.0000 | 0.0000 | 48.6143 | 1.9869 | 0.0000 | 3.0062 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 41 | 0.0000 | 0.0000 | 0.0000 |
| | 1.1235 | 0.6339 | 0.0000 | 34.0394 | 0.0000 | 0.0000 | 0.0000 | 32.7681 | 6.0185 | 0.0000 | 25.4166 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 35 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.8325 | 0.0000 | 48.1492 | 2.8822 | 0.0000 | 0.4464 | 42.3703 | 3.0855 | 0.0000 | 2.2339 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 30.8000 | 0.0000 | 0.0000 | 0.0000 | 47.4970 | 0.6879 | 0.9017 | 20.1133 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 57.1955 | 0.0000 | 2.0268 | 0.0000 | 30.1436 | 0.0000 | 0.0000 | 10.6341 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 27.4367 | 0.0000 | 0.0000 | 0.9081 | 49.5406 | 0.0000 | 0.0000 | 22.1146 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 24.8579 | 0.0000 | 0.0000 | 27.6942 | 43.2585 | 0.0000 | 0.0000 | 4.1893 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 9.0576 | 0.0000 | 0.0000 | 0.0000 | 79.8329 | 0.0000 | 0.0000 | 11.1095 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 36.4391 | 0.0000 | 0.0000 | 0.0000 | 42.8326 | 6.6770 | 0.0000 | 14.0513 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 15.5506 | 0.0000 | 0.0000 | 0.0000 | 55.9180 | 14.4791 | 0.0000 | 14.0522 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 66.2050 | 0.0000 | 0.0000 | 33.7950 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 81.3496 | 0.0000 | 0.0000 | 18.6504 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 12.7306 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 87.2694 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 49.2229 | 0.0000 | 0.0000 | 0.0000 | 50.7771 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 89.9515 | 0.0000 | 0.0000 | 10.0485 |
| 1992 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.2355 | 0.0000 | 0.0000 | 12.7720 | 6.4200 | 0.0000 | 78.5724 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 5 | 92.6781 | 7.3219 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 5 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 6 | 12.8531 | 87.1469 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 20 | 1.8715 | 95.5066 | 2.6219 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 39 | 2.3266 | 93.8678 | 0.4176 |
| | 3.3880 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 50 | 2.0361 | 84.0014 | 13.3071 |
| | 0.6554 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 59 | 0.0000 | 87.8246 | 3.0094 |
| | 8.7276 | 0.0000 | 0.0000 | 0.0000 | 0.4384 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 63 | 0.0000 | 92.0633 | 4.8787 |
| | 2.5777 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4802 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 59 | 0.0000 | 73.7118 | 9.4365 |
| | 15.8211 | 1.0307 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 49 | 0.0000 | 48.3175 | 11.0798 |
| | 26.3466 | 14.2561 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 67 | 0.0000 | 11.2755 | 11.8321 |
| | 49.1721 | 22.9876 | 0.0000 | 0.0000 | 3.7373 | 0.0000 | 0.0000 | 0.0000 | 0.9955 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 77 | 0.0000 | 3.8255 | 6.1879 |
| | 36.8128 | 33.5886 | 6.6681 | 4.8501 | 7.7036 | 0.0000 | 0.0000 | 0.0000 | 0.3636 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 86 | 0.0000 | 0.5204 | 0.8395 |
| | 27.6733 | 44.8379 | 2.5921 | 0.4455 | 17.3188 | 0.0000 | 0.0000 | 0.0000 | 5.4158 | 0.0000 | 0.3567 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 87 | 0.0000 | 0.4109 | 1.2636 |
| | 23.8779 | 27.9048 | 1.7050 | 4.4013 | 31.7483 | 0.2784 | 0.0000 | 0.0947 | 7.6167 | 0.0000 | 0.6984 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 85 | 0.0000 | 0.0000 | 0.0000 |
| | 11.9293 | 28.5800 | 0.5543 | 1.0394 | 44.2856 | 1.5045 | 0.5602 | 0.0000 | 9.7262 | 0.0000 | 1.8204 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 79 | 0.0000 | 0.0000 | 0.0000 |
| | 3.8746 | 22.6223 | 0.6754 | 0.3759 | 56.2774 | 7.3891 | 0.0000 | 0.0000 | 8.7852 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 78 | 0.0000 | 0.0000 | 0.0000 |
| | 1.7799 | 18.6776 | 2.2581 | 1.0163 | 53.2442 | 0.0000 | 0.0000 | 0.0000 | 21.1804 | 0.0000 | 1.8435 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 59 | 0.0000 | 0.0000 | 0.0000 |
| | 1.3016 | 2.6474 | 5.0208 | 0.0000 | 53.5027 | 1.1477 | 0.0000 | 0.0000 | 36.3798 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 37 | 0.0000 | 0.0000 | 0.0000 |
| | 1.6181 | 10.3936 | 0.0000 | 0.0000 | 49.3519 | 0.0000 | 0.0000 | 0.0000 | 36.0297 | 0.0000 | 2.6068 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 26 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.0356 | 0.0000 | 49.1262 | 8.1290 | 0.0000 | 0.0000 | 40.4265 | 0.0000 | 1.2827 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 35.7829 | 0.0000 | 0.0000 | 0.0000 | 54.4858 | 0.0000 | 9.7313 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.8681 | 0.0000 | 0.0000 | 10.0785 | 0.0000 | 8.1368 | 66.9167 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 30.1381 | 0.0000 | 0.0000 | 0.0000 | 69.8619 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 65.7053 | 0.0000 | 7.6896 | 0.0000 | 10.4486 | 0.0000 | 16.1565 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 75.8340 | 0.0000 | 0.0000 | 0.0000 | 24.1660 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 38.2071 | 0.0000 | 0.0000 | 30.8965 | 30.8965 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 3 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 9 | 0.0000 | 67.0652 | 32.9348 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 20 | 0.0000 | 49.0817 | 50.9183 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 50 | 1.8680 | 48.6707 | 47.0787 |
| | 2.3826 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 78 | 0.0000 | 15.1851 | 80.2214 |
| | 1.7943 | 2.4395 | 0.3597 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 92 | 0.0000 | 7.4672 | 81.4237 |
| | 2.4783 | 6.7482 | 1.8826 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 101 | 0.0000 | 2.2666 | 79.6364 |
| | 3.2295 | 12.6035 | 2.2640 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 110 | 0.0000 | 0.1925 | 67.5244 |
| | 0.4179 | 17.5069 | 12.0614 | 0.0000 | 0.0000 | 1.1983 | 0.0000 | 0.0000 | 0.0000 | 1.0985 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1994 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 119 | 0.0000 | 0.7053 | 34.7015 |
| | 1.1278 | 33.2490 | 22.2028 | 0.0000 | 0.0000 | 6.0003 | 0.0000 | 0.0000 | 0.0000 | 2.0131 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 137 | 0.0000 | 0.0000 | 17.3120 |
| | 1.5657 | 29.6653 | 33.2830 | 0.0000 | 0.0000 | 16.9740 | 0.0000 | 0.3196 | 0.0000 | 0.4824 | 0.3980 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 137 | 0.0000 | 0.3011 | 4.5976 |
| | 1.0668 | 23.0907 | 37.0423 | 0.1912 | 1.7357 | 28.9353 | 0.0000 | 0.0802 | 0.0000 | 2.8166 | 0.1426 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 137 | 0.0000 | 0.0000 | 1.2714 |
| | 0.5974 | 21.1297 | 34.7632 | 0.6325 | 0.8620 | 30.5817 | 0.4105 | 0.6265 | 0.0000 | 8.9734 | 0.1516 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 132 | 0.0000 | 0.0000 | 3.1579 |
| | 0.0000 | 11.8576 | 36.3994 | 0.6855 | 0.2132 | 38.4685 | 0.2357 | 0.0000 | 0.0000 | 8.2000 | 0.7822 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 129 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.7130 | 24.4473 | 2.3976 | 0.3604 | 54.2546 | 0.0000 | 1.0564 | 0.0000 | 9.6954 | 2.0752 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 119 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.3652 | 22.6783 | 0.9316 | 0.0000 | 45.0842 | 0.0000 | 0.2567 | 0.0000 | 27.7171 | 2.9669 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 81 | 0.0000 | 0.0000 | 0.9535 |
| | 0.0000 | 2.6385 | 24.3381 | 4.2003 | 1.1585 | 43.4636 | 0.0000 | 3.4730 | 0.6564 | 16.6180 | 2.5002 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 47 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.1444 | 19.6826 | 0.0000 | 0.0000 | 56.1426 | 0.0000 | 3.6309 | 0.0000 | 19.0465 | 0.3531 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 30 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 6.8912 | 5.3691 | 0.0000 | 0.0000 | 47.7638 | 0.0000 | 0.0000 | 0.0000 | 32.3602 | 7.6157 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 4.4743 | 0.0000 | 0.0000 | 80.0104 | 0.0000 | 0.0000 | 1.7563 | 13.7590 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 6.4833 | 16.5006 | 0.0000 | 70.7904 | 0.0000 | 0.0000 | 0.0000 | 6.2257 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 57.4999 | 0.0000 | 12.5099 | 0.0000 | 29.5010 | 0.4892 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 12.0634 | 0.0000 | 0.0000 | 87.9366 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 15.2486 | 0.0000 | 0.0000 | 72.0846 | 0.0000 | 0.0000 | 0.0000 | 12.6668 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 28.2282 | 0.0000 | 0.0000 | 14.9682 | 0.0000 | 0.0000 | 0.0000 | 41.1625 | 15.6411 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 82.0092 | 0.0000 | 0.0000 | 0.0000 | 17.9908 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 40.7924 | 0.0000 | 0.0000 | 0.0000 | 59.2076 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1994 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 81.4970 | 18.5030 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 2 | 63.4467 | 36.5533 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 2 | 55.3854 | 0.0000 | 44.6146 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1995 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 4 | 0.0000 | 0.0000 | 5.9505 |
| | 94.0495 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 4 | 0.0000 | 0.0000 | 18.2779 |
| | 81.7221 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 13 | 0.0000 | 0.0000 | 38.5370 |
| | 61.4630 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 35 | 0.0000 | 0.0000 | 44.8025 |
| | 52.0098 | 0.0000 | 1.7842 | 0.5519 | 0.0000 | 0.0000 | 0.8516 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 58 | 0.0000 | 0.0000 | 19.4350 |
| | 69.7305 | 0.9965 | 7.6541 | 1.5933 | 0.0000 | 0.0000 | 0.5905 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 68 | 0.0000 | 0.0000 | 16.0224 |
| | 68.9035 | 0.5806 | 5.9278 | 7.9159 | 0.0000 | 0.0000 | 0.6497 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 71 | 0.0000 | 0.0000 | 7.5018 |
| | 67.0799 | 0.7307 | 10.9663 | 10.0582 | 0.3681 | 0.0000 | 2.9796 | 0.0000 | 0.0000 | 0.0000 | 0.3153 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 71 | 0.0000 | 0.0000 | 1.2067 |
| | 44.6656 | 1.4078 | 11.8586 | 22.6554 | 1.8872 | 0.0000 | 13.5667 | 0.0000 | 0.0000 | 0.0000 | 2.7519 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 71 | 0.0000 | 0.0000 | 1.0630 |
| | 36.5222 | 1.4104 | 8.3606 | 30.6926 | 0.8379 | 0.0000 | 17.5221 | 0.0000 | 0.2895 | 0.0000 | 3.3017 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 74 | 0.0000 | 0.0000 | 0.4740 |
| | 12.6224 | 0.7088 | 6.9174 | 29.6173 | 0.4336 | 1.3302 | 36.2676 | 1.4332 | 0.7977 | 0.0000 | 9.3980 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 71 | 0.1608 | 0.0000 | 0.2887 |
| | 4.4116 | 0.0000 | 10.4859 | 40.5144 | 3.5402 | 0.3229 | 34.1768 | 0.6239 | 0.0000 | 0.0000 | 5.4750 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 64 | 0.0000 | 0.0000 | 0.0000 |
| | 5.1048 | 0.0000 | 2.5184 | 29.9727 | 0.2724 | 0.0000 | 49.7472 | 0.0000 | 0.3457 | 0.4954 | 11.5435 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 53 | 0.1991 | 0.0000 | 0.0000 |
| | 0.3796 | 0.0000 | 8.4351 | 21.3321 | 5.8664 | 0.0000 | 39.4947 | 0.7770 | 0.0000 | 0.0000 | 23.5160 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 39 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.4012 | 5.3716 | 33.7012 | 2.0036 | 0.0000 | 40.2985 | 0.0000 | 0.0000 | 0.0000 | 18.2239 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 5.7355 | 0.0000 | 2.6653 | 39.0255 | 0.0000 | 0.0000 | 23.2153 | 0.0000 | 1.9497 | 0.0000 | 27.4087 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 6.8872 | 31.3871 | 0.0000 | 0.0000 | 15.7158 | 0.0000 | 2.1774 | 0.0000 | 43.8325 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 23.7286 | 0.0000 | 0.0000 | 33.6020 | 0.0000 | 0.0000 | 0.0000 | 42.6694 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 34.8921 | 0.0000 | 0.0000 | 45.3075 | 0.0000 | 0.0000 | 0.0000 | 19.8004 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 51.8127 | 0.0000 | 0.0000 | 48.1873 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 5.8698 | 0.0000 | 0.0000 | 0.0000 | 88.1320 | 0.0000 | 0.0000 | 0.0000 | 5.9983 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 79.8987 | 0.0000 | 15.3704 | 0.0000 | 4.7309 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 65.3264 | 0.0000 | 0.0000 | 0.0000 | 34.6736 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 12.4719 | 0.0000 | 80.7038 | 0.0000 | 6.8243 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 9 | 59.5075 | 40.4925 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 17 | 94.6175 | 5.3825 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 29 | 92.8995 | 7.1005 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 39 | 94.3615 | 5.6385 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 47 | 92.2810 | 7.7190 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 48 | 77.9551 | 21.4170 | 0.6279 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 40 | 45.3134 | 54.6866 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 43 | 42.8753 | 52.6382 | 0.7963 |
| | 3.6902 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 51 | 15.4939 | 79.3988 | 3.9402 |
| | 1.1672 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 55 | 1.2540 | 86.8111 | 3.2412 |
| | 5.0875 | 3.6062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 53 | 0.0000 | 72.9113 | 2.3922 |
| | 10.5329 | 13.6076 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.5559 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 54 | 0.3198 | 45.5507 | 5.7994 |
| | 18.8759 | 26.5383 | 1.5425 | 0.3978 | 0.9755 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 71 | 0.0000 | 16.6965 | 3.3639 |
| | 25.9545 | 40.3591 | 0.0000 | 5.1296 | 6.8524 | 0.0000 | 0.0000 | 1.6440 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 88 | 0.0000 | 6.2748 | 1.8776 |
| | 19.7714 | 48.0107 | 0.8813 | 5.1621 | 9.5921 | 0.1831 | 0.0000 | 5.5863 | 0.0000 | 0.0000 | 2.6605 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 95 | 0.0000 | 0.0000 | 0.8307 |
| | 16.0823 | 52.3339 | 0.3209 | 9.4561 | 13.2840 | 0.3481 | 0.0000 | 6.7143 | 0.0000 | 0.0000 | 0.6296 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 96 | 0.0000 | 0.0000 | 0.0000 |
| | 15.4908 | 43.7148 | 0.1568 | 8.7846 | 13.2489 | 0.0000 | 0.0000 | 14.3619 | 0.0000 | 0.0000 | 4.2423 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 92 | 0.0000 | 0.0000 | 0.0000 |
| | 7.2528 | 26.8480 | 0.0000 | 6.0100 | 22.6914 | 0.5921 | 0.0000 | 32.9778 | 0.0000 | 0.0000 | 3.6278 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 86 | 0.0000 | 0.0000 | 0.0000 |
| | 8.3630 | 17.5408 | 0.3264 | 9.3016 | 23.4515 | 0.0000 | 0.0000 | 34.6009 | 0.0000 | 0.0000 | 6.4158 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 71 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 19.0078 | 0.0000 | 4.7150 | 34.0506 | 0.4689 | 0.0000 | 31.3917 | 0.0000 | 0.0000 | 10.3660 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 58 | 0.0000 | 0.0000 | 0.0000 |
| | 0.9565 | 1.6768 | 0.0000 | 2.8421 | 27.7766 | 0.0000 | 1.8404 | 52.0107 | 0.0000 | 0.0000 | 12.8969 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 35 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 8.9818 | 1.0959 | 0.5238 | 14.2401 | 0.0000 | 0.0000 | 63.1137 | 0.0000 | 0.9989 | 11.0459 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 32 | 0.0000 | 0.0000 | 0.0000 |
| | 2.3508 | 10.5473 | 0.0000 | 3.6420 | 14.4747 | 0.0000 | 1.2683 | 45.4643 | 0.0000 | 1.5498 | 20.7028 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.7731 | 0.0000 | 0.0000 | 45.0335 | 0.0000 | 0.0000 | 47.2019 | 0.0000 | 0.0000 | 1.9915 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 25.3341 | 3.1237 | 0.0000 | 71.5422 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 4.8400 | 2.1599 | 22.2260 | 0.0000 | 0.0000 | 70.7740 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 77.5991 | 0.0000 | 0.0000 | 22.4009 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 27.3128 | 0.0000 | 0.0000 | 36.5820 | 0.0000 | 36.1052 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 13.0269 | 0.0000 | 0.0000 | 86.9731 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 52.5445 | 47.4555 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 76.4494 | 0.0000 | 23.5506 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 18.0895 | 0.0000 | 18.0895 | 63.8211 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 7 | 0.0000 | 88.7801 | 11.2199 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 16 | 17.5711 | 72.8202 | 9.6087 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 32 | 0.0000 | 92.8366 | 7.1634 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1997 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 47 | 0.0000 | 84.9676 | 15.0324 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 59 | 0.0000 | 70.2052 | 28.3168 |
| | 0.0000 | 1.4780 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 77 | 0.0000 | 63.7515 | 31.5659 |
| | 0.3123 | 3.1367 | 0.0000 | 1.2338 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 83 | 0.0000 | 55.5168 | 41.9735 |
| | 0.0000 | 1.4911 | 1.0186 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 84 | 0.0000 | 30.0626 | 60.6906 |
| | 0.0000 | 3.8520 | 4.3311 | 0.0000 | 0.5185 | 0.0000 | 0.0000 | 0.0000 | 0.5453 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 70 | 0.0000 | 31.0054 | 42.2872 |
| | 2.5359 | 8.4392 | 10.3865 | 2.0324 | 2.5830 | 0.3739 | 0.0000 | 0.0000 | 0.3565 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 71 | 0.0000 | 3.4994 | 34.6036 |
| | 0.0000 | 11.2650 | 39.2701 | 1.5846 | 1.1669 | 7.5626 | 0.0000 | 0.0000 | 1.0479 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 57 | 0.0000 | 0.0000 | 6.5709 |
| | 0.0000 | 8.9766 | 47.3030 | 1.1424 | 4.7584 | 25.1591 | 0.0000 | 0.0000 | 4.2457 | 0.3690 | 1.4751 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 53 | 0.0000 | 0.0000 | 1.3275 |
| | 0.6359 | 7.3192 | 41.5941 | 2.5126 | 5.7137 | 14.4586 | 1.9847 | 0.3423 | 20.9463 | 0.0000 | 3.1652 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 41 | 0.0000 | 0.0000 | 0.0000 |
| | 0.4867 | 5.2923 | 27.7307 | 1.0087 | 11.1256 | 17.9942 | 0.0000 | 0.0000 | 21.3837 | 0.0000 | 14.9781 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 9.0974 | 8.9385 | 0.0000 | 25.6795 | 9.0501 | 0.0000 | 0.0000 | 34.3430 | 1.2664 | 11.6250 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.2147 | 41.7978 | 2.0290 | 2.5952 | 11.8538 | 0.0000 | 4.1999 | 27.4161 | 0.0000 | 8.8935 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 21 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 1.0886 | 5.4521 | 17.8316 | 44.4122 | 0.0000 | 1.4664 | 23.2795 | 0.0000 | 6.4696 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 7.6294 | 13.2769 | 0.0000 | 25.5173 | 0.0000 | 0.0000 | 36.3945 | 0.0000 | 17.1820 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 16.8148 | 0.0000 | 0.0000 | 25.6379 | 15.6480 | 0.0000 | 19.3959 | 0.0000 | 22.5035 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 7.6800 | 0.0000 | 0.0000 | 0.0000 | 18.5373 | 0.0000 | 73.7827 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1997 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 56.1924 | 0.0000 | 43.8076 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 4 | 4 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 5 | 5 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 3 | 84.3624 | 15.6376 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 5 | 84.0573 | 15.9427 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 11 | 95.5126 | 4.4874 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 18 | 84.9865 | 15.0135 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 11 | 83.5617 | 14.7077 | 1.7306 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 15 | 54.0935 | 39.6787 | 6.2278 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 28 | 17.6011 | 66.7594 | 13.7605 |
| | 1.8790 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 43 | 6.6987 | 80.3954 | 9.9845 |
| | 2.9213 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 59 | 0.0299 | 81.3565 | 13.2259 |
| | 5.3877 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 62 | 0.6575 | 72.1464 | 20.6063 |
| | 4.6901 | 1.8998 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 75 | 0.0000 | 47.0522 | 32.8580 |
| | 19.0700 | 0.0000 | 0.0000 | 1.0198 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 87 | 0.0000 | 19.8186 | 32.6891 |
| | 42.8161 | 1.9217 | 1.3278 | 1.4267 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 113 | 0.0000 | 3.9827 | 27.6299 |
| | 53.4591 | 5.5008 | 3.0994 | 5.7184 | 0.0000 | 0.0000 | 0.6097 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 137 | 0.0000 | 1.6524 | 19.3975 |
| | 55.5276 | 7.7690 | 5.5699 | 7.5661 | 0.6460 | 0.5905 | 1.2809 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 142 | 0.0000 | 0.9564 | 16.3507 |
| | 43.8740 | 5.3304 | 5.1557 | 19.0669 | 1.7902 | 1.0951 | 4.5527 | 0.5967 | 0.0000 | 0.9821 | 0.2492 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 117 | 0.0000 | 0.0117 | 8.2667 |
| | 37.8076 | 5.8029 | 9.1859 | 24.3469 | 2.5185 | 2.5248 | 6.6751 | 0.0000 | 0.0000 | 2.8599 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 95 | 0.0000 | 0.1861 | 3.4308 |
| | 23.4929 | 4.4030 | 8.6158 | 30.9296 | 3.2865 | 1.2972 | 13.1458 | 1.2393 | 1.9518 | 5.3036 | 2.7176 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 63 | 0.0000 | 0.0000 | 1.6762 |
| | 15.5415 | 2.3650 | 9.0552 | 35.0992 | 2.7475 | 1.6307 | 17.9610 | 0.0000 | 0.0000 | 13.7705 | 0.1534 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 50 | 0.0000 | 0.0000 | 0.2502 |
| | 10.3900 | 3.5439 | 9.6281 | 19.5470 | 0.5881 | 3.1471 | 18.1441 | 0.2985 | 0.0821 | 29.7261 | 4.6548 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 1.0069 | 1.1001 | 14.1812 | 26.2154 | 9.3837 | 8.3685 | 20.6666 | 0.8194 | 0.2303 | 10.2679 | 7.7600 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.5460 | 26.4319 | 0.4085 | 0.0000 | 44.4382 | 0.0000 | 0.0000 | 20.9593 | 7.2162 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 11.9887 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 80.6457 | 7.3655 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 3.7431 | 0.0000 | 0.0000 | 0.0000 | 36.1151 | 0.0000 | 56.6274 | 3.5145 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 19.9088 | 1.6194 | 0.0000 | 28.6377 | 0.0000 | 0.0000 | 49.8342 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 25.1189 | 0.0000 | 0.0000 | 12.8626 | 0.0000 | 0.0000 | 62.0185 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 2.8677 | 0.0000 | 0.0000 | 9.5078 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 87.6245 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 39.2386 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 60.7614 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 2.2964 | 0.0000 | 0.0000 | 0.0000 | 97.7036 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 60.7614 | 0.0000 | 0.0000 | 39.2386 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1998 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 27.0847 | 27.0847 | 0.0000 | 0.0000 | 45.8305 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 1 | 66.6667 | 33.3333 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 3 | 16.7399 | 83.2601 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 10 | 78.7176 | 14.9689 | 6.3136 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 10 | 73.8249 | 20.2209 | 5.9542 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 12 | 52.7214 | 47.2786 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1999 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 25 | 64.8728 | 35.1272 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 40 | 43.3581 | 46.7861 | 8.2564 |
| | 1.5994 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 52 | 34.2192 | 58.1022 | 7.6786 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 55 | 15.1224 | 66.5198 | 18.3579 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 59 | 3.0374 | 71.2788 | 22.0782 |
| | 3.6056 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 80 | 1.4366 | 69.4446 | 23.4475 |
| | 4.0797 | 1.5916 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 80 | 0.0000 | 58.1301 | 32.1410 |
| | 6.2737 | 1.4056 | 1.0904 | 0.9593 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 73 | 0.0000 | 27.7772 | 47.0431 |
| | 15.6080 | 6.2386 | 1.6860 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.8235 | 0.8235 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 78 | 0.0000 | 16.4514 | 49.8615 |
| | 20.3876 | 7.7908 | 1.8806 | 0.8763 | 1.7526 | 0.0000 | 0.8763 | 0.1229 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 66 | 0.0000 | 5.5692 | 36.7598 |
| | 36.6603 | 14.3764 | 3.7905 | 2.7360 | 0.1078 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 94 | 0.0000 | 1.3046 | 33.8413 |
| | 28.8908 | 21.3883 | 2.3356 | 5.7290 | 3.6238 | 0.0000 | 0.0000 | 0.9622 | 0.9622 | 0.9622 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 90 | 0.0000 | 0.9476 | 15.7103 |
| | 36.9018 | 20.6983 | 2.9795 | 8.6589 | 7.9110 | 0.8786 | 0.7824 | 2.6570 | 1.0923 | 0.0000 | 0.7824 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 99 | 0.0000 | 0.0000 | 10.9906 |
| | 32.8741 | 20.6172 | 5.7569 | 13.5580 | 7.6005 | 0.0000 | 0.0456 | 3.5294 | 0.0000 | 2.0785 | 2.9490 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 82 | 0.0000 | 0.0000 | 2.3189 |
| | 42.1622 | 21.7602 | 8.7589 | 4.2756 | 8.2643 | 4.2602 | 1.8286 | 2.5842 | 0.0000 | 1.7228 | 2.0640 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 74 | 0.0000 | 0.0000 | 2.0791 |
| | 23.6331 | 23.7682 | 4.1893 | 14.1082 | 9.8305 | 1.5909 | 2.3398 | 7.9025 | 1.4892 | 2.9784 | 6.0909 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 55 | 0.0000 | 0.0000 | 0.0000 |
| | 10.1890 | 9.6222 | 5.6381 | 12.5988 | 19.8664 | 2.0996 | 9.7728 | 15.0654 | 0.0000 | 7.3573 | 7.7903 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 36 | 0.0000 | 0.0000 | 0.1446 |
| | 14.4151 | 4.4422 | 7.8370 | 4.9153 | 24.5844 | 5.1654 | 0.9763 | 19.5735 | 0.1035 | 6.5103 | 11.3324 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 4.9662 | 0.8617 | 1.4556 | 4.9516 | 10.9021 | 4.4600 | 10.6214 | 21.3847 | 0.0000 | 4.4600 | 35.9366 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.4612 | 13.1892 | 6.1493 | 6.3388 | 31.9878 | 0.5514 | 5.2644 | 10.6259 | 10.3805 | 0.0000 | 15.0513 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 7.6764 | 0.0000 | 7.6764 | 0.0000 | 9.0443 | 0.0000 | 9.1392 | 24.2482 | 18.3933 | 0.0000 | 23.8221 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.8750 | 0.0000 | 1.4422 | 12.2047 | 0.0000 | 32.5474 | 1.5067 | 0.0000 | 0.0000 | 51.4239 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 16.5898 | 16.5898 | 0.0000 | 27.9354 | 36.3964 | 0.0000 | 0.0000 | 2.4885 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 21.4280 | 0.0000 | 0.0000 | 42.8561 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 35.7159 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 20.8992 | 0.0000 | 0.0000 | 26.4777 | 20.8992 | 0.0000 | 4.9298 | 26.7941 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 41.1149 | 0.0000 | 0.0000 | 58.8851 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 20.8674 | 0.0000 | 0.0000 | 0.0000 | 29.1326 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 6.3173 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 93.6827 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 9.7276 | 0.0000 | 0.0000 | 2.9210 | 0.0000 | 0.0000 | 87.3514 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 6.0903 | 0.0000 | 0.0000 | 0.0000 | 93.9097 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 4 | 73.7213 | 26.2787 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 2 | 38.0530 | 61.9470 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 3 | 89.2710 | 7.2036 | 3.5255 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 4 | 63.2030 | 28.7504 | 0.0000 |
| | 8.0466 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 7 | 64.7649 | 21.0059 | 14.2291 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 19 | 22.1827 | 64.3980 | 13.4193 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 18 | 26.3559 | 43.4415 | 21.3910 |
| | 8.8115 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 28 | 30.9143 | 30.0144 | 23.3670 |
| | 9.8605 | 0.5524 | 0.0000 | 5.2914 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 43 | 6.2583 | 44.8951 | 21.3236 |
| | 15.6613 | 2.9654 | 2.9654 | 5.9308 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 53 | 3.5119 | 25.8254 | 37.6828 |
| | 20.9613 | 4.5247 | 2.4980 | 2.4980 | 0.0000 | 2.4980 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 66 | 0.9163 | 7.8170 | 39.7616 |
| | 14.7483 | 25.0143 | 4.7273 | 2.4119 | 0.0000 | 2.3016 | 0.0000 | 0.0000 | 2.3016 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 99 | 0.0839 | 20.6140 | 32.9012 |
| | 16.0794 | 15.7941 | 4.3825 | 2.1116 | 4.6634 | 0.0000 | 0.0000 | 1.6850 | 0.0000 | 1.6850 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 105 | 0.0433 | 6.9693 | 36.7134 |
| | 22.8851 | 16.7679 | 9.6636 | 2.9646 | 3.0896 | 0.8899 | 0.0133 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 116 | 0.0427 | 3.0924 | 26.7106 |
| | 27.9124 | 19.2771 | 7.4489 | 8.3718 | 1.6807 | 0.6731 | 1.5336 | 2.2538 | 0.1010 | 0.0000 | 0.9019 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 137 | 0.0431 | 1.8367 | 12.1784 |
| | 18.7690 | 29.0003 | 15.5817 | 13.5194 | 4.1899 | 0.6785 | 0.3589 | 1.6578 | 0.5622 | 0.0000 | 1.6242 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 147 | 0.0000 | 0.9625 | 5.4100 |
| | 20.2993 | 27.8947 | 13.4626 | 12.8963 | 8.5213 | 0.0959 | 2.1515 | 3.1566 | 0.0340 | 2.0460 | 3.0695 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 128 | 0.0000 | 0.0305 | 5.2480 |
| | 15.9985 | 22.2338 | 15.7844 | 13.0451 | 6.7125 | 3.4663 | 1.4761 | 5.9539 | 1.1765 | 1.7143 | 7.1601 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 115 | 0.0000 | 0.0000 | 3.8856 |
| | 10.3964 | 25.6470 | 17.3660 | 13.0379 | 9.8670 | 4.5372 | 4.3572 | 3.1664 | 1.6298 | 1.9240 | 4.1854 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 88 | 0.0000 | 0.0000 | 0.0000 |
| | 5.8523 | 23.5276 | 22.7566 | 9.9678 | 11.5889 | 6.5938 | 1.7424 | 2.7764 | 4.8148 | 0.0000 | 10.3794 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 66 | 0.0000 | 0.0000 | 0.0000 |
| | 5.1463 | 32.5426 | 16.2887 | 3.8644 | 9.3523 | 1.9830 | 4.7794 | 4.9797 | 4.4849 | 6.7005 | 9.8782 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 40 | 0.0000 | 0.0000 | 0.0540 |
| | 5.6925 | 24.9033 | 19.1026 | 11.5565 | 12.2908 | 0.4610 | 10.3941 | 0.1645 | 0.5259 | 2.4664 | 12.3884 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 23 | 0.0000 | 0.0000 | 0.0000 |
| | 5.2270 | 21.1771 | 19.7987 | 6.1267 | 15.3353 | 5.7971 | 7.4912 | 5.5258 | 0.0000 | 6.0298 | 7.4912 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 18.7127 | 20.8065 | 11.0158 | 18.2115 | 8.2830 | 15.0189 | 0.0000 | 0.0000 | 0.0000 | 7.9516 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 35.2334 | 17.5224 | 24.0535 | 6.3134 | 5.5777 | 5.6757 | 0.0231 | 5.5777 | 0.0231 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 17.5409 | 1.2538 | 0.0000 | 23.2508 | 0.0000 | 11.4287 | 3.0309 | 28.8278 | 0.0000 | 14.6671 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 19.4205 | 13.8887 | 33.0222 | 11.0599 | 0.6225 | 0.0000 | 8.3846 | 0.0000 | 13.6017 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.7385 | 0.0000 | 1.4820 | 0.0000 | 0.0000 | 10.7186 | 28.3164 | 10.7186 | 0.0000 | 48.0260 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 7.6149 | 0.0000 | 0.0000 | 32.2634 | 0.0000 | 1.8841 | 0.0000 | 0.0000 | 1.2920 | 56.9457 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 14.1219 | 0.0000 | 33.1925 | 2.3169 | 17.5258 | 0.0000 | 31.6478 | 0.0000 | 1.1951 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 65.0793 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 34.9207 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 10.7871 | 0.0000 | 0.0000 | 0.0000 | 8.3187 | 0.0000 | 80.8942 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.4409 | 29.4190 | 0.0000 | 0.0000 | 68.1401 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2000 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 10 | 95.9778 | 4.0222 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 9 | 93.5221 | 6.4779 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 21 | 92.9413 | 1.9074 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 5.1512 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 24 | 95.7760 | 4.2240 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 31 | 90.9084 | 7.8572 | 1.2344 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 36 | 85.1036 | 14.5686 | 0.3278 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 56 | 88.2366 | 8.9047 | 2.8587 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 62 | 77.4209 | 20.2324 | 0.0000 |
| | 2.3467 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 68 | 74.0227 | 23.5341 | 2.4432 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 65 | 46.3746 | 42.9605 | 2.4435 |
| | 6.2020 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.0195 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 70 | 13.1090 | 56.0554 | 23.3298 |
| | 6.1027 | 0.2711 | 1.1320 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 109 | 2.7292 | 65.0400 | 24.6454 |
| | 5.9101 | 0.0000 | 1.6753 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 119 | 1.2550 | 69.4917 | 17.6483 |
| | 8.6518 | 2.8703 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0829 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 123 | 0.0695 | 61.7720 | 16.0545 |
| | 18.0592 | 1.9308 | 2.1141 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 142 | 0.0000 | 35.8368 | 13.9841 |
| | 30.9442 | 11.2071 | 3.5005 | 3.2523 | 1.2750 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 151 | 0.0938 | 17.6416 | 14.1810 |
| | 48.6099 | 11.5474 | 5.1088 | 1.9449 | 0.4494 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4233 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 173 | 0.0000 | 10.6480 | 20.5747 |
| | 37.2092 | 16.2353 | 6.7042 | 2.4634 | 2.2876 | 2.3526 | 1.1703 | 0.3547 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 178 | 0.0000 | 5.1329 | 18.2448 |
| | 31.1757 | 15.5091 | 14.5847 | 9.0923 | 0.6600 | 1.2589 | 0.9425 | 1.5540 | 0.0000 | 0.6466 | 1.1984 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 194 | 0.0155 | 2.2958 | 15.1515 |
| | 30.5911 | 18.9474 | 15.4137 | 10.3707 | 1.8362 | 1.2104 | 0.6287 | 1.2201 | 0.6147 | 0.6665 | 1.0375 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 144 | 0.0000 | 0.5489 | 13.6924 |
| | 29.8718 | 9.3637 | 23.9768 | 8.6189 | 1.7795 | 3.1621 | 2.0730 | 2.5536 | 0.8860 | 2.2639 | 1.2094 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 106 | 0.0000 | 1.1652 | 7.4980 |
| | 20.2722 | 14.1639 | 38.0681 | 8.3872 | 2.0978 | 0.3794 | 4.5652 | 1.9881 | 1.2505 | 0.0701 | 0.0942 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 76 | 0.0000 | 0.0000 | 15.5843 |
| | 8.4208 | 21.9056 | 13.8447 | 10.8587 | 7.8062 | 9.5847 | 5.9296 | 1.2831 | 3.5411 | 0.1503 | 1.0910 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 60 | 0.0000 | 0.0000 | 13.5650 |
| | 13.5613 | 7.0499 | 30.2319 | 12.6362 | 2.1519 | 5.1264 | 2.2545 | 4.6611 | 4.3295 | 0.0936 | 4.3386 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 42 | 0.0000 | 0.0000 | 6.0734 |
| | 7.4456 | 13.3753 | 31.9560 | 19.9101 | 4.0477 | 4.3653 | 0.9251 | 3.7582 | 0.0000 | 7.6722 | 0.4710 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 37 | 0.0000 | 0.0000 | 0.7205 |
| | 4.8680 | 15.9894 | 24.4527 | 32.5706 | 0.3114 | 0.5910 | 7.0157 | 6.1728 | 0.1484 | 0.0930 | 7.0664 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 13.4074 | 49.9664 | 13.7161 | 0.0000 | 0.3940 | 7.9921 | 9.0519 | 5.4722 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 9 | 0.0000 | 0.0000 | 8.8044 |
| | 0.0000 | 4.1820 | 12.8278 | 14.9037 | 43.0546 | 16.2276 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 12 | 0.0000 | 19.3100 | 0.0000 |
| | 0.0000 | 1.3829 | 21.8286 | 1.0864 | 22.1189 | 19.3100 | 0.5865 | 0.0000 | 1.4751 | 12.2246 | 0.6770 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 27.0015 | 1.8995 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 27.0015 | 44.0975 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 2.9322 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 48.0951 | 48.9728 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 44.7025 | 0.0000 | 7.4542 | 1.6916 | 0.0000 | 0.0000 | 0.0000 | 1.4491 | 44.7025 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 95.3846 | 0.0000 | 0.0000 | 0.0000 | 4.6154 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2001 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 3 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 13 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 27 | 2.1247 | 95.7506 | 2.1247 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 64 | 0.0000 | 95.3590 | 2.6181 |
| | 0.8727 | 0.1388 | 0.1388 | 0.0000 | 0.8727 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 113 | 0.0000 | 95.1641 | 4.7887 |
| | 0.0000 | 0.0472 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 153 | 0.0000 | 91.9980 | 6.8703 |
| | 1.0339 | 0.0000 | 0.0000 | 0.0000 | 0.0363 | 0.0000 | 0.0000 | 0.0615 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 176 | 0.0000 | 85.3873 | 13.5144 |
| | 0.0935 | 0.6986 | 0.0000 | 0.3063 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 156 | 0.0000 | 76.9563 | 18.7587 |
| | 3.8293 | 0.0000 | 0.0000 | 0.0000 | 0.4558 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 131 | 0.0000 | 61.9711 | 31.2492 |
| | 1.5222 | 3.2625 | 1.3795 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.5376 | 0.0000 | 0.0778 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 105 | 0.0000 | 39.0308 | 45.9714 |
| | 5.7554 | 4.7361 | 2.4839 | 0.6742 | 1.3483 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 78 | 0.0000 | 27.8686 | 42.5815 |
| | 7.9604 | 14.4468 | 6.0645 | 0.1414 | 0.9367 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 66 | 0.0000 | 8.3326 | 39.6765 |
| | 13.2185 | 27.6347 | 3.7522 | 5.7478 | 1.4087 | 0.2290 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 67 | 0.0000 | 2.7011 | 26.9102 |
| | 33.6869 | 20.8813 | 6.9134 | 1.3533 | 3.9401 | 0.4590 | 0.0000 | 0.3573 | 0.1180 | 2.1619 | 0.5174 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 72 | 0.0000 | 3.7211 | 29.3903 |
| | 16.6517 | 11.7773 | 24.6006 | 3.8595 | 6.0239 | 1.8356 | 0.1292 | 1.6634 | 0.0000 | 0.1200 | 0.2275 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 79 | 0.0000 | 2.8874 | 27.1716 |
| | 21.5811 | 29.1158 | 4.5262 | 6.4876 | 6.8730 | 0.7104 | 0.1656 | 0.1582 | 0.0000 | 0.1286 | 0.1944 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 82 | 0.0000 | 0.6613 | 19.9942 |
| | 13.9671 | 30.3310 | 8.3989 | 12.7945 | 6.5990 | 0.4834 | 2.8304 | 3.4525 | 0.2257 | 0.0000 | 0.2621 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 72 | 0.0000 | 0.0000 | 8.2051 |
| | 23.8282 | 13.9686 | 27.3380 | 11.9489 | 12.6803 | 0.6145 | 0.5761 | 0.5333 | 0.0000 | 0.0000 | 0.3070 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 58 | 0.0000 | 0.3672 | 6.2893 |
| | 16.7879 | 9.8708 | 17.8136 | 12.8968 | 9.5981 | 16.4217 | 0.0000 | 8.6194 | 0.6374 | 0.0000 | 0.6977 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 50 | 0.0000 | 0.0000 | 14.7230 |
| | 9.9641 | 2.2431 | 11.0384 | 33.0824 | 9.0271 | 7.5940 | 7.3923 | 4.9357 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 41 | 0.0000 | 0.2562 | 0.0000 |
| | 18.6323 | 1.4458 | 7.5585 | 47.3363 | 10.7860 | 3.2565 | 7.2374 | 3.2565 | 0.0000 | 0.0000 | 0.2345 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 28 | 0.0000 | 0.7756 | 0.0000 |
| | 14.8504 | 13.6231 | 28.6137 | 11.3758 | 25.9824 | 0.8431 | 1.9463 | 0.0000 | 0.9820 | 1.0077 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 32.7828 | 35.6290 | 4.5513 | 2.2117 | 0.0000 | 0.0000 | 1.1863 | 0.0000 | 5.3638 | 18.2751 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 18.8628 | 0.0000 | 19.3713 | 37.8863 | 0.8121 | 1.2883 | 1.4147 | 0.0000 | 0.7682 | 0.0000 | 19.5962 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.1331 | 4.8763 | 2.1347 | 10.9486 | 3.5786 | 0.0000 | 4.6230 | 0.0000 | 0.0000 | 69.7056 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2002 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 93.8252 | 6.1748 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 2.1014 | 0.0000 | 0.0000 | 3.6248 | 0.0000 | 0.0000 | 3.5704 | 0.0000 | 0.0000 | 0.0000 | 90.7035 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 3 | 0.0000 | 71.2562 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 25.3191 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 3.4247 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 96.2401 | 3.7599 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 2.6431 | 94.2989 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 3.0580 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 |
| 2002 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 2 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 3 | 25.2301 | 0.0000 | 74.7699 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 2 | 34.9659 | 0.0000 | 65.0341 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 6 | 0.0000 | 0.0000 | 67.0445 |
| | 14.1793 | 0.0000 | 18.7762 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 29 | 0.0000 | 12.2885 | 83.2166 |
| | 1.9813 | 2.5135 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 42 | 1.1988 | 12.8783 | 83.0554 |
| | 2.8676 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 60 | 2.2291 | 7.6961 | 85.4308 |
| | 4.1879 | 0.4560 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 92 | 0.0000 | 2.3275 | 89.5888 |
| | 3.2734 | 2.3196 | 1.8821 | 0.2846 | 0.0000 | 0.3239 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 133 | 0.0000 | 4.0689 | 89.5841 |
| | 5.2243 | 0.5236 | 0.0000 | 0.2340 | 0.2564 | 0.1086 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 205 | 0.0000 | 2.8459 | 88.3861 |
| | 6.9350 | 0.5548 | 0.4165 | 0.8618 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 264 | 0.0000 | 0.4083 | 89.4417 |
| | 6.6850 | 1.4535 | 0.6877 | 0.6883 | 0.4073 | 0.1332 | 0.0951 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 283 | 0.0000 | 0.1593 | 86.0198 |
| | 10.2672 | 1.1032 | 1.3384 | 0.5554 | 0.3432 | 0.2136 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 246 | 0.0000 | 0.2776 | 79.7670 |
| | 14.2516 | 1.7941 | 2.0656 | 1.5960 | 0.1232 | 0.1249 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 181 | 0.0000 | 0.1333 | 77.5086 |
| | 13.0956 | 1.8959 | 3.6664 | 0.9438 | 1.0921 | 0.0000 | 0.5915 | 0.7648 | 0.3079 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 121 | 0.0000 | 0.2067 | 65.4895 |
| | 12.0669 | 3.3837 | 9.3931 | 2.9650 | 4.2310 | 0.8764 | 0.5092 | 0.0000 | 0.8786 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 77 | 0.0000 | 0.0000 | 33.6670 |
| | 11.6543 | 6.0799 | 20.3503 | 14.1684 | 4.8268 | 5.4192 | 1.5674 | 0.0510 | 1.0221 | 1.1935 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 57 | 0.0000 | 0.0000 | 35.1596 |
| | 19.7946 | 5.2402 | 9.1708 | 5.5373 | 9.7924 | 7.4154 | 3.0304 | 0.0000 | 2.6344 | 0.0000 | 2.2249 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 39 | 0.0000 | 0.0000 | 19.4786 |
| | 16.4214 | 1.5509 | 7.1147 | 18.0604 | 23.1486 | 9.4697 | 2.0218 | 1.0150 | 1.7189 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 38 | 0.0000 | 0.0000 | 15.8513 |
| | 16.4441 | 10.9165 | 9.2181 | 7.0915 | 16.1898 | 6.8618 | 10.0104 | 2.4671 | 2.2992 | 0.0000 | 2.6502 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 20 | 0.0000 | 0.0000 | 4.2346 |
| | 32.6408 | 6.4441 | 9.0262 | 11.9501 | 16.3696 | 0.0000 | 9.1170 | 4.1168 | 6.1008 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 16 | 0.0000 | 0.0000 | 6.4424 |
| | 34.3507 | 5.4137 | 6.0061 | 11.0266 | 5.7823 | 20.1238 | 0.0000 | 5.2997 | 0.0000 | 0.0000 | 5.5546 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 5 | 0.0000 | 0.0000 | 33.2167 |
| | 0.0000 | 0.0000 | 25.1978 | 21.7596 | 0.0000 | 0.0000 | 19.8259 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 7 | 0.0000 | 0.0000 | 13.4015 |
| | 51.3801 | 14.1402 | 10.1843 | 10.8940 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 4 | 0.0000 | 0.0000 | 38.2433 |
| | 16.4437 | 24.2959 | 0.0000 | 21.0171 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 3 | 0.0000 | 0.0000 | 32.2822 |
| | 42.7351 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 24.9826 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 3 | 0.0000 | 63.2642 | 0.0000 |
| | 36.7358 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 11 | 0.0000 | 77.3693 | 0.0000 |
| | 22.6307 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 29 | 0.0000 | 92.6811 | 2.2532 |
| | 5.0657 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 73 | 0.0000 | 50.0519 | 17.6992 |
| | 31.7298 | 0.0000 | 0.0000 | 0.5191 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 138 | 0.0000 | 32.4013 | 25.3699 |
| | 39.9976 | 2.2312 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 197 | 0.0000 | 13.8919 | 16.5786 |
| | 67.2869 | 1.1605 | 0.0000 | 0.7766 | 0.0000 | 0.0000 | 0.0000 | 0.3055 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 284 | 0.0000 | 3.0144 | 12.0693 |
| | 80.7552 | 3.4935 | 0.4686 | 0.1991 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 298 | 0.0000 | 2.5257 | 9.1366 |
| | 84.1121 | 2.6172 | 0.2573 | 0.9314 | 0.3394 | 0.0803 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 294 | 0.0000 | 1.4280 | 5.8292 |
| | 83.5539 | 5.5435 | 0.8517 | 1.5154 | 1.0835 | 0.1948 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 244 | 0.0000 | 0.1267 | 2.9676 |
| | 80.2288 | 7.6396 | 2.4816 | 2.0360 | 3.7034 | 0.2372 | 0.5790 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 152 | 0.0000 | 0.0000 | 4.0231 |
| | 69.4477 | 10.0168 | 2.8533 | 7.5588 | 2.6439 | 0.3267 | 2.2272 | 0.9026 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 119 | 0.0000 | 0.5749 | 2.6379 |
| | 53.2718 | 9.7971 | 3.9583 | 15.6514 | 7.3959 | 1.7396 | 1.6748 | 0.0000 | 1.8014 | 0.0000 | 1.4968 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 60 | 0.0000 | 0.0000 | 0.6451 |
| | 41.3696 | 19.0949 | 2.8149 | 19.2128 | 9.5931 | 4.0456 | 2.4869 | 0.7371 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 42 | 0.0000 | 0.0000 | 1.2560 |
| | 31.0031 | 25.6111 | 5.6608 | 16.3221 | 4.2278 | 4.7061 | 8.0432 | 0.0000 | 3.1697 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 25 | 0.0000 | 0.0000 | 0.0000 |
| | 24.0461 | 22.1062 | 15.8494 | 8.6043 | 18.9752 | 3.4351 | 0.0000 | 3.4351 | 3.5486 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 19 | 0.0000 | 0.0000 | 0.0000 |
| | 16.4877 | 11.8771 | 9.7346 | 17.6822 | 20.8506 | 18.3691 | 0.0000 | 4.9987 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 15.2322 | 0.0000 | 35.8547 | 15.7928 | 33.1203 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 7 | 0.0000 | 5.5496 | 0.0000 |
| | 0.0000 | 34.0364 | 0.0000 | 10.2865 | 10.2865 | 20.4223 | 19.4187 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 30.9837 | 0.0000 | 30.3672 | 21.1318 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 17.5173 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 20.8897 | 41.7794 | 12.4672 | 0.0000 | 2.0014 | 14.6808 | 0.0000 | 0.0000 | 0.0000 | 8.1814 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 53.2028 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 46.7972 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 46.0878 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 53.9122 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 31.1297 | 0.0000 | 33.4506 | 0.0000 | 0.0000 | 0.0000 | 35.4197 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 62.4946 | 0.0000 | 0.0000 | 0.0000 | 37.5054 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 31.8608 | 36.2785 | 0.0000 | 31.8608 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 4 | 75.9636 | 0.0000 | 0.0000 |
| | 0.0000 | 24.0364 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 4 | 59.1465 | 0.0000 | 0.0000 |
| | 0.0000 | 20.4268 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 20.4268 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 12 | 60.4380 | 14.8376 | 15.4973 |
| | 0.0000 | 9.2271 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 34 | 22.8172 | 15.4977 | 25.4324 |
| | 0.0000 | 36.2527 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 74 | 0.0000 | 4.1547 | 43.8205 |
| | 3.7988 | 45.9248 | 2.3011 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 164 | 0.0000 | 1.0947 | 19.4241 |
| | 10.5147 | 60.8563 | 6.8488 | 1.2613 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 295 | 0.0000 | 1.1515 | 18.5480 |
| | 7.4110 | 67.5427 | 4.5849 | 0.7619 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 362 | 0.0000 | 0.1610 | 11.0382 |
| | 7.7153 | 71.3990 | 7.2409 | 1.5930 | 0.3777 | 0.4749 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 373 | 0.0000 | 0.0000 | 6.2876 |
| | 7.1447 | 77.4137 | 6.2128 | 1.2949 | 0.8957 | 0.2733 | 0.4774 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 324 | 0.0000 | 0.0000 | 2.7079 |
| | 4.8809 | 78.6475 | 5.4771 | 4.1960 | 1.6608 | 1.4938 | 0.1942 | 0.7419 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 246 | 0.0000 | 0.0000 | 2.4570 |
| | 5.9689 | 73.1165 | 8.1584 | 1.6351 | 3.5234 | 3.3170 | 0.4923 | 0.8471 | 0.0000 | 0.4844 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 150 | 0.0000 | 0.0000 | 0.0000 |
| | 5.4446 | 60.8193 | 12.2810 | 2.4857 | 9.1187 | 4.7743 | 1.2780 | 3.7983 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 98 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 57.4716 | 13.7951 | 9.7457 | 10.4795 | 3.1058 | 1.0874 | 2.4240 | 1.8909 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 63 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 57.7884 | 9.1190 | 3.9215 | 8.5727 | 4.4900 | 5.0715 | 3.4948 | 5.2985 | 0.0000 | 2.2436 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 42 | 0.0000 | 0.0000 | 0.0000 |
| | 2.4743 | 50.2460 | 5.5151 | 1.3506 | 12.9541 | 12.1306 | 6.4064 | 8.9231 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 73.4832 | 8.8881 | 0.0000 | 0.0000 | 0.0000 | 17.6287 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 19 | 0.0000 | 0.0000 | 4.2726 |
| | 0.0000 | 28.2234 | 15.9563 | 20.3060 | 12.4316 | 0.0000 | 8.1613 | 10.6489 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 18.2674 | 29.8330 | 13.0949 | 9.7737 | 10.9861 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 18.0449 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 80.6927 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 19.3073 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 62.5334 | 0.0000 | 37.4666 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 38.7649 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 61.2351 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 6 | 6 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 7 | 7 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 8 | 8 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 9 | 9 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 10 | 10 | 4 | 61.4175 | 29.2586 | 0.0000 |
| | 0.0000 | 0.0000 | 9.3239 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 11 | 11 | 6 | 87.0975 | 0.0000 | 0.0000 |
| | 0.0000 | 1.7087 | 11.1938 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 1 | 1 | 0 | 0 | 1 | 12 | 12 | 7 | 84.4624 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 15.5376 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 13 | 13 | 11 | 79.0938 | 0.0000 | 0.0000 |
| | 3.3389 | 12.2352 | 5.3321 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 14 | 14 | 11 | 77.3138 | 0.0000 | 0.0000 |
| | 0.0000 | 13.3539 | 3.3052 | 6.0271 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 15 | 15 | 10 | 84.9386 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 15.0614 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 16 | 16 | 9 | 50.9263 | 30.3615 | 0.0000 |
| | 6.2293 | 0.0000 | 12.4829 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 17 | 17 | 7 | 64.9597 | 22.9910 | 0.0000 |
| | 0.0000 | 0.0000 | 12.0493 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 18 | 18 | 14 | 20.7910 | 69.3304 | 0.0000 |
| | 4.3218 | 0.0000 | 5.5568 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 19 | 19 | 28 | 10.2521 | 87.5447 | 0.0000 |
| | 0.0000 | 0.0000 | 2.2032 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 20 | 20 | 51 | 1.3575 | 91.4340 | 1.6318 |
| | 3.4688 | 0.0000 | 1.3202 | 0.7877 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 21 | 21 | 96 | 1.9162 | 83.8648 | 4.9835 |
| | 2.8534 | 0.0000 | 5.1133 | 1.0615 | 0.0000 | 0.2074 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 22 | 22 | 107 | 0.9175 | 69.3420 | 4.4757 |
| | 6.9825 | 0.5414 | 16.6750 | 0.7333 | 0.0887 | 0.0000 | 0.0000 | 0.0000 | 0.2440 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 23 | 23 | 128 | 1.2455 | 42.8001 | 5.4722 |
| | 15.3218 | 0.7116 | 31.1015 | 3.3473 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 24 | 24 | 187 | 0.2057 | 15.9179 | 5.6572 |
| | 16.2964 | 3.5007 | 56.1581 | 1.2004 | 0.0000 | 0.6445 | 0.1819 | 0.2371 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 25 | 25 | 275 | 0.4537 | 4.4598 | 3.0595 |
| | 16.0356 | 8.8825 | 61.2042 | 4.6467 | 0.2903 | 0.4840 | 0.2272 | 0.2565 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 26 | 26 | 298 | 0.0904 | 2.8909 | 0.9755 |
| | 10.4165 | 6.5571 | 73.7407 | 3.9325 | 0.2390 | 0.6437 | 0.1183 | 0.2200 | 0.0000 | 0.1753 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 27 | 27 | 328 | 0.4802 | 0.6359 | 0.6590 |
| | 9.3384 | 5.9656 | 77.1238 | 3.7950 | 0.2761 | 0.3423 | 0.1946 | 0.7786 | 0.4106 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 28 | 28 | 248 | 0.1139 | 0.3110 | 0.0000 |
| | 7.3783 | 6.7129 | 77.6165 | 3.7902 | 1.2342 | 1.0243 | 0.9865 | 0.1077 | 0.6209 | 0.1035 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 29 | 29 | 187 | 0.0000 | 0.0000 | 0.2002 |
| | 8.8935 | 6.0821 | 71.5724 | 6.1528 | 3.3283 | 2.2178 | 1.2844 | 0.0000 | 0.2685 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 30 | 30 | 112 | 0.0000 | 0.4340 | 0.4854 |
| | 6.8237 | 4.1858 | 65.5305 | 5.5493 | 3.5146 | 6.6576 | 2.8926 | 0.9063 | 0.0000 | 0.0000 | 3.0203 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 31 | 31 | 72 | 0.0000 | 0.0000 | 1.4149 |
| | 1.2392 | 11.0744 | 49.6231 | 9.3608 | 10.0499 | 4.9817 | 3.0744 | 1.8737 | 5.8509 | 0.0000 | 1.4570 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 32 | 32 | 45 | 0.0000 | 0.0000 | 0.0000 |
| | 0.9594 | 1.7162 | 57.8223 | 6.1027 | 4.4882 | 20.7786 | 1.4188 | 3.8237 | 0.0000 | 2.8900 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 33 | 33 | 18 | 3.1718 | 2.2765 | 0.0000 |
| | 2.2523 | 0.0000 | 54.1912 | 0.0000 | 9.5523 | 7.8333 | 20.7226 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 34 | 34 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 55.4659 | 0.0000 | 7.7621 | 0.0000 | 9.6332 | 23.3300 | 3.8087 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 35 | 35 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 53.1925 | 0.0000 | 0.0000 | 46.8075 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 36 | 36 | 8 | 0.0000 | 0.0000 | 2.0868 |
| | 10.9016 | 0.0000 | 67.0000 | 0.0000 | 7.7199 | 12.2916 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 37 | 37 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 71.8846 | 4.6216 | 23.4938 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 38 | 38 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 52.6715 | 18.1045 | 0.0000 | 29.2240 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 39 | 39 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 19.6965 | 35.0791 | 29.0206 | 16.2039 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 41 | 41 | 2 | 0.0000 | 78.1709 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 21.8291 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 47 | 47 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 76.6759 | 23.3241 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 1 | 1 | 0 | 0 | 1 | 49 | 49 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 31.7770 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 68.2230 |
| 2006 | 1 | 1 | 0 | 0 | 1 | 51 | 51 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 11.8193 | 0.0000 | 29.4805 | 0.0000 | 0.0000 | 0.0000 | 23.0737 | 35.6264 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0021 | 0.0021 | 0.0516 |
| | 0.0186 | 0.0619 | 0.3773 | 0.1093 | 0.1031 | 0.0866 | 0.0825 | 0.0722 | 0.0330 | 0.0000 | 0.0000 |
| 1978 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0000 | 0.0000 | 0.0339 |
| | 0.0593 | 0.0475 | 0.1797 | 0.2220 | 0.1898 | 0.1051 | 0.0814 | 0.0356 | 0.0305 | 0.0153 | 0.0000 |
| 1979 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0000 | 0.0000 | 0.0188 |
| | 0.0554 | 0.1162 | 0.1019 | 0.1877 | 0.2699 | 0.0983 | 0.0706 | 0.0331 | 0.0223 | 0.0152 | 0.0107 |
| 1980 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0311 | 0.0411 | 0.1629 | 0.0609 | 0.0782 | 0.4464 | 0.0841 | 0.0411 | 0.0411 | 0.0133 | 0.0000 |
| 1981 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0000 | 0.0000 | 0.0488 |
| | 0.0131 | 0.0682 | 0.0667 | 0.2070 | 0.0411 | 0.1141 | 0.2988 | 0.0721 | 0.0290 | 0.0411 | 0.0000 |
| 1982 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0000 | 0.0000 | 0.0221 |
| | 0.4268 | 0.0352 | 0.0460 | 0.0451 | 0.1410 | 0.0320 | 0.0249 | 0.1931 | 0.0189 | 0.0150 | 0.0000 |
| 1983 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0009 | 0.2180 | 0.0160 |
| | 0.0280 | 0.4999 | 0.0201 | 0.0291 | 0.0260 | 0.0869 | 0.0120 | 0.0040 | 0.0530 | 0.0040 | 0.0020 |
| 1984 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0000 | 0.0180 | 0.2150 |
| | 0.0280 | 0.1500 | 0.3380 | 0.0331 | 0.0381 | 0.0250 | 0.0779 | 0.0151 | 0.0130 | 0.0429 | 0.0060 |
| 1985 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0020 | 0.0020 | 0.0808 |
| | 0.2648 | 0.0544 | 0.1072 | 0.3173 | 0.0162 | 0.0181 | 0.0181 | 0.0544 | 0.0122 | 0.0000 | 0.0524 |
| 1986 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0021 | 0.0021 | 0.0043 |
| | 0.0608 | 0.5878 | 0.0369 | 0.0369 | 0.1757 | 0.0196 | 0.0087 | 0.0152 | 0.0217 | 0.0066 | 0.0217 |
| 1987 | 1 | 2 | 0 | 0 | 1 | 1 | 51 | 60 | 0.0000 | 0.0094 | 0.0063 |
| | 0.0016 | 0.0268 | 0.7414 | 0.0300 | 0.0300 | 0.1088 | 0.0063 | 0.0047 | 0.0126 | 0.0094 | 0.0126 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 16 | 16 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 3 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 4 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 4 | 0.0000 | 6.3044 | 89.6250 |
| | 0.0000 | 0.0000 | 0.0000 | 4.0706 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 4 | 0.0000 | 0.0000 | 60.7560 |
| | 0.0000 | 0.0000 | 2.3914 | 36.8526 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 5 | 0.0000 | 1.5729 | 41.7798 |
| | 0.0000 | 3.5574 | 1.5437 | 50.2753 | 0.0000 | 0.0000 | 1.2709 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 5 | 0.0000 | 0.0000 | 26.6184 |
| | 1.2935 | 0.9831 | 1.0017 | 68.4734 | 0.0000 | 0.6468 | 0.9831 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 5 | 0.0000 | 1.1629 | 17.6282 |
| | 0.9447 | 0.9447 | 0.4196 | 76.1232 | 1.2997 | 0.0000 | 1.4770 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 5 | 0.0000 | 0.0000 | 9.1513 |
| | 0.0000 | 1.5958 | 2.1765 | 85.4805 | 1.5958 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 5 | 0.0000 | 0.0000 | 5.6998 |
| | 0.3985 | 1.7216 | 1.2115 | 85.2983 | 1.1044 | 0.3985 | 3.6688 | 0.4987 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 5 | 0.0000 | 0.0000 | 4.3091 |
| | 0.7201 | 1.1850 | 1.9050 | 79.8803 | 2.7018 | 1.4401 | 7.8586 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 5 | 0.0000 | 0.0000 | 0.8354 |
| | 0.8354 | 0.0000 | 2.7857 | 74.1439 | 2.3901 | 1.6865 | 17.3232 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 5 | 0.0000 | 0.0000 | 1.3332 |
| | 0.0000 | 0.5231 | 0.7951 | 81.1743 | 1.3332 | 1.5663 | 12.7516 | 0.0000 | 0.0000 | 0.5231 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 2.2722 | 62.0348 | 1.2485 | 5.5389 | 25.5848 | 0.0000 | 0.0000 | 1.6604 | 1.6604 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 3.8442 | 64.7440 | 1.5798 | 0.0000 | 25.4487 | 0.0000 | 2.9553 | 0.6382 | 0.7899 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 52.9545 | 1.0714 | 4.2796 | 29.8044 | 0.0000 | 2.6815 | 0.0000 | 9.2085 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 5 | 0.0000 | 0.0000 | 2.5509 |
| | 0.0000 | 0.0000 | 0.0000 | 55.9367 | 6.0172 | 5.1019 | 24.0494 | 2.6389 | 0.0000 | 1.0661 | 2.6389 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 49.7658 | 0.0000 | 3.8324 | 19.9592 | 0.0000 | 4.0981 | 0.0000 | 22.3446 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 3.9552 |
| | 0.0000 | 0.0000 | 0.0000 | 40.6330 | 1.3209 | 7.9104 | 36.3443 | 4.0916 | 0.0000 | 0.0000 | 5.7446 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 20.8516 | 6.9982 | 7.4834 | 35.7035 | 0.0000 | 10.1257 | 0.0000 | 18.8376 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 21.9616 | 4.6980 | 7.7314 | 43.6475 | 0.0000 | 9.0828 | 3.7959 | 9.0828 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 46.2006 | 0.0000 | 0.0000 | 38.0590 | 0.0000 | 0.0000 | 0.0000 | 15.7404 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 56.5366 | 0.0000 | 0.0000 | 15.9231 | 5.8085 | 0.0000 | 0.0000 | 21.7317 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 71.5686 | 0.0000 | 0.0000 | 0.0000 | 28.4314 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1988 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 5 | 0.0000 | 5.8167 | 0.0000 |
| | 84.1468 | 0.0000 | 0.0000 | 0.0000 | 10.0365 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 92.2612 | 0.0000 | 0.0000 | 0.0000 | 7.7388 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 75.6758 | 0.0000 | 0.0000 | 0.0000 | 24.1465 | 0.0000 | 0.0000 | 0.1777 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 69.7277 | 0.0000 | 0.0000 | 0.0000 | 30.2723 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 6 | 0.0000 | 0.0000 | 1.1227 |
| | 56.4107 | 0.0000 | 0.0000 | 0.0000 | 41.8502 | 0.0000 | 0.6165 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 6 | 0.0000 | 0.0000 | 0.0955 |
| | 47.7346 | 0.0000 | 0.0000 | 0.7973 | 49.2166 | 0.0000 | 1.5975 | 0.5584 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 34.2849 | 0.7332 | 1.0387 | 0.0000 | 61.6335 | 0.0000 | 0.0000 | 2.3097 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 23.6464 | 0.0000 | 0.0000 | 1.0067 | 65.7410 | 3.0201 | 1.4234 | 3.7389 | 1.4234 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 20.8079 | 0.0000 | 0.0000 | 1.9676 | 71.4979 | 2.7752 | 0.0000 | 1.9676 | 0.9838 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 6 | 0.0000 | 0.0000 | 1.5321 |
| | 15.1694 | 0.0000 | 0.0000 | 0.0000 | 74.8774 | 0.0000 | 1.7324 | 6.6887 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 1.6671 | 0.0000 | 0.0000 | 0.0000 | 86.8619 | 0.0000 | 0.0000 | 11.4709 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 11.1103 | 0.0000 | 0.0000 | 2.2426 | 53.1446 | 4.0837 | 5.7126 | 23.7062 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 4.0316 | 0.0000 | 0.0000 | 0.0000 | 73.0170 | 3.8792 | 9.7322 | 9.3399 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 8.5068 | 0.0000 | 67.4896 | 2.8932 | 7.0481 | 13.4653 | 0.0000 | 0.0000 | 0.5969 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 5 | 0.0000 | 3.0608 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 71.0214 | 0.0000 | 4.2157 | 17.9739 | 0.0000 | 0.0000 | 3.7283 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 59.3457 | 0.0000 | 3.9483 | 27.9484 | 0.0000 | 0.0000 | 8.7576 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 65.6347 | 0.0000 | 0.0000 | 30.0995 | 0.0000 | 0.0000 | 4.2659 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 6.8382 | 0.0000 | 0.0000 | 0.0000 | 71.0408 | 0.0000 | 0.0000 | 12.4522 | 0.0000 | 9.6688 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 26.7426 | 8.9142 | 0.0000 | 64.3432 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 4.0625 | 0.0000 | 0.0000 | 0.0000 | 47.9688 | 0.0000 | 23.9844 | 23.9844 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 33.3333 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 49.3889 | 0.0000 | 0.0000 | 50.6111 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 51.7326 | 0.0000 | 0.0000 | 21.7610 | 0.0000 | 0.0000 | 26.5064 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 41.4164 | 0.0000 | 0.0000 | 29.2918 | 0.0000 | 0.0000 | 29.2918 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 64.5512 | 0.0000 | 0.0000 | 35.4488 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 71.9844 | 0.0000 | 0.0000 | 4.7915 | 0.0000 | 0.0000 | 23.2241 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 2 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 3 | 0.0000 | 35.7231 | 24.4672 |
| | 0.0000 | 15.3425 | 24.4672 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 3 | 0.0000 | 85.7913 | 0.0000 |
| | 0.0000 | 14.2087 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 4 | 0.0000 | 60.5645 | 15.5811 |
| | 0.0000 | 18.6213 | 1.1096 | 0.0000 | 0.0000 | 4.1235 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 5 | 0.0000 | 33.2665 | 3.2314 |
| | 0.0000 | 63.5021 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 6 | 0.0000 | 11.8141 | 6.7755 |
| | 0.0000 | 75.6215 | 0.9087 | 0.0000 | 0.0000 | 3.1622 | 0.0000 | 0.0000 | 1.7180 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 4 | 0.0000 | 5.6135 | 5.1876 |
| | 1.5057 | 76.2552 | 0.0000 | 1.4233 | 0.0000 | 10.0147 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 4 | 0.0000 | 1.1787 | 1.4615 |
| | 0.0000 | 76.2210 | 0.0000 | 0.0000 | 0.0000 | 20.1135 | 1.0254 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 4 | 0.0000 | 0.0000 | 2.3674 |
| | 0.0000 | 69.7542 | 2.0254 | 0.0000 | 0.0000 | 24.6559 | 0.0000 | 0.0000 | 1.1971 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 4 | 0.0000 | 0.0000 | 1.9858 |
| | 0.0000 | 58.6654 | 0.0000 | 0.0000 | 0.0000 | 39.3488 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 51.0920 | 1.2324 | 1.2324 | 0.0000 | 44.0766 | 1.8843 | 0.0000 | 0.4823 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 30.1584 | 1.1719 | 0.0000 | 0.0000 | 67.4978 | 1.1719 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 19.8203 | 0.0000 | 0.0000 | 0.0000 | 63.7319 | 0.0000 | 0.0000 | 16.4478 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 16.3544 | 0.0000 | 0.0000 | 0.0000 | 77.5344 | 1.5708 | 0.0000 | 4.5404 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 7.4256 | 0.0000 | 0.0000 | 0.0000 | 89.1205 | 0.0000 | 0.0000 | 3.4539 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 8.0127 | 0.0000 | 0.0000 | 0.0000 | 66.4542 | 0.0000 | 0.0000 | 25.5331 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.9469 | 1.8055 | 0.0000 | 0.0000 | 89.6365 | 0.0000 | 0.0000 | 3.6110 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 36.4109 | 0.0000 | 0.0000 | 0.0000 | 37.7752 | 18.2054 | 0.0000 | 5.0723 | 2.5362 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 20.3994 | 10.1997 | 1.4209 | 0.0000 | 46.6066 | 0.0000 | 0.0000 | 19.9526 | 0.0000 | 1.4209 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 98.2304 | 0.0000 | 0.0000 | 1.7696 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.4949 | 0.0000 | 0.0000 | 0.0000 | 45.7511 | 0.0000 | 0.0000 | 41.2561 | 0.0000 | 8.4979 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 91.5065 | 0.0000 | 0.0000 | 5.5551 | 0.0000 | 2.9384 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 81.1256 | 0.0000 | 0.0000 | 18.8744 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 67.1548 | 0.0000 | 0.0000 | 0.0000 | 32.8452 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 51.4269 | 0.0000 | 0.0000 | 24.6790 | 0.0000 | 23.8942 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 97.0837 | 0.0000 | 0.0000 | 2.9163 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 26.8376 | 0.0000 | 0.0000 | 73.1624 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 21.7905 | 0.0000 | 0.0000 | 78.2095 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 |
| 1990 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 3 | 0.0000 | 0.0000 | 19.2376 |
| | 0.0000 | 0.0000 | 33.3563 | 0.0000 | 0.0000 | 0.0000 | 47.4061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 6 | 0.0000 | 0.0000 | 50.8965 |
| | 0.0000 | 0.0000 | 14.7887 | 0.0000 | 0.0000 | 0.0000 | 34.3148 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 14 | 0.0000 | 0.0000 | 19.6483 |
| | 6.6233 | 0.0000 | 40.4406 | 0.0000 | 0.0000 | 0.0000 | 29.4001 | 0.0000 | 0.0000 | 3.8877 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 16 | 0.0000 | 0.0000 | 5.6833 |
| | 2.6161 | 0.0000 | 63.9009 | 0.0000 | 0.0000 | 0.0000 | 27.7997 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 16 | 0.0000 | 0.0000 | 7.6819 |
| | 1.0123 | 0.0000 | 59.7111 | 0.6366 | 0.0000 | 0.0000 | 30.9581 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 16 | 0.0000 | 0.0000 | 7.6250 |
| | 1.0092 | 0.5664 | 52.9652 | 0.3267 | 0.0000 | 0.0000 | 36.9122 | 0.3267 | 0.0000 | 0.2687 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 16 | 0.0000 | 0.0000 | 2.4189 |
| | 2.1439 | 0.0000 | 57.4609 | 0.0000 | 0.0000 | 0.0000 | 37.9763 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 16 | 0.0000 | 0.0000 | 3.7635 |
| | 1.0953 | 0.0000 | 52.7777 | 1.0522 | 0.0000 | 0.0000 | 40.9601 | 0.0000 | 0.0000 | 0.3512 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.9689 | 0.6273 | 58.5972 | 0.0000 | 0.0000 | 0.0000 | 37.9596 | 0.0000 | 0.0000 | 1.8470 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 16 | 0.0000 | 0.0000 | 1.4660 |
| | 0.9599 | 1.2436 | 51.7808 | 0.4454 | 0.0000 | 0.0000 | 38.9176 | 0.0000 | 0.0000 | 5.1868 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 5.2182 | 0.0000 | 56.6579 | 0.0000 | 0.0000 | 0.0000 | 33.5796 | 0.0000 | 0.0000 | 2.7799 | 1.7645 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 13 | 0.0000 | 0.0000 | 1.2305 |
| | 4.8022 | 0.0000 | 47.0160 | 0.0000 | 0.0000 | 0.0000 | 43.9191 | 3.0322 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 8 | 0.0000 | 0.0000 | 5.3333 |
| | 19.6523 | 0.0000 | 38.1907 | 0.0000 | 0.0000 | 0.0000 | 24.3468 | 0.0000 | 0.0000 | 12.4769 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 39.9216 | 0.0000 | 0.0000 | 0.0000 | 60.0784 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 5.4106 | 0.0000 | 0.0000 | 0.0000 | 94.5894 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 15.5855 | 0.0000 | 0.0000 | 0.0000 | 68.8290 | 0.0000 | 0.0000 | 15.5855 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 13.5111 | 0.0000 | 33.1684 | 0.0000 | 0.0000 | 0.0000 | 43.6433 | 0.0000 | 0.0000 | 9.6772 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 48.1802 | 0.0000 | 0.0000 | 0.0000 | 51.8198 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 61.4689 | 0.0000 | 0.0000 | 0.0000 | 38.5311 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 34.7238 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 65.2762 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1991 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 85.6597 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.3403 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 3 | 0.0000 | 0.0000 | 80.3424 |
| | 19.6576 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 9 | 0.0000 | 6.2879 | 44.7363 |
| | 38.3101 | 0.0000 | 0.0000 | 10.6657 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 15 | 0.0000 | 7.0722 | 41.5500 |
| | 20.0280 | 2.9101 | 0.0000 | 28.4396 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 22 | 0.0000 | 4.5658 | 31.6650 |
| | 32.4590 | 3.7538 | 0.0000 | 26.8091 | 0.0000 | 0.0000 | 0.0000 | 0.7472 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 27 | 0.0000 | 0.0000 | 15.5741 |
| | 31.8231 | 3.3404 | 1.0983 | 40.1073 | 0.0000 | 0.0000 | 0.0000 | 8.0568 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 29 | 0.0000 | 0.1863 | 7.2162 |
| | 25.8570 | 3.1171 | 0.0000 | 51.5449 | 0.0000 | 0.0000 | 0.0000 | 12.0784 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 29 | 0.0000 | 0.3284 | 4.5688 |
| | 22.1408 | 5.4517 | 0.3489 | 46.2755 | 0.3702 | 0.0000 | 0.3489 | 20.1668 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 29 | 0.0000 | 0.0000 | 2.5722 |
| | 14.1088 | 3.9159 | 0.2611 | 51.3812 | 0.2278 | 0.0000 | 0.0000 | 26.7931 | 0.0000 | 0.0000 | 0.7399 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 29 | 0.0000 | 0.0000 | 0.8081 |
| | 7.8786 | 2.9477 | 0.5650 | 52.0025 | 0.8084 | 0.0000 | 0.0000 | 34.6561 | 0.0000 | 0.0000 | 0.3337 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 29 | 0.0000 | 0.4800 | 0.0000 |
| | 6.5071 | 1.1843 | 0.7626 | 49.9765 | 0.5615 | 0.0000 | 0.0000 | 37.5026 | 1.2594 | 0.0000 | 1.7659 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 1.7841 | 0.6335 | 0.0000 | 61.2641 | 0.0000 | 0.0000 | 0.5236 | 35.3381 | 0.0000 | 0.0000 | 0.4566 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 4.5975 | 1.0209 | 0.0000 | 58.5140 | 0.0000 | 0.0000 | 0.0000 | 32.1291 | 0.0000 | 2.2907 | 1.4478 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 50.8801 | 0.0000 | 0.0000 | 0.0000 | 46.3370 | 0.0000 | 0.0000 | 2.7828 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 6.1009 | 0.0000 | 35.9426 | 0.0000 | 0.0000 | 0.0000 | 38.1745 | 0.0000 | 0.0000 | 19.7821 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 12 | 0.0000 | 0.0000 | 6.3754 |
| | 0.0000 | 0.0000 | 0.0000 | 56.9667 | 0.0000 | 0.0000 | 0.0000 | 25.5639 | 0.0000 | 0.0000 | 11.0940 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 28.6995 | 0.0000 | 0.0000 | 0.0000 | 51.8697 | 0.0000 | 0.0000 | 19.4308 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 66.8232 | 0.0000 | 0.0000 | 0.0000 | 17.0368 | 0.0000 | 0.0000 | 16.1400 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 39.7366 | 0.0000 | 0.0000 | 20.5850 | 0.0000 | 0.0000 | 0.0000 | 21.7288 | 0.0000 | 0.0000 | 17.9496 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 13.4411 | 29.3404 | 0.0000 | 19.8597 | 0.0000 | 0.0000 | 0.0000 | 23.9177 | 0.0000 | 0.0000 | 13.4411 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 49.1174 | 0.0000 | 0.0000 | 0.0000 | 50.8826 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 15 | 15 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 5 | 0.0000 | 26.6898 | 0.0000 |
| | 0.0000 | 18.3235 | 0.0000 | 0.0000 | 10.3733 | 0.0000 | 0.0000 | 0.0000 | 44.6133 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 10 | 0.0000 | 37.8464 | 0.0000 |
| | 47.5900 | 14.5636 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 14 | 0.0000 | 4.9041 | 22.0439 |
| | 39.1695 | 23.9205 | 0.0000 | 0.0000 | 2.7889 | 0.0000 | 0.0000 | 0.0000 | 7.1732 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 17 | 0.0000 | 0.6494 | 7.0367 |
| | 39.8757 | 33.0115 | 4.0036 | 0.0000 | 13.6150 | 0.0000 | 0.0000 | 0.0000 | 1.8081 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 17 | 0.0000 | 1.3388 | 4.8118 |
| | 28.2022 | 24.9771 | 1.5960 | 0.0000 | 33.9739 | 0.8396 | 0.0000 | 0.0000 | 4.2605 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 18 | 0.0000 | 0.8310 | 2.3378 |
| | 18.2521 | 26.4722 | 0.7770 | 0.1619 | 44.9885 | 0.0000 | 0.0000 | 0.0000 | 6.1795 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 18 | 0.0000 | 0.0000 | 2.1300 |
| | 13.8090 | 16.3809 | 2.2466 | 0.4296 | 51.2941 | 0.0000 | 0.0000 | 0.0000 | 13.7098 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 18 | 0.0000 | 0.0000 | 0.1665 |
| | 9.7005 | 20.0005 | 1.8943 | 0.9956 | 47.9483 | 0.0000 | 0.0000 | 0.0000 | 19.2943 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 4.0128 | 19.1813 | 2.2702 | 0.0000 | 54.6354 | 1.4544 | 0.0000 | 0.0000 | 18.0235 | 0.0000 | 0.4223 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 18 | 0.0000 | 0.0000 | 0.4842 |
| | 3.2948 | 19.1826 | 1.0716 | 0.0000 | 47.2305 | 0.0000 | 0.0000 | 0.0000 | 27.1141 | 1.6221 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 17 | 1.4840 | 0.0000 | 2.0119 |
| | 5.1462 | 5.9392 | 1.2735 | 0.0000 | 60.5888 | 0.0000 | 0.0000 | 0.0000 | 23.5563 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 6.7564 | 3.2026 | 0.0000 | 56.7488 | 0.0000 | 0.0000 | 0.0000 | 33.2922 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1993 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.4877 | 0.0000 | 0.0000 | 46.0230 | 0.0000 | 0.0000 | 0.0000 | 49.4894 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 10.4251 | 24.2361 | 0.0000 | 52.0746 | 0.0000 | 0.0000 | 0.0000 | 13.2642 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 90.2191 | 0.0000 | 0.0000 | 0.0000 | 9.7809 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1993 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 84.4475 | 0.0000 | 0.0000 | 0.0000 | 15.5525 | 0.0000 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 14 | 14 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 16 | 16 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 6 | 0.0000 | 14.4585 | 31.9991 |
| | 5.9410 | 2.6279 | 14.4585 | 0.0000 | 0.0000 | 12.3868 | 18.1283 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 10 | 0.0000 | 6.0661 | 47.4744 |
| | 8.1868 | 9.2152 | 12.2838 | 0.0000 | 0.0000 | 13.2767 | 0.0000 | 0.0000 | 0.0000 | 3.4970 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 20 | 0.0000 | 11.2990 | 12.4229 |
| | 16.6869 | 20.5798 | 20.3017 | 10.5249 | 0.0000 | 6.1926 | 0.0000 | 0.0000 | 0.0000 | 1.9922 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 24 | 0.0000 | 0.8490 | 6.3622 |
| | 3.9495 | 20.7882 | 29.5400 | 1.9631 | 1.8837 | 27.1227 | 0.0000 | 0.0000 | 0.0000 | 7.5416 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 28 | 0.0000 | 1.2578 | 3.6380 |
| | 5.6402 | 18.2769 | 22.2773 | 3.2224 | 0.4621 | 38.9595 | 0.8383 | 0.0000 | 0.0000 | 5.2828 | 0.1446 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 29 | 0.0000 | 0.0000 | 3.0747 |
| | 2.3867 | 14.4386 | 21.4523 | 1.7714 | 0.2478 | 42.5464 | 0.5635 | 0.0000 | 0.0000 | 13.3054 | 0.2130 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 30 | 0.0000 | 0.0000 | 0.3694 |
| | 1.0625 | 9.8580 | 18.5671 | 3.1453 | 1.3310 | 50.7316 | 0.5218 | 0.0000 | 0.0000 | 13.9831 | 0.4302 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 31 | 0.0000 | 0.1746 | 0.3953 |
| | 1.7092 | 12.9185 | 19.5231 | 2.7557 | 1.4986 | 45.0807 | 0.6697 | 0.2670 | 0.0000 | 14.6172 | 0.3905 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 30 | 0.0000 | 0.0000 | 0.6154 |
| | 0.9075 | 7.1674 | 16.6082 | 2.4943 | 0.0000 | 48.5380 | 1.0980 | 1.0605 | 0.0000 | 20.9602 | 0.5506 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 28 | 0.0000 | 0.0000 | 0.0000 |
| | 0.6276 | 4.9702 | 10.5820 | 2.3404 | 0.4291 | 57.6936 | 0.1380 | 0.0000 | 0.0000 | 21.6141 | 1.6052 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 28 | 0.0000 | 0.0000 | 1.2824 |
| | 0.4869 | 9.3177 | 16.0695 | 2.2733 | 0.0000 | 49.1590 | 0.0000 | 1.2578 | 0.0000 | 20.1535 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.3780 | 6.9685 | 6.5269 | 0.0000 | 63.4885 | 0.7242 | 0.0000 | 0.0000 | 17.2196 | 0.6942 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 23 | 0.0000 | 0.0000 | 0.0000 |
| | 2.1538 | 2.8669 | 10.8352 | 2.1653 | 1.2172 | 43.7358 | 1.2603 | 0.0000 | 0.0000 | 35.7654 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 14.6412 | 1.8250 | 0.0000 | 68.8108 | 0.0000 | 0.0000 | 0.0000 | 12.0511 | 2.6720 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 21 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 1.5690 | 5.6967 | 0.0000 | 0.0000 | 77.2324 | 0.0000 | 0.0000 | 0.0000 | 13.1471 | 2.3548 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 20.1111 | 6.8357 | 6.7826 | 0.0000 | 50.7438 | 0.0000 | 0.0000 | 0.0000 | 6.1955 | 9.3312 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 11.1169 | 0.0000 | 0.0000 | 67.0520 | 0.0000 | 0.0000 | 0.0000 | 21.8311 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 20.5179 | 0.0000 | 0.0000 | 0.0000 | 71.0039 | 0.0000 | 0.0000 | 0.0000 | 8.4782 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 31.8341 | 0.0000 | 0.0000 | 0.0000 | 68.1659 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 17.4656 | 0.0000 | 0.0000 | 35.5239 | 0.0000 | 0.0000 | 0.0000 | 21.2441 | 25.7665 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 19.2392 | 0.0000 | 0.0000 | 0.0000 | 34.7734 | 0.0000 | 0.0000 | 0.0000 | 45.9874 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 72.6101 | 0.0000 | 0.0000 | 0.0000 | 27.3899 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 48.5051 | 0.0000 | 0.0000 | 0.0000 | 51.4949 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 62.6427 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 37.3573 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 73.9850 | 0.0000 | 0.0000 | 0.0000 | 26.0150 | 0.0000 |
| 1994 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1994 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 24.8900 | 75.1100 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 4 | 4 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 5 | 5 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 6 | 6 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 7 | 7 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 8 | 8 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 9 | 9 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 14 | 14 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 6 | 0.0000 | 10.6538 | 28.3016 |
| | 39.8779 | 17.4412 | 3.7255 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 11 | 0.0000 | 0.0000 | 46.0288 |
| | 24.6433 | 19.3823 | 1.1377 | 3.9358 | 0.0000 | 0.0000 | 4.8721 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 18 | 2.0151 | 1.7489 | 37.7617 |
| | 21.5169 | 3.6474 | 10.0192 | 10.2279 | 3.9071 | 0.0000 | 9.1559 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 21 | 0.0000 | 0.0000 | 21.4840 |
| | 15.2299 | 8.2037 | 16.7580 | 12.4910 | 5.4090 | 1.8969 | 13.1973 | 0.0000 | 1.2699 | 0.0000 | 4.0603 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 21 | 0.0000 | 1.4621 | 13.1683 |
| | 10.0681 | 4.3691 | 11.8982 | 20.2917 | 3.0899 | 0.0000 | 29.5313 | 1.8141 | 0.0000 | 0.0000 | 4.3072 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 21 | 0.0000 | 0.3626 | 7.5269 |
| | 9.0344 | 3.7396 | 13.4012 | 17.2258 | 2.1148 | 0.0000 | 36.7460 | 1.0195 | 0.0000 | 0.0000 | 8.8292 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 21 | 0.0000 | 0.9273 | 3.3657 |
| | 1.7649 | 1.0752 | 11.9957 | 20.7637 | 2.8561 | 1.1670 | 41.3078 | 1.5160 | 0.0000 | 0.0000 | 13.2606 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 21 | 0.0000 | 0.6254 | 1.3095 |
| | 1.4513 | 4.4794 | 14.6152 | 17.6470 | 4.5295 | 0.0000 | 42.0861 | 0.7842 | 0.0000 | 0.0000 | 12.4724 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 21 | 0.0000 | 0.0000 | 1.9459 |
| | 1.7132 | 0.5627 | 12.0681 | 19.1760 | 3.4602 | 1.9755 | 43.7541 | 0.3082 | 0.0000 | 0.0000 | 15.0361 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 21 | 0.0000 | 0.0000 | 1.2182 |
| | 2.6063 | 0.9849 | 7.0741 | 18.5017 | 7.9863 | 1.1466 | 38.1765 | 0.0000 | 0.0000 | 0.0000 | 22.3055 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 17 | 0.0000 | 0.0000 | 2.8853 |
| | 0.0000 | 4.8046 | 8.8804 | 9.0454 | 7.5949 | 1.9407 | 48.4562 | 0.5610 | 0.0000 | 0.0000 | 15.8316 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 2.8075 | 4.5812 | 3.1857 | 10.2594 | 8.3558 | 2.6622 | 51.0211 | 0.6556 | 0.0000 | 0.0000 | 16.4716 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 3.3670 | 9.6102 | 9.5458 | 0.0000 | 55.3611 | 0.0000 | 0.0000 | 0.0000 | 22.1159 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 3.1627 | 3.1627 | 12.7777 | 8.9619 | 0.0000 | 51.7997 | 0.0000 | 0.0000 | 0.0000 | 20.1352 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 11.2047 | 5.6975 | 2.8488 | 0.0000 | 71.7243 | 0.0000 | 0.0000 | 0.0000 | 8.5247 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 17.6680 | 10.1958 | 0.0000 | 57.2601 | 0.0000 | 0.0000 | 0.0000 | 14.8761 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 4.9656 | 0.0000 | 92.3786 | 0.0000 | 0.0000 | 0.0000 | 2.6558 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 24.3890 | 0.0000 | 7.1372 | 35.3064 | 0.0000 | 0.0000 | 0.0000 | 33.1674 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 60.0368 | 0.0000 | 0.0000 | 0.0000 | 39.9632 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 43.8814 | 0.0000 | 24.7729 | 0.0000 | 0.0000 | 8.1002 | 0.0000 | 0.0000 | 0.0000 | 23.2455 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 69.2498 | 0.0000 | 0.0000 | 0.0000 | 30.7502 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.8730 | 52.8292 | 0.0000 | 0.0000 | 0.0000 | 32.2978 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1995 | 1 | 2 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 12 | 12 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 13 | 13 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 14 | 14 | 3 | 78.0076 | 11.7577 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 10.2347 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 15 | 15 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 16 | 16 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 8 | 94.8812 | 5.1188 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 9 | 89.5886 | 6.7133 | 0.0000 |
| | 0.0000 | 3.6981 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 12 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 7 | 85.7299 | 11.7351 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.5350 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 8 | 72.3487 | 16.5795 | 7.2300 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 3.8418 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 6 | 38.8745 | 32.0014 | 0.0000 |
| | 0.0000 | 29.1241 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 14 | 9.0684 | 33.2724 | 3.5870 |
| | 30.8600 | 14.7298 | 2.4478 | 2.4478 | 0.0000 | 0.0000 | 0.0000 | 3.5870 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 15 | 3.9226 | 18.4714 | 6.1814 |
| | 16.5173 | 33.7676 | 2.6727 | 13.0775 | 1.6947 | 3.6948 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 22 | 0.0000 | 3.4021 | 4.8187 |
| | 20.9632 | 26.9642 | 3.9740 | 16.3547 | 16.1433 | 0.0000 | 0.0000 | 7.3798 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 24 | 0.0000 | 2.2983 | 2.6885 |
| | 21.2818 | 20.5699 | 3.7905 | 12.4498 | 12.8256 | 1.8007 | 2.5754 | 15.7647 | 0.5282 | 0.0000 | 3.4265 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 24 | 0.0000 | 0.0000 | 0.2881 |
| | 16.0579 | 20.4885 | 4.8585 | 14.5075 | 15.8043 | 0.2539 | 0.4841 | 22.3987 | 0.0000 | 0.0000 | 4.8586 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 24 | 0.0000 | 0.3435 | 0.8692 |
| | 8.5083 | 12.3609 | 4.8758 | 12.7770 | 17.6452 | 1.2519 | 0.0000 | 34.4438 | 0.0000 | 0.0000 | 6.9243 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 24 | 0.0000 | 0.0000 | 0.0000 |
| | 6.2472 | 8.8435 | 1.7685 | 14.1130 | 17.4975 | 2.1947 | 2.8530 | 37.8727 | 0.0000 | 0.0000 | 8.6100 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 23 | 0.4097 | 0.9982 | 0.0000 |
| | 4.1682 | 9.3085 | 3.8703 | 13.8288 | 20.7596 | 4.5244 | 1.1307 | 32.3307 | 0.0000 | 0.0000 | 8.6710 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 23 | 0.0000 | 0.0000 | 0.0000 |
| | 7.8320 | 2.5326 | 4.3156 | 9.3034 | 10.5391 | 6.5604 | 0.0000 | 42.3445 | 0.0000 | 0.0000 | 16.5724 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 2.0489 | 4.9198 | 2.0025 | 12.4525 | 10.6265 | 5.8694 | 0.0000 | 46.5845 | 0.0000 | 0.0000 | 15.4960 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 3.2628 | 4.9063 | 4.6609 | 12.3902 | 16.0379 | 1.7591 | 0.0000 | 44.9328 | 0.0000 | 0.0000 | 12.0500 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 4.1464 | 8.1333 | 0.0000 | 0.0000 | 22.0496 | 9.3078 | 0.0000 | 38.7191 | 0.0000 | 0.0000 | 17.6438 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 17.5558 | 4.8629 | 0.0000 | 42.6823 | 0.0000 | 0.0000 | 34.8990 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 27.2358 | 33.8671 | 38.8971 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 16.3021 | 0.0000 | 17.7081 | 19.0753 | 17.2038 | 0.0000 | 0.0000 | 29.7107 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 22.8103 | 0.0000 | 0.0000 | 61.2434 | 0.0000 | 0.0000 | 15.9463 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 6.1202 | 0.0000 | 0.0000 | 0.0000 | 53.6431 | 0.0000 | 0.0000 | 40.2366 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 39.4312 | 0.0000 | 0.0000 | 60.5688 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 74.0428 | 0.0000 | 0.0000 | 25.9572 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1996 | 1 | 2 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 7 | 0.0000 | 81.0768 | 0.0000 |
| | 18.9232 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 10 | 0.0000 | 20.1115 | 77.5042 |
| | 0.0000 | 2.3844 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 17 | 2.1862 | 92.9427 | 3.5760 |
| | 0.4681 | 0.0000 | 0.5445 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.2826 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 21 | 0.3374 | 20.1641 | 28.0504 |
| | 33.5001 | 0.3238 | 0.3847 | 17.0506 | 0.1889 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 22 | 0.2630 | 46.0588 | 43.4534 |
| | 1.6216 | 4.6346 | 1.7022 | 0.7184 | 0.2724 | 1.2215 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0541 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 22 | 0.6131 | 17.7140 | 37.2391 |
| | 1.0979 | 7.2643 | 28.2294 | 0.4949 | 2.7945 | 2.4103 | 0.0000 | 0.0000 | 2.1425 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 23 | 0.0000 | 10.9674 | 13.8762 |
| | 0.9089 | 11.0178 | 14.3445 | 2.0475 | 3.5702 | 36.3197 | 0.7429 | 0.0000 | 5.1554 | 0.0000 | 1.0494 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 23 | 0.0000 | 1.5181 | 24.6070 |
| | 0.7182 | 27.2289 | 6.5875 | 10.7247 | 4.5754 | 15.3888 | 1.0711 | 0.4813 | 6.1515 | 0.3350 | 0.6125 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 23 | 0.0000 | 1.1386 | 1.5768 |
| | 7.2051 | 18.7021 | 24.5253 | 7.4987 | 9.5959 | 10.3645 | 0.8885 | 0.0000 | 10.9969 | 6.8443 | 0.6634 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 23 | 0.0000 | 0.0000 | 1.3438 |
| | 0.7895 | 15.8022 | 5.8932 | 11.7198 | 15.1517 | 16.3505 | 1.7849 | 0.2569 | 18.1323 | 11.8292 | 0.9459 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 22 | 0.0000 | 0.1541 | 0.5176 |
| | 0.9401 | 31.0157 | 32.4702 | 0.4122 | 2.5547 | 7.7589 | 14.2932 | 0.6151 | 6.9604 | 0.2961 | 2.0117 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 0.3708 | 18.6354 | 17.1067 | 0.8573 | 1.6956 | 19.5074 | 32.6800 | 0.0000 | 6.9234 | 1.1089 | 1.1146 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 15.5198 | 4.9636 | 6.2072 | 17.2204 | 15.7121 | 0.0000 | 0.0000 | 21.4871 | 2.8185 | 16.0713 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.7487 | 2.2570 | 39.5750 | 0.1133 | 42.4071 | 4.0059 | 1.6902 | 1.6300 | 4.6953 | 0.9947 | 1.8828 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 3.3503 | 9.4937 | 3.2181 | 0.0000 | 18.3153 | 20.7841 | 3.2181 | 0.0000 | 30.5483 | 5.7422 | 5.3298 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 8.4445 | 0.0000 | 0.0000 | 33.4947 | 0.9728 | 0.0000 | 0.0000 | 47.4580 | 9.6301 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.1527 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 74.5960 | 0.0000 | 21.2513 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 8.3875 | 0.0000 | 0.0000 | 91.6125 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 97.5437 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.2854 | 1.8855 | 0.2854 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1997 | 1 | 2 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 9 | 9 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 15 | 15 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 4 | 3.4454 | 0.0000 | 1.8946 |
| | 34.4925 | 0.0000 | 0.0000 | 25.6750 | 0.0000 | 34.4925 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 8 | 0.0000 | 59.8556 | 37.4926 |
| | 2.6519 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 10 | 12.5619 | 57.8007 | 17.7805 |
| | 11.8568 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 17 | 0.0000 | 85.3760 | 12.0469 |
| | 1.7238 | 0.0000 | 0.0000 | 0.0000 | 0.8533 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 18 | 0.0000 | 51.3866 | 38.1005 |
| | 8.9539 | 1.5590 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 19 | 0.0000 | 44.6087 | 22.1469 |
| | 27.6094 | 0.6415 | 1.3630 | 3.3097 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.3208 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 25 | 0.0000 | 11.6714 | 34.1848 |
| | 46.6291 | 2.5282 | 1.7490 | 2.4290 | 0.0000 | 0.6648 | 0.1436 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 24 | 0.0000 | 3.0898 | 38.3291 |
| | 33.5845 | 2.4741 | 13.7499 | 5.0000 | 1.0441 | 2.6143 | 0.1142 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 25 | 0.0000 | 0.0000 | 28.5037 |
| | 47.6535 | 3.1239 | 9.2539 | 6.2631 | 1.1773 | 1.7497 | 2.1919 | 0.0000 | 0.0000 | 0.0830 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 25 | 0.0000 | 3.5922 | 23.1875 |
| | 33.6465 | 2.7300 | 10.1321 | 15.0962 | 0.0742 | 2.9252 | 7.1627 | 1.2619 | 0.0000 | 0.0000 | 0.1915 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 25 | 0.0000 | 0.2230 | 28.7138 |
| | 18.8379 | 0.2059 | 7.8917 | 18.1749 | 5.1758 | 7.7714 | 8.1353 | 1.9907 | 0.1274 | 2.2193 | 0.5329 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 25 | 0.0000 | 1.4067 | 17.1958 |
| | 16.2242 | 2.3773 | 13.9308 | 14.2595 | 3.6962 | 9.8896 | 11.1114 | 2.2326 | 0.0000 | 5.2154 | 2.4605 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 23 | 0.0000 | 3.4917 | 5.4887 |
| | 6.5722 | 0.7343 | 21.2336 | 16.7645 | 0.1795 | 6.4888 | 14.3573 | 2.1027 | 0.0000 | 21.1978 | 1.3890 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 21 | 0.0000 | 0.0000 | 1.9862 |
| | 5.3427 | 2.1193 | 24.0337 | 11.7148 | 0.3332 | 7.1828 | 9.9537 | 0.0000 | 0.7037 | 25.7308 | 10.8990 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 22 | 0.0000 | 0.0000 | 4.9417 |
| | 11.6114 | 0.0000 | 8.6283 | 22.0083 | 0.0000 | 23.7538 | 2.3777 | 0.0000 | 0.0000 | 24.0849 | 2.5940 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 17 | 0.0000 | 0.0000 | 7.1689 |
| | 4.6363 | 3.8814 | 26.2762 | 15.0353 | 2.5905 | 1.6836 | 7.4968 | 0.0000 | 0.3902 | 30.2303 | 0.6103 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 2.6130 | 2.6130 | 0.0000 | 0.0000 | 28.8912 | 0.0000 | 7.4230 | 56.7110 | 1.7488 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 29.3671 | 0.0000 | 18.5193 | 2.9120 | 0.0000 | 7.6187 | 8.1788 | 0.0000 | 0.0000 | 33.4042 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 3.3786 | 0.0000 | 45.4246 | 39.9996 | 0.0000 | 0.0000 | 0.0000 | 11.1973 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 29.3114 | 0.0000 | 0.0000 | 0.0000 | 29.3114 | 41.3772 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 47.9537 | 47.9537 | 4.0926 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 14.9752 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 19.2433 | 65.7815 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 76.8209 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 23.1791 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 2 | 2 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 3 | 3 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 4 | 4 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 7 | 7 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 11 | 11 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 12 | 12 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 13 | 13 | 5 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 14 | 14 | 10 | 94.6376 | 1.1095 | 4.2529 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 15 | 15 | 7 | 97.8549 | 0.0000 | 0.0000 |
| | 2.1451 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 16 | 16 | 10 | 97.0726 | 0.4496 | 2.4778 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 16 | 87.7470 | 6.7411 | 5.5119 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 17 | 71.3126 | 17.6973 | 4.4448 |
| | 6.5452 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 19 | 46.6888 | 27.1769 | 22.5983 |
| | 3.5361 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 26 | 22.7967 | 39.3763 | 28.6332 |
| | 5.1512 | 4.0426 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 27 | 0.3731 | 35.3539 | 46.4436 |
| | 14.6905 | 3.1390 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1999 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 30 | 0.0000 | 18.4635 | 41.5785 |
| | 22.2615 | 17.1277 | 0.0000 | 0.0000 | 0.5689 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 35 | 1.7355 | 10.3823 | 40.7963 |
| | 22.6283 | 22.7352 | 0.0000 | 0.0000 | 1.7224 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 36 | 0.0000 | 2.4391 | 33.9976 |
| | 25.9733 | 31.3929 | 4.3700 | 0.1568 | 1.6703 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 35 | 0.1611 | 2.8790 | 20.7361 |
| | 39.2493 | 27.5741 | 3.5539 | 2.9799 | 1.6229 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.2436 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 37 | 0.0000 | 1.4461 | 11.0482 |
| | 41.6282 | 32.3638 | 3.7816 | 1.8844 | 1.8343 | 1.0996 | 2.2007 | 1.1518 | 0.0000 | 0.7399 | 0.8215 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 38 | 0.6285 | 1.2510 | 2.2789 |
| | 39.8713 | 28.6417 | 3.1423 | 7.7646 | 8.8872 | 1.3478 | 2.1132 | 1.7500 | 0.0000 | 0.3966 | 1.9270 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 38 | 0.0000 | 0.0601 | 3.1758 |
| | 36.1888 | 23.5396 | 3.0589 | 11.8537 | 9.3516 | 2.0086 | 3.4823 | 2.6113 | 1.8079 | 0.0000 | 2.8613 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 34 | 0.0000 | 0.0000 | 1.8395 |
| | 24.9310 | 21.3679 | 4.0757 | 11.5135 | 8.1371 | 5.6077 | 7.8070 | 6.6966 | 1.7415 | 0.8717 | 5.4109 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 35 | 0.0000 | 0.0000 | 1.9482 |
| | 37.5050 | 16.0633 | 0.8513 | 7.6020 | 15.3154 | 3.7622 | 4.5159 | 6.8102 | 0.9994 | 0.0000 | 4.6271 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 31 | 0.0000 | 0.0000 | 5.8809 |
| | 30.4247 | 12.5163 | 0.0000 | 5.8766 | 11.0245 | 3.3369 | 2.4130 | 9.0141 | 4.1931 | 0.0000 | 15.3199 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 27 | 0.0000 | 2.5650 | 2.9423 |
| | 12.1110 | 8.2400 | 7.0375 | 22.2208 | 10.7310 | 7.9834 | 2.7027 | 2.9876 | 2.2656 | 3.8632 | 14.3498 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 11.2155 | 17.3296 | 0.0000 | 29.6857 | 9.5058 | 4.3954 | 10.0074 | 0.0000 | 6.6200 | 0.0000 | 11.2407 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 6.7945 | 0.0000 | 0.6924 | 3.5969 | 15.9741 | 4.3380 | 7.6923 | 8.8294 | 5.2370 | 6.7129 | 40.1324 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 11 | 1.5017 | 0.0000 | 0.0000 |
| | 6.4688 | 10.0428 | 0.0000 | 15.9582 | 14.9952 | 0.0000 | 0.0000 | 38.5261 | 10.4125 | 0.0000 | 2.0947 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 22.6029 | 24.4873 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 20.6949 | 15.0158 | 0.0000 | 3.1319 | 14.0671 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 2.3928 | 0.0000 | 19.5809 | 13.7001 | 0.0000 | 20.9967 | 2.3928 | 2.3928 | 19.1556 | 0.0000 | 19.3884 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 5.2727 | 0.0000 | 0.0000 | 0.0000 | 24.7555 | 0.0000 | 36.6476 | 33.3242 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 29.4820 | 0.0000 | 0.0000 | 28.0885 | 6.8730 | 0.0000 | 35.5565 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1999 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 51.6311 | 0.0000 | 0.0000 | 0.0000 | 48.3689 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 12 | 12 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 15 | 15 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 16 | 16 | 3 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 4 | 0.0000 | 84.1370 | 15.8630 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 5 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 6 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 5 | 0.0000 | 90.7037 | 6.0536 |
| | 0.0000 | 3.2426 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 9 | 2.8502 | 95.9526 | 0.0000 |
| | 0.0000 | 1.1972 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 13 | 0.0000 | 88.0052 | 9.5750 |
| | 2.4198 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 14 | 1.1740 | 88.4699 | 4.3847 |
| | 2.3944 | 1.4019 | 0.0000 | 0.0000 | 2.1750 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 14 | 0.0000 | 84.5189 | 11.1647 |
| | 3.3775 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.9389 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 17 | 0.7002 | 71.2600 | 15.0732 |
| | 3.5931 | 6.2459 | 2.8172 | 0.0000 | 0.0000 | 0.3103 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 16 | 0.0000 | 45.9027 | 17.9657 |
| | 8.2848 | 19.2957 | 6.9211 | 0.0000 | 0.7748 | 0.8552 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 18 | 0.8062 | 34.1155 | 12.1712 |
| | 16.2378 | 15.6014 | 13.2997 | 2.0121 | 2.9699 | 1.3277 | 0.6934 | 0.0000 | 0.0000 | 0.0000 | 0.7653 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 19 | 0.0000 | 14.0509 | 8.1382 |
| | 10.2016 | 35.5219 | 19.6965 | 2.1266 | 3.0109 | 1.9057 | 3.6632 | 0.6577 | 1.0267 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 19 | 0.0000 | 7.9601 | 5.3036 |
| | 14.4351 | 32.6668 | 25.1905 | 4.4965 | 2.9822 | 0.8918 | 0.7408 | 3.3722 | 0.5991 | 0.0000 | 1.3612 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 19 | 0.0000 | 1.8032 | 1.3350 |
| | 10.5989 | 35.3355 | 23.8926 | 2.8062 | 7.9534 | 7.3059 | 0.6828 | 3.1039 | 0.5522 | 0.8460 | 3.7844 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 20 | 0.0000 | 0.9093 | 1.0448 |
| | 3.7114 | 30.3537 | 29.9134 | 3.4956 | 6.9947 | 2.6153 | 1.3367 | 3.4113 | 12.8183 | 1.5953 | 1.8002 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 18 | 0.0000 | 0.9603 | 2.1467 |
| | 7.9871 | 33.1434 | 15.2018 | 2.1201 | 12.1199 | 6.4598 | 4.2997 | 0.7020 | 4.6431 | 3.9872 | 6.2289 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 8.2190 | 31.6499 | 18.8080 | 1.1624 | 12.7034 | 10.0289 | 7.0599 | 4.7562 | 1.4951 | 0.0000 | 4.1172 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 17 | 0.0000 | 0.0000 | 1.2085 |
| | 2.0017 | 31.6943 | 19.7651 | 2.1221 | 21.3663 | 3.4694 | 1.2991 | 4.1445 | 10.5558 | 1.3574 | 1.0158 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 15 | 0.0000 | 0.0000 | 0.0000 |
| | 0.4818 | 33.8017 | 19.3591 | 1.2685 | 12.9634 | 0.9512 | 0.4818 | 2.5955 | 0.6592 | 3.4017 | 24.0360 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 9 | 0.0000 | 0.5887 | 0.0000 |
| | 0.0000 | 66.6340 | 8.2161 | 0.0000 | 0.0000 | 6.9103 | 0.0000 | 9.4295 | 6.4698 | 0.5887 | 1.1628 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 11.5220 | 15.9183 | 0.0000 | 1.6331 | 26.5578 | 2.1208 | 1.7212 | 13.3548 | 12.6561 | 0.8487 | 13.6673 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 6 | 0.0000 | 3.0321 | 0.0000 |
| | 0.0000 | 12.9927 | 5.2606 | 0.0000 | 5.6906 | 0.0000 | 57.8144 | 5.2606 | 0.0000 | 0.0000 | 9.9489 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 6 | 0.0000 | 0.0000 | 20.0439 |
| | 0.0000 | 4.8480 | 0.0000 | 20.0439 | 5.1614 | 1.9729 | 0.0000 | 24.5484 | 20.0439 | 0.0000 | 3.3375 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 55.2635 | 0.0000 | 4.9076 | 4.3060 | 0.0000 | 0.0000 | 32.8521 | 2.6709 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 16.4847 | 0.0000 | 55.4426 | 0.0000 | 14.7289 | 0.0000 | 0.0000 | 13.3438 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 6.8087 | 6.8087 | 0.0000 | 46.8738 | 0.0000 | 0.0000 | 20.5300 | 0.0000 | 0.0000 | 18.9789 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 3.1611 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 96.8389 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 2000 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 12 | 12 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 3 | 0.0000 | 0.0000 | 25.2248 |
| | 0.0000 | 74.7752 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 4 | 0.0000 | 35.0968 | 64.9032 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 6 | 0.0000 | 12.5619 | 38.6885 |
| | 29.3046 | 8.1788 | 0.0000 | 8.1788 | 0.0000 | 3.0873 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 11 | 0.0000 | 10.6051 | 47.9065 |
| | 1.8855 | 18.6558 | 17.2688 | 3.6782 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 15 | 0.0000 | 0.0000 | 49.8991 |
| | 6.5348 | 26.5859 | 7.5934 | 5.4393 | 2.4826 | 0.0000 | 0.0000 | 1.4649 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 18 | 0.0000 | 8.2561 | 42.8702 |
| | 10.5765 | 9.7779 | 10.4295 | 7.9146 | 1.2916 | 0.0000 | 4.2439 | 1.4980 | 2.3998 | 0.7419 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 20 | 0.0000 | 4.9425 | 37.8272 |
| | 12.1583 | 19.0817 | 10.7765 | 6.2054 | 2.3492 | 1.2178 | 2.3304 | 0.0000 | 1.4246 | 0.7058 | 0.9807 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 20 | 0.0000 | 1.6174 | 23.0089 |
| | 9.9997 | 14.7910 | 23.1580 | 17.5764 | 1.9380 | 2.0128 | 2.1124 | 0.4453 | 0.7993 | 2.0101 | 0.5306 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 20 | 0.0000 | 1.6219 | 22.3448 |
| | 5.6923 | 12.2921 | 30.2529 | 5.3492 | 3.5770 | 3.1349 | 4.9783 | 1.3018 | 4.3030 | 2.8388 | 2.3131 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 20 | 0.0000 | 0.7375 | 21.6876 |
| | 10.6965 | 8.8968 | 28.8062 | 12.3512 | 2.0641 | 5.2578 | 3.3536 | 0.2201 | 1.6195 | 2.5782 | 1.7309 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 20 | 0.0000 | 1.7561 | 16.8479 |
| | 4.8175 | 7.7288 | 30.2077 | 13.7698 | 4.0777 | 3.3433 | 5.9727 | 2.0526 | 2.4755 | 2.3848 | 4.5656 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 19 | 0.0000 | 0.0000 | 6.6062 |
| | 1.0494 | 5.2167 | 37.8560 | 24.3453 | 0.9989 | 4.9287 | 7.3963 | 4.7019 | 1.2642 | 3.7703 | 1.8660 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 18 | 0.0000 | 1.4872 | 1.2159 |
| | 0.9395 | 6.3342 | 37.9015 | 24.7375 | 4.3686 | 6.8019 | 4.7427 | 0.0000 | 4.6578 | 3.0184 | 3.7948 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 19 | 0.0000 | 0.0000 | 0.0000 |
| | 1.9467 | 9.2585 | 25.4506 | 18.8768 | 6.4191 | 0.9494 | 10.3323 | 3.6184 | 12.6713 | 0.9494 | 9.5274 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 17 | 0.0000 | 0.0000 | 1.3305 |
| | 3.2822 | 10.1370 | 33.5628 | 12.0628 | 4.1253 | 6.7308 | 10.9591 | 0.0000 | 1.5370 | 8.7205 | 7.5519 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 11.4294 | 27.6693 | 18.6110 | 3.5874 | 10.9540 | 9.9317 | 2.5622 | 4.6699 | 3.3864 | 7.1987 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.4466 | 34.8437 | 20.6244 | 11.3742 | 7.0159 | 9.2641 | 5.0713 | 3.1561 | 3.2036 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 36.0220 | 5.3011 | 0.0000 | 11.0325 | 13.6640 | 9.9940 | 3.3418 | 7.7238 | 12.9208 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 9 | 0.0000 | 0.0000 | 6.8589 |
| | 0.0000 | 7.1619 | 49.7460 | 0.0000 | 6.8589 | 22.2123 | 7.1619 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 6.9324 | 21.2889 | 5.3734 | 12.7642 | 18.0418 | 14.3104 | 21.2889 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 52.5958 | 0.0000 | 0.0000 | 23.6052 | 13.9290 | 9.8700 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 33.6671 | 33.6671 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 32.6658 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 28.2727 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 71.7273 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 48.5839 | 27.9563 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 23.4599 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 2 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 48.9195 | 0.0000 | 51.0805 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 1 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 8 | 0.0000 | 42.3639 | 45.1912 |
| | 12.4449 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 3 | 0.0000 | 17.1018 | 82.8982 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 5 | 0.0000 | 33.5639 | 17.2156 |
| | 38.7468 | 0.0000 | 10.4737 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 11 | 0.0000 | 10.1682 | 42.7429 |
| | 4.1362 | 31.5825 | 11.3703 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 15 | 0.0000 | 0.0000 | 21.0578 |
| | 26.8497 | 24.8504 | 7.2586 | 8.3690 | 6.1733 | 2.0629 | 3.3782 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 22 | 0.0000 | 1.0663 | 22.9492 |
| | 28.9467 | 8.3092 | 5.9522 | 15.1476 | 7.8443 | 1.0165 | 3.2895 | 2.7009 | 0.0000 | 2.7776 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 24 | 0.0000 | 1.0806 | 10.4197 |
| | 32.7813 | 11.5939 | 8.6118 | 16.2868 | 13.5632 | 1.2248 | 0.0000 | 0.0000 | 0.0000 | 2.8768 | 1.5611 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 25 | 0.0000 | 0.0000 | 10.2991 |
| | 39.2676 | 10.2788 | 9.6153 | 13.0745 | 8.1587 | 2.9222 | 2.6789 | 2.7661 | 0.0000 | 0.9387 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 26 | 0.0000 | 0.0000 | 8.9592 |
| | 31.1028 | 14.7763 | 9.0802 | 16.5015 | 11.0516 | 1.7012 | 1.1197 | 4.2000 | 0.0000 | 0.0000 | 1.5074 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 26 | 0.0000 | 1.1350 | 5.9499 |
| | 40.2491 | 6.7256 | 6.3068 | 20.4834 | 8.1864 | 0.6422 | 1.5461 | 2.7718 | 0.0000 | 3.0604 | 2.9432 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 26 | 0.0000 | 0.0000 | 4.8161 |
| | 33.8745 | 6.3276 | 9.1029 | 18.4557 | 13.8195 | 3.9930 | 2.3153 | 4.1518 | 0.5827 | 0.0000 | 2.5609 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 26 | 0.0000 | 0.7673 | 8.9400 |
| | 30.5344 | 6.4356 | 8.6302 | 19.3262 | 13.2542 | 2.8175 | 1.5265 | 2.0964 | 1.1651 | 0.8161 | 3.6906 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 26 | 0.0000 | 0.0000 | 4.9976 |
| | 20.3347 | 7.5862 | 15.9785 | 30.3148 | 10.7139 | 1.1348 | 5.0741 | 0.7193 | 0.0000 | 1.1421 | 2.0041 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 25 | 0.0000 | 0.0000 | 3.3938 |
| | 18.1511 | 8.8107 | 9.1303 | 37.3568 | 9.8545 | 0.8651 | 1.9355 | 2.4102 | 1.3884 | 2.0345 | 4.6692 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 25 | 0.0000 | 0.0000 | 5.1217 |
| | 13.7079 | 6.2973 | 11.6000 | 30.2736 | 12.6475 | 3.9881 | 0.9051 | 7.1326 | 0.0000 | 2.8971 | 5.4292 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 21 | 0.0000 | 0.0000 | 0.0000 |
| | 9.9737 | 2.1620 | 9.5299 | 35.3383 | 16.8471 | 2.4629 | 3.2460 | 8.5750 | 2.2157 | 0.0000 | 9.6493 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 13 | 0.0000 | 0.0000 | 3.7014 |
| | 0.0000 | 3.1279 | 16.8292 | 40.9721 | 27.4825 | 3.3522 | 4.5347 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 18 | 0.0000 | 0.0000 | 4.0782 |
| | 3.6010 | 8.7241 | 10.1919 | 24.4442 | 5.0716 | 4.1021 | 8.4367 | 10.1702 | 8.3743 | 0.0000 | 12.8057 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2002 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 12 | 0.0000 | 0.0000 | 5.5343 |
| | 0.0000 | 0.0000 | 25.3984 | 17.3582 | 11.5257 | 7.9052 | 5.0439 | 8.9366 | 0.0000 | 4.8582 | 13.4395 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 11.9223 | 61.8329 | 13.6021 | 0.0000 | 6.2803 | 0.0000 | 6.3624 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 44.3172 | 21.2872 | 0.0000 | 10.5131 | 0.0000 | 0.0000 | 0.0000 | 23.8824 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.3248 | 0.0000 | 0.0000 | 49.6752 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 34.7540 | 30.4919 | 34.7540 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 2002 | 1 | 2 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 13 | 13 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 14 | 14 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 1 | 0.0000 | 0.0000 | 100.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 3 | 0.0000 | 0.0000 | 75.1993 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 24.8007 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 11 | 0.0000 | 0.0000 | 68.0069 |
| | 11.9223 | 6.5124 | 10.1511 | 3.4072 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 14 | 0.0000 | 0.0000 | 68.5910 |
| | 20.7945 | 2.7590 | 3.9542 | 1.9883 | 1.9129 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 14 | 0.0000 | 2.2715 | 56.1839 |
| | 27.1537 | 4.6842 | 5.8375 | 1.0781 | 0.9145 | 1.8766 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 15 | 0.0000 | 1.8347 | 58.2497 |
| | 15.9159 | 5.4840 | 7.1744 | 3.1595 | 3.2125 | 2.8268 | 1.0581 | 0.0000 | 1.0843 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 15 | 0.0000 | 0.0000 | 37.9090 |
| | 25.6187 | 4.1695 | 11.1978 | 7.9117 | 4.7170 | 5.6703 | 0.7105 | 1.3675 | 0.7281 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 15 | 0.0000 | 0.0000 | 41.1892 |
| | 24.7730 | 3.1076 | 10.5619 | 5.5564 | 6.3114 | 4.6666 | 1.5611 | 0.0000 | 1.4044 | 0.0000 | 0.8685 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 15 | 0.0000 | 0.0000 | 27.3169 |
| | 20.1340 | 8.1287 | 17.6890 | 8.4899 | 10.7135 | 5.5262 | 2.0018 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 15 | 0.0000 | 0.0000 | 29.7089 |
| | 11.6836 | 5.8189 | 20.9520 | 7.7314 | 12.1244 | 3.8823 | 2.0193 | 1.4668 | 3.4105 | 0.0000 | 1.2020 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 15 | 0.0000 | 0.0000 | 12.7050 |
| | 23.0225 | 11.3418 | 15.6006 | 7.2251 | 11.3127 | 13.4500 | 2.0643 | 0.0000 | 1.7657 | 0.0000 | 1.5122 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 13 | 0.0000 | 0.0000 | 14.9922 |
| | 10.2756 | 19.6119 | 11.5581 | 15.5361 | 12.5532 | 5.5570 | 6.1898 | 0.0000 | 3.7262 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 13 | 0.0000 | 0.0000 | 5.1573 |
| | 25.0678 | 17.7324 | 19.4986 | 13.4747 | 4.5097 | 9.1017 | 2.3121 | 0.0000 | 0.0000 | 3.1456 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 11 | 0.0000 | 0.0000 | 10.2821 |
| | 11.9718 | 16.1300 | 25.4043 | 6.6695 | 11.3009 | 8.4387 | 0.0000 | 3.7301 | 3.0363 | 3.0363 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 14.6259 | 5.3860 | 18.7776 | 10.2861 | 25.0699 | 7.1959 | 15.6727 | 0.0000 | 2.9858 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 9 | 0.0000 | 0.0000 | 7.4336 |
| | 18.6799 | 31.6749 | 25.9355 | 0.0000 | 6.1934 | 0.0000 | 5.0413 | 0.0000 | 0.0000 | 0.0000 | 5.0413 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 7 | 0.0000 | 0.0000 | 8.1690 |
| | 8.4396 | 6.9973 | 6.9973 | 0.0000 | 46.0660 | 6.9973 | 16.3335 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 13.9593 | 0.0000 | 9.8441 | 10.1687 | 44.6501 | 7.4971 | 13.8807 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 8.8864 | 25.5914 | 12.1233 | 0.0000 | 18.3589 | 0.0000 | 0.0000 | 10.7181 | 11.4809 | 0.0000 | 12.8410 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 35.3488 | 0.0000 | 46.5278 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 18.1233 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 30.4629 | 0.0000 | 29.8403 | 12.3816 | 12.3816 | 0.0000 | 14.9337 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 31.2604 | 29.9916 | 0.0000 | 38.7480 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 2 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 10 | 10 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 11 | 11 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 13 | 13 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 14 | 14 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 15 | 15 | 2 | 58.5058 | 0.0000 | 0.0000 |
| | 0.0000 | 41.4942 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 16 | 16 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 17 | 17 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 20.0000 | 80.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 18 | 18 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 70.3463 | 0.0000 | 0.0000 | 29.6537 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 2 | 0.0000 | 0.0000 | 69.7592 |
| | 15.1204 | 15.1204 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 3 | 0.0000 | 18.5905 | 12.3094 |
| | 12.3094 | 0.0000 | 56.7906 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 11 | 0.0000 | 59.5820 | 0.0000 |
| | 28.2325 | 12.1855 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 20 | 0.0000 | 15.7398 | 5.3963 |
| | 68.3498 | 6.0162 | 4.4979 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 26 | 0.0000 | 12.1471 | 4.2035 |
| | 75.1852 | 7.0790 | 0.5242 | 0.8610 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 31 | 0.0000 | 3.3954 | 3.1360 |
| | 83.0647 | 7.4869 | 1.9282 | 0.5061 | 0.4828 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 32 | 0.0000 | 0.4806 | 3.3481 |
| | 73.8552 | 16.8292 | 1.3742 | 1.0506 | 1.6342 | 0.7833 | 0.6446 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 32 | 0.0000 | 0.1480 | 1.6040 |
| | 77.4460 | 11.8914 | 1.5654 | 2.3193 | 2.9626 | 1.4027 | 0.6608 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 32 | 0.0000 | 0.0000 | 1.0505 |
| | 71.5285 | 14.3562 | 3.7921 | 4.6284 | 2.2864 | 0.9735 | 0.8338 | 0.5506 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 32 | 0.0000 | 0.0000 | 0.3648 |
| | 66.9496 | 11.6435 | 1.6843 | 9.3227 | 3.2830 | 3.6290 | 2.4464 | 0.4998 | 0.1771 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 31 | 0.0000 | 0.6148 | 1.6688 |
| | 52.8248 | 18.4309 | 5.1258 | 9.0259 | 3.9787 | 5.3783 | 1.9338 | 0.6384 | 0.1424 | 0.2374 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 31 | 0.0000 | 0.0000 | 0.8168 |
| | 48.1210 | 15.9151 | 7.1241 | 7.1275 | 8.3661 | 6.0448 | 4.0745 | 0.9355 | 0.0000 | 1.4747 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 31 | 0.0000 | 0.0000 | 1.3335 |
| | 28.9472 | 12.6999 | 5.3087 | 21.7823 | 10.7703 | 9.1874 | 3.3931 | 1.7166 | 2.5684 | 0.0000 | 2.2926 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 27 | 0.0000 | 0.0000 | 1.3629 |
| | 38.0457 | 12.4769 | 2.8790 | 18.3370 | 8.6651 | 5.2718 | 7.0365 | 3.8091 | 0.3186 | 0.0000 | 1.7974 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 18 | 0.0000 | 0.0000 | 5.0351 |
| | 30.3249 | 7.4597 | 14.4638 | 13.2756 | 10.1302 | 4.3905 | 12.4469 | 0.0000 | 0.0000 | 2.4733 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 17 | 0.0000 | 0.0000 | 4.7410 |
| | 27.2558 | 6.4929 | 16.5327 | 17.6294 | 14.5815 | 4.9506 | 0.0000 | 0.0000 | 7.8160 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 16.2430 | 21.1304 | 37.7515 | 6.4001 | 2.2887 | 0.0000 | 3.5434 | 0.0000 | 0.0000 | 5.9357 | 6.7072 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 18.7749 | 17.3509 | 16.7304 | 20.5671 | 9.8512 | 1.4830 | 0.0000 | 6.2013 | 0.0000 | 2.8398 | 6.2013 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 33.4903 | 25.3500 | 0.0000 | 0.0000 | 0.0000 | 6.9906 | 6.9906 | 0.0000 | 0.0000 | 27.1784 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 27.2174 | 34.5735 | 10.2453 | 5.9507 | 16.0624 | 5.9507 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 21.3531 | 23.2676 | 0.0000 | 55.3793 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 16.4672 | 0.0000 | 36.7710 | 15.1911 | 0.0000 | 16.3795 | 0.0000 | 0.0000 | 0.0000 | 15.1911 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 27.4407 | 72.5593 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2004 | 1 | 2 | 0 | 0 | 1 | 43 | 43 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2004 | 1 | 2 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 19 | 19 | 2 | 0.0000 | 0.0000 | 48.1581 |
| | 0.0000 | 51.8419 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 1 | 0.0000 | 0.0000 | 33.3333 |
| | 0.0000 | 66.6667 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 54.9785 | 23.3997 | 0.0000 | 21.6217 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 12 | 0.0000 | 0.0000 | 2.1305 |
| | 9.6919 | 81.3755 | 1.0653 | 5.7368 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 17 | 0.0000 | 0.0000 | 5.7333 |
| | 0.7260 | 78.4467 | 10.0868 | 0.0000 | 0.0000 | 5.0073 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 19 | 0.0000 | 0.0000 | 1.2904 |
| | 0.4253 | 75.3246 | 20.2576 | 2.7022 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 20 | 0.0000 | 0.0000 | 2.9404 |
| | 5.2453 | 61.1145 | 19.0020 | 2.2002 | 7.5969 | 1.9007 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 20 | 0.0000 | 0.0000 | 2.7307 |
| | 0.5408 | 78.2032 | 13.5949 | 0.0560 | 4.2289 | 0.6455 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 20 | 0.0000 | 0.0000 | 1.8891 |
| | 0.7415 | 59.2870 | 14.5850 | 5.9192 | 4.5569 | 12.7027 | 0.0445 | 0.2742 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 19 | 0.0000 | 0.0000 | 0.0000 |
| | 7.8885 | 56.7435 | 8.0792 | 1.7191 | 15.0864 | 5.0461 | 2.3092 | 2.6023 | 0.0000 | 0.0000 | 0.5257 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 5.5995 | 51.0252 | 16.4191 | 5.6248 | 6.6792 | 0.0000 | 7.1602 | 2.8124 | 2.4402 | 0.0000 | 2.2394 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 3.5818 | 50.9193 | 14.7590 | 0.0000 | 1.6819 | 12.1680 | 4.7397 | 7.8140 | 0.0000 | 0.0000 | 4.3362 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 35.9155 | 23.6230 | 1.3729 | 5.6135 | 25.9310 | 7.3158 | 0.2282 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 71.8001 | 0.0000 | 28.1999 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 24.3379 | 34.4539 | 0.0000 | 41.2082 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 51.3215 | 1.1804 | 0.0000 | 2.1615 | 0.0000 | 24.9166 | 1.1804 | 19.2397 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 19.4059 | 21.6556 | 0.0000 | 0.0000 | 19.8919 | 23.1695 | 15.8771 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 69.2278 | 0.0000 | 28.6446 | 0.0000 | 0.0000 | 2.1276 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 40.5194 | 29.7403 | 0.0000 | 0.0000 | 29.7403 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 89.6871 | 0.0000 | 0.0000 | 10.3129 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 20 | 20 | 2 | 0.0000 | 31.7620 | 0.0000 |
| | 0.0000 | 0.0000 | 68.2380 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 21 | 21 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 22 | 22 | 3 | 0.0000 | 15.4233 | 45.4465 |
| | 0.0000 | 0.0000 | 39.1302 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 23 | 23 | 3 | 0.0000 | 13.1413 | 0.0000 |
| | 38.9266 | 0.0000 | 47.9321 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 24 | 24 | 5 | 0.0000 | 2.0155 | 0.0000 |
| | 21.4846 | 16.6798 | 36.3976 | 23.4225 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 1 | 2 | 0 | 0 | 1 | 25 | 25 | 7 | 1.7564 | 2.0218 | 2.1803 |
| | 5.9594 | 1.9542 | 79.9160 | 6.2118 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 26 | 26 | 9 | 0.0000 | 1.1349 | 0.0000 |
| | 3.8898 | 3.9845 | 69.7502 | 14.8623 | 0.5053 | 1.9953 | 1.3641 | 2.5137 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 27 | 27 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 13.5145 | 1.3618 | 70.3171 | 7.8816 | 5.1353 | 0.7495 | 0.6641 | 0.3761 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 28 | 28 | 10 | 0.0000 | 0.0000 | 0.9410 |
| | 2.5701 | 3.3383 | 75.8994 | 7.6959 | 3.6945 | 3.2584 | 1.9299 | 0.0000 | 0.2994 | 0.0000 | 0.3731 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 29 | 29 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 6.3252 | 5.0282 | 65.3053 | 8.4477 | 3.3393 | 5.0609 | 4.4159 | 1.3120 | 0.0000 | 0.0000 | 0.7655 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 30 | 30 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 3.8088 | 4.3184 | 72.7137 | 6.4553 | 4.0356 | 1.3609 | 2.5348 | 1.3495 | 1.7494 | 1.6737 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 31 | 31 | 11 | 0.0000 | 0.0000 | 2.4894 |
| | 2.3836 | 1.7826 | 68.5063 | 8.1655 | 1.2056 | 10.9231 | 0.3962 | 2.0894 | 0.0000 | 1.5997 | 0.4587 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 32 | 32 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.8151 | 4.8252 | 54.2806 | 9.3832 | 8.5011 | 4.1590 | 8.4249 | 6.1707 | 2.9092 | 0.5310 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 33 | 33 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.1870 | 62.4207 | 10.1236 | 4.0147 | 6.7748 | 1.8620 | 5.2954 | 0.0000 | 0.0000 | 5.3218 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 34 | 34 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 57.0671 | 7.0306 | 6.7845 | 2.3022 | 5.3278 | 12.2545 | 9.2334 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 35 | 35 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 3.0668 | 0.0000 | 59.4547 | 20.5677 | 2.7839 | 0.0000 | 14.1268 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 36 | 36 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 43.5242 | 29.3610 | 7.6706 | 0.0000 | 19.4443 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 37 | 37 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 48.9155 | 0.0000 | 4.3642 | 4.5956 | 9.2067 | 23.5419 | 9.3761 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 50.4426 | 0.0000 | 25.3979 | 13.7215 | 10.4379 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 6.7783 | 0.0000 | 40.3996 | 0.0000 | 52.8221 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 40 | 40 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 14.3389 | 0.0000 | 5.2551 | 27.1444 | 0.0000 | 41.9714 | 11.2901 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 41 | 41 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 62.2392 | 0.0000 | 0.0000 | 11.4155 | 0.0000 | 26.3453 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 42 | 42 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 7.9399 | 43.3208 | 29.0123 | 7.5400 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 12.1870 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 42.0659 | 0.0000 | 0.0000 | 0.0000 | 57.9341 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 2006 | 1 | 2 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 7 | 7 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 9 | 9 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 10 | 10 | 1 | 66.6667 | 33.3333 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 1 | 57.1429 | 42.8571 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 2 | 92.8571 | 7.1429 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 3 | 85.7143 | 14.2857 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 4 | 82.9268 | 17.0732 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 3 | 80.0000 | 20.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 9 | 67.2414 | 24.1379 | 8.6207 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 14 | 68.2540 | 20.6349 | 9.5238 |
| | 0.0000 | 0.0000 | 1.5873 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 16 | 60.6061 | 30.3030 | 9.0909 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 14 | 53.5211 | 29.5775 | 16.9014 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1977 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 17 | 50.0000 | 26.3889 | 22.2222 |
| | 1.3889 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 20 | 25.6757 | 31.0811 | 41.8919 |
| | 1.3514 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 22 | 10.0000 | 22.3077 | 61.5385 |
| | 4.6154 | 0.7692 | 0.0000 | 0.7692 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 24 | 2.7027 | 16.8919 | 72.9730 |
| | 4.7297 | 2.0270 | 0.6757 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 29 | 0.0000 | 16.0976 | 75.6098 |
| | 3.4146 | 0.9756 | 3.9024 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 34 | 0.0000 | 6.2500 | 82.5000 |
| | 5.0000 | 1.2500 | 4.5833 | 0.4167 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 40 | 0.0000 | 3.1873 | 72.1116 |
| | 5.5777 | 4.3825 | 13.9442 | 0.3984 | 0.0000 | 0.0000 | 0.3984 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 41 | 0.3215 | 3.5370 | 54.9839 |
| | 4.5016 | 6.1093 | 29.5820 | 0.3215 | 0.0000 | 0.3215 | 0.3215 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 45 | 0.0000 | 0.2283 | 31.5068 |
| | 7.0776 | 9.1324 | 47.7169 | 3.1963 | 1.1416 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 48 | 0.0000 | 0.0000 | 19.4707 |
| | 3.0246 | 8.5066 | 63.1380 | 4.1588 | 1.1342 | 0.1890 | 0.3781 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 48 | 0.0000 | 0.1724 | 12.2414 |
| | 4.4828 | 9.1379 | 65.5172 | 5.5172 | 1.2069 | 0.8621 | 0.1724 | 0.6897 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 45 | 0.0000 | 0.0000 | 6.9243 |
| | 2.4155 | 7.2464 | 68.9211 | 9.1787 | 2.5765 | 2.0934 | 0.3221 | 0.3221 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 47 | 0.0000 | 0.0000 | 2.9240 |
| | 1.1696 | 5.8480 | 64.3275 | 12.4756 | 6.6277 | 4.0936 | 1.3645 | 0.9747 | 0.0000 | 0.1949 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 46 | 0.0000 | 0.0000 | 1.3921 |
| | 0.4640 | 4.6404 | 55.9165 | 16.0093 | 10.4408 | 6.9606 | 3.0162 | 0.6961 | 0.4640 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 44 | 0.0000 | 0.0000 | 2.5890 |
| | 1.6181 | 3.5599 | 46.6019 | 16.5049 | 11.0032 | 7.7670 | 7.7670 | 2.2654 | 0.0000 | 0.3236 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 40 | 0.0000 | 0.0000 | 0.4202 |
| | 0.8403 | 0.8403 | 47.8992 | 15.5462 | 13.4454 | 11.3445 | 3.7815 | 3.7815 | 1.6807 | 0.4202 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 38 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.9070 | 33.7209 | 16.8605 | 18.6047 | 13.9535 | 7.5581 | 2.3256 | 4.0698 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 31 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.1583 | 33.0935 | 14.3885 | 22.3022 | 10.0719 | 10.7914 | 5.7554 | 1.4388 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 33 | 0.0000 | 0.0000 | 0.0000 |
| | 0.7042 | 0.0000 | 21.8310 | 19.7183 | 17.6056 | 16.9014 | 9.8592 | 9.1549 | 3.5211 | 0.7042 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.6316 | 22.3684 | 14.4737 | 17.1053 | 22.3684 | 7.8947 | 7.8947 | 2.6316 | 2.6316 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 19 | 0.0000 | 0.0000 | 1.8182 |
| | 0.0000 | 0.0000 | 14.5455 | 9.0909 | 16.3636 | 23.6364 | 16.3636 | 9.0909 | 3.6364 | 3.6364 | 1.8182 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.0000 | 20.0000 | 14.0000 | 16.0000 | 22.0000 | 14.0000 | 4.0000 | 6.0000 | 2.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 10.2564 | 12.8205 | 20.5128 | 5.1282 | 23.0769 | 15.3846 | 12.8205 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.7778 | 5.5556 | 13.8889 | 11.1111 | 19.4444 | 19.4444 | 19.4444 | 2.7778 | 2.7778 | 2.7778 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 44 | 44 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 13.7931 | 17.2414 | 31.0345 | 20.6897 | 10.3448 | 6.8966 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 4.7619 | 33.3333 | 23.8095 | 14.2857 | 9.5238 | 4.7619 | 0.0000 | 9.5238 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 27.7778 | 11.1111 | 11.1111 | 16.6667 | 16.6667 | 5.5556 | 5.5556 | 5.5556 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 47 | 47 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 10.0000 | 0.0000 | 0.0000 | 10.0000 | 60.0000 | 10.0000 | 0.0000 | 0.0000 | 10.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 48 | 48 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 11.1111 | 33.3333 | 22.2222 | 11.1111 | 11.1111 | 11.1111 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 49 | 49 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 12.5000 | 12.5000 | 12.5000 | 0.0000 | 0.0000 | 25.0000 | 25.0000 | 0.0000 | 12.5000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 16.6667 | 33.3333 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1977 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 7 | 0.0000 | 0.0000 | 9.0909 |
| | 0.0000 | 0.0000 | 18.1818 | 0.0000 | 9.0909 | 0.0000 | 9.0909 | 9.0909 | 0.0000 | 9.0909 | 36.3636 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 4 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 7 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 9 | 2.0833 | 93.7500 | 4.1667 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 10 | 1.5385 | 95.3846 | 3.0769 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 12 | 1.1236 | 94.3820 | 4.4944 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 10 | 0.0000 | 93.3036 | 6.6964 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 12 | 0.0000 | 92.6316 | 6.8421 |
| | 0.5263 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 11 | 0.0000 | 86.1111 | 13.1944 |
| | 0.6944 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 10 | 0.0000 | 70.3704 | 29.6296 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 12 | 0.0000 | 55.8824 | 32.3529 |
| | 0.0000 | 2.9412 | 8.8235 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 13 | 0.0000 | 22.2222 | 22.2222 |
| | 27.7778 | 11.1111 | 16.6667 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 16 | 0.0000 | 8.6957 | 8.6957 |
| | 30.4348 | 21.7391 | 13.0435 | 13.0435 | 0.0000 | 4.3478 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 18 | 0.0000 | 1.8182 | 5.4545 |
| | 34.5455 | 16.3636 | 27.2727 | 1.8182 | 10.9091 | 1.8182 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 19 | 0.0000 | 0.0000 | 0.0000 |
| | 25.3333 | 16.0000 | 38.6667 | 12.0000 | 5.3333 | 2.6667 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 21 | 0.0000 | 0.0000 | 0.0000 |
| | 18.0124 | 14.9068 | 36.6460 | 9.3168 | 18.0124 | 3.1056 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 24 | 0.0000 | 0.0000 | 0.4386 |
| | 13.5965 | 13.1579 | 42.1053 | 12.7193 | 14.0351 | 2.6316 | 0.8772 | 0.0000 | 0.4386 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 6.2500 | 5.8594 | 42.9688 | 11.3281 | 25.3906 | 6.2500 | 1.5625 | 0.0000 | 0.3906 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 4.0359 | 4.4843 | 38.1166 | 8.0717 | 32.2870 | 7.6233 | 4.4843 | 0.4484 | 0.4484 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 21 | 0.0000 | 0.0000 | 0.0000 |
| | 2.6432 | 5.2863 | 37.4449 | 5.2863 | 30.3965 | 13.2159 | 3.9648 | 1.3216 | 0.0000 | 0.0000 | 0.4405 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 19 | 0.0000 | 0.0000 | 0.0000 |
| | 2.2599 | 0.5650 | 30.5085 | 14.1243 | 31.6384 | 9.0395 | 7.9096 | 1.1299 | 1.6949 | 0.5650 | 0.5650 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.7463 | 3.7313 | 27.6119 | 6.7164 | 29.8507 | 19.4030 | 8.2090 | 2.2388 | 0.7463 | 0.0000 | 0.7463 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 0.9901 | 1.9802 | 23.7624 | 9.9010 | 30.6931 | 16.8317 | 8.9109 | 3.9604 | 2.9703 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 19 | 0.0000 | 1.3699 | 0.0000 |
| | 1.3699 | 2.7397 | 15.0685 | 2.7397 | 31.5068 | 23.2877 | 8.2192 | 5.4795 | 4.1096 | 4.1096 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 20.0000 | 8.0000 | 30.0000 | 16.0000 | 22.0000 | 2.0000 | 2.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 9.3750 | 6.2500 | 21.8750 | 34.3750 | 25.0000 | 3.1250 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 4.5455 | 9.0909 | 4.5455 | 22.7273 | 22.7273 | 22.7273 | 4.5455 | 4.5455 | 0.0000 | 4.5455 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 5.8824 | 0.0000 | 5.8824 | 5.8824 | 29.4118 | 11.7647 | 29.4118 | 11.7647 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 18.1818 | 18.1818 | 36.3636 | 9.0909 | 9.0909 | 9.0909 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 25.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 40.0000 | 40.0000 | 20.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 28.5714 | 57.1429 | 14.2857 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 33.3333 | 0.0000 | 0.0000 | 0.0000 | 33.3333 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 49 | 49 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.2857 | 28.5714 | 0.0000 | 28.5714 | 28.5714 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 33.3333 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 |
| 1980 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 25.0000 | 0.0000 | 25.0000 | 25.0000 | 25.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 2 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 4 | 5.8824 | 94.1176 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 3 | 3.1250 | 96.8750 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 5 | 1.6393 | 98.3607 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 7 | 0.0000 | 97.3333 | 1.3333 |
| | 0.0000 | 1.3333 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 8 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 9 | 0.0000 | 98.1132 | 1.8868 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 13 | 0.0000 | 96.2963 | 1.2346 |
| | 2.4691 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 11 | 0.0000 | 100.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 11 | 0.0000 | 90.3226 | 6.4516 |
| | 3.2258 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 9 | 0.0000 | 80.7692 | 9.6154 |
| | 3.8462 | 5.7692 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 13 | 0.0000 | 49.0566 | 5.6604 |
| | 5.6604 | 35.8491 | 3.7736 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 12 | 0.0000 | 27.5862 | 6.8966 |
| | 5.1724 | 55.1724 | 3.4483 | 1.7241 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 13 | 0.0000 | 7.2464 | 4.3478 |
| | 4.3478 | 79.7101 | 1.4493 | 1.4493 | 0.0000 | 1.4493 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 12 | 0.0000 | 3.1915 | 2.1277 |
| | 3.1915 | 78.7234 | 6.3830 | 3.1915 | 1.0638 | 2.1277 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 13 | 0.0000 | 0.0000 | 1.0638 |
| | 4.2553 | 81.9149 | 6.3830 | 3.1915 | 2.1277 | 0.0000 | 0.0000 | 1.0638 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 12 | 0.0000 | 0.0000 | 1.2195 |
| | 2.4390 | 74.3902 | 8.5366 | 6.0976 | 2.4390 | 4.8780 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 1.4085 | 60.5634 | 2.8169 | 7.0423 | 8.4507 | 11.2676 | 4.2254 | 4.2254 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 58.1818 | 9.0909 | 10.9091 | 7.2727 | 7.2727 | 3.6364 | 1.8182 | 1.8182 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 39.2157 | 7.8431 | 7.8431 | 11.7647 | 21.5686 | 3.9216 | 7.8431 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 22.7273 | 2.2727 | 11.3636 | 13.6364 | 22.7273 | 9.0909 | 4.5455 | 11.3636 | 2.2727 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 13.3333 | 3.3333 | 23.3333 | 20.0000 | 26.6667 | 10.0000 | 3.3333 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 5.8824 | 5.8824 | 11.7647 | 11.7647 | 23.5294 | 11.7647 | 11.7647 | 17.6471 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 9.0909 | 0.0000 | 18.1818 | 18.1818 | 9.0909 | 9.0909 | 9.0909 | 27.2727 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 9.0909 | 0.0000 | 0.0000 | 18.1818 | 36.3636 | 18.1818 | 9.0909 | 0.0000 | 9.0909 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 20.0000 | 20.0000 | 40.0000 | 20.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 66.6667 | 0.0000 | 0.0000 | 16.6667 | 16.6667 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 47 | 47 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1983 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 10 | 10 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 6 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 8 | 96.3855 | 3.6145 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 8 | 97.6190 | 2.3810 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 9 | 98.1595 | 1.8405 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 9 | 97.6471 | 2.3529 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 11 | 89.3617 | 8.5106 | 2.1277 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 8 | 76.4706 | 17.6471 | 5.8824 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 10 | 80.0000 | 20.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 5 | 20.0000 | 20.0000 | 20.0000 |
| | 0.0000 | 40.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 6 | 0.0000 | 0.0000 | 11.1111 |
| | 0.0000 | 88.8889 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 20.0000 | 80.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 21 | 0.0000 | 0.0000 | 2.0202 |
| | 7.0707 | 84.8485 | 4.0404 | 2.0202 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 21 | 0.0000 | 0.0000 | 1.3245 |
| | 5.2980 | 88.7417 | 3.3113 | 1.3245 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 20 | 0.0000 | 0.0000 | 0.9050 |
| | 5.4299 | 86.8778 | 6.3348 | 0.4525 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 21 | 0.0000 | 0.0000 | 0.4630 |
| | 2.3148 | 90.2778 | 4.6296 | 1.8519 | 0.4630 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 21 | 0.0000 | 0.0000 | 0.5848 |
| | 4.6784 | 80.1170 | 9.9415 | 4.0936 | 0.5848 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 2.4390 | 67.4797 | 13.0081 | 4.8780 | 12.1951 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 2.1505 | 61.2903 | 12.9032 | 13.9785 | 9.6774 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 4.1096 | 46.5753 | 17.8082 | 9.5890 | 20.5479 | 0.0000 | 1.3699 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 41.3793 | 12.0690 | 17.2414 | 27.5862 | 1.7241 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 18.0000 | 18.0000 | 18.0000 | 42.0000 | 2.0000 | 2.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 11 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 12.1951 | 9.7561 | 12.1951 | 56.0976 | 4.8780 | 2.4390 | 0.0000 | 2.4390 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 25.7143 | 2.8571 | 14.2857 | 34.2857 | 8.5714 | 8.5714 | 2.8571 | 2.8571 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 13.0435 | 0.0000 | 4.3478 | 43.4783 | 13.0435 | 13.0435 | 0.0000 | 13.0435 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 15.0000 | 0.0000 | 5.0000 | 40.0000 | 10.0000 | 20.0000 | 0.0000 | 10.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 7.6923 | 15.3846 | 38.4615 | 7.6923 | 15.3846 | 0.0000 | 15.3846 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 7.6923 | 7.6923 | 30.7692 | 15.3846 | 7.6923 | 7.6923 | 15.3846 | 7.6923 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 8.3333 | 8.3333 | 33.3333 | 16.6667 | 8.3333 | 0.0000 | 25.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 55.5556 | 22.2222 | 11.1111 | 0.0000 | 11.1111 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 16.6667 | 33.3333 | 16.6667 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 25.0000 | 25.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 75.0000 | 0.0000 | 25.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 66.6667 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | 1 | 3 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 |
| 1986 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 50.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 8 | 8 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 6 | 77.7778 | 22.2222 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 8 | 88.5714 | 8.5714 | 2.8571 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 7 | 82.0513 | 15.3846 | 2.5641 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 9 | 71.0526 | 23.6842 | 2.6316 |
| | 2.6316 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 10 | 8.3333 | 37.5000 | 8.3333 |
| | 41.6667 | 4.1667 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 15 | 0.0000 | 7.6923 | 0.0000 |
| | 74.3590 | 5.1282 | 2.5641 | 0.0000 | 10.2564 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 20 | 0.0000 | 1.6667 | 1.6667 |
| | 90.0000 | 0.8333 | 0.0000 | 0.0000 | 5.0000 | 0.0000 | 0.0000 | 0.8333 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 20 | 0.0000 | 0.8475 | 1.6949 |
| | 86.8644 | 1.6949 | 0.4237 | 0.4237 | 7.2034 | 0.4237 | 0.0000 | 0.4237 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 20 | 0.0000 | 0.0000 | 0.3571 |
| | 76.0714 | 0.3571 | 1.0714 | 0.3571 | 20.0000 | 1.0714 | 0.0000 | 0.7143 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 65.4110 | 1.7123 | 0.0000 | 1.7123 | 28.4247 | 1.7123 | 0.3425 | 0.6849 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 20 | 0.0000 | 0.0000 | 0.0000 |
| | 48.6772 | 1.0582 | 1.0582 | 1.5873 | 43.3862 | 2.6455 | 0.0000 | 1.5873 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 18 | 0.0000 | 0.0000 | 0.8197 |
| | 32.7869 | 0.8197 | 0.8197 | 2.4590 | 59.8361 | 0.8197 | 0.0000 | 1.6393 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 19.5652 | 2.1739 | 1.0870 | 3.2609 | 64.1304 | 2.1739 | 2.1739 | 5.4348 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 16 | 0.0000 | 0.0000 | 0.0000 |
| | 18.1818 | 0.0000 | 0.0000 | 0.0000 | 70.4545 | 4.5455 | 0.0000 | 6.8182 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 8.3333 | 0.0000 | 4.1667 | 0.0000 | 75.0000 | 0.0000 | 0.0000 | 12.5000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 20.0000 | 0.0000 | 0.0000 | 0.0000 | 60.0000 | 6.6667 | 0.0000 | 13.3333 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 80.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 20.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 12.5000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 37.5000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 57.1429 | 0.0000 | 0.0000 | 42.8571 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 66.6667 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 66.6667 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 44 | 44 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1989 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 66.6667 | 0.0000 | 0.0000 | 33.3333 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 5 | 5 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 6 | 6 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 7 | 7 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 8 | 8 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 9 | 9 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 10 | 10 | 5 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 7 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 7 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 8 | 96.1538 | 3.8462 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 8 | 96.6102 | 3.3898 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 8 | 86.2745 | 13.7255 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 7 | 89.7959 | 10.2041 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 6 | 87.5000 | 12.5000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 6 | 50.0000 | 16.6667 | 33.3333 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 5 | 12.5000 | 50.0000 | 25.0000 |
| | 12.5000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 8 | 10.0000 | 20.0000 | 50.0000 |
| | 20.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 7 | 0.0000 | 11.1111 | 38.8889 |
| | 44.4444 | 5.5556 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 10 | 0.0000 | 3.8462 | 38.4615 |
| | 53.8462 | 3.8462 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 24 | 0.0000 | 5.2632 | 47.3684 |
| | 36.8421 | 1.7544 | 0.0000 | 8.7719 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 28 | 0.0000 | 2.6316 | 26.3158 |
| | 48.2456 | 5.2632 | 0.8772 | 13.1579 | 0.8772 | 0.0000 | 0.0000 | 2.6316 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 36 | 0.0000 | 2.0725 | 12.9534 |
| | 37.3057 | 3.1088 | 1.0363 | 36.7876 | 1.5544 | 0.0000 | 0.0000 | 4.6632 | 0.5181 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 38 | 0.0000 | 0.0000 | 9.5238 |
| | 23.8095 | 2.1978 | 0.7326 | 46.8864 | 0.7326 | 1.0989 | 0.3663 | 14.6520 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 39 | 0.0000 | 0.0000 | 3.8596 |
| | 15.4386 | 4.2105 | 0.7018 | 56.8421 | 1.4035 | 0.7018 | 0.7018 | 14.0351 | 1.4035 | 0.0000 | 0.7018 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 37 | 0.0000 | 0.0000 | 1.2658 |
| | 13.5021 | 2.1097 | 0.4219 | 60.7595 | 2.1097 | 1.2658 | 0.0000 | 16.4557 | 0.4219 | 0.0000 | 1.6878 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 34 | 0.0000 | 0.0000 | 0.6024 |
| | 9.0361 | 1.2048 | 3.0120 | 50.6024 | 3.0120 | 0.6024 | 0.0000 | 30.1205 | 1.2048 | 0.0000 | 0.6024 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 30 | 0.0000 | 0.0000 | 0.9524 |
| | 6.6667 | 0.0000 | 0.9524 | 50.4762 | 0.9524 | 2.8571 | 0.9524 | 33.3333 | 1.9048 | 0.0000 | 0.9524 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 22 | 0.0000 | 0.0000 | 0.0000 |
| | 1.4706 | 1.4706 | 0.0000 | 47.0588 | 1.4706 | 1.4706 | 1.4706 | 42.6471 | 1.4706 | 0.0000 | 1.4706 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 18 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 2.3256 | 4.6512 | 34.8837 | 2.3256 | 0.0000 | 2.3256 | 39.5349 | 4.6512 | 0.0000 | 9.3023 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 6.6667 | 50.0000 | 3.3333 | 0.0000 | 0.0000 | 30.0000 | 3.3333 | 0.0000 | 6.6667 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 35.2941 | 5.8824 | 0.0000 | 5.8824 | 41.1765 | 0.0000 | 0.0000 | 11.7647 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 25.0000 | 8.3333 | 0.0000 | 0.0000 | 58.3333 | 8.3333 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 77.7778 | 0.0000 | 0.0000 | 0.0000 | 22.2222 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 11.1111 | 55.5556 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 16.6667 | 16.6667 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 33.3333 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 40.0000 | 0.0000 | 0.0000 | 0.0000 | 60.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 | 0.0000 | 75.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 |
| 1992 | 1 | 3 | 0 | 0 | 1 | 44 | 44 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 75.0000 | 0.0000 | 0.0000 | 25.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 9 | 9 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 9 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 13 | 97.9167 | 2.0833 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 15 | 95.4023 | 3.4483 | 1.1494 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 21 | 89.3443 | 10.6557 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 20 | 85.7143 | 13.0952 | 0.0000 |
| | 1.1905 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 17 | 73.5849 | 24.5283 | 1.8868 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 14 | 51.8519 | 33.3333 | 3.7037 |
| | 11.1111 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 6 | 11.1111 | 22.2222 | 11.1111 |
| | 55.5556 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 11 | 0.0000 | 28.5714 | 7.1429 |
| | 57.1429 | 0.0000 | 0.0000 | 7.1429 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 15 | 0.0000 | 3.4483 | 6.8966 |
| | 82.7586 | 0.0000 | 3.4483 | 3.4483 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 26 | 0.0000 | 1.9231 | 5.7692 |
| | 65.3846 | 3.8462 | 7.6923 | 13.4615 | 0.0000 | 0.0000 | 1.9231 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 40 | 0.0000 | 1.0101 | 5.0505 |
| | 67.6768 | 2.0202 | 10.1010 | 8.0808 | 0.0000 | 0.0000 | 5.0505 | 0.0000 | 0.0000 | 0.0000 | 1.0101 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 45 | 0.0000 | 0.0000 | 2.7027 |
| | 56.0811 | 4.0541 | 5.4054 | 16.8919 | 0.6757 | 0.0000 | 12.1622 | 0.0000 | 0.0000 | 0.0000 | 2.0270 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 49 | 0.0000 | 0.0000 | 1.5228 |
| | 41.1168 | 0.0000 | 10.1523 | 25.8883 | 1.5228 | 0.0000 | 14.7208 | 0.0000 | 1.5228 | 0.0000 | 3.5533 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 53 | 0.0000 | 0.0000 | 0.0000 |
| | 28.3721 | 0.9302 | 4.6512 | 26.9767 | 0.0000 | 0.0000 | 30.2326 | 0.0000 | 0.9302 | 0.0000 | 7.9070 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 50 | 0.0000 | 0.0000 | 0.4651 |
| | 17.2093 | 1.8605 | 4.1860 | 26.5116 | 0.9302 | 0.0000 | 35.8140 | 0.4651 | 1.3953 | 0.0000 | 11.1628 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 47 | 0.0000 | 0.0000 | 0.0000 |
| | 7.9545 | 1.7045 | 3.9773 | 34.6591 | 0.5682 | 0.0000 | 36.9318 | 0.0000 | 1.1364 | 0.0000 | 13.0682 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 38 | 0.0000 | 0.0000 | 0.0000 |
| | 5.2632 | 1.5038 | 5.2632 | 34.5865 | 0.0000 | 0.0000 | 39.8496 | 0.0000 | 3.0075 | 0.0000 | 10.5263 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 3.1915 | 2.1277 | 4.2553 | 27.6596 | 0.0000 | 0.0000 | 51.0638 | 0.0000 | 2.1277 | 0.0000 | 9.5745 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 17 | 0.0000 | 0.0000 | 0.0000 |
| | 1.9231 | 1.9231 | 7.6923 | 25.0000 | 0.0000 | 0.0000 | 44.2308 | 0.0000 | 3.8462 | 0.0000 | 15.3846 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 14 | 0.0000 | 0.0000 | 0.0000 |
| | 3.3333 | 0.0000 | 0.0000 | 30.0000 | 0.0000 | 0.0000 | 46.6667 | 0.0000 | 0.0000 | 0.0000 | 20.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 5.8824 | 29.4118 | 0.0000 | 0.0000 | 47.0588 | 0.0000 | 0.0000 | 0.0000 | 17.6471 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 8.3333 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 41.6667 | 0.0000 | 0.0000 | 0.0000 | 16.6667 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 10.0000 | 10.0000 | 0.0000 | 0.0000 | 70.0000 | 0.0000 | 0.0000 | 0.0000 | 10.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1995 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 16.6667 | 0.0000 | 0.0000 | 83.3333 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 25.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 71.4286 | 0.0000 | 14.2857 | 0.0000 | 14.2857 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 | 25.0000 | 0.0000 | 25.0000 | 0.0000 | 25.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 | 0.0000 | 75.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 20.0000 | 0.0000 | 0.0000 | 40.0000 | 0.0000 | 0.0000 | 0.0000 | 40.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 33.3333 | 0.0000 | 33.3333 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 |
| 1995 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 75.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 5 | 5 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 6 | 6 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 7 | 7 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 8 | 8 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 9 | 9 | 10 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 10 | 10 | 13 | 95.2381 | 4.7619 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 16 | 95.1613 | 4.8387 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 20 | 86.2069 | 12.6437 | 1.1494 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 23 | 89.4737 | 10.5263 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 23 | 84.0580 | 15.9420 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 31 | 73.6842 | 26.3158 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 31 | 52.3810 | 42.8571 | 3.1746 |
| | 1.5873 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 30 | 22.7273 | 72.7273 | 3.0303 |
| | 1.5152 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 36 | 11.1111 | 78.8889 | 6.6667 |
| | 3.3333 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 39 | 1.9417 | 92.2330 | 5.8252 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 50 | 0.8333 | 80.8333 | 16.6667 |
| | 1.6667 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 44 | 0.0000 | 78.9474 | 13.6842 |
| | 5.2632 | 0.0000 | 2.1053 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 55 | 0.0000 | 39.2308 | 31.5385 |
| | 26.9231 | 0.7692 | 0.7692 | 0.7692 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 62 | 0.0000 | 20.1258 | 32.7044 |
| | 37.7358 | 0.6289 | 5.0314 | 1.8868 | 0.6289 | 0.0000 | 1.2579 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 66 | 0.0000 | 4.1667 | 39.8148 |
| | 38.8889 | 3.7037 | 5.0926 | 6.4815 | 1.3889 | 0.0000 | 0.4630 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 64 | 0.0000 | 3.2558 | 22.3256 |
| | 49.7674 | 2.7907 | 4.6512 | 11.6279 | 1.3953 | 0.9302 | 2.3256 | 0.0000 | 0.0000 | 0.9302 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 57 | 0.0000 | 1.1834 | 20.7101 |
| | 37.2781 | 2.3669 | 6.5089 | 20.1183 | 2.3669 | 0.5917 | 5.9172 | 0.0000 | 0.0000 | 2.9586 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 49 | 0.0000 | 0.0000 | 14.0625 |
| | 30.4688 | 3.1250 | 11.7188 | 17.1875 | 1.5625 | 2.3438 | 10.9375 | 0.0000 | 0.7813 | 7.0313 | 0.7813 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 51 | 0.0000 | 0.0000 | 12.7119 |
| | 11.0169 | 2.5424 | 12.7119 | 18.6441 | 5.0847 | 3.3898 | 19.4915 | 0.0000 | 1.6949 | 7.6271 | 5.0847 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 46 | 0.0000 | 1.0753 | 10.7527 |
| | 8.6022 | 5.3763 | 6.4516 | 27.9570 | 4.3011 | 3.2258 | 12.9032 | 1.0753 | 1.0753 | 11.8280 | 5.3763 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 31 | 0.0000 | 0.0000 | 7.6923 |
| | 5.7692 | 0.0000 | 3.8462 | 28.8462 | 5.7692 | 1.9231 | 26.9231 | 0.0000 | 0.0000 | 17.3077 | 1.9231 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 22 | 0.0000 | 0.0000 | 2.9412 |
| | 8.8235 | 0.0000 | 2.9412 | 23.5294 | 0.0000 | 0.0000 | 23.5294 | 2.9412 | 0.0000 | 26.4706 | 8.8235 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 10.0000 | 20.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 10.0000 | 50.0000 | 10.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 16.6667 | 16.6667 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 14.2857 | 14.2857 | 0.0000 | 28.5714 | 0.0000 | 0.0000 | 28.5714 | 14.2857 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 25.0000 | 25.0000 | 25.0000 | 0.0000 | 0.0000 | 0.0000 | 25.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 50.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 50.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 | 0.0000 | 66.6667 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 20.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 20.0000 | 40.0000 | 0.0000 | 0.0000 | 20.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 |
| 1998 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 8 | 8 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 3 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 8 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 14 | 98.1132 | 1.8868 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 17 | 96.1538 | 2.8846 | 0.9615 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 20 | 93.9394 | 4.2424 | 1.8182 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 20 | 94.1558 | 3.8961 | 1.2987 |
| | 0.6494 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 20 | 86.7470 | 9.6386 | 3.6145 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 17 | 90.4762 | 9.5238 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 13 | 69.6970 | 27.2727 | 3.0303 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 10 | 29.4118 | 41.1765 | 23.5294 |
| | 5.8824 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 17 | 3.0303 | 75.7576 | 15.1515 |
| | 3.0303 | 0.0000 | 3.0303 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 14 | 0.0000 | 87.0968 | 3.2258 |
| | 9.6774 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 18 | 2.0408 | 73.4694 | 14.2857 |
| | 8.1633 | 2.0408 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 22 | 0.0000 | 50.0000 | 15.9091 |
| | 29.5455 | 2.2727 | 2.2727 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 17 | 0.0000 | 33.3333 | 18.1818 |
| | 33.3333 | 12.1212 | 3.0303 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 29 | 0.0000 | 11.1111 | 22.2222 |
| | 37.5000 | 12.5000 | 9.7222 | 6.9444 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 29 | 0.0000 | 2.1505 | 27.9570 |
| | 33.3333 | 13.9785 | 6.4516 | 9.6774 | 3.2258 | 1.0753 | 2.1505 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 30 | 0.0000 | 2.5316 | 25.9494 |
| | 29.1139 | 15.1899 | 8.8608 | 8.8608 | 1.8987 | 3.1646 | 1.8987 | 1.2658 | 0.6329 | 0.0000 | 0.6329 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 30 | 0.0000 | 0.5952 | 31.5476 |
| | 23.8095 | 18.4524 | 14.2857 | 5.9524 | 2.9762 | 1.7857 | 0.5952 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 28 | 0.0000 | 0.9950 | 21.3930 |
| | 23.3831 | 18.9055 | 11.4428 | 10.9453 | 2.9851 | 2.9851 | 1.9900 | 0.9950 | 2.9851 | 0.4975 | 0.4975 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 27 | 0.0000 | 1.1976 | 18.5629 |
| | 17.9641 | 16.1677 | 19.1617 | 11.9760 | 2.9940 | 4.7904 | 2.9940 | 1.7964 | 1.7964 | 0.0000 | 0.5988 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 25 | 0.0000 | 0.0000 | 10.4478 |
| | 11.1940 | 11.9403 | 32.8358 | 14.1791 | 5.2239 | 4.4776 | 2.9851 | 2.2388 | 1.4925 | 0.7463 | 2.2388 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 26 | 0.0000 | 0.0000 | 10.0840 |
| | 7.5630 | 15.1261 | 24.3697 | 15.9664 | 5.0420 | 5.0420 | 2.5210 | 5.0420 | 3.3613 | 1.6807 | 4.2017 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 24 | 0.0000 | 0.0000 | 5.6180 |
| | 13.4831 | 14.6067 | 29.2135 | 11.2360 | 6.7416 | 4.4944 | 5.6180 | 3.3708 | 1.1236 | 0.0000 | 4.4944 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 25 | 0.0000 | 0.0000 | 1.5385 |
| | 1.5385 | 9.2308 | 30.7692 | 13.8462 | 12.3077 | 9.2308 | 4.6154 | 6.1538 | 0.0000 | 1.5385 | 9.2308 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 18 | 0.0000 | 0.0000 | 2.4390 |
| | 0.0000 | 7.3171 | 31.7073 | 19.5122 | 4.8780 | 4.8780 | 12.1951 | 0.0000 | 7.3171 | 2.4390 | 7.3171 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 13 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 12.5000 | 37.5000 | 20.8333 | 4.1667 | 4.1667 | 4.1667 | 0.0000 | 4.1667 | 0.0000 | 12.5000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 10 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 15.0000 | 35.0000 | 10.0000 | 10.0000 | 5.0000 | 10.0000 | 10.0000 | 0.0000 | 0.0000 | 5.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 10 | 0.0000 | 5.0000 | 0.0000 |
| | 0.0000 | 5.0000 | 40.0000 | 10.0000 | 0.0000 | 15.0000 | 5.0000 | 10.0000 | 0.0000 | 0.0000 | 10.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 12.5000 | 50.0000 | 12.5000 | 12.5000 | 0.0000 | 12.5000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 8 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 7.1429 | 14.2857 | 7.1429 | 0.0000 | 21.4286 | 14.2857 | 0.0000 | 21.4286 | 7.1429 | 7.1429 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 14.2857 | 0.0000 | 28.5714 | 14.2857 | 0.0000 | 14.2857 | 14.2857 | 0.0000 | 14.2857 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 33.3333 | 33.3333 | 0.0000 | 0.0000 | 33.3333 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 44 | 44 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 25.0000 | 25.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 25.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 25.0000 | 25.0000 | 0.0000 | 25.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 48 | 48 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 49 | 49 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 16.6667 | 16.6667 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 16.6667 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 25.0000 | 50.0000 | 0.0000 | 0.0000 | 25.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2001 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 4 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 22.2222 | 0.0000 | 0.0000 | 33.3333 | 11.1111 | 0.0000 | 11.1111 | 11.1111 | 11.1111 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 6 | 6 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 9 | 9 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 2 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 4 | 75.0000 | 5.0000 | 5.0000 |
| | 15.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 4 | 91.6667 | 4.1667 | 0.0000 |
| | 4.1667 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 8 | 58.6207 | 13.7931 | 6.8966 |
| | 20.6897 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 8 | 53.8462 | 0.0000 | 3.8462 |
| | 38.4615 | 3.8462 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 8 | 55.2632 | 0.0000 | 7.8947 |
| | 28.9474 | 7.8947 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 9 | 14.2857 | 23.8095 | 28.5714 |
| | 33.3333 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 14 | 17.1429 | 17.1429 | 40.0000 |
| | 25.7143 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 14 | 9.3750 | 18.7500 | 68.7500 |
| | 0.0000 | 0.0000 | 3.1250 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 29 | 0.0000 | 4.5455 | 80.3030 |
| | 13.6364 | 1.5152 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 43 | 0.0000 | 8.5938 | 86.7188 |
| | 4.6875 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 56 | 0.0000 | 1.7007 | 88.0952 |
| | 7.4830 | 1.3605 | 0.3401 | 0.6803 | 0.3401 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 55 | 0.0000 | 1.4327 | 90.5444 |
| | 5.7307 | 0.5731 | 1.4327 | 0.2865 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 59 | 0.0000 | 0.8746 | 79.5918 |
| | 12.8280 | 1.1662 | 3.4985 | 1.4577 | 0.2915 | 0.2915 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 61 | 0.0000 | 0.6173 | 61.7284 |
| | 12.6543 | 3.7037 | 10.1852 | 4.9383 | 2.4691 | 1.8519 | 1.2346 | 0.3086 | 0.3086 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 53 | 0.0000 | 0.0000 | 47.1264 |
| | 16.8582 | 3.4483 | 16.4751 | 7.6628 | 3.4483 | 3.8314 | 0.0000 | 0.3831 | 0.3831 | 0.0000 | 0.3831 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 55 | 0.0000 | 0.0000 | 28.9256 |
| | 12.3967 | 4.9587 | 17.3554 | 14.4628 | 5.3719 | 8.2645 | 2.0661 | 0.8264 | 2.8926 | 0.0000 | 2.4793 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 43 | 0.0000 | 0.0000 | 20.9581 |
| | 10.1796 | 6.5868 | 19.7605 | 15.5689 | 7.7844 | 10.7784 | 2.9940 | 1.1976 | 1.7964 | 1.1976 | 1.1976 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 41 | 0.0000 | 0.0000 | 16.4286 |
| | 10.0000 | 7.1429 | 15.7143 | 14.2857 | 5.7143 | 12.1429 | 5.7143 | 2.8571 | 2.1429 | 5.0000 | 2.8571 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 32 | 0.0000 | 0.0000 | 13.7931 |
| | 13.7931 | 5.7471 | 21.8391 | 12.6437 | 11.4943 | 11.4943 | 2.2989 | 3.4483 | 0.0000 | 1.1494 | 2.2989 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 28 | 0.0000 | 0.0000 | 8.7500 |
| | 7.5000 | 6.2500 | 18.7500 | 16.2500 | 13.7500 | 10.0000 | 5.0000 | 5.0000 | 0.0000 | 5.0000 | 3.7500 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 24 | 0.0000 | 0.0000 | 5.3571 |
| | 5.3571 | 19.6429 | 16.0714 | 12.5000 | 17.8571 | 8.9286 | 5.3571 | 1.7857 | 3.5714 | 3.5714 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 19 | 0.0000 | 0.0000 | 11.9048 |
| | 11.9048 | 14.2857 | 7.1429 | 11.9048 | 16.6667 | 9.5238 | 4.7619 | 7.1429 | 2.3810 | 2.3810 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 11.4286 | 25.7143 | 14.2857 | 20.0000 | 14.2857 | 5.7143 | 0.0000 | 0.0000 | 2.8571 | 0.0000 | 5.7143 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 4.1667 | 29.1667 | 20.8333 | 8.3333 | 29.1667 | 0.0000 | 0.0000 | 0.0000 | 4.1667 | 0.0000 | 4.1667 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 7 | 0.0000 | 0.0000 | 0.0000 |
| | 11.7647 | 35.2941 | 0.0000 | 5.8824 | 17.6471 | 17.6471 | 5.8824 | 0.0000 | 5.8824 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 13.3333 | 33.3333 | 6.6667 | 6.6667 | 13.3333 | 0.0000 | 6.6667 | 0.0000 | 13.3333 | 0.0000 | 6.6667 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 12.5000 | 0.0000 | 12.5000 | 37.5000 | 25.0000 | 0.0000 | 12.5000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 25.0000 | 0.0000 | 0.0000 | 25.0000 | 25.0000 | 12.5000 | 0.0000 | 12.5000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 41 | 41 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 14.2857 | 14.2857 | 0.0000 | 28.5714 | 14.2857 | 14.2857 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.2857 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 42 | 42 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 28.5714 | 14.2857 | 14.2857 | 28.5714 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.2857 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 43 | 43 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 57.1429 | 0.0000 | 0.0000 | 0.0000 | 28.5714 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 14.2857 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 50.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 47 | 47 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 50.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 48 | 48 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2003 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 14.2857 | 28.5714 | 0.0000 | 28.5714 | 14.2857 | 0.0000 | 0.0000 | 14.2857 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 9 | 9 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 10 | 10 | 1 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 11 | 11 | 4 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 12 | 12 | 6 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 13 | 13 | 7 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 1 | 3 | 0 | 0 | 1 | 14 | 14 | 10 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 15 | 15 | 8 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 16 | 16 | 10 | 100.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 17 | 17 | 9 | 91.8919 | 8.1081 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 18 | 18 | 10 | 86.9565 | 8.6957 | 4.3478 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 19 | 19 | 8 | 50.0000 | 28.5714 | 21.4286 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 20 | 20 | 10 | 33.3333 | 40.0000 | 26.6667 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 21 | 21 | 6 | 25.0000 | 37.5000 | 12.5000 |
| | 25.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 22 | 22 | 22 | 0.0000 | 9.0909 | 36.3636 |
| | 12.1212 | 42.4242 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 23 | 23 | 28 | 0.0000 | 5.1948 | 25.9740 |
| | 15.5844 | 48.0519 | 3.8961 | 1.2987 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 24 | 24 | 36 | 0.0000 | 1.1173 | 12.2905 |
| | 7.2626 | 73.1844 | 5.0279 | 1.1173 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 25 | 25 | 41 | 0.0000 | 0.0000 | 12.3016 |
| | 7.1429 | 73.8095 | 5.1587 | 0.7937 | 0.3968 | 0.0000 | 0.3968 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 26 | 26 | 42 | 0.0000 | 0.0000 | 5.1471 |
| | 5.8824 | 75.3676 | 8.0882 | 1.4706 | 1.8382 | 1.1029 | 1.1029 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 27 | 27 | 41 | 0.0000 | 0.0000 | 3.2653 |
| | 5.3061 | 69.3878 | 8.5714 | 4.8980 | 4.4898 | 1.2245 | 1.6327 | 0.0000 | 0.4082 | 0.0000 | 0.8163 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 28 | 28 | 39 | 0.0000 | 0.0000 | 1.5957 |
| | 7.4468 | 65.4255 | 10.6383 | 3.7234 | 6.3830 | 2.1277 | 2.1277 | 0.5319 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 29 | 29 | 32 | 0.0000 | 0.0000 | 0.8333 |
| | 1.6667 | 66.6667 | 10.0000 | 3.3333 | 6.6667 | 5.0000 | 2.5000 | 2.5000 | 0.8333 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 30 | 30 | 27 | 0.0000 | 0.0000 | 0.0000 |
| | 4.4776 | 55.2239 | 5.9701 | 1.4925 | 14.9254 | 8.9552 | 5.9701 | 0.0000 | 1.4925 | 0.0000 | 1.4925 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 31 | 31 | 23 | 0.0000 | 0.0000 | 2.1277 |
| | 4.2553 | 44.6809 | 6.3830 | 4.2553 | 10.6383 | 8.5106 | 2.1277 | 8.5106 | 4.2553 | 2.1277 | 2.1277 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 32 | 32 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 33.3333 | 9.5238 | 9.5238 | 9.5238 | 19.0476 | 9.5238 | 4.7619 | 4.7619 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 33 | 33 | 12 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 20.0000 | 26.6667 | 13.3333 | 13.3333 | 0.0000 | 20.0000 | 6.6667 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 34 | 34 | 9 | 0.0000 | 0.0000 | 0.0000 |
| | 8.3333 | 25.0000 | 25.0000 | 8.3333 | 16.6667 | 8.3333 | 0.0000 | 8.3333 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 35 | 35 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 25.0000 | 25.0000 | 0.0000 | 0.0000 | 37.5000 | 12.5000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 36 | 36 | 3 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 37 | 37 | 5 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 20.0000 | 40.0000 | 0.0000 | 20.0000 | 20.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 38 | 38 | 2 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 50.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 39 | 39 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 40 | 40 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 45 | 45 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 46 | 46 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 49 | 49 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 50 | 50 | 1 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 100.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2005 | 1 | 3 | 0 | 0 | 1 | 51 | 51 | 6 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 14.2857 | 0.0000 | 0.0000 | 0.0000 | 42.8571 | 14.2857 | 14.2857 | 0.0000 | 14.2857 | 0.0000 |

0 #_N_MeanSize-at-Age_obs
#Yr Seas Flt/Svy Gender Part Ageerr Ignore datavector(female-male)
# samplesize(female-male)

0 #_N_environ_variables
0 #_N_environ_obs

999

```
#  hake ss2 version 1.ctl
#  datafile:_hake ss2.dat
1	#_N_growthmorphs

#_assign_sex_to	each_morph_(1=female;_2=male)
1

1	#_N_Areas_(populations)

#_each_fleet/survey_operates_in_just_one_area
#_but_different_fleets/surveys_can be assigned_to_share_same_selex
1	1	1	1		#area_for_each_fleet/survey

0	#do_migration_(0/1)

6	#_N_Block_Designs
4
1
1
3
3
2
# Lmin
1982	1987
1988	1999
2000	2002
2003	2006
#K blocks
1980	1986
#1988	1993
#1994	1997
#1998	1999
#2000	2002
#2003	2006
# Lmax blocks
1984	2006
#1994	1997
#1998	2002
#2003	2006
# US Fish sel blocks
1984	1992
1993	2000
2001	2006
# Can sel blocks
1995	2000
2001	2002
2003	2006
# US inf1 blocks
1984	2000
2001	2006

#Natural_mortality_and_growth_parameters_for_each_morph
4	#_Last_age_for_natmort_young
15	#_First_age_for_natmort_old
2	#_age_for_growth_Lmin
12	#_age_for_growth_Lmax
-3	#_MGparm_dev_phase
#LO	HI	INIT	PRIOR	PR_type	SD	PHASE	env-variable		use_dev	dev_minyr	dev_maxyr
	dev_stddev
0.05	0.6	0.23	0.23	0	0.8	-3	0	0	0	0	0.5
	0	0	#M1_natM_young
-3	3	0	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#M1_natM_old_as_exponential_offset(rel_young)
10	40	33	33	0	99	3	0	0	0	0	0.5
	0	0	#M1_Lmin
30	70	53	50	0	99	3	0	0	0	0	0.5
	3	2	#M1_Lmax
```

```
0.1	0.7	0.30	0.40	0	99	3	0	0	0	0	0.5
	2	2	#M1_VBK
0.01	0.35	0.072	0.10	0	99	3	0	0	0	0	0.5
	0	0	#M1_CV-young
-3	3	-0.1599	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#M1_CV-old_as_exponential_offset(rel_young)
#-3	3	0	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#M2_natM_young_as_exponential_offset(rel_morph_1)
#-3	3	0	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#M2_natM_old_as_exponential_offset(rel_young)
#-3	3	0	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#M2_Lmin_as_exponential_offset
#-3	3	0	0	0	0.8	-2	0	0	0	0	0.5
	0	0	#M2_Lmax_as_exponential_offset
#-3	3	0	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#M2_VBK_as_exponential_offset
#-3	3	0	0.	0	0.8	-3	0	0	0	0	0.5
	0	0	#M2_CV-young_as_exponential_offset(rel_CV-young_for_morph_1)
#-3	3	0	0.	0	0.8	-3	0	0	0	0	0.5
	0	0	#M2_CV-old_as_exponential_offset(rel_CV-young)

# Add 2+2*gender lines to read the wt-Len and mat-Len parameters
-3	3	7.0E-06	7.0E-06	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female wt-len-1
-3	3	2.9624	2.9624	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female wt-len-2
-3	3	36.89	36.89	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female mat-len-1
-3	3	-0.48	-0.48	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female mat-len-2
-3	3	1.	1.	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female eggs/gm intercept
-3	3	0.	0.	0	0.8	-3	0	0	0	0	0.5
	0	0	#Female eggs/gm slope
#-3	3	0	0	0	0.8	-3	0	0	0	0	0.5
	0	0	#Male wt-len-1

# pop*gmorph lines For the proportion of each morph in each area
0	1	1	1	0	0.8	-3	0	0	0	0	0.5
	0	0	#frac to morph 6 in area 1

# pop lines For the proportion assigned to each area
0	1	1	1	0	0.8	-3	0	0	0	0	0.5
	0	0	#frac to area 1

# Enter maturity at age (multiplied by 0.5 for female mature biomass)
#0	0	0.088	0.3305	0.445	0.4845	0.493	0.498	0.5	0.5	0.5	0.5
	0.5	0.5	0.5	0.5

#_custom-env_read
0	#_	0=read_one_setup_and_apply_to_all_env_fxns; 1=read_a_setup_line_for_each_MGparm_with_Env-var>0

#_custom-block_read
1	#_	0=read_one_setup_and_apply_to_all_MG-blocks;	1=read_a_setup_line_for_each_block x
MGparm_with_block>0
# LMIN
#10	40	30	33	0	99	3
#10	40	30	33	0	99	3
#10	40	30	33	0	99	3
#10	40	30	33	0	99	3
# Lmax
30	70	50	50	0	99	3
#30	70	50	50	0	99	3
#30	70	50	50	0	99	3
# K
0.1	0.7	0.22	0.40	0	99	3
#0.1	0.7	0.30	0.40	0	99	3
#0.1	0.7	0.32	0.40	0	99	3
#0.1	0.7	0.35	0.40	0	99	3
#0.1	0.7	0.30	0.40	0	99	3
```

```
#0.1     0.7     0.30    0.40    0       99      3

#        LO      HI      INIT    PRIOR   Pr_type SD      PHASE

#_Spawner-Recruitment_parameters
1        # SR_fxn:  1=Beverton-Holt
#LO      HI      INIT    PRIOR   Pr_type SD      PHASE
11       31      15.4    15      0       99      2       #Ln(R0)
0.2      1       0.75    1       2       0.2     -4      #steepness
0        2       1.13    1.2     0       0.8     -3      #SD_recruitments
-5       5       0       0       0       1       -3      #Env_link
-5       5       0       0       0       1       -4      #init_eq
0        #env-var_for_link
#        recruitment_residuals
#        start_rec_year  end_rec_year    Lower_limit     Upper_limit     phase
         1967    2006    -15     15      1

#init_F_setupforeachfleet
#LO      HI      INIT    PRIOR   PR_type SD      PHASE
0        1       0.0     0.01    0       99      -1
0        1       0.0     0.01    0       99      -1

#_Qsetup
#_add_parm_row_for_each_positive_entry_below(row_then_column)
#-Float(0/1)     #Do-power(0/1)  #Do-env(0/1)    #Do-dev(0/1)  #env-Var      #Num/Bio(0/1)     for
         each    fleet   and     survey
0        0       0       0       0       1
0        0       0       0       0       1
1        0       0       0       0       1
1        0       0       0       0       0

#LO      HI      INIT    PRIOR   PR_type SD      PHASE
-5       .5      0       0       0       0.112   -2      # Acoustic survey
-15      10      -11     4       0       99      2       # recruit survey 2

#_SELEX_&_RETENTION_PARAMETERS
#Pattern Retention(0/1)  Male(0/1)  Special
# Size_selex
0        0       0       0       #_fleet_1
0        0       0       0       #_fleet_2
0        0       0       0       #_acoustic
0        0       0       0       #_recruit

#_Age_selex
#13      0       0       0       #_fleet_1
#13      0       0       0       #_fleet_2
#13      0       0       0       #_acoustic

19       0       0       0       #_fleet_1
19       0       0       0       #_fleet_2
19       0       0       0       #_acoustic
11       0       0       0       #_recruit 2

#LO      HI      INIT    PRIOR   PR_type SD      PHASE   env-variable    use_dev   dev_minyr dev_maxyr
         dev_stddev      Block_Pattern

#2       60   45   10   0   99   -4   0   0   0   0   0.5   0   0   #peak
#0.0000  0.1   0.0   0   0   99   -2   0   0   0   0   0.5   0   0   #init
#-5   5   0.0   0.3   0   99   2   0   1   1975   2004   0.1   0   0   #infl
#0.0000  10   0.3   0.3   0   99   2   0   1   1975   2004   0.1   0   0   #slope1
#-10   100   -4   -4   0   99   -2   0   0   0   0   0.5   0   0   #final
#-5   5   0.0   0.5   0   99   2   0   1   1975   2004   0.1   0   0   #infl2
#0.0001  10   0.3   .3   0   99   2   0   1   1975   2004   0.1   0   0   #slope2
#0.   25   1   0.2   0   99   -2   0   0   0   0   0.5   0   0   #width of top

#2       60   50   8   0   99   -3   0   0   0   0   0.5   0   0   #peak
#0.0000  0.1   0.0   0   0   99   -2   0   0   0   0   0.5   0   0   #init
#-5   5   0.0   1.7   0   99   2   0   1   1988   2004   0.1   0   0   #infl
#0.0001  10   0.3   1.0   0   99   2   0   1   1988   2004   0.1   0   0   #slope1
#-10   10   -2   -2   0   99   2   0   0   0   0   0.5   0   0   #final
```

#-5 5 0.0 0.1 0 99 2 0 0 0 0 0.5 0 0 #infl2
#0.0001 10 0.3 0.1 0 99 2 0 0 0 0 0.5 0 0 #slope2
#0. 25 2 2 0 99 -4 0 0 0 0 0.5 0 0 #width of top

1 20 3.4 3 0 99 4 0 0 1975 2004 0.005 4 2
#inf_1
0.00001 10 1.7 2.5 0 99 4 0 0 1975 2004 0.005 4
2 #slp_1
1 40 11.9 12 0 99 4 0 0 1975 2004 0.005 4
2 #inf_2
0.00001 10 1.0 1.0 0 99 4 0 0 1975 2004 0.005 4
2 #slp_2
2 2 0 2 0 99 -2 0 0 0 0 0.5 0
0 #min_age
2 2 0 2 0 99 -2 0 0 0 0 0.5 0
0 #

1 20 5.2 3 0 99 4 0 0 1988 2004 0.05 5 2
#inf_1
0.00001 10 1.3 0.9 0 99 4 0 0 1988 2004 0.05 5
2 #slp_1
1 40 13.1 7 0 99 4 0 0 0 0 0.5 0
0 #inf_2
0.00001 10 1.3 0.5 0 99 4 0 0 0 0 0.5 0
0 #slp_2
2 2 2 2 0 99 -2 0 0 0 0 0.5 0
0 #min_age
2 2 0 2 0 99 -2 0 0 0 0 0.5 0
0 #

1 20 11.6 3 0 99 4 0 0 0 0 0.5 0 0
#inf_1
0.00001 10 0.94 0.9 0 99 4 0 0 0 0 0.5 0
0 #slp_1
1 40 2.41 7 0 99 4 0 0 0 0 0.5 0
0 #inf_2
0.00001 10 0.87 0.5 0 99 4 0 0 0 0 0.5 0
0 #slp_2
2 2 2 2 0 99 -2 0 0 0 0 0.5 0
0 #min_age
2 2 0 2 0 99 -2 0 0 0 0 0.5 0
0 #

0 40 0 0 0 99 -1 0 0 0 0 0.5
0 0 #min_age
0 40 0 0 0 99 -1 0 0 0 0 0.5
0 0 #min_age

#_custom-env_read
0 #_ 0=read_one_setup_and_apply_to_all;_1=Custom_so_read_1_each;

#_custom-block_read
1 #_ 0=read_one_setup_and_apply_to_all;_1=Custom_so_see_detailed_instructions_for_N_rows_in_Custom_setup

# US inf1 blocks
1 20 2.5 3 0 99 4
1 20 2.9 3 0 99 4
1 20 2.9 3 0 99 4

# US slp1 blocks
0.00001 10 2.5 0.9 0 99 4
0.00001 10 2.4 0.9 0 99 4
0.00001 10 3.0 0.9 0 99 4

# US inf2 blocks
1 40 12.5 7 0 99 4
1 40 14.0 7 0 99 4
1 40 12.6 7 0 99 4

# US slp2 blocks

```
0.00001	10	1.3	0.5	0	99	4
0.00001	10	1.6	0.5	0	99	4
0.00001	10	1.2	0.5	0	99	4


# Can inf1 blocks
1	20	4.6	3	0	99	4
1	20	3.6	3	0	99	4
1	20	4.8	3	0	99	4

# Can slp1 blocks
0.00001	10	0.6	0.9	0	99	4
0.00001	10	5.2	0.9	0	99	4
0.00001	10	1.7	0.9	0	99	4

#	LO	HI	INIT	PRIOR	PR_type	SD	PHASE
-6	#_phase_for_selex_parm_devs

0 0 0 0.2
0 0 0 0
0 0 0 0
.3 1 1 1
.5 1 1 1
1 1 1 1

1	#_max_lambda_phases:_read_this_Number_of_values_for_each_componentxtype_below
1	#_include (1) or not (0) the constant offset For Log(s) in the Log(like) calculation
#_survey_lambdas
0	0	1	1
#_discard_lambdas
0	0	0	0
#_meanbodywt
0
#_lenfreq_lambdas
1	1	1	0
#_age_freq_lambdas
1	1	1	0
#_size@age_lambdas
0	0	0	0
#_initial_equil_catch
1
#_recruitment_lambda
1
#_parm_prior_lambda
1
#_parm_dev_timeseries_lambda
1
# crashpen lambda
100
#max F
0.9

999	#_end-of-file
```

# APPENDIX 2: UNRESOLVED PROBLEMS
# A PROSPECTUS

## Recurring problems in the Stock Assessment of Pacific Hake

Over the past 4 years the assessment model for Pacific hake has evolved considerably. In the 2005 assessment, the modeling platform underwent a transition to the SS2 framework (developed by Dr. Richard Methot) that is commonly used for most groundfish stocks off the west coast of the US. Despite this transition a few problems in resolving key parameters such as $B_o, h$ and $Q$ have still persisted. Between 2004 and 2005 the number of estimated parameters was reduced considerably; however, despite this apparent simplification there is still considerable confounding between $B_o$ (unfished spawning stock biomas) and $h$ (steepness), and as such $h$ has been fixed at a value of 0.75 (or constrained through the use of priors). As a result, uncertainty in key parameters has been grossly underestimated. The harvest control rules for Pacific hake ($F_{40}$ and $B_{40}$) are derived from estimates of $h$ and $B_o$ and the overall goals of the assessment model is 3-fold: (1) estimate the current status of the stock, (2) estimate the key parameters that define the harvest control rule, and (3) provide short-term projections of future biomass based on predicted future recruitment to the population.

There are at least 5 recurring problems that come up each year (some of which have serious implications for decision making and providing management advice):

1. **Insufficient information to estimate Q**. The relative abundance information generated from the acoustic surveys lack sufficient contrast to treat $Q$ as an unknown to be estimated from the data. This is the key parameter that scales the overall population size such that $B_o$ can be determined.

2. **Parameter confounding**. Specifically, there is strong confounding between $B_o$ and $h$ due to the same lack of contrast in the relative abundance indices. Furthermore, what contrast is available in the data is "white-washed" by additional confounding between the numerous blocks of selectivities and recruitment deviations (see point 3). As such, steepness has been fixed at a value of $h = 0.75$ in recent years to allow parameter estimation to proceed and $F_{40}$ (used in the harvest control rule) is determined by $h$ and the selectivity patterns estimated from the composition information.

3. **Changes in selectivities**. The composition information from the US and CAN zones have indicated strong changes in apparent selectivity. Attempting to recovery annual (or blocks of selectivities) introduces additional confounding in the estimates of recruitment deviations. While there is little doubt that selectivities differ in each zone and probably with each fishery type (e.g., domestic vs. JV fisheries) over time it is difficult to assess the relative abundance of each cohort until the cohort has entered the fishery for 3-5 years. As such, short-term biomass forecasts are potentially biased due to changes in selectivity.

4. **Recruitment forecasts and harvest projections**. Harvest projections are based on the application of the 40:10 harvest control rule to short term projections current biomass plus future recruitment. Information for recruitment forecasts is available from three potential sources: (1) based on the underlying stock recruitment model, (2) estimates of historical recruitment (which may be biased due to change in selectivity) and (3) from fisheries-independent information on relative juvenile abundance. Furthermore a weighted scheme could be developed to use all potential sources of information. In any of the above cases, incorrect predictions may lead to implementation errors through unintended consequences like changes in selectivity.

5. **Temporal changes in growth**. This issue has not necessarily plagued the stock assessment process, as there is reliable biological information collected for Pacific hake on an annual basis. However, changes in growth rates (especially a reduction in growth rates) can dramatically alter the vulnerable biomass relative to the reference level of $B_{40}$. Furthermore, changes in growth create additional confounding when estimating temporal changes in selectivity.

A workshop was convened in December 2006 by the SSC (La Jolla, CA.) to address three issues:

1. Evaluate the performance of the 40-10 harvest policy for stocks with different life history and stock-recruit patterns.

2. Evaluate alternative methods to estimate $B_0$ and $B_{MSY}$ proxies and provide recommendations on their use.

3. Provide recommendations on the use of priors for key assessment parameters in stock assessment models. Parameter for which priors could potentially be useful include natural mortality, stock-recruit steepness, survey catchability, and recruitment variability.

Although the conclusions of the workshop have not been finalized (to the knowledge of SM) some of the advice provided to assessment authors was to use a prior for steepness. However, in the preliminary results of a metaanalysis (Dorn unpublished data) the likelihood profile of $h$ for Pacific hake suggested the most likely value of $h$ to be very near 1.

## Principle issues for decision making

The harvest control rules for Pacific hake (which is defined by the 40:10 rule) requires estimates of $B_o, h$ and a biomass forecast to determine annual ABCs. Due to the lack of contrast in the relative abundance data, and additional problems as outlined above, $h$ and $Q$ are not well determined and must be fixed. Recall, that $h$ combined with the selectivities determines $F_{40}$ and $Q$ along with the prior catch history and fixed value $h$ determines $B_{40}$. Thus the only real information in the data that is being used to make decisions is given by the composition information (which defines the selectivity curves and historical recruitment deviations and are partially confounded). The principle information for decision making should come from $B_o$ and $h$, which in effect are **fixed** quantities (via fixed $h$ and fixed $Q$) because there is no information in the relative abundance data to estimate these parameters jointly.

In the Pacific hake situation where the confounding between $B_o$ and $h$ can not be resolved, the historical solution of fixing $h$ at a specific value is equivalent to applying a prior with an infinitely small variance. A more honest approach would be to use an informative prior, perhaps derived from a metaanalysis from similar species etc. In the case of Pacific hake, such metadata does not exist to allow for the development of an informative prior for $h$.

In short, the relative abundance information collected thus far for Pacific hake lacks information to properly guide decision makers through the transformation for $B_o, h$ estimates to $F_{40}, B_{40}$ used in the harvest control rules. Also, there is insufficient information to develop a reasonable prior for steepness from meta data on *Merluccius productus*. However, the inverse of the parameter transformation problem (i.e., the transformation from $F_{40}, B_{40}$ to $B_o, h$) may not be true. For example, in cases where there is strong correlation between $B_o$ and $h$ (i.e., a tightly defined ridge or 'banana shape' in the joint posterior disribution), similar long-term equilibrium yields can be obtained from a small very productive stock (small $B_o$ and high $h$), or a large unproductive stock (large $B_o$ and low $h$). In other words, the correlation between $MSY$ and $F_{msy}$ or $F_{40}$ and $B_{40}$ breaks down. This inverse relationship was first demonstrated by Schnute and Kronlund (1996) for simple stock-recruitment models and later extended to age-structured models (with knife-edge selectivity) by Schnute and Richards (1998). This suggestion of using the inverse relationship would require that the assessment model for Pacific hake be parameterized in terms of $F_{40}$ and $B_{40}$ which are proxies for $F_{msy}$ and $MSY$ to derive estimates of $B_o$ (or the $R_o$ equivalent) and $h$ or the (Goodyear recruitment compensation parameter $\kappa$ equivalent Goodyear, 1980).

## Parameterizing age-structured models in terms of $F_{msy}$ and $MSY$

To implement the above suggestion for the Pacific hake assessment model and parameterizes age-structured models in terms of a management oriented approach, we extend the earlier work of Schnute and Richards (1998); Schnute and Kronlund (1996, 2002) to include instantaneous mortality rates and age-specific selectivity. The leading parameters (i.e., the parameters that determine the overall productivity of the stock and the scale) are given by $F_{msy}$ and $MSY$ rather than the traditional unfished stock size $R_o$ and recruitment compensation $\kappa$. The approach laid out here utilizes "incidence" functions and I refer you to Botsford and Wickham (1979); Walters and Martell (2004) for more details. We have not applied this approach to the Pacific hake data; however, there have been a few unpublished applications to data sets that lack contrast to resolve parameter confounding that have shown remarkable improvements in addressing uncertainty.

The approach starts with the Baranov catch equation given by:

$$Y_e = B_e \frac{F_e}{M + F_e}(1 - e^{-M-F_e}) \tag{1}$$

where the subscript $e$ denotes equilibrium conditions. In an age-structured model the equilibrium yield is actually a sum over all ages times the fraction of the age-specific mortality associated with fishing. Thus the yield equation cab be written as:

$$Y_e = \sum_{a=1}^{\infty} B_{a,e} \frac{F_{a,e}}{M_a + F_{a,e}}(1 - e^{-M_a-F_{a,e}}) \tag{2}$$

where $F_{a,e} = F_e v_a$ and $v_a$ is the age-specific probability of capture or selectivity. Biomass-at-age at equilibrium ($B_{a,e}$) is defined as the product of numbers-at-age ($N_a$) times the mean weight at age ($w_a$). This can also be expressed as the survivorship at age times the mean weight times the unfished age-1 recruits ($R_o$). For unfished conditions the age-specific survivorship is given recursively by:

$$l_a = \begin{cases} 1, & a = 1 \\ l_{a-1}e^{-M_{a-1}}, & a > 1. \end{cases} \tag{3}$$

The age-specific biomass is then given by

$$B_{a,e} = R_o l_a w_a. \tag{4}$$

An incidence function is simply the sum of the age-specific schedules (e.g., survivorship, length-at-age, weight-at-age, etc.) that expresses population units (e.g. biomass, numbers, fecundity, etc.) on a per recruit basis. For example total biomass per recruit is given by:

$$\phi_B = \sum_{a=1}^{\infty} l_a w_a$$

For notation purposes we denote all of the incidence functions using $\phi$ and the subscripts correspond to the type of incidence function (e.g., $\phi_E$ = eggs per recruit, $\phi_{VB}$ = vulnerable biomass per recruit). The use of the incidence functions greatly simplifies the math required in subsequent calculations in that it is now possible to calculate total population abundances, fecundities, biomass etc. based on an estimate or initial guess at the unfished recruitment $R_o$. For example total biomass is given by $B = R_o\phi_B$.

Expressing the catch equation as a sum over ages of biomass that is vulnerable to harvest

$$Y = FR_o \sum_{a=1}^{\infty} l_a w_a \frac{v_a}{M_a + Fv_a}(1 - e^{-M_a-Fv_a}), \tag{5}$$

the summation term can also be expressed as an incidence function, namely:

$$\phi_Q = \sum_{a=1}^{\infty} l_a w_a \frac{v_a}{M_a + Fv_a}(1 - e^{-M_a-Fv_a}), \tag{6}$$

and the yield equation reduces to

$$Y = FR_o\phi_Q. \tag{7}$$

Equilibrium recruitment for the Beverton-Holt stock recruitment model can also be expressed as a function of equilibrium fishing mortality rate $F_e$, where total egg production has been reduced through the effects of fishing. Using incidence functions we can express equilibrium recruits as:

$$R_e = R_o \frac{\kappa - \phi_e/\phi_f}{\kappa - 1} \tag{8}$$

where $\kappa$ is the relative improvement in juvenile survival rate at low egg deposition rates (also referred to as the recruitment compensation ratio), $\phi_e$ is the eggs per recruit in unfished conditions and $\phi_f$ is the eggs per recruit for a given equilibrium fishing mortality rate. To calculate the eggs per recruit under fished conditions ($\phi_f$) we modify the survivorship calculation to include the effects of fishing ($l_a^{(f)}$):

$$l_a^{(f)} = \begin{cases} 1, & a = 1 \\ l_{a-1}^{(f)} e^{-M_{a-1} - F_e v_{a-1}}, & a > 1. \end{cases} \tag{9}$$

and $\phi_e$ and $\phi_f$ are given by

$$\phi_e = \sum_{a=1}^{\infty} l_a f_a, \quad \phi_f = \sum_{a=1}^{\infty} l_a^{(f)} f_a$$

where $f_a$ is the age-specific fecundity at age. Note that is is not necessary to have the absolute fecundity values for each age-class only the relative contribution as the units cancel out in the $\phi_e/\phi_f$ ratio in eq. 8.

To determine the optimal fishing mortality rate ($F_{msy}$) that achieves the maximum sustainable yield ($MSY$) we differentiate eq. 7 with respect to $F$ and set this derivative to 0 and solve for $F$. This corresponds to $F_{msy}$ and $MSY$ is determined by substituting $F_{msy}$ into eq. 7. This calculation requires the leading parameters $R_o$ and $\kappa$ to determine the values of $F_{msy}$ and $MSY$.

To parameterize the model in terms of $F_{msy}$ and $MSY$ directly we differentiate eq. 7 with respect to $F$, set it equal to 0 and solve for $\kappa$. The derivative of eq. 7 is given by:

$$\frac{\partial Y}{\partial F} = R_e \phi_Q + F \phi_Q \frac{\partial R_e}{\partial F} + F R_e \frac{\partial \phi_Q}{\partial F} \tag{10}$$

The partial derivative of $R$ with respect to $F_{msy}$ is given by:

$$\frac{\partial R}{\partial F} = \frac{R_o}{\kappa - 1} \frac{\phi_e}{\phi_f^2} \frac{\partial \phi_f}{\partial F} \tag{11}$$

Substituting eq. 8 and eq. 11 into eq. 10 and setting the derivative equal to 0 and solving for $\kappa$ results in:

$$\begin{aligned}
\frac{\partial Y}{\partial F_{msy}} = 0 &= R_o \frac{\kappa - \phi_e/\phi_f}{\kappa - 1} \phi_Q + F \phi_Q \frac{R_o}{\kappa - 1} \frac{\phi_e}{\phi_f^2} \frac{\partial \phi_f}{\partial F} + F R_o \frac{\kappa - \phi_e/\phi_f}{\kappa - 1} \frac{\partial \phi_Q}{\partial F} \\
0 &= (\kappa - \frac{\phi_e}{\phi_f}) \phi_Q + F \phi_Q \frac{\phi_e}{\phi_f^2} \frac{\partial \phi_f}{\partial F} + F(\kappa - \frac{\phi_e}{\phi_f}) \frac{\partial \phi_Q}{\partial F} \\
-F \phi_Q \frac{\phi_e}{\phi_f^2} \frac{\partial \phi_f}{\partial F} &= (\kappa - \frac{\phi_e}{\phi_f}) \left[ \phi_Q + F \frac{\partial \phi_Q}{\partial F} \right] \\
\kappa &= \frac{\phi_e}{\phi_f} - \frac{F \phi_Q \frac{\phi_e}{\phi_f^2} \frac{\partial \phi_f}{\partial F}}{\phi_Q + F \frac{\partial \phi_Q}{\partial F}}
\end{aligned} \tag{12}$$

To determine $R_o$ from $MSY$ and $F_{msy}$ use the following relationships

$$\begin{aligned}
R_e &= \frac{MSY}{F_{msy} \phi_Q} \\
R_o &= R_e \frac{\kappa - 1}{\kappa - \frac{\phi_e}{\phi_f}}
\end{aligned} \tag{13}$$

The final trick to getting estimates of $\kappa$ and $R_o$ from $F_{msy}$ and $MSY$ is to obtain the partial derivatives for $\phi_f$ and $\phi_Q$. The analytical solution for these derivatives are a recursive function of survivorship given by:

$$\frac{\partial \phi_f}{\partial F} = \sum_{a=2}^{\infty} f_a \frac{\partial l_a^{(f)}}{\partial F} \tag{14}$$

$$\frac{\partial \phi_Q}{\partial F} = \sum_{a=1}^{\infty} w_a \frac{v_a}{Z_a} (1 - e^{Z_a}) \frac{\partial l_a^{(f)}}{\partial F} + \frac{l_a^{(f)} w_a v_a}{Z_a} \left[ e^{-Z_a} - \frac{1 - e^{Z_a}}{Z_a} \right] \tag{15}$$

where $\frac{\partial l_a^{(f)}}{\partial F}$ is calculated recursively using:

$$\frac{\partial l_a^{(f)}}{\partial F} = \begin{cases} 0, & a = 1 \\ \frac{\partial l_{a-1}^{(f)}}{\partial F} e^{-Z_{a-1}} - l_{a-1} v_{a-1} e^{-Z_{a-1}}, & a > 1 \end{cases} \tag{16}$$

In cases where the steepness parametrization of the Beverton-Holt stock recruitment model is desired, the model can then be parameterized in terms of $MSY$ and $h$. To do so, replace eq. 8 with the alternative parametrization and carry out the steps laid out in eqs. 10-13. A much simpler approach however, is to utilize the relationship between $h$ and $\kappa$ which can be calculated as:

$$h = \frac{\kappa}{\kappa + 4}, \quad \kappa = \frac{4h}{(1-h)}$$

for the Beverton-Holt model.

## Using a simplified model to explore alternative assumptions

To explore alternative assumptions about the input data and model structure, a simplified version of the data structures and observation models was constructed such that alternative hypotheses could be explored in a time efficient manner during the course of the STAR Panel Review. The results of this model presented herein are not intended for management advice. The aim of this exploration is to better understand how assumptions about data weighting and variance partitioning affects the overall reference point calculations and estimates of relative depletion.

The first simplification consisted of a data-aggregation process; this aggregation was necessary to severely reduce the computational time required to estimate model parameters. The data aggregation and model assumptions are summarized as follows:

- Catches from the US and CAN fisheries were combined into a single fishery and it was assumed that both fisheries had a single asymptotic selectivity curve,
- Age-composition information from US and CAN were aggregated into a single catch-age proportion matrix, where the proportions-at-age were combined using a weighted average where the weights are the relative proportions of catch in each of the two countries.
- Age-composition information from the Acoustic surveys were disregarded, and it was assumed that the relative abundance index from the acoustic survey was proportional to the vulnerable biomass. This further assumes that the selectivity of the acoustic survey was constant throughout time. The survey $q$ was assumed unknown and no informative priors were used for $q$ (the conditional maximum likelihood estimate for $q$ was used).
- Observation errors (survey CV's) in the acoustic survey were assumed unknown but constant over time. The 1986 survey point was included in the analysis and assumed to have the same CV as all other survey points.
- The process error variance (recruitment CV's) was assumed unknown and estimated conditional on a specified ratio ($\rho$) of observation errors relative to process errors. Thus, the total error ($\kappa$) was treated as an estimated parameter and the observation error is given by $\sigma = \rho\kappa$ and the process error is given by $\tau = (1-\rho)\kappa$.
- The observed mean weights-at-age data were used to calculate stock biomass in each year.

Despite these data and model simplifications, the overall trends in estimated abundance were very similar to the results obtained by SS2. However, there were a few substantive differences in overall population scale and relative depletion depending on how much weight was assigned to the age-composition data and the assumed observation-process error ratio $\rho$. Here we present six alternative scenarios (S1-S6) to demonstrate how the overall population scale changes with alternative data weighting assumptions.

The five scenarios are summarized as follows:

**S1** In the first scenario the assumed variance ratio was set at $\rho = 0.1$ and the age-composition information were severely down weighted to an effective sample size of 4.

**S2** In scenario two, the effective sample size for the age-composition information was increased to 40.

**S3** In scenario three, the effective sample size for the age-composition information was increased to 400.

**S4** In scenario four, the acoustic survey values from 1977-1989 were omitted from the likelihood criterion, and the model was fit only to the 1992-2005 acoustic survey data and an effective sample size of 4. This scenario is nearly equivalent to the assumptions in SS2, where the assumed CV's for the 1977-1989 are inflated relative to the 1992-2005 survey.

**S5** In scenario five the assumed variance ratio $\rho$ was increased to $\rho = 0.2$ and the effective sample size for the age composition information was equal to 4. The net effect of increasing the ratio of observation errors relative to the process errors is nearly equivalent to increasing the CVs on the acoustic surveys and decreasing the value of $\sigma_R$ in SS2. Also, as $\rho \to 1$ the model becomes an observation error only model and vice versa.

**S6** In scenario six, the variance ratio was set equal to $\rho = 0.3$ and all other terms are the same as S5.

The results of each of these scenarios are summarized in the form of biomass trends and depletion trends in Fig 1. Overall, the net effect of increasing the weights on the age-composition information results in a reduction in $B_o$ (compare S1-S3 in Fig. 1a). This reduction in $B_o$ was necessary to in order to generate sufficiently strong recruitment deviations to explain the large 1980, 1984 year classes as well as be consistent with the increase in relative abundance index between 1983 and 1986. When the 1977-1989 acoustic survey data were removed from the fitting criterion (S4 in Fig. 1a) the unfished biomass $B_o$ increases. This suggests that the down weighting of the 1977-1989 acoustic survey information in SS2 could bias the estimates of $B_o$ upwards and appear to have resulted in a much stronger depletion by 2006. Overall, each of scenarios S1-S4 resulted in similar estimates of absolute abundance in 2006; however, the estimates of relative depletion differed significantly due to the vast differences in estimates of $B_o$.

In contrast to increasing the weights on the age-composition information, admitting more uncertainty in the acoustic survey estimates resulted in an increase in $B_o$ (Fig. 1c). In other words, as we admit less process error and more observation error in the model, there is a tendency for $B_o$ to increase because recruitment variation is bound by tighter constraints. However, if the weight on the age-composition information is adjusted upwards there will also be a corresponding downward adjustment in $B_o$ that was demonstrated in scenarios S1-S3.

In summary, trends in abundance from the simple model are comparable with that of SS2. In addition present day biomass estimates from the simple model is also comparable to the results produced by SS2. The principle difference between the two models is the historical estimates of $B_o$ and therefore the relative levels of depletion. Also note that levels of MSY for the stock are proportional to estimates of $B_o$, therefore lower $B_o$ estimates result in lower estimates of MSY.

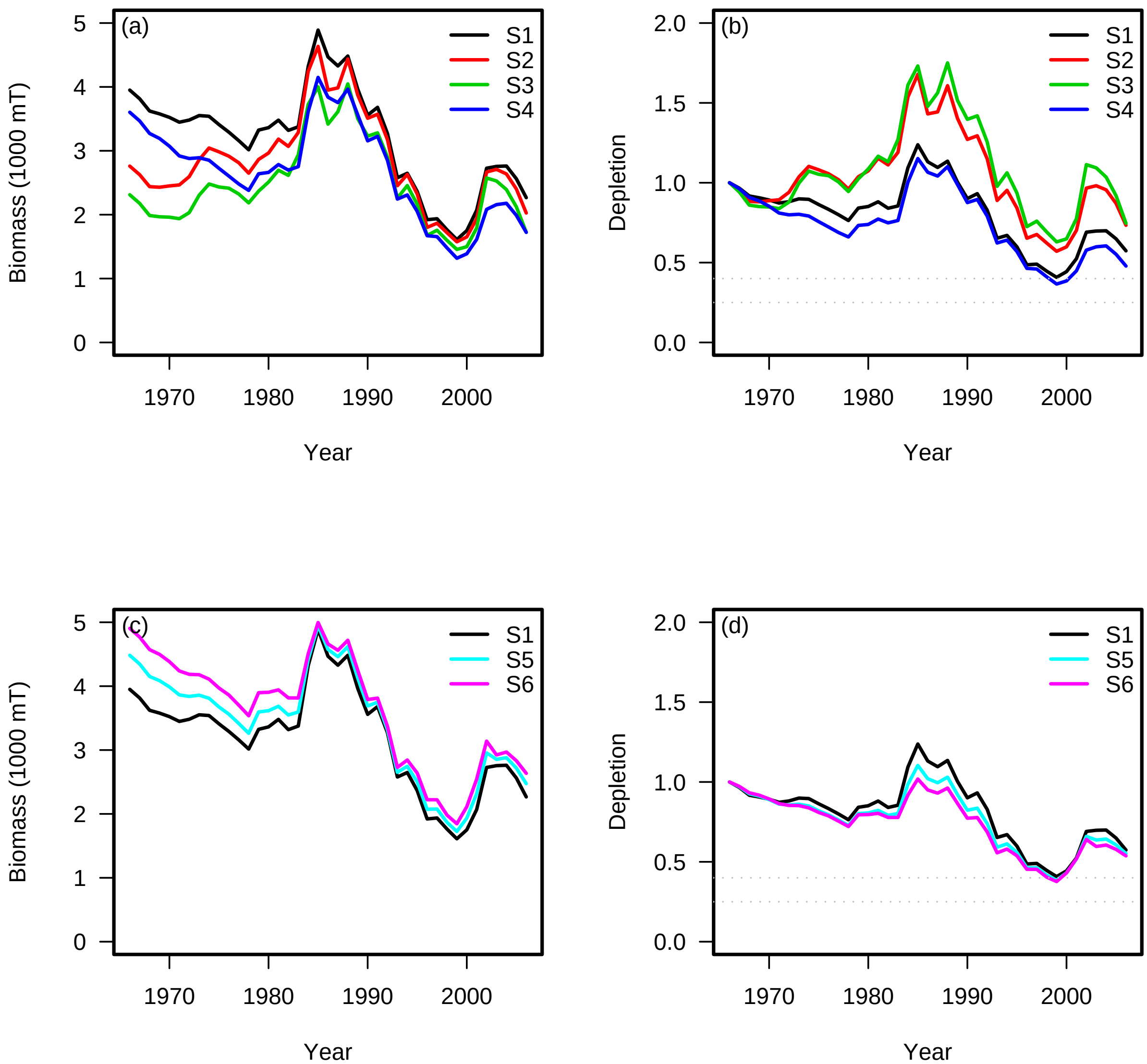


Figure 1: Biomass trends and depletion trends for Pacific hake using the simplified data and model structure described in this appendix. See description of alternative scenarios above for explanations of S1-S6.

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# Report

**of the**

# Joint Canadian and U.S. Pacific Hake/Whiting Stock Assessment Review Panel

**Silver Cloud Inn – University District**
**Seattle, Washington**

**5-9 February 2007**

# Overview

During 5-9 February 2007, a joint Canada-U.S. Pacific Hake/Whiting Stock Assessment Review (STAR) Panel met in Seattle, Washington, to review the stock assessment by Helser and Martell (2007). The Panel operated under the U.S. Pacific Fishery Management Council's Terms of Reference for STAR Panels (SSC 2006), but as in previous years, the Panel attempted to adhere to the spirit of the Canada-U.S. Treaty on Pacific Hake/Whiting. As was the case in 2004, 2005, and 2006, both a Panel member and Advisor from Canada participated in the review (see *List of Participants*). The revised stock assessment and the STAR Panel review will be forwarded to the Pacific Fishery Management Council, Council advisory groups, and to Canadian DFO managers and the PSARC Groundfish Sub-committee.

Both members of the stock assessment team (STAT) – Drs. Thomas Helser and Steve Martell – attended and actively participated in the meeting. Public comment was entertained throughout the week. A local area network and file server were set up in the meeting room to facilitate sharing the presentations, model results, and various parts of the Panel's draft report. The STAR Panel members received a draft of the assessment two weeks prior to the meeting, which was sufficient time to adequately review the assessment.

The Panel convened at 13:00 on February 5$^{th}$. Jim Hastie (NWFSC) welcomed the group. Ray Conser (STAR Panel Chair) then opened the meeting with an overview of the review process including the terms of reference, Panel membership, expected products, and a timeline for completion of the Panel's report. Rapporteurs were assigned for each section of the Panel report. Tom Helser then provided a detailed description of the stock assessment including an overview of the acoustic survey work and Steve Martell presented preliminary research on a simplified stock assessment model for hake (Helser and Martell 2007 – Appendix 2). Jim Hastie summarized the results and conclusions of the "Pre-Recruit Survey Workshop" held in September 2006 (Ralston and Hastie 2006). Steve Martell also presented a paper evaluating the utility and cost effectiveness of pre-recruit surveys. Barry Ackerman and Jeff Fargo provided an overview of the Canadian hake fisheries in 2006 and Dan Waldeck and Mark Saelens provided a similar review of the 2006 U.S. fisheries.

Based on discussion of the stock assessment document and related presentations, the Panel requested nine additional model runs to help clarify the base cases and the full range of uncertainty in the stock assessment. This iterative process of making additional model runs and discussing the results continued through the end of the day on February 8$^{th}$. The Panel spent the morning of February 9$^{th}$ reviewing a first draft of its report. The meeting was adjourned at 12:00 on February 9$^{th}$. The Panel Chair agreed to produce a second draft of the Panel report and distribute it by email to all Panel participants. The final Panel report was completed on February 16$^{th}$ – the deadline for material to be included in the PFMC's "briefing book" for its March meeting.

The Panel recommended acceptance of two equally plausible SS2 models (conditioned on differing catchability assumptions for the acoustic survey) to reflect stock status and to quantify the uncertainty in the relative depletion level and productivity of the stock[1]. In Model 1, survey q was fixed at 1.0; while in Model 2, survey q was estimated using a highly informative prior (mean of 1.0 and a standard deviation equivalent to 0.1). The estimated 2007 spawning stock biomass (SSB) is either near the mid-point (Model 1) or near the maximum (Model 2) of the precautionary range ($0.25 \cdot SSB_0 - 0.40 \cdot SSB_0$). However, projections indicate that if the annual allowable biological catches (ABC) are taken, the SSB will fall below the overfished threshold ($0.25 \cdot SSB_0$) in either 2008 (Model 1) or 2009 (Model 2). The current fishing mortality (2006) rate is less than the $F_{MSY}$-proxy ($F_{40\%}$) for both models. Since 1999, managers have set the annual allowed harvest below the ABC. Continuation of this practice could delay a fall below the overfished threshold until 2009 (Model 1) or 2010 (Model 2) – see Table 1.

The Panel concurred that the stock assessment is suitable for use by the Council and Council advisory bodies for ABC and optimal yield (OY) determination, and for stock projections.

The status of the hake stock – as well as the quantification of uncertainty – is not greatly different than that indicated in the last stock assessment (Helser et al. 2006). However, the Panel considered several potentially important sources of uncertainty in the SS2 modelling that if fully explored in the context of the next assessment, may lead to different conclusions. In particular, the Panel found that the currently-configured SS2 model for hake tends to overestimate $SSB_0$ – the critical level needed for depletion estimation and the determination of an overfished state. When coupled with the observation that SSB has been in decline since 2003 while ABC has increased substantially over the same period (both models), there may be cause for concern if managers elect to take the full ABC.

The STAR Panel commends the STAT for the quality of the document provided for review and their cooperation in performing additional analyses requested during the meeting.

## Summary of stock assessment and Panel discussion

The 2007 assessment was conducted using the Stock Synthesis II (SS2) model, Version 1.23E, and was the first hake assessment conducted after the migration to this model, which was accomplished in 2006. U.S. and Canadian fishery data were updated through the end of 2006 and a new coast-wide pre-recruit survey (PWCC/NMFS-SWFSC Santa Cruz survey) was used as an index of recruitment in SS2, following the findings of the pre-recruit survey workshop in September 2006 (Ralston and Hastie 2006). Comparison of the 2006 assessment with the 2007 assessment (with the only difference being the

[1] In the Helser and Martell (2007) stock assessment document, the two models are called "base model" and "alternative model." Since the models are considered equally likely by the STAT and the STAR Panel, the Panel prefers the nomenclature "Model 1" and "Model 2," respectively. The latter naming convention is used throughout the STAR Panel report.

updated fishery data) showed that trends in Age-0 recruitment, age 3+ biomass, and depletion in 2007 did not differ substantially from trends estimated in 2006. Use of the new recruitment index did not alter trends in these parameters relative to trends produced using the Santa Cruz index only.

STAT provided a detailed review of the data used in the assessment (fishery, hydroacoustic survey, and biological), the SS2 model structure and assumptions, model results and diagnostic tests, and preliminary assessment of hake stock status and future prognosis. There was some discussion about the sensitivity of a forward projecting model such as SS2 to initial conditions, particularly the value of $B_0$, the virgin unexploited biomass, which is assumed to be 1966 for hake. There are no records of catches prior to 1967 in U.S. waters and although there may have been harvesting activities in Canadian waters, the records of these landings are not readily available at present. Based on the review of the fishery data, it is clear that both the at-sea and shore-based fisheries in the U.S. and Canada were primarily harvesting fish from the 1999 year-class. The STAT recognized that future directions for research and modelling include incorporating migration into the model, evaluating the use of environmental covariates, modelling different sectors of the hake fishery in the U.S. and Canada independently, and further evaluating cohort-specific growth.

There was some discussion regarding interesting features in both age and length composition data and in growth rates. For example, Canadian length composition data suggest a strong 1994 year class (observed as age 1 fish in 1995, age 2 fish in 1996, with apparently rapid growth rates), not observed in any other data. The working hypothesis is that these fish may have been spawned in the north and never migrated south. The lack of fit in 2001 and 2002 may be due to a limited migration of the main stock and changes in the spatial distribution of fishing effort. Based on the 2005 acoustic survey length composition data a moderately strong 2003 year-class was moving into the fishery, whereas the fishery data are consistent with a moderately strong 2004 year-class.

Discussion of the SS2 model assumptions and structure focused on the appropriateness of fixing h = 0.75 (steepness of the stock-recruit relationship) and the use of dome-shaped fishery and acoustic survey selectivity curves. The steepness (h) parameter is difficult to estimate directly because it is confounded with other parameters estimated at the same time, notably $R_0$. The original formulation of the Beverton-Holt stock recruitment relationship has better numerical stability and may be a better parameterization to use within the SS2 model.

Discussion of the acoustic survey time series focused on potential biases and differences in trends inferred from the fishery data. The model was run using survey data from all years except 1986, which was omitted because of transducer calibration issues. Given the assumed CVs for the survey, omitting the 1986 data point results in a long-term survey index that is essentially flat (1977-2005). This flatness conflicts with the SS2 trend of sharply declining biomass over the 1988-97 period, which is largely driven by the age-composition data – a less than idea situation for stock assessment.

The possibility of disregarding the pre-1992 data altogether was also discussed, as acoustic technology has changed substantially since this period, and the raw data for early years are difficult to reconstruct and reanalyze. Prior to 1992 acoustic surveys did not go sufficiently far north in Canadian waters to ensure that the entire distribution of hake was covered and the acoustic data from this period are potentially biased as a result of signal saturation when high hake densities were observed. The Simrad EK-500 system, which is more stable in performance and less subject to signal saturation, has been used by both countries beginning with the 1992 survey. The U.S. upgraded to the Simrad EK-60 system for the 2005 survey and Canada will upgrade to this system when its new research vessel is delivered (~2011).

A brief synopsis of a pre-recruit survey workshop held in September 2006 at the SWFSC, Santa Cruz, was provided by Jim Hastie (see also Ralston and Hastie 2006). The focus of this workshop was on integrating the older SWFSC Santa Cruz juvenile rockfish survey with the newer PWCC/NMFS young-of-the-year Pacific whiting/hake survey. The SWFSC survey was initiated in 1983 and the newer PWCC/NMFS survey in 2001. Since 2001 substantial work has gone into standardizing the gear, tow durations, and design of these surveys. Spatial coverage of these surveys has gradually expanded south and north during the 2001-2006 period. Workshop participants suggested that for species found north of Point Conception (including Pacific hake), data from the SWFSC and PWCC/NMFS survey combined during the 2001-2006 period may provide acceptable spatial coverage for a coast-wide index of recruitment abundance and that the methods and catch rate patterns of the SWFSC and PWCC/NMFS surveys are sufficiently similar to permit combining the data to form a single pre-recruit index. However, the spatial coverage of the SWFSC survey during the 1983-2000 period was inadequate for indexing pre-recruit abundance for most species, especially for coast-wide assessment areas. Workshop participants also agreed that substantial density-dependent mortality can occur following the measurement of pre-recruit abundance and if this mortality did occur, then it would result in non-linearities in the relationship between the index and recruitment.

A modelling exercise looking at the impact of juvenile surveys on assessment model performance and management performance was discussed by Steve Martell. Four scenarios (1-Juvenile index used in fitting, forecast based on mean R from previous 5 years; 2-Forecast based on mean S-R relationship; 3-Forecast based solely on juvenile survey; and 4-Forecast based on weighted average of S-R and juvenile surveys) were assessed. Regardless of the scenario chosen, there was little impact on stock assessment performance, but clear impacts on management performance. Improvements in forecasting could potentially enhance fisheries yields or reduce implementation error. Juvenile surveys do little to improve estimates of reference points. This introduces a trade-off: Invest more resources in juvenile surveys or surveys that provide better estimates of $B_0$ and recruitment compensation (steepness). Based on the results of this exercise and subsequent discussion, more investment in increasing the precision of the juvenile surveys is warranted, but it may be extremely costly to reduce survey CVs so that they are less than the CV in recruitment deviations. Furthermore, this cost may exceed the value of the additional gains.

Steve Martell also introduced a simplified age-structured model designed to provide another view of Pacific hake dynamics and status of the stock (from that provided using SS2). The appeal of the model (described in Appendix 2 of the stock assessment document) lies in its ability to include all available hake data sources; the principal dynamics of the fisheries and the survey; and time-varying biology, (e.g. changes in growth), yet the model appears to run several orders of magnitude more quickly than SS2. This makes extensive sensitivity analysis feasible, provides better insight into the dominant axes of uncertainty, and allows for practical management strategy evaluation. The simplified model was used to explore alternative model structure and assumptions which differed from those used in the Model 1 and Model 2 SS2 runs. For example, in one run of the simplified the parameters q, $B_0$, h, and M were all estimated and the selectivities for all fisheries and the survey were taken to be flat-topped.

The simplified model runs – carried out before and during the Panel meeting – suggested large uncertainty in the estimate of $B_0$, and that $B_0$ may be smaller than that estimated by SS2 Model 1 and Model 2 runs. However, the MSY and ABC posterior densities suggested estimates similar to those from SS2. The Panel recognized that there was value in using this simplified age-structured model to investigate some of the complexities of SS2 behavior. But the Panel also recognized that SS2 has been peer reviewed and used widely for Pacific groundfish assessments in the U.S. while Martell's simplified model is still under development and has yet to have been peer reviewed – although similar models have used in other assessment/management settings. As such, it would be premature to use the simplified model's results as the basis of management recommendations. Nonetheless, there appears to be great promise in this approach.

The Panel and the STAT briefly discussed two sources of data that were not used in the stock assessment modelling, namely (1) NMFS Triennial Bottom Trawl Survey and (2) the CalCOFI Ichthyoplankton Survey. Both have potentially useful information on hake abundance but also have shortcomings and/or limitations that may diminish their utility. The Panel did not have an opinion on pursuing these data sources but for completeness, asked the STAT to briefly describe them in the revised assessment document and provide the rationale for not using them in the assessment.

**List of New Analyses Requested by the STAR Panel**

The following list describes each request made of the STAT team, the rationale for the request, and outcome of the analysis:

1. The scaling factor, q, should be estimable from the acoustic survey biomass time-series, but this has proven difficult to do in the past, resulting in a previous Panel's request to conduct two model runs (one with q = 1.0 and the other with q estimated with an informative prior) representing alternate states of nature. The 2007 STAR Panel requested that STAT:

a. Estimate q for 1992 to 2005 survey data. Acoustic survey biomass and age composition data from 1977 to 1989 period are ignored since survey spatial coverage was known to be incomplete (not far enough north) during this period and acoustic gear issues also affected measurements prior to the 1992 survey. Both Canada and the U.S. had switched to the Simrad EK-500 echosounder by 1992, which reduced biases associated with gear issues in the earlier surveys.
b. Estimate separate q and selectivities for the 1977-1989 and 1992-2005 surveys.

Response: [1.a.] Using Model 1, the STAT estimated q = 0.15 from the 1992 to 2005 acoustic survey data. However, the standard error of the q estimate was large, i.e., precision was low. Survey selectivity for this time period was still dome-shaped, but less so than the selectivity estimated in SS2 Models 1 and 2. The biomass scaled much higher. These results were not credible.

[1.b.] Using Model 1, the STAT reported that including the early survey data resulted in the model estimating a q of 0.062 (1977-1989) and 0.069 (1992-2005). Selectivities in this run were dome-shaped, but the 1977-1989 data exhibit a more pronounced dome-shape, presumably due to incomplete spatial coverage in Canadian waters. The precision of the selectivity estimates were not available, but the different patterns in 1977-1989 and 1992-2005 seem to provide a more realistic picture to the STAR panel, at least consistent with what is known about the survey history. Discussion of these results led the STAR Panel to Request 8, below.

2. The SS2 Model 1 and 2 dome-shaped selectivity for the Canadian and U.S. fisheries as well as for the acoustic survey needs to be examined more closely. The Panel was concerned that the proportion of the SSB never observed through fishery or survey sampling (cryptic biomass) appeared to be quite large, particularly in recent years. Quantify the contribution of the cryptic biomass in the SS2 Model 1 and Model 1 SSB results; and further explore this issue as follows:
    a. Use asymptotic selectivity for the Canadian fishery (large fish get further north – distributional rationale) and do a sensitivity run with M and h fixed as before.
    b. Use asymptotic selectivity for both fisheries and the acoustic survey and do a sensitivity run with age-specific M of 0.23 $yr^{-1}$ up to age 10, followed by a linear increase to 0.46 $yr^{-1}$ or some model estimated value (preferred option) of M over remaining ages

Response: [2.a.] STAT reported that using an asymptotic selectivity curve for the Canadian fishery degraded the model fit by 500 log likelihood units. The main areas of degradation are in the fits to the Canadian fishery age compositions and acoustic survey age compositions. The degradation in fit of the acoustic survey age compositions was unexpected but related to the fact that most of the older fish are in Canada. This run forced an unusual selectivity pattern for the acoustic survey, which explained the lack of fit. The SS2 model only sees old fish in Canada so it skews the selectivity for this observation. These results are similar to findings of previous STAR panel requests to explore flat-topped selectivities. The bottom line is that the acoustic survey data is affected in a non-intuitive way.

[2.b.] In order to do a sensitivity run with age specific M and asymptotic selectivities, STAT allowed dome-shaped selectivity for the US fishery and allowed M to ramp up, otherwise the model drives biomass to low levels that are inconsistent with observations. Although the preferred option was to estimate the final M, STAT suggests that this did not work because the base level M (0.23 $yr^{-1}$) was too high. An M of 0.46 $yr^{-1}$ for older ages drove the population down to 2.2%, indicating that the SS2 penalties may not be strong enough to entertain this scenario. The U.S. fishery appears to have dome-shaped selectivity in the early time blocks but later periods tend to be asymptotic, which may reflect the fact that the US fishery is fishing almost exclusively on the 1999 year-class in later years. The plausibility of the mortality schedule used in this run of SS2 is clearly questionable, but it was used because the STAR panel is trying to address alternate explanations for the observed data and the very low selectivities of older fish in the Model 1 and 2 runs. Discussion of this run resulted in a follow-up request from the STAR panel (see 9 below).

3. Do sensitivity run of model with h=1.0. In particular, what is the impact on model projections relative to h=0.75?

   Response: The results of this run were not surprising. A higher value of h allows recruitment variation to increase and results in higher spawning biomass. Slightly higher yields result in the forward projections relative to those from Model 1 (h=0.75, q = 1.0). When h=1.0 and q is estimated with informative prior, SSB is lower than the Model 2 run (h=0.75, q estimated with informative prior), which implies that $B_0$ is lower. This result appeared to be counter-intuitive.

4. The simplified age-structured model – as reported in the stock assessment document – did not capture growth changes. Capture changes in growth regimes in new series of runs.

   Response: STAT (Steve Martell) provided six scenarios with different assumptions regarding weights on age composition data (effective sample size), catch-age likelihood (multinomial vs. Fournier's robust likelihood), and use of acoustic survey data. These scenarios are described fully in Appendix 2 of the revised stock assessment document. All 6 scenarios result in similar estimates of current SSB (2006). However, major uncertainty was seen in estimates of $SSB_0$ and in some cases, the respective depletion levels. The simplified model tended to estimate lower M (~ 0.15 $yr^{-1}$) than the fixed M=0.23 assumption used in the SS2 model runs. Steepness (h) estimates were generally in the neighborhood of h=0.75. Survey q estimates varied but tended to be less than 1.0. The conclusion from this analysis is that the structural assumptions, especially objective function weighting, do have an impact on the bottom line. The Panel used this simplified model as an exploratory tool to help with its understanding of the sensitivities of SS2 to changes to the weighting of age composition data and acoustic surveys. The Panel followed up with an SS2 request (Request 9) to examine objective function weighting in SS2. The results from the simplified model were instrumental in specifying the details of Request 9.

5. Carry out sensitivity analyses that drop the early years of the Santa Cruz pre-recruit survey – consistent with the findings of September 2006 Santa Cruz workshop.

   Response: STAT reported that dropping the Santa Cruz survey data from the 1983-2000 had little impact on model fitting. The 1999 year class remained relatively strong and current SSB remained about the same. $SSB_0$ did not change, and the fit to the acoustic survey did not change. There were no surprises in these results. The STAR Panel recommends that STAT remove the Santa Cruz recruitment survey data (1983-2000) from Models 1 and 2, consistent with the findings of the juvenile survey workshop (Ralston and Hastie, 2006) and the related results presented to the STAR panel. The early part of this survey had limited spatial coverage and the index of hake recruitment was based on catches at 5 stations in the outer Monterey stratum.

6. STAT team should be clear about why 2007 SSB and projections of catch and depletion rates are similar to 2006 SSB and projections. Are these similarities due to model changes, data changes or both?

   Response: STAT is cognizant of the need to clarify this point in the assessment document that will go forward from the Panel process.

7. The Panel attempted to explore an alternate explanation of the observed data compared to those attempted by previous Panels by trying to determine if the SS2 model can estimate M values that make population dynamics sense, including population sizes consistent with removals. Following from request 2b, the Panel requests that STAT:
   a. Assign asymptotic selectivities to the Canadian and U.S. fisheries and the acoustic survey and allow the model to estimate base M (ages 0 through 10) and where M ultimately ends up for the older age groups.
   b. A default option if 7a is not feasible is to fix the upper M at 0.46 $yr^{-1}$ and allow the model to estimate the initial or base M (ages 0 through 10).

   Response: STAT reported that these requests were difficult to fulfill. Freely estimating an initial M and final M for older age groups [7.a.] resulted in values of 0.1 and 0.26, respectively. However, the model developed pathological behavior near the end of the simulation period, apparently because the 1999 year class was not large enough to support the observed removals. This result was unexpected and there was much discussion of possible explanations. The Panel concluded that freely estimating M when all selectivities are asymptotic cannot easily be accomplished with SS2. Dome-shaped selectivity patterns for all fisheries and the survey remain a source of uncertainty in the model with important management implications – particularly with the concomitant high proportion of cryptic biomass in the population. STAT advised that pursing this line of investigation further was not practical given time constraints and the amount of work necessary to implement the process in SS2.

8. Block acoustic surveys into 1977-1989 and 1992-2005 periods and estimated separate selectivities for each period. The Panel requests that STAT do this for runs in which
    a. q is fixed at 1.0, and
    b. q estimated using informed prior.

Response: With q fixed at 1.0, blocking the acoustic survey data into 2 periods [8.a.] improves the model fit marginally by about 40 likelihood units. The likelihood for the fit to the acoustic survey data changes little relative to the Model 1. The gain in fit seems to be in the age composition fits, especially the acoustic survey age compositions. The fit to the survey biomass is similar to the Model 1, but it does not dip down between 2003 and 2005 as in Model 1. Blocking the acoustic surveys also seems to have resulted in an increase in 1999 year-class recruitment. Depletion in the final year was 0.405. 2007 spawning biomass is roughly at the $B_{40}$ target. The STAR Panel noted the marginal improvement in statistical fit of the age composition data but was not able to determine what property in these data would account for this improvement. The 1992-2005 selectivity is still dome-shaped, but is shifted to the right of the 1977-1989 selectivity curve. The STAR Panel did not see any real advantage in proceeding with block selectivities of acoustic surveys in SS2 because improvement in model performance was marginal; change for change's sake is not warranted in these circumstances.

9. Objective function weighting. The Panel is concerned that the acoustic survey data are having little or no influence in the model and consequently, the age- and length-compositions are unduly influencing trend and scale. Give more weight to acoustic survey and down-weight age- and length- compositions. Decrease acoustic survey CVs assigned to the early years and reduce age-composition and length- composition effective sample sizes. Note that in Models 1 and 2, the effective age composition sample size was set to 50% of the nominal sample size and that the effective size composition sample size was set to 30% of the nominal sample size. Also note that in Models 1 and 2, the survey CV was set to 0.50 for the early years (1977-89) and 0.25 for the latter survey years (1992-2005).
    a. Conduct runs with age compositions (effective sample size) set to 25% of the nominal sample size for q = 1.0 and q estimated with an informed prior,
    b. Conduct runs with age compositions (effective sample size) set to 15% of the nominal sample size for q = 1.0 and q estimated with an informed prior, and
    c. Conduct runs with age compositions (effective sample size) set to 15% of the nominal sample size and length compositions set to 15% of the nominal sample size for q = 1.0 and q estimated with an informed prior.

Response: For all runs, the STAT set the acoustic survey CV=0.25 for all years. Results are shown in Figure 1 for Model 1 (q=1) and in Figure 2 for Model 2 (q estimated with an informed prior). Despite significant downweighting of the age- and size-compositions, all of the runs appeared to fit the observed age- or size-compositions quite well. For both Model 1 and Model 2, fits to the acoustic survey data improved as less weight was given to the age- and size-compositions (Figures 1a and 2a); furthermore, estimates of $SSB_0$ declined as less weight was given to the age- and size-compositions (Figures 1b and 2b). Depletion estimates were not affected as greatly but some down weighted runs showed terminal depletion levels below the $0.25 \cdot SSB_0$ overfished threshold (Figures 1c and 2c).

Although the particular levels of downweighting used in these requests are somewhat arbitrary, the exercise established that the rigidity of the SS2 hake modelling (i.e. M fixed, h fixed, and q essentially fixed) coupled with the large relative weighting given to the age- and size-compositions may be causing lack of fit to the acoustic survey and an upward bias in the Model 1 and Model 2 estimates of $SSB_0$ as well as concomitant effects in depletion estimates. These results are consistent with dozens of runs made using the simplified model (Request 4, above) that tended to estimate smaller $SSB_0$ than the Model 1 and 2 SS2 estimates. The STAT suggested that a more objective way to handle downweighting the age- and size-compositions would be to use Fournier's robust likelihood (as done in MULTIFAN-CL). While this was done for the simplified model (Request 4, above), it was not possible to make such modifications to SS2 during the course of the Panel meeting. The Panel recommended that this be done in the next hake stock assessment.

**Technical merits and deficiencies**

1. The current form of the assessment model (SS2 Ver 1.23E) evolved from a 2005 STAR Panel recommendation to develop a more parsimonious model. The number of parameters has been reduced from more than 300 to the current 80 or so parameters. The current version is a single-sex age/length structured model with standard fish population dynamics. The objective function is maximum likelihood with different weighting schemes for different data sources. Bayesian priors can be used in the parameter estimation. Nonlinear optimization is carried out using the tools in the AD Model Builder package. The Panel generally supports the use of this modelling and estimation procedure but also saw value in the use of a simplified age-structured model to provide better understanding of the sometimes complex behavior of SS2. The Panel recommends the joint use of these complementary models in future assessments.

2. Objective function weighting is a particularly difficult issue in the hake assessment. Appropriate CVs for the acoustic survey are not known. CVs are set somewhat arbitrarily to 25% for the recent period (1992-2005) and 50% for the earlier years (1977-89). The number of available age and size samples is unusually large and the nominal number of samples considerably overestimates the true effective sample sizes. The original sample sizes were reduced somewhat arbitrarily by 50% for age-compositions and 70% for the length-compositions in Models 1 and 2. An exercise carried out at the Panel meeting to reduce further the effective sample sizes showed little effect on model fit but somewhat different conclusions on the value of earlier survey data, the estimates of $SSB_0$, and on

some depletion estimates. The Panel encourages further work on objective function weighting in conjunction with the next assessment (as outlined in Request 9, above).

3. The estimated selectivity functions for the Canadian fishery, the U.S. fishery, and the acoustic survey are all strongly dome-shaped. While plausible mechanisms were postulated for some degree of domeness, the Panel did not find the unusually small selectivities for older fish (say age 12+) to be entirely credible. Such model structure has management implications in that the cryptic biomass can represent a significant proportion of standing stock of SSB in some years. Since by definition the cryptic biomass can never be sampled or measured directly by either fishery or by the acoustic survey, it is difficult to gauge the reliability of the SSB and other biomass estimates.

4. The Panel suggests that the re-parameterization of the original Beverton-Holt stock-recruitment model to the Mace-Doonan formulation in SS2 (Methot 2005, page 8, equation 1.6) may lead to numerical instabilities. Steepness (h) and $S_0$ are more highly confounded in the Mace-Doonan formulation than are the $\alpha$ and $\beta$ parameters in the original Beverton-Holt formulation.

**Areas of Major Uncertainty**

The Panel identified three major axes of uncertainty in the hake stock assessment. Only the first of these uncertainties can be expressed quantitatively at this time.

a) Acoustic survey catchability continues to be a major source of uncertainty in the stock assessment. This has been a central issue in previous assessments and for the STAR Panels that reviewed them. No new information or data has come to light that helps to resolve the issue. Following the recommendation from the 2006 STAR Panel, the STAT captured this uncertainty quantitatively by developing two models – one with q=1.0 (Model 1) and the other with q estimated with an informative prior (Model 2). The Panel endorses the continuation of this approach. But future research should focus sharply on both the catchability and the selectivity of the acoustic survey. If the SS2 modelling is correct, then the resultant small survey q ($q \approx 0.1$ when freely estimated) and the sharply domed-shaped selectivity curve (missing both young and old fish) may imply that the acoustic survey (as presently conducted) is not an efficient means to develop a reliable fishery-independent index of abundance for hake.

b) Objective function weighting of the fishery-dependent and fishery-independent data is potentially a major source of uncertainty (see discussion under Request 9 and Technical Merits and Deficiencies #2, above). However, at this time there does not appear to be a practical means of quantifying this uncertainty. Without quantification, this uncertainty cannot be captured in decision tables. The next assessment should address this issue quantitatively.

c) The correct shape of the various selectivity curves (dome-shaped or asymptotic) is potentially a major source of uncertainty (see discussion under Technical Merits and Deficiencies #3, above). However, at this time there does not appear to be a practical means to quantify this uncertainty. Without quantification, this uncertainty cannot be captured in decision tables. The next assessment should address this issue quantitatively.

**Areas of Disagreement**
There were no substantial areas of disagreement among STAR Panel members or between the STAT team and the STAR Panel.

**Management, data, or fishery issues raised by Panel advisors**

Summary of Management and the Fishery of Pacific Hake in 2006

Canadian Fishery

In 2007, Pacific hake was allocated to domestic and JV operations with 79,826 t caught in domestic operations and 13,735 t caught during the Joint Venture. The JV started Aug. 1 in Queen Charlotte Sound.

- Catch was distributed between Queen Charlotte Sound (27,600 t) and the west coast of Vancouver Island (52,180 t) between the months of May-November.
- The catch peaked in July for Queen Charlotte Sound and in October for the west coast of Vancouver Island.
- Landings from the north were composed of exceptionally large fish with a low parasite load. While landings from the south were dominated by smaller fish.
- The fishery was monitored with observers and electronic monitoring devices.

U.S. Fishery

- The United States allocation was split between the following sectors:
  Tribal (35,000 mt)
  U.S. shoreside (97,469 mt)
  At-sea Catcher/Processor (78,903 mt)
  At-sea Mothership (55,696 mt)
  Bycatch in all other fisheries (2,000 mt)

- Video cameras were used to monitor the shoreside fishery while the at-sea fishery (JV) was monitored by observers.

- The catcher-processor sector of the fishery voluntarily curtailed fishing operations in response to higher than normal widow rockfish bycatch to prevent premature closure of the shoreside fishery. After the shoreside fishery attained it's allocation and closed, both at-sea sectors resumed and the entire catcher-processor and mothership allocations were caught.

- The catch taken in the early part of the fishery showed a high proportion of juveniles while larger fish dominated as the season progressed.

- The shoreside fleet reduced bycatch for Chinook salmon, canary rockfish, darkblotched rockfish and widow rockfish compared to 2005.

- The shoreside fishery nearly reached their full allocation and closed on August 6.

- The shoreside observation program will begin to transition to federal coordination during 2007.

**Research Recommendations**

The Panel considered the topic of research recommendations in two parts: 1) review of the status of previous research recommendations (made by previous STAR Panels) and 2) development of new recommendations. The Panel prioritized each of the previous recommendations as “S” (short term; to be addressed in the 2008 assessment), “M” (medium term; to be addressed by the 2009 assessment), and “L” (long term; to be addressed by the 2010 assessment and beyond).

<u>2005 STAR Recommendations</u>

1. Continue to compare spatial distributions of hake across all years and between bottom trawl and acoustic surveys to estimate changes in catchability/availability across years. The two primary issues are related to the changing spatial distribution of the survey as well as the environmental factors that may be responsible for changes in the spatial distribution of hake. This issue is also important with respect to the acoustic survey selectivity curve, and with respect to the potential inclusion of environmental covariates in selectivity. (M-in progress).

2. Initiate analysis of the acoustic survey data to determine variance estimates for application in the assessment model. The analysis would provide a first cut to define the appropriate CV for the weighting of the acoustic data (M to L-in progress)

3. Continue to analyze proportions at age for the acoustic survey, as well as with the bottom trawl survey and commercial fisheries, to further evaluate the evidence for domeshaped selectivity. Evaluate the changes in growth on selectivity. (S- in progress)

4. Continue to evaluate the current target strength for possible biases, and explore alternative methods for estimating target strength. (M- in progress)

5. Develop an informed prior for the acoustic q. This could be done either with empirical experiments (particularly in off-years for the survey) or in a workshop format with technical experts. This prior could be used in the model when estimating the q parameter. (M)

6. Investigate covariates that may influence fishery selectivity (L)

7. Hold a workshop (currently in early planning stages) that focuses on evaluating the methodology and utility of the two ongoing juvenile surveys. Issues to be considered include investigating how the surveys are conducted and how the resulting indices are brought into assessment models. *Completed.*

8. As a diagnostic exercise, conduct an alternative analysis in parallel with SS2 using a simplified model, e.g. a VPA (Virtual Population Analysis) or as recommended by the 2007 Panel, Martell's age-structure model. (S-in progress).

9. Address the inconsistencies in age reading, attempt to standardize the criteria and methods between the two labs, preferably thorough the Committee of Age Reading Experts (CARE). Although this has been a recommendation in the past the ageing lab at PBS has done some comparison with the NMFS-Seattle lab and found no discrepancy. (M)

<u>2006 STAR Panel Recommendations</u>

10. Review the acoustic data to assess whether there are spatial trends in the acoustic survey indices that are not being captured by the model. The analysis should include investigation of the migration (expansion/contraction) of the stock in relation to variation in environmental factors. This would account for potential lack of availability of older animals and how it affects the selectivity function. (M) *Acoustic survey workshop topic – see Item 5.*

11. Consider localized depletion experiments to estimate trawl and acoustic survey catchability coefficients (q's) and selectivity. Begin this process with consideration of experimental procedures and design, including smaller-scale trial experiments. (M)

12. Evaluate harvest strategies and stock-size thresholds, through simulation studies or other means, that may better account for the variability and dynamics of the hake resource. This evaluation should include management strategies based on trend data,

rather than absolute abundance estimates, similar to the current approach for managing Pacific cod in Canada. (M)

13. Consider the carrying capacity of the California Current to Pacific hake from an ecosystem perspective. For example, use existing information on the relative abundance and productivity of hake prey, from available data and/or ecosystem models (Ecopath, Atlantis), to consider plausible bounds on the total hake biomass in the California Current (L)

14. Investigate aspects of the life history characteristics for Pacific hake and their possible effects on the interrelationship of growth rates and maturity at age. This should include additional data collection of maturity states and fecundity, as current information is limited (L)

<u>2007 STAR Panel Recommendations</u>

15. Current modelling assumes a single (U.S./Canada) coastwide stock without explicit parameterization for migration. As research advances on spatially-explicit models, hake might be a good candidate for application of these models (M).

16. Currently the assessment is conducted using a single sex model. Empirical evidence suggests growth differences between sexes and most fisheries and survey data are available by sex. Future assessment should consider modelling both sexes (S).

17. Use Martell's simplified age-structured model in parallel with SS2 for the next stock assessment and for the provision of management advice. Compare management advice from both approaches (S).

18. With regard to Martell's simplified model, add the frequency of the stock going below $0.25 \cdot SSB_0$ as a performance measure. This would make Martell's analysis relevant to both Magnuson-Stevens Act mandates – achieving optimum yield and preventing overfishing (S).

19. Investigate whether the early fishery (foreign fishery) operated differently, e.g., bottom trawl rather than mid-water trawl, which could influence the age of fish caught during that period (L).

20. In the next assessment, capture all three major axes of uncertainty in the management advice (see Areas of Major Uncertainty, above) (S).

21. Investigate whether the SS2 model handles the underlying production curve correctly as a code debugging exercise. Put the model in deterministic mode with fixed M, q, h, and selectivities, seed the model with previously estimated $B_0$, and run forward to present day. In this mode the model should return an estimate of MSY similar to the true, analytically-calculated MSY (S).

## List of STAR Panel Participants

Ray Conser, SSC, SWFSC-La Jolla, Panel Chair
Din Chen, SDSU, CIE Reviewer
John Holmes, DFO-Nanaimo, Panel Participant

Jeff Fargo, DFO-Nanaimo, Advisor
Mark Saelens, GMT, ODFW, Advisor
Dan Waldeck, GAP, PWCC, Advisor

## List of STAT Team Participants

Tom Helser, NWFSC-Seattle, Lead Author
Steve Martell, UBC, Co-Author

## References


Helser, Thomas E., and Steve Martell. 2007. Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2007

Methot, Richard. 2006. User Manual for the Assessment Program Stock Synthesis 2 (SS2). Model Version 1.21. January 20, 2006. .NOAA Fisheries Seattle, WA.

Ralston, Stephen, and Jim Hastie. 2006. Pre-recruit survey workshop, September 13-15, 2006, Southwest Fisheries Science Center, Santa Cruz, California. Summary report, 7 p.

Table 1. Decision table showing the consequences of management action given a state of nature. States of nature include the Model 1 (h=0.75, q=1.0) and Model 2 (h=0.75, q prior). The management actions include the optimum yield (OY) from each state of nature and constant coast wide catch scenarios.

| **Relative probability** | | | **State of Nature** 0.5 | 0.5 |
|---|---|---|---|---|
| **Model** | | | **h = 0.75, q = 1.0** | **h = 0.75, q prior** |
| **Management action** | Total coast-wide Catch (mt) | Year | Relative depletion (2.5%-97.5% interval) | |
| OY Model h=0.75, q=1.0 | 573,858 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 378,962 | 2008 | 0.245 (0.195-0.295) | 0.326 (0.236-0.417) |
| | 234,093 | 2009 | 0.193 (0.150-0.236) | 0.271 (0.180-0.363) |
| | 193,195 | 2010 | 0.184 (0.102-0.266) | 0.257 (0.138-0.376) |
| OY Model h=0.75, q prior | 889,555 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 568,864 | 2008 | 0.208 (0.126-0.290) | 0.293 (0.236-0.350) |
| | 341,109 | 2009 | 0.139 (0.052-0.226) | 0.222 (0.176-0.268) |
| | 236,775 | 2010 | 0.124 (0.008-0.240) | 0.203 (0.117-0.289) |
| Total coast-wide | 100,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 100,000 mt | 100,000 | 2008 | 0.305 (0.230-0.379) | 0.377 (0.290-0.463) |
| | 100,000 | 2009 | 0.279 (0204-0.354) | 0.344 (0.259-0.428) |
| | 100,000 | 2010 | 0.274 (0.167-0.381) | 0.333 (0.218-0.447) |
| Total coast-wide | 200,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 200,000 mt | 200,000 | 2008 | 0.291 (0.216-0.367) | 0.365 (0.277-0.452) |
| | 200,000 | 2009 | 0.254 (0.177-0.332) | 0.323 (0.233-0.409) |
| | 200,000 | 2010 | 0.239 (0.131-0.348) | 0.303 (0.186-0.419) |
| Total coast-wide | 300,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 300,000 mt | 300,000 | 2008 | 0.278 (0.201-0.355) | 0.354 (0.266-0.442) |
| | 300,000 | 2009 | 0.230 (0.150-0.309) | 0.302 (0.213-0.389) |
| | 300,000 | 2010 | 0.205 (0.094-0.316) | 0.273 (0.155-0.392) |
| Total coast-wide | 400,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| catch = 400,000 mt | 400,000 | 2008 | 0.265 (0.187-0.342) | 0.343 (0.253-0.432) |
| | 400,000 | 2009 | 0.205 (0.124-0.286) | 0.280 (0.190-0.371) |
| | 400,000 | 2010 | 0.170 (0.057-0.283) | 0.244 (0.123-0.364) |

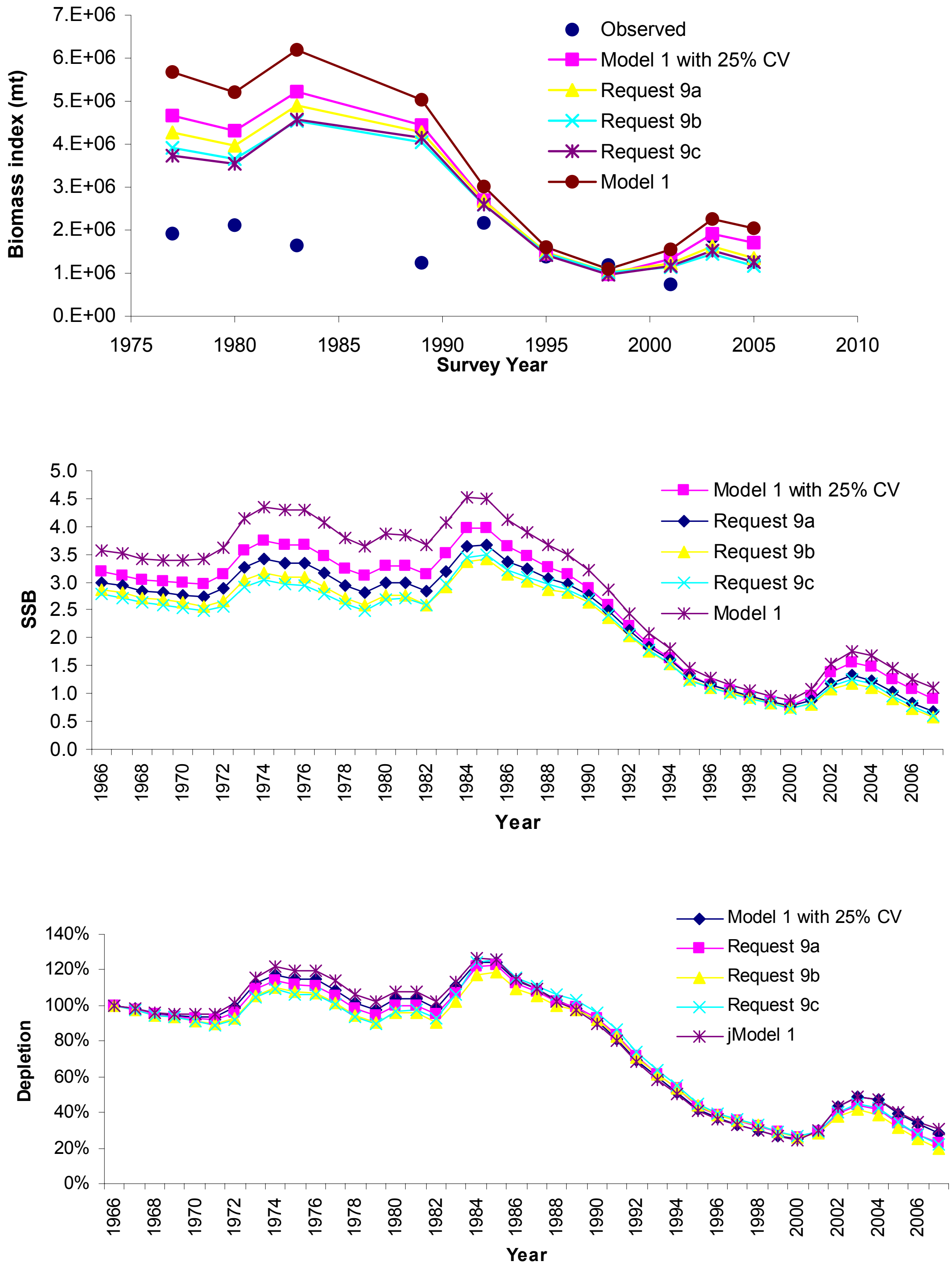


Figure 1. Results from STAR Panel Request 9 for Model 1 (q=1). In the text, the top panel is called Fig. 1a, the middle panel is Fig. 1b, and the lower panel is Fig 1c.

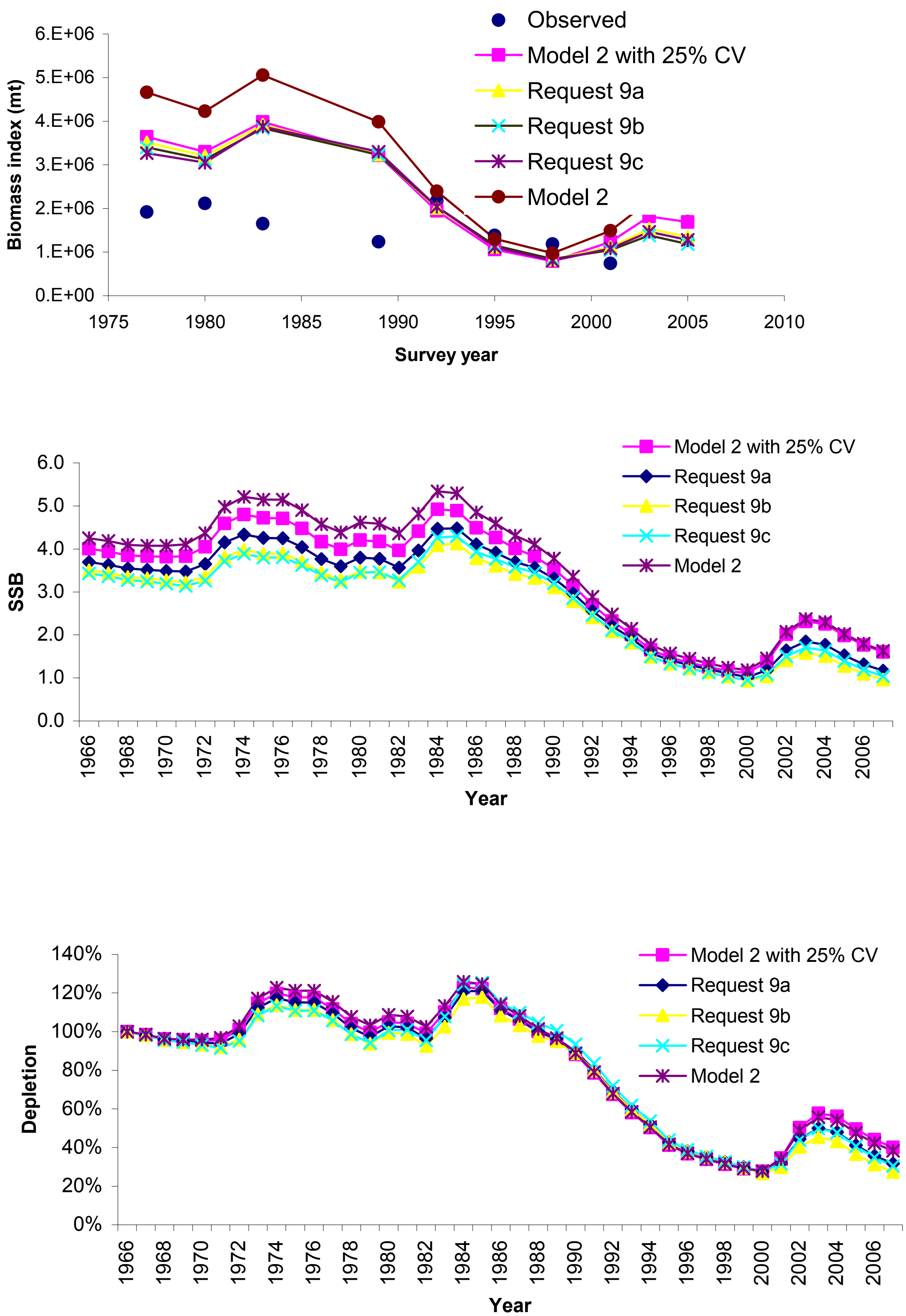


Figure 2. Results from STAR Panel Request 9 for Model 2 (q estimated using informed prior). In the text, the top panel is called Fig. 2a, the middle panel is Fig. 2b, and the lower panel is Fig 2c.

# TRAWL RATIONALIZATION (TRAWL INDIVIDUAL QUOTA [TIQ]) PROGRAM

At its September 2006 meeting, the Council was scheduled to confirm the results and alternatives from the Stage I development of the TIQ Program analysis (identification of impacts and methods) and to review initial progress on Stage II (completion of the analysis). At that time there were five major alternatives under consideration: status quo, three individual fishing quota (IFQ) alternatives and permit stacking. The Council added a new alternative, co-ops for the whiting fishery, and directed that the Groundfish Allocation Committee (GAC) meet to develop recommendations for this Council meeting, taking into account the advisory body reports from the September meeting. The addition of co-ops brought the total number of alternatives to six, the sixth including a separate co-op program for each of the whiting sectors (Agenda Item E.4.a, Attachment 1).

The GAC met December 12-14, 2006, and developed recommendations to substantially narrow the alternatives. The result from the GAC recommendations would be a set of three simplified alternatives (status quo, individual fishing quotas (IFQs), and whiting co-ops). The reduction was achieved by combining all of the IFQ alternatives into a single alternative with IFQs for all groundfish species and eliminating the permit stacking alternative (Agenda Item E.4.b, GAC Report). The alternatives, as they would appear if all the GAC recommendations are accepted, are provided in Attachment A to the GAC report. The GAC discussed revising the goals and objectives and accepted an offer from Phil Anderson to redraft the existing goals and objectives (Agenda Item E.4.b, Goals and Objectives).

The Trawl Individual Quota Committee (TIQC) (Agenda Item E.4.c, TIQC Report to the GAC), Groundfish Management Team (GMT), and Independent Experts Panel (IEP) (Agenda Item E.4.d, December 2006 IEP Report) each provided reports for the December GAC meeting. After the GAC meeting, the GMT developed an updated report based on its more recent discussions (Agenda Item E.4.d, GMT Report). The TIQC report to the GAC will be supplemented by a report to the Council based on the TIQC's February 20-22, 2007 meeting (Agenda Item E.4.c, Supplemental TIQC Report). Information that the TIQC will review at its February meeting is provided as Agenda Item E.4.a Attachment 2 and Supplemental Attachment 3.

Just prior to the GAC meeting, Congress completed reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The reauthorization language pertaining to individual quota programs is provided in Agenda Item E.4.a, Attachment 4. The MSA term "limited access privilege programs" (LAPPs) encompasses both individual quota and co-operative management. Earlier versions of the reauthorizing legislation had included provisions exempting the Pacific Council's groundfish trawl IFQ program. However, this exemption was not contained in the final version. The GAC reviewed all relevant provisions and found that, in general, it did not appear to require substantial deviation from the alternatives that the Council has thus far developed. The reauthorized MSA does, however, require that this Council submit a fully analyzed proposal for a rationalization program for the trawl groundfish and whiting fisheries, including the shorebased sector of the whiting fishery, within 24 months of the enactment of the reauthorization. The report may cover just the whiting fishery, if the Council determines that a rationalization plan for the fishery as a whole cannot be achieved before the Congressional deadline. The report is to fully analyze and include alternatives allocating limited access privileges to fishermen and processors working together in a cooperative manner to harvest and process the fish.

**Council Action:**

1. **Consider modifying the goals and objectives.**
2. **Decide on the number of major alternatives (GAC Report recommendations 1-3)**
3. **Refine the remaining alternatives and assign tasks (GAC Report recommendations 4-19)**

Reference Materials:

1. Trawl Individual Quota (TIQ) Alternatives (December 5, 2006) (Agenda Item E.4.a, Attachment 1)
2. Preliminary Quantitative Analysis -- Initial Allocation Formulas And Vessel Accumulation Limits (Agenda Item E.4.a, Attachment 2)
3. Supplemental Preliminary Quantitative Analysis -- Initial Allocation Formulas and Industry Integration (Agenda Item E.4.a, Supplemental Attachment 3)
4. HR 5946: Magnuson-Stevens Conservation and Management Reauthorization Act of 2006, Limited Access Privilege Programs and the Pacific Fishery Management Council (Agenda Item E.4.a, Attachment 4)
5. GAC Report on Trawl Rationalization (Agenda Item E.4.b, GAC Report)
6. Proposed Revised Goals and Objectives (Agenda Item E.4.b, Goals and Objectives)
7. Trawl Individual Quota Committee Report to the Groundfish Allocation Committee, December 2006 (Agenda Item E.4.c, TIQC Report to the GAC)
8. Supplemental Trawl Individual Quota Committee Report on Trawl Rationalization (Agenda Item E.4.c, Supplemental TIQC Report)
9. Groundfish Management Team Report on Trawl Rationalization (Agenda Item E.4.d, GMT Report)
10. IEP Memorandum to the Groundfish Allocation Committee (Agenda Item E.4.d, December 2006 IEP Report)
11. Public Comment (Agenda Item E.4.e, Public Comment)

Agenda Order:

| | | |
|---|---|---|
| a. | Agenda Item Overview | Jim Seger |
| b. | Report of the GAC | Don McIsaac |
| c. | Report of the TIQC | Dave Hanson |
| d. | Reports and Comments of Advisory Bodies | |
| e. | Public Comment | |
| f. | **Council Action:** Refine Alternatives | |

PFMC
02/16/07

# Trawl Individual Quota (TIQ) Alternatives

**NOTE:**

**This document contains the provisions of the TIQ alternatives**

**as they stood after the September 2006 Council meeting.**

**Agenda Item E.4.c, Groundfish Allocation Committee (GAC) Report,**

**contains a set of recommendations that,**

**if adopted by the Council, would revise and simplify**

**the alternatives displayed in this document.**

**The revised alternatives would be**

**as displayed in Attachment A of the GAC Report.**

## December 5, 2006

# 1 Purpose and Need

The Pacific Fishery Management Council (Council) is considering an individual fishing quota (IFQ) program that would change the primary management tool used to control trawl catch of West Coast groundfish from a system of periodic landing limits to one based on total catch quota shares (QS) where each quota pound (QP) derived from QS could be caught at any time during an open season. The status quo alternative (No Action) is also considered. From the set of alternatives analyzed in this draft analysis, the Council will identify a preferred alternative that will be termed “the proposed action.

## 1.1 Need for Action (Problems for Resolution)

Despite the recently completed buyback program, management of the West Coast limited entry groundfish trawl fishery (West Coast groundfish trawl fishery) is still marked by serious biological, social, and economic concerns, similar to those cited in the US Commission on Ocean Policy’s 2004 report. The trawl fishery is currently viewed as economically unsustainable given the current number of participating vessels, the current status of certain groundfish stocks, and the various measures in place to protect those stocks.

One major source of concern stems from the management of bycatch (discarded incidental catch), particularly of overfished species. Over the past several years the Council’s groundfish management efforts have been preoccupied with drafting rebuilding plans for overfished species, and general developing management schemes for minimizing bycatch and specific management of overfished species incidental catch. Through the groundfish Strategic Plan and the draft Amendment 18 process, the Council has indicated its support for future use of IFQ programs to manage commercial groundfish fisheries. These programs will give individual fishery participants more flexibility in how they participate in the fishery, and more accountability for how individual actions affecting incidental catch of overfished species impact the groundfish fishery as a whole.

Upon the recommendations of its Trawl Individual Quota Committee (TIQC), the Council sent the following problem statement out for public review during the public scoping period.

As a result of the legal requirement to minimize bycatch of overfished species, considerable harvest opportunity is being forgone in an economically stressed fishery. The West Coast groundfish trawl fishery is a multi-species fishery in which fishermen exert varying and limited control of the mix of species in their catch. The optimum yields (OYs) for many overfished species have been set at low levels, placing a major constraint on the industry’s ability to fully harvest the available OYs of the more abundant target species that co-occur with the overfished species, wasting economic opportunity. Average discard rates for the fleet are applied to project bycatch of overfished species. These discard rates determine the degree to which managers must constrain the harvest of target species that co-occur with overfished species. These discard rates are developed over a long period of time and do not rapidly respond to changes in fishing behavior by individual vessels or for the fleet as a whole. Under this system, there is little direct incentive for individual vessels to do everything possible to avoid take of species for which there are conservation concerns, such as overfished species. In an economically stressed environment, uncertainties about average bycatch rates become highly controversial. As a consequence, members of fishing fleets tend to place pressure on managers to be less conservative in their estimates of bycatch. Given all of these factors, in the current system there are uncertainties about the accuracy of bycatch estimation, few incentives for the individual to reduce personal bycatch rates, and an associated loss of economic opportunity related to the harvest of target species.

## Purpose and Need

The current management regime is not responsive to the wide variety of fishing business strategies and operational concerns. For example, historically the Pacific Council has tried to maintain a year-round groundfish fishery. Such a pattern works well for some business strategies in the industry, but there has been substantial comment from fishermen who would prefer to be able to pursue a more seasonal groundfish fishing strategy. The current management system does not have the flexibility to accommodate these disparate interests. Nor does it have the sophistication, information, and ability to make timely responses necessary to react to changes in market, weather, and harvest conditions that occur during the fishing year. The ability to react to changing conditions is a key factor in conducting an efficient fishery in a manner that is safe for the participants.

Fishery stock depletion and economic deterioration of the fishery are concerns for fishing communities. Communities have a vital interest in the short-term and long-term economic viability of the industry, the income and employment opportunities it provides, and the safety of participants in the fishery.

In summary, management of the fishery is challenged with the competing goals of: minimizing bycatch, taking advantage of the available allowable harvests of more abundant stocks, increasing management efficiency, and responding to community interest. "Taking advantage of the available allowable harvests" includes conducting safe and efficient harvest activities in a manner that optimizes net benefits over both the short and long term.

### 1.2 Purpose of the Proposed Action

The TIQC was charged with the task of assisting the Council in identifying the elements of a trawl individual quota program and scoping alternatives and potential impacts of those alternatives in support of the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and National Environmental Policy Act (NEPA). At its first meeting in October 2003, the TIQC drafted a set of goals and objectives. The Independent Experts Panel (IEP) and TIQC subsequently recommended modifying some of the goals and objectives.

The following list of "goals, objectives, and constraints and guiding principles" outlines the purpose of the proposed action. This list is based on recommendations of the IEP, as modified by the TIQC and Council. The Council adopted this list in June 2005 while recommending moving forward with consideration of an Individual Fishing Quota (IFQ) program for the trawl fishery.

#### Goals

1. Increase regional and national net benefits including improvements in economic, social, environmental and fishery management objectives.
2. Achieve capacity rationalization through market forces and create an environment for decision making that can rapidly and efficiently adjust to changing conditions.

#### Objectives

1. Provide for a viable, profitable and efficient groundfish fishery.
2. Minimize negative ecological impact while taking the available harvest.
3. Reduce bycatch and discard mortality.
4. Promote individual accountability – responsibility for catch (landed catch and discards).
5. Increase stability for business planning.

6. Increase operational flexibility.
7. Minimize adverse effects from an IFQ program on fishing communities to the extent practical.
8. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
9. Provide quality product for the consumer.
10. Increase safety in the fishery.

### Constraints and Guiding Principles

1. Taking into account the biological structure of the stocks including such factors as populations and genetics.
2. Taking into account the need to ensure that the total OYs and Allowable Biological Catch (ABC) for the trawl and all other sectors are not exceeded.
3. Accounting for total groundfish mortality.
4. Avoiding provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.
5. Avoiding excessive quota concentration.
6. Providing efficient and effective monitoring and enforcement.
7. Designing a responsive review evaluation and modification mechanism.
8. Take into account the management and administrative costs of implementing and overseeing the IFQ program and complementary catch monitoring programs and the limited state and federal resources available.

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# 2 Description of Proposed Alternatives

***The alternatives around which the EIS is constructed are identified in brief in Section 2.1.3, which starts on page 2-6.*** Section 2.1 provides an overview of the general structure of the alternatives. Section 2.2 describes the management regime alternatives and Section 2.3 provides design details for the IFQ program alternatives. Each of these sections also discusses how the alternatives would perform with respect to the goals and objectives (NOT YET INCLUDED) described in Chapter 1. Section 2.4 provides decision points for the alternatives. Section 2.5 provides alternatives considered but excluded from a detailed analysis. A comparison of the relative impacts of the alternatives will be provided in Section 2.6. There are a number of design options that were not included as part of one of the program alternatives, which the Council may still consider for possible inclusion at a later point. These options and related analysis are provided in Appendices A and B.

## 2.1. Overview of the Alternatives and Tables

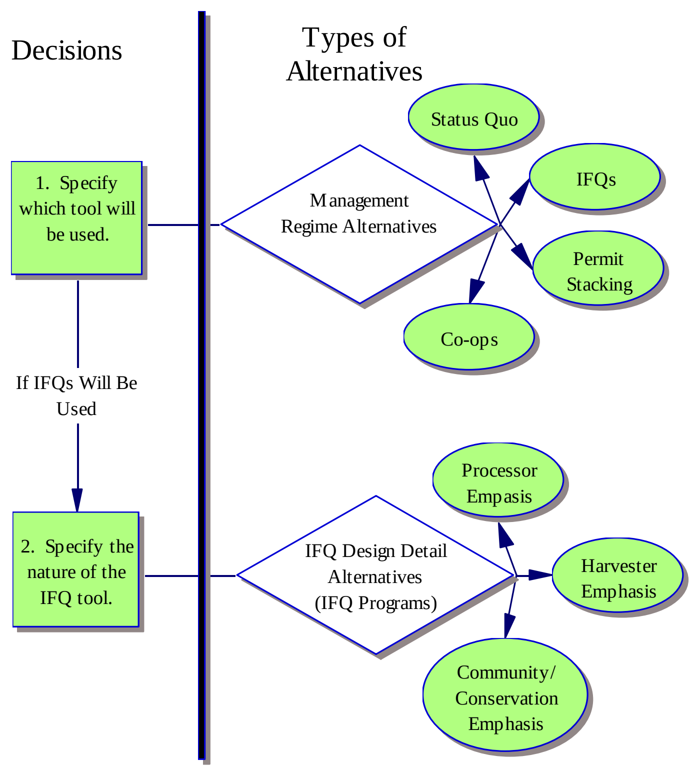
All together, there are four management regime approaches being considered for the control of harvest by limited entry trawl vessels. Each approach relies on a different primary catch control tool:

- Status Quo (Cumulative Landing Limits and Season Closures)
- IFQs
- Permit stacking (for Non-whiting Deliveries)
- Vessel Cooperatives (for Whiting Deliveries)

Because IFQs involve design elements that or more detailed than the other approaches under consideration, there is a separate tier of decisions alternatives having to do with the specifics of the IFQ program design. Therefore there are two basic questions for the Council:

1. What primary tool(s) will be used to control catch by trawl vessels and how will they be applied?

2. If IFQs are one of the tools, what will be the specific design details of the IFQ program?

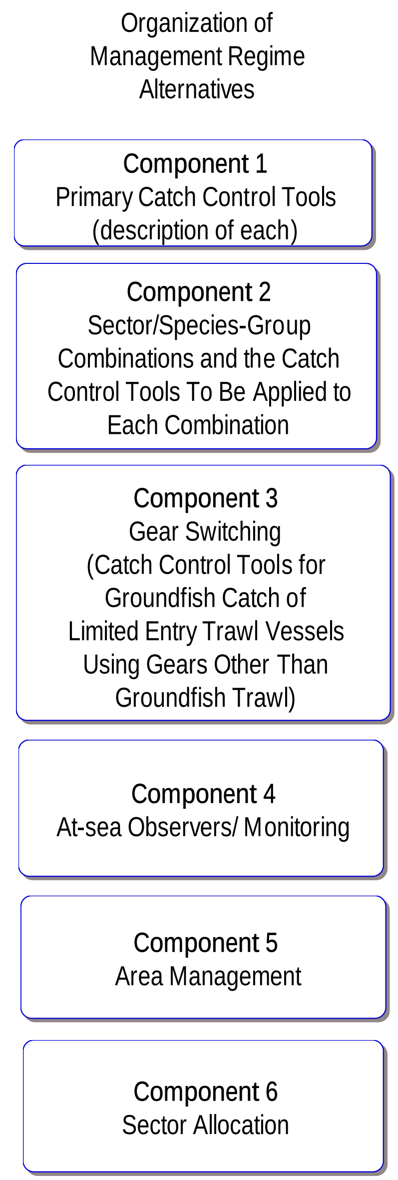



Each of these questions has its own set of possible answers/alternatives. Answering the first question involves specifying the management regime that would be used. Thus, the first set of alternatives are "management regime alternatives."

The second question applies only when IFQs are chosen in response to the first question. If the management regime is based on IFQs, then design details for an IFQ program must be considered.

The the second set of alternatives are IFQ design detail alternatives. They are provided not only because of the extensive design details that must be considered but also because of the desire to be able to mix-and-match different suites of design details (IFQ programs) with the different management regime alternatives that would use IFQs. For management regimes not involving IFQs (permit stacking and vessel cooperatives), the details of the catch control tools are provided within the management regime alternatives. For management regime alternatives that specify that IFQs would be used as a catch control tool, an accompanying decision is needed on the IFQ design detail (program) alternatives to be applied. The **IFQ design detail alternatives** describe the nature of the tool that would be used in the **IFQ management regime alternative.**

### 2.1.1 *Management Regime Alternatives (What Tool(s) will be used?)*




The **management regime alternatives** are defined by the primary catch control tools and are covered in detail in the following sections.

| | |
|---|---|
| Cumulative landing limits and seasons (Status quo, Alternative 1) | Section 2.2.1 |
| IFQs (3 alternatives, Alternatives 2, 3 and 4) | Section 2.2.2 |
| Permit Stacking (Alternative 5) | Section 2.2.3 |
| Vessel Cooperatives (Alternative 6) | Section 2.2.4 |

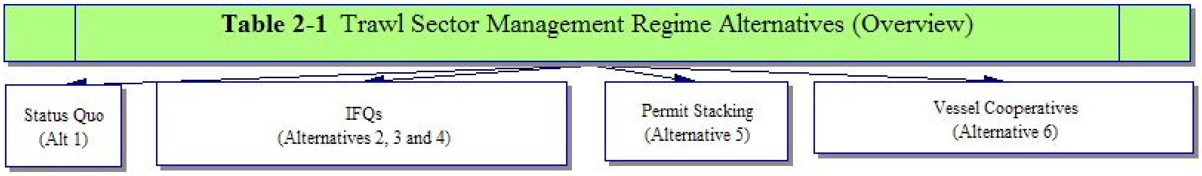
There are six main components considered for each of the management regime alternatives. Decisions on each of these components define the management regime alternatives. The first of these components is the basic decision about the primary catch control tool that will be used to manage the trawl fishery. A key aspect of all the catch control tools presented as alternatives to status quo is a shift from landings based management (status quo) to catch based management.

There are three management regime alternatives that use IFQs. There is one management regime alternative that would use permit stacking (registering more than one permit to a single vessel in order to increase the cumulative limit for that vessel). The permit stacking regime includes an option for a nonwhiting permit endorsement. Finally there is a management regime that would create cooperative programs for the whiting fishery. This alternative is subdivided such that there would be a separate co-op program for each sector (Alternatives 6a, 6b, and 6c).

Most of the alternatives would maintain four trawl sectors: nonwhiting groundfish delivered shoreside, whiting delivered shoreside, whiting deliveries to motherships, and whiting caught by catcher processors. The alternative creating three trawl sector would merge the two shoreside sectors into a single sector. One alternative would merge all trawl sectors into a single sector.

## Overview

The following is a schematic for Table 2-1, which summarizes the basic management approaches used to construct the management regime alternatives.

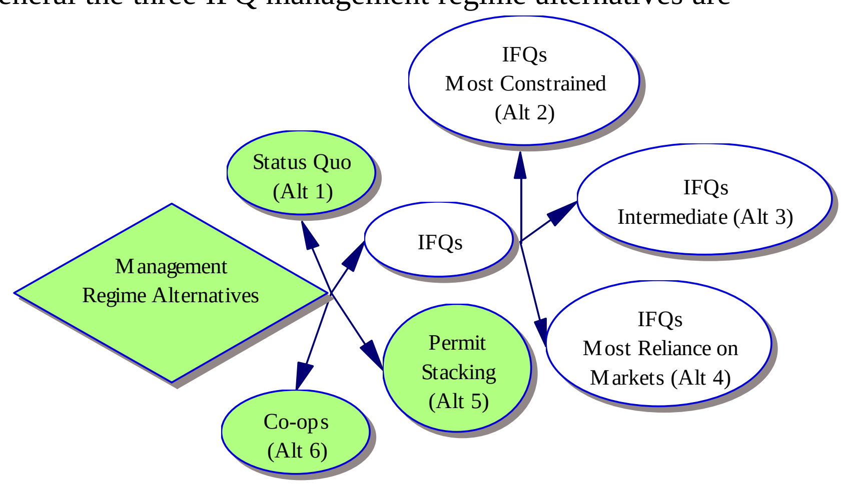



Under each of the columns representing different management regime approaches there is a separate section for each component, so that the table is patterned as illustrated here.

Layout of Tables 2-1 and 2-4 [There is a separate section in each table covering the **details** of each component (rows) for each of the management regime alternatives (columns)].

| Status Quo | IFQs | Permit Stacking | Co-ops |
|---|---|---|---|
| Component 1 | | | |
| details | details | details | Details |
| Component 2 | | | |
| details | details | details | Details |
| Component 3 | | | |
| details | details | details | Details |
| Component 4 | | | |
| details | details | details | Details |
| Component 5 | | | |
| details | details | details | Details |
| Component 6 | | | |
| details | details | details | Details |

**IFQ Management Regime Themes:** As noted above, three of the management regime alternatives are based on IFQs. In general the three IFQ management regime alternatives are arrayed from an approach with the most restrictions on the use of IFQs to those in which IFQs are allowed to resolve more management issues through market mechanisms. The Alternative 2 management regime covers the fewest species, maintains a division among the trawl sectors, and does not allow gear switching. The Alternative 4 management regime would manage all species with IFQs, and manage the entire trawl sector as a whole, including the catch of trawl vessels with all directed groundfish gear (i.e. it would allow gear switching). Alternative 3 is intermediate between Alternatives 2 and 4.

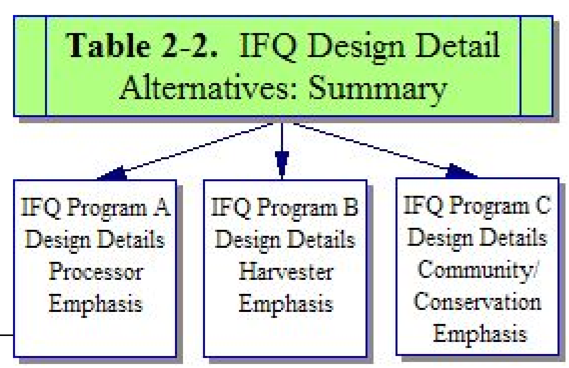


## Overview

The table on the following page is a synopsis of the management regime alternatives and the main ways in which all the alternatives vary by component.

| Management Regime Alternatives (Overview of Main Differences Among the Alternatives) | | | | | |
|---|---|---|---|---|---|
| | Alternative 2 | Alternative 3 | Alternative 4 | | |
| | *Alt 2, 3 and 4 may be matched with any of the design detail alternatives: Programs A, B and C on the following page* | | | | |
| Alternative 1 | | | | Alternative 5 | Alternative 6 |
| Component 1. Primary Catch Control Tools | | | | | |
| Status Quo (No Action)<br><br>Cumulative Landing Limits And<br><br>Season Closures. | IFQs Based on Catch And<br><br>Transferable Cumulative Catch Limits for Some Species | IFQ Based on Catch And<br><br>Cumulative Catch Limits for Some Species | IFQs Based on Catch | Permit Stacking And Cumulative Catch Limits<br><br>Option for a Nonwhiting Endorsement | Whiting Vessel Cooperatives<br><br>(Catcher vessel endorsements and possible closed processor classes) |
| Component 2. Sectors/Species Combinations and Catch Control Tools to be Applied to Each Combination | | | | | |
| Four Trawl Sectors | Four Trawl Sectors | Three Trawl Sectors | Single Trawl Sector | Three Trawl Sectors | Four Trawl Sectors |
| Cumulative limit management for most species<br><br>Season management for whiting | IFQs for<br><br>Trawl Target and Allocated Groundfish<br><br>(For whiting sectors: IFQs only for Whiting) | IFQs for<br><br>All Groundfish Except the "Other Fish" Category of Groundfish | IFQs for<br><br>All Groundfish | Permit Stacking Does not Apply to Whiting Trips | Vessel Co-ops for the Whiting Sector (Not for the Nonwhiting Sector) |
| Component 3: Gear Switching (scope) | | | | | |
| No Gear Switching | No Gear Switching | Limited Gear Switching | Gear Switching | Gear Switching Option | Gear Switching Not Applicable |
| Component 4. At-sea Observers/Monitoring | | | | | |
| Partial Observer Coverage (100% For At-Sea Deliveries) | 100% Observer Coverage | 100% Observer Coverage | 100% Observer Coverage | 100% Observer Coverage | 100% Observer Coverage |
| Component 5. Latitudinal Area Management | | | | | |
| Some North/South (Latitudinal) Area Management | Possible Increase In Area Management | Possible Increase In Area Management | Possible Increase In Area Management | No Immediate Change In Area Management | No Immediate Change In Area Management |
| Component 6. Allocation. | | | | | |
| Some existing allocations | Allocations Needed: (1) Among Trawl, (2) Trawl/Nontrawl, (3) Open Access Adjustment. | Allocations Needed: (1) Among Trawl, (2) Trawl/Nontrawl. | Allocations Needed: Trawl/Nontrawl. | Allocations Needed: None | Allocations Needed: Among Trawl |

### 2.1.2 *IFQ Program Design Detail Alternatives (What would the IFQ tool look like?)*




Each of the IFQ management regime alternatives reference IFQs as a tool that could be employed. IFQ programs can be designed in many ways. In Table 2-2, three IFQ program alternatives are summarized. An overview is provided in the following text table.

| IFQ Program Design Details (Overview of Main Differences Among the Design Detail Program Alternatives) | IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|---|
| **B.1.0 Initial IFQ Allocation** | | | |
| ***Eligible Groups and Relative Shares*** | 50% to permits<br>50% to processors | 100% to permits<br>0% to processors | 75% to permits<br>25% to processors |
| ***Qualifying Criteria: Recent Participation*** | Yes | Yes or No (to be decided) | Yes |
| ***Allocation Formula***<br>Permit-Related Allocation | Based on a mix of delivery history, equal allocation, and, for catcher-processors, an industry agreement | Based on delivery history (possible equal allocation for overfished species) | Same as Program A |
| Processor Allocation | Processing history for groundfish received unprocessed | N/A | Same as Program A |
| Weighting Among Years (Measure of Landings History) | Absolute pounds – no weighting between years | Relative pounds (share of annual catch) | Same as Program B |
| **B.2.0 IFQ/Permit Holding Requirements and IFQ Acquisition (After Initial Allocation)** | | | |
| ***IFQ and LE Permit Holding Requirements*** | LE permit required to use IFQ. Vessels cannot fish again until landing is covered by IFQ. To be decided: whether some amount needs to be held prior to departure | | |
| ***Carryover of Quota Pounds to a Following Year***<br>Non-overfished Species | 10% carryover | 30% carryover | 5% carryover |
| Overfished Species | 5% carryover | 30% carryover | No carryover |
| ***Quota Share Use-or-Lose Provisions*** | Do not include a use-or-lose provision but evaluate need as part of future program reviews. | | |
| ***Entry Level Opportunities*** | No special provisions | Same as Prog. A | Yes |
| ***Eligible Owners/Holders (Who May Own or Lease IFQ)*** | Any entity eligible to own or control a US documented fishing vessel is eligible to own or lease QS/QP (includes AFA exceptions). | | |
| ***Permanent Transfers and Leases of QS/QP*** | Leasing allowed | Leasing prohibited | Leasing allowed |
| ***Accumulation Limits on QS/QP*** (ownership, control and vessel use) | 50% or No Limits | Consider all limits as sub-options | Most restrictive (1% or 5%) **OR** Intermediate (10% or 25%) |
| **3.0 Program Administration** | | | |
| ***Tracking Quota Pounds and Quota Shares, Monitoring Landings, and Enforcement***<br>At-Sea Compliance Observers | 100% (option to provide an alternative to carrying observers, for small vessels) | 100% | 100% or cameras and full retention |
| Discard Monitoring and Reporting System | Upgrade | No upgrade, so full retention | Upgrade |
| Shoreside Monitoring | Less than 100% | 100% | Less than 100% |
| Electronic Landings Reporting | Yes (State) | Yes (State) | Yes (parallel federal) |
| Potential Landing Times and Sites | Unlimited times only at licensed sites. | Limited times and ports | Unlimited times only at licensed sites |
| ***Cost Recovery/Sharing and Rent Extraction*** | Cost recovery for management. Up to 3% of ex-vessel value to cover management. | Same as Program A | Full cost recovery. Privatization of some elements |
| ***Data Collection (for evaluating system performance)*** | Expanded voluntary | Expanded mandatory | Same as Program B |
| **4.0 Community Stability Program** | | | |
| | No | No | Yes |

## Overview

The following is a brief synopsis of the design elements that relate to the area of emphasis for each of the program alternatives.

**IFQ Design Program A (Processor Emphasis)** would give more of the initial allocation of quota share to processors than the other options (the program would evenly split the initial allocation of quota shares between processors and permit holders). The program includes the highest accumulation limits and limited provisions for carrying over IFQ from one year to the next.

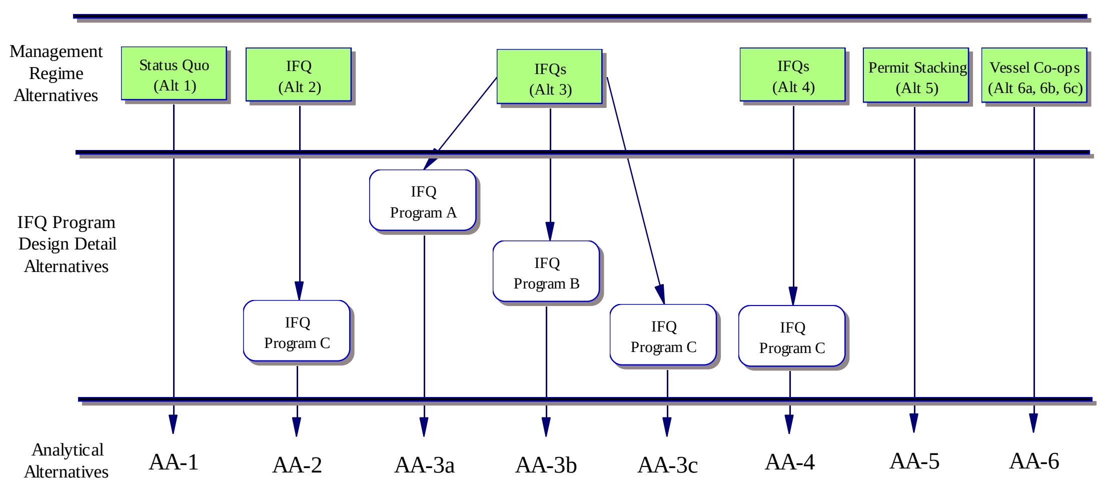
**IFQ Design Program B (Harvester Emphasis)** would give all of the initial allocation of quota share to permit holders. The program includes a full range accumulation limits (except the option of no limits) and limited provisions for carrying over IFQ from one year to the next.

**IFQ Design Program C (Community/Conservation Emphasis)** would give 25% of the initial allocation of quota share to processors and 75% to permit holders. The program includes low to moderate accumulation limits, a community stability program, and the most limited provisions for carrying over unused IFQs from one year to the next (particularly for overfished species).

### 2.1.3 *Analytical Alternatives*

The management regime alternatives and IFQ design detail alternatives are combined to create the analytical alternatives around which the analysis is structured. The analytical alternatives and the management regime alternatives are the same except with respect to the IFQ management regime alternatives. The combinations are illustrated in the following diagram.

**Constructionof Analytical Alternatives (AA) from Management Regime and IFQ Program Alternatives**




The IFQ management regime alternatives are combined with different IFQ program alternatives in order to develop a suite of analytical alternatives that are useful for demonstrating how various choices influence outcome and impacts. Using this array, decision makers and the public will be able to distinguish:

- The relative performance of the IFQ management regime alternatives while holding the IFQ program alternative constant (by comparing AA 2, AA 3C and AA 4).
- The relative performance of the IFQ program alternatives while holding the management regime alternative constant (by comparing AA 3A, AA 3B, and AA 3C).

There are 10 analytical alternatives, which vary from one another based on multiple design features. The detailed description of the alternatives is provided in Section 2.2. The design details that differentiate Alternatives 3a, 3b, and 3c from one another are provided in Section 2.3. The analytical alternatives are as follows.

## *Analytical Alternatives*

### Status Quo Management Regime Approach (Section 2.2.1)

| | |
|---|---|
| Analytical Alternative 1 | **Status quo,** cumulative catch limits for nonwhiting and season management for whiting. |

### IFQ-Based Management Regime Approach (Section 2.2.2)

| | |
|---|---|
| Analytical Alternative 2 | **Constrained IFQs and Community/Conservation Emphasis:** IFQs for Trawl Target and Allocated Species with 75% of the initial allocation going to vessel permit holders and 25% going to processors. (Management Regime Alternative 2 and IFQ Program C |
| Analytical Alternative 3a | **Intermediate Constrained IFQs and Processor Emphasis:** IFQs for nearly all groundfish species with 50% of the initial allocation going to trawl vessel permit holders and 50% going to processors.) (Management Regime Alternative 3 and IFQ Program A) |
| Analytical Alternative 3b | **Intermediate Constrained IFQs and Harvester Emphasis:** IFQs for nearly all groundfish species with 100% of the initial allocation going to trawl vessel permit holders. (Management Regime Alternative 3 and IFQ Program B) |
| Analytical Alternative 3c | **Intermediate Constrained IFQs and Community/Conservation Emphasis:** IFQs for nearly all groundfish species with 75% of the initial allocation going to trawl vessel permit holders and 25% going to processors. (Management Regime Alternative 3 and IFQ Program C) |
| Analytical Alternative 4 | **Least Constrained IFQs and Community/Conservation Emphasis:** IFQs for all groundfish species with 75% of the initial allocation going to vessel permit holders and 25% going to processors. (Management Regime Alternative 4 and IFQ Program C) |

### Permit Stacking Based Management Regime Approach (Section 2.2.3)

| | |
|---|---|
| Analytical Alternative 5 | Permit stacking for the nonwhiting fleet and a nonwhiting endorsement. |

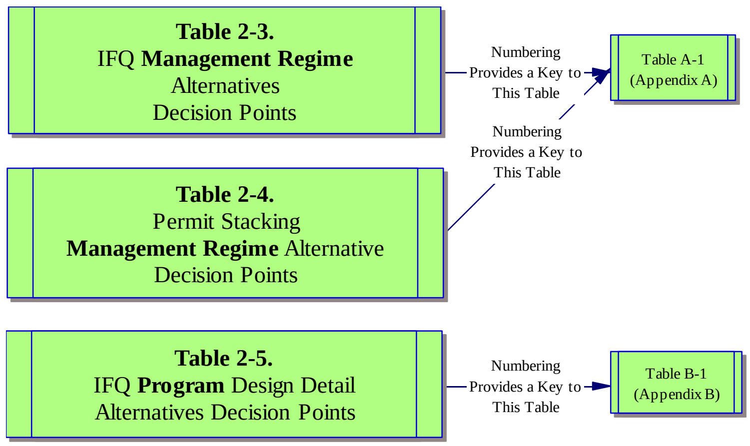
### Vessel Cooperative Management Regime Approach (not mutually exclusive, Section 2.2.4)

| | |
|---|---|
| Analytical Alternative 6a | Catcher vessel co-ops for the mothership fishery and limited entry for motherships. |
| Analytical Alternative 6b | Catcher vessel co-ops for the whiting shoreside fishery [and possibly limited entry for shoreside processors, (option development pending)]. |
| Analytical Alternative 6c | Catcher vessel co-ops for the catcher-processor sector and limited entry for motherships. |

**Mixing and Matching.** The status quo and the IFQ alternatives are mutually exclusive to the other alternatives (i.e., if status quo or an IFQ alternative is adopted for a particular trawl sector, Alternatives 5, 6a, 6b, or 6c could not be adopted for that sector). Alternatives 5, 6a, 6b, and 6c could all be adopted because they each apply to a different sector the trawl fishery. And an IFQ alternative could be adopted for one sector and a non-IFQ alternative for another sector. Additionally, among the IFQ alternatives there is also an opportunity to mix and match. For example, Alternative 4 could be adopted in combination with the allocation splits indicated in alternative 3a or 3b. The IFQ program details and more information on mixing and matching are described in section 2.3.

### 2.1.4 *Decision Points*

After the alternatives are described in Sections 2.2 and 2.3, Section 2.4 provides a summary of the decision points and options described in Sections 2.2 and 2.4. The options for the IFQ management regime, permit stacking and IFQ program design detail alternatives are formatted in tables somewhat differently than in Sections 2.2 and 2.3 The Section 2.4 formatting and accompanying numbering preserves a link to analysis provided in Appendices A and B. Additionally, in these tables there is a footnote for each option which provides detailed text on the options. Matching detailed text is provided in Appendices A and B for all provisions of the IFQ and permit stacking management regime alternatives, and the IFQ design detail programs.



## 2.2. Management Regime Alternatives

The six management regime alternatives are summarized in Table 2-1. Subsections of text on each management regime alternative contain a description of the alternatives and how each addresses the goals and objectives identified in Chapter 1. What follows here is a general description of each alternative.

### Alternative 1: No-action.

- The status quo management regime for groundfish species would be continued.
- The permit system allows only limited entry trawl permit holders to fish for groundfish with groundfish trawl gear.
- There are four trawl sectors (shoreside nonwhiting, shoreside whiting, deliveries to motherships, catcher-processors).
- Whiting is managed with seasons that close on attainment of whiting allocations or bycatch caps.
- Nonwhiting groundfish, with the exception of the "Other Fish" category of groundfish, are managed with cumulative landings limits applied to all limited entry trawl vessels every two months. Catches of "Other Fish" of groundfish—sharks (except spiny dogfish), skates, rays, ratfish, morids, grenadiers, etc.-are monitored but Optimum Yields (OYs) are not constraining (note: spiny dogfish, cabezon, and kelp greenling will likely be managed separate from "Other Fish" in the near future).
- For the nonwhiting fleet, at-sea discards are estimated based on data from the observer program but reporting of at-sea discards of groundfish by individual vessels is not required. Maximized retention continues to be required for the shoreside whiting fishery. At-sea deliveries continue to be subject to 100% observer coverage.

### Alternative 2: IFQs for trawl target and allocated species

- The permit system and four trawl sectors would be maintained.
- For the nonwhiting sectors, IFQs would be issued only for trawl target species and for other species for which a trawl allocation is established under the intersector allocation process or as part of biennial harvest specifications.
- For the whiting sector, there would be IFQ only for whiting.
- Species not managed with IFQs would be managed with transferable, cumulative catch limits (option for a four-month limit), except that catches of the "Other Fish" category of groundfish would only be monitored, and cumulative catch limits would not apply to the whiting fishery, when open.
- Vessel-specific reporting of all groundfish catch would be required (including discards).
- Full at-sea compliance observer coverage would be required for all vessels.
- Option to allow for later subdivision of IFQs by area.

### Alternative 3: IFQs for all groundfish species except the "Other Fish" category of groundfish

- The existing permit system would be maintained.
- The shoreside whiting and nonwhiting sectors would be combined into a single shoreside sector, resulting in 3 sectors.
- IFQs would be issued for all groundfish except "Other Fish."
- Catches of the "Other Fish" category of groundfish would only be monitored.
- Vessel-specific reporting of all groundfish catch would be required (including discards).
- Full at-sea compliance observer coverage would be required for all vessels.

- Option to allow for later subdivision of IFQs by area.

### Alternative 4: IFQs for all groundfish species

- The existing permit system would be maintained.
- The distinction between trawl sectors would be eliminated, resulting in one sector.
- IFQs would be issued for all groundfish.
- Vessel-specific reporting of all groundfish catch would be required (including discards).
- Full at-sea compliance observer coverage would be required for all vessels.
- Option to allow for later subdivision of IFQs by area.

### Alternative 5: Permit stacking

- The existing permit system and four trawl sectors would be maintained.
- Groundfish catch would be controlled as under the No-Action Alternative, but cumulative landing limits would become cumulative catch limits and limited entry trawl vessels would be allowed to "stack" additional permits. Vessels would receive either a full complement of cumulative trip limit pounds for each permit registered for the vessel or, under a sub-option, would receive partial cumulative limits for each additional permit stacked.
- A sub-option would provide that a non-whiting endorsement be established such that permits previously used only in the whiting fishery could not be used in the nonwhiting fishery.
- Vessel-specific reporting of all groundfish catch would be required.
- At-sea monitoring would be required on all vessels.

### Alternative 6: Vessel Cooperatives for the Whiting Sectors

- The existing permit system would be augmented by the creation of limited entry permits for mothership [and possibly shoreside processors (options pending)].
- The four trawl sectors would be maintained.
- Three types of endorsements would be added to the groundfish trawl limited entry permits: vessels delivering to shoreside processors, vessels delivering to motherships, and catcher-processors.
- Vessels would join together in co-ops. Each year catchers and catcher-processors would choose between participating in a vessel cooperative or a non-co-op fishery.
- Depending on options selected by the Council, a catcher vessel might or might not be required to participate in a non-co-op fishery if it switches its deliveries to a different processor.
- Catcher vessel cooperatives would be assigned catch based on the predetermined catch history of each permit participating in the cooperative.
- The non-co-op fishery would be assigned catch based on the predetermined catch history of each permit participating in the non-co-op fishery.
- For catcher-processors, the co-op(s)' ability to effectively function would depend on the participation of all permits. If a permit chose not to participate in the co-op, the co-op management system would likely not work.
- The catcher vessel co-op systems allow vessels to opt-out of co-op participation without diminishing the effectiveness of co-ops for those who opt-in to co-op participation.
- Depending on options selected by the Council, bycatch might or might not be divided among the sectors.
- For all sectors, NMFS will continue monitor the progress of the fishery and close the whiting sector or each individual sector when appropriate.

## Management Regime Alternatives – General Comparison

Table 2-1 Trawl[a] sector management regime alternatives, overview and contrast of the main types management regime alternatives.

| Alternative 1<br>Status Quo | Alternatives 2, 3 and 4<br>IFQs | Alternative 5<br>Permit Stacking | Alternative 6<br>Vessel Coops |
|---|---|---|---|
| **COMPONENT 1: Catch Control Tools[b]** | | | |
| **Landing Limits:** Catch is controlled using landing limits. Landing limits are set taking into account estimates of discards and related mortality to keep the fishery within total mortality caps.<br>**Primary Tools:**<br>• **Vessel-Level Cumulative Landing Limits**<br>• **Season Closures** | **Catch Limits:** All alternatives to status quo would impose vessel-level limits on catch (in contrast to status quo under which vessel-level limits apply to landings), except that under Alternative 6 landing limits and other status quo measures would be continued for the nonwhiting shoreside fishery.<br>**Primary Tool: IFQs**<br>Also, some cumulative catch limits (see Component 2) & season closures.<br>IFQ are revocable privileges. Holders would not be entitled to compensation as a result of future modification or elimination of the program. | **Primary Tool (Nonwhiting):** Permit stacking and option for a nonwhiting endorsement. One cumulative catch limit for each permit stacked.<br>**Primary Tool (Whiting):** Season closures (status quo management) | **Primary Tool (Nonwhiting):** Cumulative landing limits (status quo management).<br>**Primary Tool (Whiting):** Vessel cooperatives, a closed processor class (for motherships and [shoreside?]) and season closures for each of the three whiting sectors. |
| **COMPONENT 2: Sector/Species Group Combinations and the Catch Control Tools To Be Applied** | | | |
| **Three Sectors:** Current trawl sectors would be maintained (Shoreside, whiting deliveries to motherships, whiting catcher processors).[c] | **One to Four Sectors:** The current trawl sectors may be maintained, the shoreside sector may divided into whiting and nonwhiting deliveries, or all trawl sectors may be united into a single trawl sector. | **Three Sectors:** Current trawl sectors would be maintained. | **Three Sectors:** Current trawl sectors would be maintained. |
| **Nonwhiting Trawl Sector:** The primary tools used to control catch are cumulative landing limits. Season closures are sometimes used when cumulative catch limits and other measures have not achieved the goal of providing a year-round fishery.<br>**Whiting Trawl Sectors:** The whiting sectors begin their season in the spring to avoid impacts on ESA-listed salmon and for reasons related to distribution of the stock, market timing, and other fishing opportunities. The fishery for each sector closes on | **All Trawl Sectors.** The primary tool used to control catch would be IFQs. Cumulative catch limits may continue to be used in limited situations (for some species for which a trawl allocation is not established and to impose shoreside delivery closures in the whiting fishery).<br>**Whiting Trawl Sectors:** Season opening and closings may be used to address ESA salmon species concerns and control bycatch (if bycatch is not controlled with IFQs). | **Nonwhiting Trawl Sector:** Permit stacking would be used to control catch. A vessel would receive credits for additional cumulative catch limits for each permit registered to the vessel. Option: the Council will decide whether the alternative would provide a full credit or partial credit for each additional permit. The partial credit option would be intended to maintain the size of cumulative limits for those not stacking.<br>An option would establish a nonwhiting endorsement to prevent permits used in the whiting fishery from being stacked in the nonwhiting fishery (effort transfer).<br>**Whiting Trawl Sectors:** There would be no changes in management of the whiting | **Nonwhiting Trawl Sectors:** There would be no changes in management of the nonwhiting fishery.<br>**Whiting Trawl Sectors:** Vessel cooperatives would be formed to control catch in the whiting fishery. Each catcher vessel permit will have an allocation and the permit's allocation will be assigned to the co-op in which it participates or to a seasonal fishery if the vessel chooses not to participate in a co-op. For catcher-processors, the Pacific Whiting Conservation Co-op will have an allocation. NMFS will monitor the catch in the seasonal fishery and |

## Management Regime Alternatives – General Comparison

| Alternative 1<br>Status Quo | Alternatives 2, 3 and 4<br>IFQs | Alternative 5<br>Permit Stacking | Alternative 6<br>Vessel Coops |
|---|---|---|---|
| attainment of allocations or bycatch limits. | | fishery. | each cooperative, shutting each down when catch caps are reached. |
| **COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Gear Switching)** | | | |
| Gear switching could be achieved by modifying status quo trip limits for LE trawl vessels so that their open-access-gear limits would be equivalent to the trawl-gear limits.[d] | Options provided to allow gear switching. | Options provided to allow gear switching. | Nonwhiting management measures not addressed. |
| **COMPONENT 4. At-sea Observers/ Monitoring** | | | |
| **Nonwhiting Fishery:** Partial coverage. Status quo observer coverage would continue (as administered by the West Coast Groundfish Observer Program).<br>**Shoreside Whiting Fishery:** Partial coverage. Status quo observer coverage would continue (as administered by the West Coast Groundfish Observer Program).<br>**At-sea Whiting Fishery:** 100% coverage would continue. | **Nonwhiting Fishery and Shoreside Whiting Fishery:** Increase coverage to 100% to enforce catch accounting requirements.<br>**At-sea Whiting Fishery:** 100% coverage would continue.<br><br>For some coverage, cameras may be used in place of observers (feasibility to be determined). | **Nonwhiting Fishery:** Increase coverage to 100% to enforce catch accounting requirements.<br>**Whiting Fishery:** 100% coverage would continue.<br><br>For some coverage, cameras may be used in place of observers (feasibility to be determined). | **Nonwhiting Fishery:** Status quo coverage.<br>**Shoreside Whiting Fishery:** Increase coverage to 100% to enforce catch accounting requirements.<br>**At-sea Whiting Fishery:** 100% coverage would continue.[e]<br><br>For some coverage, cameras may be used in place of observers (feasibility to be determined) |
| **COMPONENT 5. Latitudinal Area Management[f]** | | | |
| Existing area subdivisions are as reflected in rows of the ABC/OY table in the biennial specifications. | Provisions for post-implementation area subdivisions.<br>Possible process to consider need for increased area subdivision in response to expected impacts of IFQ programs. | Potential for increased local concentration of harvest activities, but need for increased area management not yet determined (as compared to status quo). | No heightened need for increased area management identified (as compared to status quo). |
| **COMPONENT 6. Sector Allocation** | | | |
| Currently trawl allocations are in place only for sablefish & whiting.<br>Open access allocations were established under Amendment 6, based on 1984-1988 catch history.<br>There is no fixed allocation of | Trawl/nontrawl allocation required.<br>Possible need to adjust open access allocation.<br>Possible need to allocate bycatch species among whiting sectors and between whiting and nonwhiting | No need for additional intersector allocation. | No need for additional intersector allocation (unless bycatch pools are specific to each trawl sector). |

## Management Regime Alternatives – General Comparison

| Alternative 1<br>Status Quo | Alternatives 2, 3 and 4<br>IFQs | Alternative 5<br>Permit Stacking | Alternative 6<br>Vessel Coops |
|---|---|---|---|
| bycatch among whiting and nonwhiting sectors.[g] | sectors. | | |

[a] With respect to the trawl sector, the scope of this action includes only the nontribal fishery, unless otherwise noted.

[b] The catch control tools within the scope of this process are those used to directly limit fleet and vessel catch. For example, RCAs are a catch control tool that is important in reducing bycatch rates, but the ultimate control of vessel and fleet catch is achieved through OY-based total mortality limits and vessel landing limits. Other regulations, such as mesh size restrictions, also affect catch composition but do not directly limit mortality.

[c] Earlier versions of this document described four sectors for status quo. This was changed to three sectors after discussion with the GMT; however, there continues to be a variety of views on the issue. It can be reasonably argued that there are three sectors or four sectors under status quo. For purposes here, status quo is considered to have three sectors. Alternative 2 would firmly establish four sectors, and Alternative 3 would firmly establish three sectors.

[d] Such a change in trip limits for trawl vessels using open access gear would need to take into account differences in bycatch and mortality rates for trawl and open access gears.

[e] Which may include two observers on a single vessel.

[f] "Latitudinal Area Management" references management by latitudinal areas (e.g., north and south of Conception). RCAs are not covered by this term.

[g] Such allocations are established as part of the biennial specifications process.

### *2.2.1 Status Quo*

[Section reserved for description of status quo management]

### 2.2.2 IFQ Management Regime Alternatives

There are three IFQ management regime alternatives. For each component, Alternative 2 is described first, followed by a description of how alternatives 3 and 4 vary from or are similar to Alternative 2. Section 2.3 covers the IFQ design details (IFQ programs) that would be combined with management regimes that designate IFQs as a catch control tool.

**IFQ Management Regime Themes.** Options pertaining to the issues identified in the above components are structured into management regime themes, as discussed in Section 2.1.1.

| IFQ Alternative 2 | IFQ Alternative 3 | IFQ Alternative 4 |
|---|---|---|
| Most constrained<br><br>(Use IFQ for some groundfish species and cumulative catch limits for others, maintain four trawl sectors, do not allow gear switching) | - - - intermediate - - -<br><br>(Use IFQ for nearly all groundfish species, merge the shoreside fisheries into a single sector and constrain gear switching with open access trip limits) | Least constrained, most reliance on markets<br><br>(Use IFQ for all groundfish species, create one trawl sector and allow market mechanisms to determine distribution of harvest among trawl harvest modes and whether or not vessels switch gears) |

**COMPONENT 1: Catch Control Tools**

***Alternative 2***

1) Catch will be controlled directly using a mix of IFQs, transferable cumulative limits, and seasonal management.
2) When used, cumulative limits will be transferable on a temporary basis between vessels within the period (except with respect to whiting trips). The cumulative limit period is two months. There will be a maximum on the number of cumulative limits that can be used on a single vessel (maximum to be specified.) **Option:** The cumulative limit period will be expanded to four months and transfer of partially used limits allowed.
3) Spring whiting season openings may remain in place to protect ESA-listed species.
4) Season closures
   a) In general, trawl seasonal closures will be used if necessary to prevent the fishery (all trawl and nontrawl sectors combined) from going over total mortality caps (OYs, harvest guidelines or quotas) for any species.
   b) In general, trawl season closures will also be used to prevent the trawl sector from going over catch limits, particularly for species not managed with IFQs, but if overages make it necessary, also for IFQ species.
   c) Whiting Opening: The whiting fishery . . . **Option 1**: will open on its current schedule; **Option 2:** will open as soon as allowable under the current section 7 consultation; **Option 3**: will open January 1.
   d) Whiting Closure: A whiting sector will close if its bycatch pool is exhausted.

| ***Alternative 3***<br>**IFQs for All Groundfish Except Other Fish** | ***Alternative 4***<br>**IFQs for All Groundfish** |
|---|---|
| Same as management regime Alternative 2 except cumulative catch limits, which apply only to the “Other Fish” category, will not be transferable. | Same as management regime Alternative 2 except there will be no cumulative catch limits other than those needed to allow for whiting bycatch when the shoreside whiting fishery is closed. |

**COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied**

***Alternative 2***

1) **Sectors:** There will be four trawl sectors: Shoreside nonwhiting, shoreside whiting, mothership, and catcher-processors.
2) **Shoreside Nonwhiting Sector:** In the shoreside nonwhiting fishery, IFQs will be used for all species for which the trawl sector has an allocation. Transferable cumulative catch limits will be used for the remaining (unallocated) species that need to be managed with a catch control tool. Catch will be monitored for species for which catch controls are not needed.[a] Transferable cumulative catch limits only apply to nonwhiting trips.[b] Whiting incidental catch will be constrained by a nontransferable whiting cumulative limit.
3) **Whiting Sectors:** In the three whiting sectors, IFQs will be the primary tool used to control the catch of whiting. IFQs cannot be transferred between sectors, unless there is a rollover. There . . . **(Option 1)** will OR **(Option 2)** will not be . . . a rollover of whiting IFQ between sectors.
4) **Whiting Sector Bycatch:**
   a) When incidental catch limits are necessary, there will be **Option 1:** a single bycatch cap for all sectors OR **Option 2:** a bycatch cap for each whiting sector and an opportunity for rollover of unused bycatch (mechanism to be specified).
   b) Otherwise, bycatch mortality will be monitored and counted against the OY for the bycatch species but not specifically limited.
5) There will be an opportunity to augment the bycatch pools by the acquisition of IFQ from the nonwhiting sector.[c]
6) **Whiting Closure:** A whiting sector will close if its bycatch pool is exhausted, even if whiting IFQ remain unused. Closure of the shoreside whiting season will be implemented through the imposition of a nontransferable cumulative catch limit, to allow retention of incidental whiting catch. When cumulative catch limits are in place, whiting IFQ will also be required. At-sea sectors will be closed through a complete closure.
7) **Whiting Rollover Option 1:** No rollover. **Option 2.** For the whiting IFQ for a particular sector, the restriction on transfers of whiting IFQ to other sectors will be eliminated midseason if a NMFS survey determines that no processor is interested/committed to processing the whiting for that sector.

| ***Alternative 3*** **IFQs for All Groundfish Except Other Fish** | ***Alternative 4*** **IFQs for All Groundfish** |
|---|---|
| 1) **Sectors:** There will be three trawl sectors: Shoreside, mothership, and catcher-processors. (No at-sea nonwhiting deliveries would be allowed, except bycatch.)<br>**2) All Sectors:**<br>a) IFQs will be used to manage all species except those for which catch control tools are not necessary (currently the "Other Fish" category of groundfish).<br>b) There will not be a rollover of IFQ between sectors.<br>3) **Whiting Closures.** If the whiting season is closed for part of the year, a shoreside whiting closure will be achieved with a cumulative catch limit to allow for incidental catch. When cumulative catch limits are in place, whiting IFQ will also be required. At-sea sectors will be closed through a complete closure. | 1) **Sectors:** There will be one trawl sector.<br>2) **All Sectors:** IFQ will be used to manage all species.<br>3) **Whiting Closures.** Same as Alternative 3. |

**COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Gear Switching)**

***Alternative 2***

1) **Directed Open Access (except fishpot and longline):** IFQ **will not** be required for trawl permitted vessels using directed groundfish nontrawl gear, except for longline and fishpot gear. Open access trip limits will apply. Catch will count against the open access allocation. An adjustment to the sector allocations will be required to compensate the open access sector (see Component 6).
2) **Unendorsed Fishpot and Longline:**
   a) IFQ **will** be required for the catch by trawl permitted vessels using longline or fishpot gear (limited entry fixed gear) **without** a longline or fishpot gear endorsed limited entry permit. Such vessels will also be required to comply with the limited entry fixed gear regulations that apply to vessels with fixed gear permits that are not endorsed for sablefish.
   b) Catch by these vessels using longline or fishpot gear will count against the trawl allocation.
3) **Endorsed Fishpot and Longline:**
   a) IFQ **will not** be required for the catch of trawl permitted vessels using longline or fishpot gear **with** a longline or fishpot gear endorsed limited entry permit. Such vessels will be required to comply with the appropriate limited entry fixed gear regulations. IFQ may not be used to augment fixed gear catch.
   b) Catch with longline or fishpot gear will count against the fixed gear allocation.
4) **Incidental Open Access:** IFQ **will not** be required for trawl permitted vessels taking part in the incidental open access fishery.

| ***Alternative 3***<br>**IFQs for All Groundfish Except Other Fish** | ***Alternative 4***<br>**IFQs for All Groundfish** |
|---|---|
| 1) **Directed Groundfish:**<br>a) IFQ **will be required** for all catch by trawl permitted vessels using directed groundfish gear **except** for catch by vessels using longline or fishpot gear with limited entry endorsements for those gears.<br>b) For such dual endorsed vessels, IFQ will **not** be required and instead limited entry longline or fishpot limits will apply. Additionally, trawl permitted vessels may use IFQ for any longline or fishpot catch taken in excess of limited entry longline or fishpot limits.<br>c) All directed groundfish catch will count against the limited entry trawl allocation.<br>2) **Incidental Open Access:** IFQ **will not** be required for trawl permitted vessels taking part in the incidental open access fishery.<br>3) Open access trip limits will apply for vessels using directed open access gears.[d] | Same as Alternative 3 except open access trip limits **will not** apply for vessels using directed open access gears.[d] |

**COMPONENT 4. At-sea Observers/ Monitoring**

For ***Alternatives 2 and 3*** there would be 100% at-sea coverage by compliance observers. Detailed monitoring and enforcement provisions for each IFQ program are described in Table 2-2.

For ***Alternative 4,*** vessels could use cameras in place of observers. Whether or not such an option is feasible has not been determined and but will be evaluated as part of the analysis.

**COMPONENT 5. Latitudinal Area Management**

***All three IFQ management regime alternatives.*** There are two approaches being pursued. One pertains to design features of the IFQ program and the other pertains to the process for considering the need for increased area management as part of an IFQ program. At its June 2005 meeting, the Council left both of these on the table for consideration and explicitly deferred a decision on the process option until additional information is available, e.g. when preliminary DEIS is ready.

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> **Area Provision for All IFQ Alternatives**: Plan to establish additional regional management areas as needed at a later time. Provisions are included in Element B.1.4 of the IFQ program design alternatives to allow later subdivision of IFQs by area.
>
> **Process Option:** Task a group to begin considering the need for additional regional management areas (biological or socio-economic) and potential boundaries along with a process for identifying and responding to regional management area issues that may develop or become more apparent in the future.

## COMPONENT 6. Sector Allocation

***All three IFQ management regime alternatives.*:** A trawl/nontrawl allocation will be achieved through the intersector allocation process.

***Alternative 2***

1. An adjustment to the open access sector allocation will be needed if this alternative is adopted. (Component 3 in this alternative would change the catch accounting system such that trawl vessel catch with open access gear will count against the open access allocation instead of the limited entry allocation.)
2. Allocation of whiting fishery bycatch species between whiting and nonwhiting sectors and among the whiting sectors will be necessary. Options based on fleet catch history have been developed.

| ***Alternative 3*** **IFQs for All Groundfish Except Other Fish** | ***Alternative 4*** **IFQs for All Groundfish** |
|---|---|
| Same as alternative 2, except no adjustment required for the open access sector. | Same as Alternative 3. |
| Allocation of whiting fishery bycatch species among the three sectors will be necessary. Options based on fleet catch history have been developed. | Allocation among trawl sectors may be necessary for initial QS allocation.[e] |

### How the Alternative Addresses Goals and Objectives

**[TO BE COMPLETED]**

[a] Currently the only groundfish species group in this category is "Other Fish."

[b] Only the base limit applies to whiting trips. The base limit is the limit associated with the LE permit registered for the vessel before any transfers occur.

[c] If bycatch pools are augmented in such a fashion, the augmented pool will be available to all members of the sector.

[d] Longline and fishpot gear count as directed open access gears when used by vessels without endorsements for those gears.

[e] An initial allocation among sectors may still be required if there is unevenness in the quality of data among the sectors. For example, if bycatch data for the nonwhiting shoreside sector is incomplete relative to the whiting sectors the amount of QS to be allocated to the shore sector may need to be determined first. After that determination, all members of the shoreside sector would be on equal footing, with respect to the relative quality of the data on which their allocation is based. The quota shares allocated would not be sector specific; therefore, there would be no need to maintain the sector allocations after the initial QS allocation is completed.

### *2.2.3 Permit Stacking*

Under this alternative, there would be no changes in management of the whiting fishery. (Other alternatives such as vessel cooperatives might be adopted for the whiting fishery.)

**COMPONENT 1: Catch Control Tools**

Cumulative catch limits, permit stacking and nonwhiting endorsements would be used to control catch in the nonwhiting fishery.

**1)** **Catch Limits:** Cumulative limits will be for total catch (in contrast to status quo under which vessel-level limits apply to landings).

**2)** **Permit Stacking:** A vessel will receive credit toward a larger cumulative limit for each permit stacked.

**Credit Option 1:** A vessel will receive full credit for each permit registered to the vessel (i.e. a complete set of cumulative limits for each permit; the size of the limit will be equivalent to the limit for the base permit).

**Credit Option 2:** A vessel will receive full credit for the base permit and partial credit for each additional permit registered to the vessel. The size of the partial limit will be set such that the limits for the base permits will not be reduced as a consequence of the stacking provision. (Allowing full credit for stacked permits would be expected to result in the activation of latent permit capacity. Increases in active capacity could have the effect of reducing the base limit. Partial credit for stacked permits is expected to reduce the erosion of the base permit limits.)

**Size Endorsements:** Only one permit (the **"base" permit**) need have a size endorsement appropriate for the length of the vessel. The length endorsement restriction will not apply for stacked permits. Additionally, the length endorsement penalty will be suspended for permits stacked on a vessel smaller than that authorized by the length endorsement (the suspension does not apply to the base permit). The length endorsement penalty permanently reduces the length endorsement on a permit if it is registered for use with a vessel more than five feet smaller than that which is authorized by the length endorsement.

**Stacking Limit:** No more than three permits may be stacked on a single vessel.

**3)** **Nonwhiting Endorsement:** **Option 1:** No endorsement. **Option 2:** A nonwhiting endorsement would be established. The nonwhiting endorsement would prevent permits previously used only in the whiting fishery from transferring into the shoreside nonwhiting fishery ("traditional fishery"). The following are the qualification requirement options to be considered: OPTIONS TO BE DEVELOPED)

**4)** **Whiting season opening:** Spring season opening will be used to address ESA-listed salmon species concerns.

**5)** **Season closures** Seasonal closures will be used, if necessary, to prevent the fishery (the trawl sector or all trawl and nontrawl sectors combined) from going over total mortality caps (OYs, caps, harvest guidelines, quotas, or allocations) for any species.

## COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

**1)** **Trawl Sectors:** Current trawl sectors would be maintained.

**2)** **Nonwhiting Fishery:** Cumulative catch limits and permit stacking would apply for all species covered with cumulative landing limits under status quo and any other groundfish species for which such limits are established under the procedures provided in the groundfish FMP. Season closures would be used when cumulative catch limits have not achieved the goal of providing a year-round fishery.

**3)** **Whiting Fishery:** Status quo management. The whiting sectors begin their season in the spring to avoid impacts on ESA listed salmon and for reasons related distribution of the stock, market timing, and other fishing opportunities. The fishery for each sector closes on attainment of whiting allocations or bycatch limits. On September 15 of each year NMFS assesses the likelihood that each sector will achieve its whiting allocation and rolls over any unneeded allocation to other sectors. Vessels with stacked permits that also fish in the whiting fishery would not be allowed to take more fish on whiting trips than allowed under their base permit or more than allowed under rules for management of the whiting fishery, whichever is greater.

## COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Gear Switching)

**1)** **Gear Switching**

**Option 1: Gear Switching Not Allowed**

a) **Open access fishery cumulative limits** will apply to limited entry trawl vessels **using directed open access gears** (permit stacking does not apply).

b) **Limited entry fixed gear limits** will apply to limited entry trawl vessels that are also endorsed for and **using longline or fishpot gear**.

**Option 2: Gear Switching Allowed**

a) **Stacked trawl permit cumulative limits** will apply to limited entry trawl vessels using directed **open access gears** and to limited entry trawl vessels endorsed for and **using longline or fishpot gear (**except that such limits will not apply when a vessel is fishing against its sablefish tier limit.)

2) **Incidental open access gears.** Status quo management applies to limited entry trawl vessels using incidental open access gears.

## COMPONENT 4. At-sea Observers/ Monitoring

**Nonwhiting Fishery:** Increase at-sea monitoring to 100% to enforce catch limits (as compared to the landing based limits through which catch is controlled under status quo management). At-sea monitoring will be achieved through observers except that, if determined feasible and effective, cameras may be used in place of observers.

**Whiting Fishery:** Status quo coverage would continue.

**COMPONENT 5. Latitudinal Area Management**

There may be some potential for increased local concentration of harvest activities but the potential need and options for increased latitudinal area management (as compared to status quo) have not yet determined.

**COMPONENT 6. Sector Allocation**

A permit stacking program does not require additional intersector allocations.

**How the Alternative Addressed Goals and Objectives**

### 2.2.4 Vessel Cooperatives

Under this alternative, there would be no changes in management of the nonwhiting fishery. (Other alternatives considered here might be adopted for the nonwhiting fishery.)

**COMPONENT 1: Catch Control Tools**

***Catcher Vessels Delivering to Motherships (Alternative 6a)***

The mothership whiting fishery would be managed in two modes:
1. Catcher vessels delivering to motherships (CV(MS)) co-op(s)
2. Seasonal management for those not participating in co-ops

Catcher vessels with a CV(MS) co-op endorsement would choose the mode in which they will fish during a fishing year and commit to that mode for the entire fishing year.

**CV(MS) Endorsement**
Permits with a qualifying history would be designated as CV(MS) permits through the addition of an endorsement to their limited entry groundfish permit.

**Qualifying for a CV(MS) Endorsement.** A limited entry permit will qualify for a CV(MS) endorsement if it has a total of more than 500 mt of whiting deliveries to motherships from

**Qualification Option A:** 1998 through 2004
**Qualification Option B**: 1994 through 2003

**Initial calculation to be used by NMFS to determine the distribution to co-op and non-co-op fishery pools.** A CV(MS) permit calculated catch history will be based on

**Allocation Option A:** its best 6 out of 7 years from 1998 through 2004
**Allocation Option B**: its best 9 out of 11 years from 1994 through 2004
**Allocation Option C:** its best 6 out of 7 years from 1998 through 2003
**Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

**Mothership (MS) Permits.** The vessel owners of qualifying motherships will be issued MS permits. In the case of bareboat charters, the charterer of the bareboat will be issued the permit. Only vessels for which such permits are held may receive at-sea deliveries from catcher vessels. A qualifying mothership is one which processed

at least 1,000 mt of whiting in each of any two years from
1998 through 2004

MS permits will be transferable and there will be no size endorsements associated with the permit. A vessel may not harvest whiting and operate as a mothership in the same year. MS permits may only be used for processing by one vessel per year. Exclusionary language will be added to indicate that a vessel that has left US fisheries may not return.

**Annual Registration.** Each year MS and CV(MS) permit holders planning to participate in the mothership sector must register with NMFS. At that time they must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery so that NMFS can make appropriate distributions to the co-op and non-co-op fisheries.

**Co-op Formation.** Co-ops will be formed among CV(MS) permit owners.
Multiple Co-ops <u>**must**</u> be formed based on the mothership where the CV permit holders delivered the majority of their most recent years' catch. Co-op agreements will be submitted to NMFS.

Co-op agreements must distribute catch allocations to members based on their catch history calculation distributed to the co-op by NMFS

**Co-op Allocation:** Each year NMFS will determine the distribution to be given to each co-op based on the catch history calculation of CV(MS) permits registered to participate in the co-op that year.

**Non-co-op Allocation:** Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

**Movement between Motherships.**

**Option A:** Each year, CV(MS) permit owners will choose between fishing in the non-co-op fishery or delivering to the same mothership that they most recently delivered the majority of their whiting catch in the last calendar year in which they participated. However, if a CV(MS) permit participated in the non-co-op fishery in the previous year, or did not participate in the mothership whiting fishery, it is released from its obligation and may deliver to any mothership in a subsequent year. In the first year of the program, the CV(MS) permit owner's choice will be between delivering in the non-co-op fishery and making co-op deliveries to the licensed mothership to which the permit made a majority of its whiting deliveries in the last calendar year in which they participated.

**Option B:** CV(MS) permit owners may move between motherships at any time. (If this option is selected, conforming changes will be made to all other sections of the mothership co-op alternative.)

**Mutual Agreement Exception:** By mutual agreement of the CV(MS) permit owner and mothership to which the permit is obligated, and on a year-to-year basis, a permit may deliver to a licensed mothership other than that to which it is obligated. Such an agreement will not change the permit's future year obligation to the mothership (i.e., the vessel would still need to participate in the non-co-op fishery for one year in order to move from one mothership to another).

**Temporary Transfer of Allocation to CV(MS) and non-CV(MS) Endorsed Permits.** Owners of valid limited entry permits that are members of co-ops are permitted to transfer co-op allocations amongst other coop members. Such inter- or intra- co-op transfers must deliver co-op shares to the mothership to which allocation is obligated unless released by mutual agreement. Also, a co-op allocation may be harvested by any catcher vessel holding a valid limited entry trawl permit (including one that does not have a CV(MS) endorsement). Whiting allocations are not permanently separable from a limited entry permit. Allocations may not be transferred from the mothership sector to another sector.

**CV(MS) Permit Combination to Achieve a Larger Size Endorsement**

A CV(MS) endorsed permit that is combined with a limited entry trawl permit that is not CV(MS) endorsed or one that is CV(Shorside) [CV(SS)] endorsed will be reissued with the CV(MS) endorsement. If the other permit is CV(SS) endorsed, the CV(SS) endorsement will also be maintained on the resulting permit. However, CV(MS) and CV(SS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(MS) permit is combined with a CP permit, the CV(MS) endorsement and history would not be reissued on the combined permit. The size endorsement resulting from permit combinations would be determined based on the existing permit combination formula.

**Accumulation Limits.**

**MS Permit Ownership:** No individual or entity owning a MS permit(s) may process more than XX% of the total mothership sector whiting allocation.

**CV(MS) Permit Ownership:** No individual or entity may own CV(MS) permits for which the allocation totals greater than XX% of the total whiting mothership allocation.

**Mothership Permit Transfer.**

If a mothership transfers its MS permit to a different mothership or different owner, the CV(MS) permit obligation remains in place unless changed by mutual agreement or participation in the non-co-op fishery.

**Mothership Withdrawal.**

If a mothership does not participate in the fishery and does not transfer its permit to another mothership or mutually agree to transfer delivery to another mothership, the CV(MS) permit holders obligated to that mothership may participate in the non-co-op fishery.

If a mothership does not qualify for an MS permit in the first year of the program, the vessels which delivered to that mothership in the previous year may deliver to the qualified mothership to which it last delivered its majority of catch or participate in the non-co-op fishery.

***Catcher Vessels Delivering to Shoreside Processors—Strawman Placeholder Based on Mothership Proposal (Alternative 6b)***

**THIS ALTERNATIVE PROVIDES A GENERAL STRUCTURE FOR CONSIDERATION, MODELLED AFTER THE PROPOSALFOR THE MOTHERSHIP SECTOR. INDUSTRY REPRESENTATIVES ARE DEVELOPING A PROPOSAL IN CONSULTATION WITH THEIR CONSTITUENTS.**

The shoreside whiting fishery would be managed in two modes:

1. CV(SS) co-op(s)
2. Non-co-op Fishery: Seasonal management for those not participating in co-ops .

Catcher vessels with a CV(SS) co-op endorsement would choose the mode in which they will fish during a fishing year and commit to that mode for the entire fishing year.

**CV(SS) Endorsement**

Permits with a qualifying history would be designated as CV(SS) permits through the addition of an endorsement to their limited entry groundfish permit.

**Qualifying for a CV(SS) Endorsement.** A limited entry permit will qualify for a CV(SS) endorsement if it has a total of more than 500 mt of whiting deliveries to shoreside processors from

**Qualification Option A:** 1998 through 2004
**Qualification Option B**: 1998 through 2003
**Qualification Option C**: 1994 through 2004
**Qualification Option D**: 1994 through 2003

**Initial calculation to be used in determining NMFS distribution to co-op and non-co-op fishery pools.** A CV(SS) permit calculated catch history will be based on

**Allocation Option A:** its best 6 out of 7 years from 1998 through 2004
**Allocation Option B**: its best 9 out of 11 years from 1994 through 2004
**Allocation Option C:** its best 6 out of 7 years from 1998 through 2003
**Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

**Shorseside Processor (SSP) Permits.** Owners of qualifying shoreside processors will be issued SSP permits. Only processors for which SSP permits are held may receive shoreside deliveries from catcher vessels. A qualifying shoreside processor is one which processed at least 1,000 mt of whiting in each of any two years from 1998 through 2004. SSP permits will be transferable. SSP permits may only be used by one owner during the year.

**Annual Registration.** Each year SSP and CV(SS) permit holders planning to participate in the shoreside sector must register with NMFS. At that time they must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery so that NMFS can make appropriate distributions to co-op(s) and the non-co-op fishery.

**Co-op Formation.** Co-ops will be formed among CV(SS) permit owners.
**Number of Co-ops** Multiple co-ops **must** be formed.

Co-op formation will be based on the shoreside processor where the CV(SS) permit holders
**History Tie Option A:** delivered the majority of their most recent years' catch.
**History Tie Option B:** delivered the majority of the catch for the entire time period from 1994 thought 2003.
**History Tie Option C:** delivered the majority of the catch for the entire time period from 1994 thought 2004.

Co-op agreements will be submitted to NMFS. Co-op agreements must distribute catch allocations to members based on the permit specific catch history calculation that NMFS used to distribute allocation to the co-op.

**Co-op Allocation:** Each year NMFS will determine the distribution to be given to each co-op based on the catch history calculation of CV(SS) permits registered to participate in the co-op that year.
**Non-co-op Allocation:** Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

**Movement between Shoreside Processors.**
**Option A.** Each year, CV(SS) permit owners will choose between fishing in the non-co-op fishery or, if the vessel has met its two year commitment to a processor [need more interpretation of this] , delivering to the same shoreside processor to which they most recently delivered the majority of their whiting catch in the last calendar year in which they participated. However, if a CV(SS) permit participated in the non-co-op fishery in the previous **two years** it is released from its obligation and may deliver to any shoreside processor in a subsequent year. In the first year of the program, the CV(SS) permit owner's choice will be between delivering in the non-co-op fishery and making co-op deliveries to the licensed shoreside processor to which the permit made a majority of its whiting landings in the last calendar year in which they participated.
**Option B:** CV(SS) permit owners may move between processors at any time (if this option is selected, conforming changes will be made to all other sections of the shoreside co-op alternative).

**Mutual Agreement Exception:** By mutual agreement of the CV(SS) permit owner and shoreside processor to which the permit is obligated, and on a year-to-year basis, a permit may deliver to a licensed shoreside processor other than that to which it is obligated. Such an agreement will not change the permit's future year obligation to the shoreside processor (i.e. the vessel would still need to participate in the non-co-op fishery for one year in order to move from one shoreside processor to another).

**Temporary Transfer of Allocation to CV(SS) and non-CV(SS) Endorsed Permits.** Owners of valid limited entry permits that are members of co-ops are permitted to transfer co-op allocations amongst other co-op members. Such inter- or intra co-op transfers must deliver co-op shares to the shoreside processor to which allocation is obligated unless released by mutual agreement. Also, a co-op allocation may be harvested by any catcher vessel holding a valid trawl limited entry permit (including one that does not have a CV(SS) endorsement). Whiting allocations are not permanently separable from a trawl limited entry permit Allocations may not be transferred from the shoreside sector to another sector.

**CV(SS) Permit Combination to Achieve a Larger Size Endorsement**

A CV(SS) endorsed permit that is combined with a limited entry trawl permit that is not CV(SS) endorsed or one that is CV(MS) endorsed will be reissued with the CV(SS) endorsement. If the other permit is CV(MS) endorsed, the CV(MS) endorsement will also be maintained on the resulting permit. However, CV(SS) and CV(MS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(SS) permit is combined with a CP permit, the CV(SS) endorsement and history would not be reissued on the combined permit. The size endorsement resulting from permit combinations would be determined based on the existing permit combination formula.

**Accumulation Limits.**

**Shoreisde Processing Permit Ownership:** No individual or entity of a SSP permit(s) may process more than XX% of the total shoreside sector's whiting allocation.

**CV(SS) Permit Ownership:** No individual or entity may own CV(SS) permits for which the allocation totals greater than XX% of the total whiting shoreside allocation.

**SSP Permit Transfer.**

If a shoreside processor transfers its SSP permit to a different shoreside processor or different owner, the CV(SS) permit's obligation remains in place unless changed by mutual agreement or participation in the non-co-op fishery.

**Shoreside Processor Withdrawal.**

If a shoreside processor does not participate in the fishery and does not transfer its SSP permit to another shoreside processor or mutually agree to transfer delivery to another shoreside processor, the CV(SS) permit holders obligated to that shoreside processor may participate in the non-co-op fishery.

If a shoreside processor does not qualify for a SSP permit in the first year of the program, the vessels which delivered to that shoreside catcher processor in the previous year may deliver to the qualified shoreside processor that it last delivered its majority of catch or participate in the non-co-op fishery.

#### *Catcher-Processors (Alternative 6c)*

Catch by the catcher-processor sector would be controlled primarily by closing the fishery when a constraining allocation is reached. As under status quo, vessels may form co-ops to achieve benefits that result from a slower paced more controlled harvest. The main change from status quo is the creation of a catcher-processor endorsement that would close the catcher-processor fishery to new entrants.

**Catcher-Processor (CP) Endorsement.** The class of CP endorsed permits (CP permits) would be limited by an endorsement placed on a limited entry permit. Limited entry permits registered to qualified catcher-processor vessels would be endorsed as CP permits. A qualified vessel is one that harvested and processed in the catcher-processor sector of the Pacific whiting fishery sometime from 1997 through 2006. Only vessels with a CP limited entry permit would be allowed to process whiting at-sea. Limited entry permits with CP endorsements would continue to be transferable.

**Annual Registration.** No annual registrations or declarations are required.

**Co-op Formation.** As under status quo, co-op(s) will be formed among holders of permits for catcher-processors. Participation in the co-op will be at the discretion of those permit holders. If eligible participants choose to form a co-op, the catcher-processor sector will be managed as a private voluntary cooperative and governed by a private contract that specifies, *inter alia*, allocation of whiting among CP permits, catch/bycatch management, and enforcement and compliance provisions. Since NMFS would not establish an allocation of catch or catch history among permits, if any permit holder decides not to participate, the potential co-op benefits will diminish and a race for fish is likely to ensue. Similarly, if more than one co-op forms, a race for fish would likely ensue, absent an inter co-op agreement.

**Co-op Allocation.** There would be no government directed subdivision of the catcher-processor sector quota among participants. The catcher-processor sector allocation would be divided among eligible catcher-processor vessels (i.e., those catcher-processor vessels for which a CP permit is held) according to an agreed catcher-processor cooperative harvest schedule as specified by private contract.

**CP Permit Combination to Achieve a Larger Size Endorsement**

A CP permit that is combined with a limited entry trawl permit that is not CP endorsed would result in a single CP permit with a larger size endorsement (a CV(MS) or CV(SS) endorsement on one of the permits being combined would not be reissued on the resulting permit). The resulting size endorsement would be determined based on the existing permit combination formula.

### COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied (Alternatives 6a, 6b and 6c)

There will be four trawl sectors: Shoreside nonwhiting, shoreside whiting, mothership and catcher-processors.

**Whiting**

Whiting will continue to be divided among the sectors.

The whiting catch history calculation for each CV(MS) and CV(SS) permit will be assigned to a pool for the co-op in which the permit will participate or a pool for the mothership or shoreside non-co-op fishery. Co-ops are responsible for monitoring and enforcing the catch limits of co-op members. NMFS will monitor the catch in the non-co-op fishery, the co-op fisheries and the overall catch of the shoreside and mothership sectors. NMFS will close these fisheries when their catch limits have been achieved.

**Annual Whiting Rollovers**

**Whiting Rollover Option 1.** There **will not** be a **rollover** of unused whiting from one whiting sector to another.

**Whiting Rollover Option 2.** Each year rollovers to other sectors may occur if sector participants are surveyed by NMFS and no participants intend to harvest remaining sector allocations in that year. Current provisions for NMFS to re-allocate unused sector allocations of whiting (from sectors no longer active in the fishery) to other sectors still active in the fishery would be maintained (see 50CFR660.323(c) – Reapportionments).

**Bycatch Species**

For the foreseeable future the whiting fishery will be managed under bycatch limits (hard caps) for widow, canary, and darkblotched rockfish. The ESA-listed salmon bycatch management measures, that is, the 11,000 Chinook threshold, 0.05 rate threshold, and triggered 100 fathom closure, will also continue to be in place. The goal of bycatch management is to control the rate and amounts of rockfish and salmon bycatch to ensure each sector is provided an opportunity to harvest its whiting allocation.

**Bycatch Allocation Subdivision**

**Subdivision Option A:** Subdivide bycatch species allocation among each of the whiting sectors (see Component 6 for basis for allocation).
**Subdivision Option B:** Do not subdivide bycatch species.

**No Bycatch Subdivision** If bycatch species are not allocated among the sectors, then

- **Bycatch Management Option 1:** all sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species; a controlled pace may be established if the sectors choose to work together cooperatively, potentially forming an intersector/interco-op cooperative.
- **Bycatch Management Option 2:** Same as Option 1, including the potential for forming co-ops, except there will be seasonal releases of bycatch allocation.

At the outset, it is envisioned that the seasonal approach would be used to manage widow rockfish bycatch; for canary rockfish and darkblotched rockfish, status quo management would be maintained (i.e., no sector allocation and no seasonal apportionment).

A seasonal release bycatch management program would be implemented through regulation. For reference, a similar program is used to manage halibut bycatch in NPFMC-managed flatfish and Pacific cod fisheries, see 50CFR679.21(d).

In practice, seasonal releases protect the next sector entering the fishery. For example, a May 15-June 15 release would be used by the catcher-processors and motherships, but it protects the shoreside fishery; the June15-September release would be used by shoreside and whatever catcher-processors and motherships are still fishing whiting, and to protect a fall at-sea season after September 15; the final release in September would again be shared by the catcher-processors and motherships, assuming shoreside is done.

For example:

1. No sector bycatch allocations.
2. Status quo for canary and darkblotched rockfish; i.e., no seasonal or sector allocation.
3. May 15 - June 15; 40% of widow hard cap released.
4. June 15 - August 31; an additional 45% of widow hard cap released.
5. Sept. 1 - Dec. 31; final 15% of widow hard cap released.
6. Once a seasonal release of widow rockfish is reached, the whiting fishery is closed to all three sectors for that period. The fishery re-opens to all three sectors upon release of the next seasonal release of widow rockfish.
7. Unused amounts from one seasonal release rollover into subsequent release periods.

(note–percentages are for illustration purposes only, actual release percentages would be developed through the PFMC process)

**Bycatch Subdivision**

Rollovers. If each sector has its own allocation of bycatch, unused bycatch may be rolled over from one sector to another if the sector's full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.

**COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Gear Switching) (Alternatives 6a, 6b and 6c)**

Nonwhiting groundfish management measures are not addressed in this alternative.

**COMPONENT 4. At-sea Observers/ Monitoring (Alternatives 6a, 6b and 6c)**

- **Shoreside Whiting Fishery:** Increase to 100% to enforce catch accounting requirements.
- **At-sea Whiting Fishery:** 100% coverage aboard mothership and catcher-processors would continue.

For some coverage, cameras may be used in place of observers (feasibility to be determined).

**COMPONENT 5. Latitudinal Area Management (Alternatives 6a, 6b and 6c)**

No heightened need for area management identified (as compared to status quo).

**COMPONENT 6. Sector Allocation (Alternatives 6a, 6b and 6c)**

- Existing whiting trawl allocations to remain intact between shoreside whiting sector (42%), mothership delivery sector (24%) and catcher-processor sector (34%).
- If incidental catch species are allocated between the whiting sectors (see options in Component 3), the allocations will be made on a *pro-rata* basis relative to whiting allocated to each sector.

**How the Alternative Addressed Goals and Objectives**

## 2.3. IFQ Program Design Detail Alternatives (IFQ Programs)

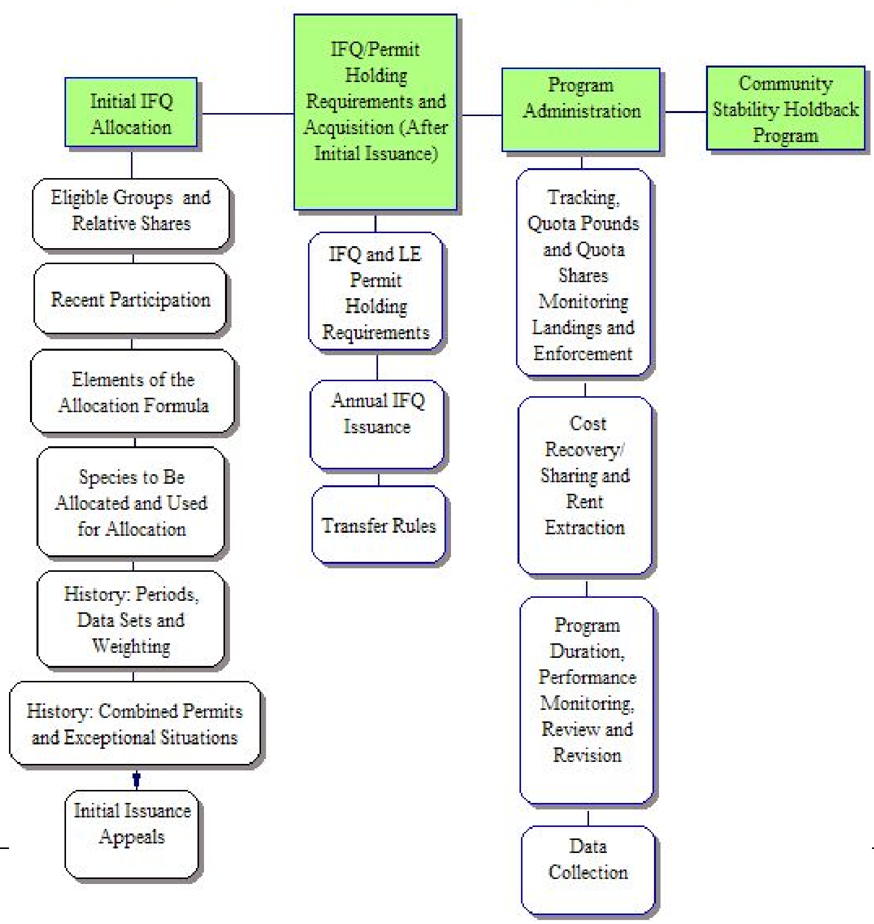
The previous section described the management regime alternatives, some of which call for the use of IFQs. This section describes the IFQ programs that could be used with the management regime alternatives that would employ IFQs. The Council developed three basic IFQ programs, described in Table 2-2. These IFQ program alternatives vary in terms of the relative amounts of initial allocation that would go to permit holders and processors; accumulation limits; the provision of community stability holdback quota; carryover of IFQ from one year to the next; and a number of other design features. In general the three IFQ management regime alternatives are arrayed from an approach with the most restrictions on the use of IFQs to those in which IFQs are allowed to resolve more management issues through market mechanisms.

IFQ Program Alternatives

| IFQ Program A<br>Processor Emphasis | IFQ Program B<br>Harvester Emphasis | IFQ Program C<br>Community/Conservation Emphasis |
|---|---|---|
| Initial allocation, 50% to permit holders, and 50% to processors, liberal accumulation limits. | Initial allocation, 100% to permit holders and 0% to processors, range of accumulation limits to be determined after preliminary analysis. | Initial allocation, 75% to permit holders and 25% to processors, conservative to moderate accumulation limits (to be determined after preliminary analysis) and community stability holdback quota |

The accompanying diagram shows the four main sections of Table 2-2 describing the IFQ program alternatives and the topics under each of the main sections.

Sections and organization of Table 2-2, describing the IFQ progam alternatives.




**<u>IFQ Programs and How They Address Goals and Objectives Identified in Chapter 1</u>**

Program A: Permit owners and processors are initially allocated equal amounts of quota shares (QS), which give them rights to harvest groundfish. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. EXPAND

Program B: Permit owners are allocated QS that give them rights to harvest groundfish. EXPAND

Program C: Permit owners and processors are allocated

QS that give them rights to harvest groundfish. Permit owners would initially receive 75 percent of the QS and processors would receive the remaining 25 percent. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. Additionally, up to 20 percent of the quota pounds issued each year may be allocated to support proposals presented to benefit community stability (community stability holdback quota). EXPAND.

Table 2-2. IFQ Program Design Alternatives, Summary (see Table 2-4 for details on the options within this table).

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| **B.1.0 Initial IFQ Allocation**[a] | | |
| ***Eligible Groups*** The initial allocation of quota shares would be made to permit holders or permit holder and processors (quota pounds are allocated annually based on the amount of quota shares a person has). After the initial allocation those eligible to purchase quota shares would not necessarily be limited to these groups (see below: "IFQ/Permit Holding Requirements and IFQ Acquisition").<br>The following are the shares of the initial IFQ allocation that are being considered for the eligible groups under each program. | | |
| Allocate 50% of quota shares to current permit owners and 50% to processors. | Allocate 100% of quota shares to current permit owners | Allocate 75% of quota shares to current permit owners and 25% to processors.[b] |
| Processor Definition: If an allocation is made to processors, the processing entity needs to be defined and a special definition of processing is proposed. | | |
| Processor history would accrue to<br>**Options:**<br>A. the current owner of the facility,<br>B. the current owner (unless leased in which case allocation would go to the lease holder), or<br>C. the owner at the time processing (one of the preceding to be specified by the Council).<br>A special definition of processor and processing would be used for quota share allocation. The intent of the definition is to ensure that only the first processor of the fish receives an initial allocation of quota shares. The proposed processor definition is provided in the decision point table (Table 2-7). | No special definition needed: no processor allocation. | Same as Program A |
| ***Qualifying Criteria: Recent Participation.*** A member of an eligible group may need to demonstrate recent participation in order to receive an initial allocation. If there is a recent participation requirement and a person has not met that requirement, that person would not receive an initial allocation regardless of the other qualifying criteria the person met. The following are the options pertaining to recent participation being considered for each program. | | |

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| Permit owners--recent participation required: At least (number of trips or number of years in which a landing is made yet to be specified) trawl groundfish landings or deliveries must have been made on a permit from 1998-2003 in order for the owner of that permit **(including permits held for catcher-processors)** to qualify for an initial allocation.<br><br>Shoreside and mothership processors--recent participation required: at least (number of trips or number of years in which a landing is made yet to be specified trawl groundfish delivery(ies) must have been received by a processor from 1994-2004 in order for the owner of that permit **(including permits held for catcher processors)** to qualify for an initial allocation. | Recent participation **not** required.<br>**OR**<br>Recent participation required: At least one trawl groundfish landing or delivery must have been made on a permit from 1998-2003 in order for the owner of that permit to qualify for an initial allocation. | Same as Program A. |
| ***Elements of the Allocation "Formula"*** | | |
| This section specifies in general the factors that would be considered in determining the amount of quota shares that an entity would receive as part of the initial allocation. To receive an initial allocation, an entity would have to be a member of an eligible group, and if there is recent participation requirement, would have to meet the recent participation requirement (see above). | | |
| Permit-Related Allocation | | |
| Owners of catcher vessel permits will be allocated quota shares based on<br>(1) the landing/delivery history of the permit, plus<br>(2) an equal division of the quota that would be attributed to permit history of bought-back permits based on landing/delivery history alone.<br>However, overfished species may be allocated equally among all permit owners, rather than based on landing/delivery history.<br><br>Owners of permits for catcher processors (all of whom are members of the Pacific Whiting Conservation Co-op) will develop an allocation schedule by unanimous consent and submit it to the Council for consideration.<br><br>[A rule may be needed to classify catcher vessel and catcher-processor permits .(?)] | Owners of catcher vessel permits: same as Program A.<br><br>Owners of catcher-processor permits: Allocate to owners of catcher-processor permits based on permit history.<br><br>[A rule may be needed to classify catcher vessel and catcher-processor permits. (?)] | Same as Program A. |
| Processor Allocation | | |
| Processors are allocated quota shares based entirely on the processing of groundfish trawl landings received unprocessed. | No processor allocation. | Same as Program A. |

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| ***Species/Species Groups to Be Allocated and Used for Allocation, Including Post Implementation Subdivision*** | | |

There are four issues addressed here. (1) the aggregation of species/species groups for which quota shares will be issued, (2) future allocations of QS, (3) future subdivisions of QS, and (4) potential use of proxy species.

1. The species and species groups for which there will be an allocation of quota shares and area subdivisions.

   QS Species Categories to be Allocated -- **Option A**: Quota shares for each species/species-group/area combination in the OY table, covered under the proposed management regime, and for which a trawl allocation exists.

   QS Species Categories to be Allocated -- **Option B**: Same as Option A except that quota shares will be allocated for all species and remain dormant until needed.

   QS Species Categories to be Allocated -- **Option C**: Same as Option A or Option B except that some species/species groups will be subdivided into geographic areas that are smaller than is reflected in the OY Table.

2. How to handle future allocation of quota shares for species for quota shares are not initially allocated (management regime Alternative 2 only).

   Species or species groups for which there is not an initial allocation -- Suboptions:

   **Suboption A.1:** Determine the allocation criteria later, or

   **Suboption A.2:** Establish now that future allocation of QS for species not covered in the initial allocation will be based on a person's ownership of related species QS at that time.

3. How to handle the future subdivision of a group quota share (subdivision by area or subdivision of a species group)

   Post implementation subdivision of QS -- **All Programs:** Divide proportionally based on ownership of the QS being subdivided.

4. The species/species group landing/delivery history that will be used for those species and species groups for which quota shares will be allocated. For example, darkblotched rockfish in the nonwhiting fishery might be allocated on the basis of DTS landing/delivery history rather than landing/delivery history of darkblotched rockfish, or all individual species and species groups might be allocated based on a permits aggregate landing/delivery of all groundfish.

   For each species/species group to be allocated quota shares, the history to be used for allocation will be that for:

   **Option A:** the QS species/species group being allocated.

   **Option B:** the QS species/species group the species being allocated or for a closely related target species. For nontarget-overfished species and other incidental species listed here the related target species used to allocate QS will be: . . . List of species for which proxies will be used (and the proxies) to be generated and provided here.

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| ***History: Allocation Periods, Data Sets, and Weighting*** | | |
| For the portion of the allocation formula based on catch history, a period has been identified for each eligible group. Options are also provided that would allow each applicant to drop from its catch history the applicant's two worst years. The time period and drop-year options are as follows. The periods and drop-year options are being considered for all programs.<br>Permits for Shoreside Catcher Vessels:<br>Use fish tickets. 1994-2003. Drop 2 years for whiting trips. Drop 3 years for non-whiting trips.<br>Permits for Mothership Catcher Vessels and, Under Program B, Permits for Catcher Processors:<br>Use observer data. 1994-2003.<br>Shore Processors:<br>Use fish tickets for 1999-2004. Drop 2 years.<br>Motherships:<br>Use observer data. 1998-2003. Do not drop any years. | | |
| Use absolute pounds – no weighting between years. Give the same weight to a given poundage of history regardless of the year in which the landing/delivery was made. | Use annual percentages to calculate catch history. For a given species or species group, calculate the history for each permit using that permit's landings/deliveries as a percent of the total landings/deliveries of that species or species group for all permits for that year. [c] | Same as Program **B**<br>(Use annual percentages). |
| ***History: Combined Permits and Other Exceptional Situations*** | | |
| Permit history for combined permits would include the history for all the permits that have been combined. History for illegal landings/deliveries will not count toward an allocation of quota shares. Landings made under EFPs that are in excess of the cumulative limits in place for the non-EFP fishery will not count toward an allocation of quota shares. Compensation fish will not count toward an allocation of quota shares.[d] | | |
| ***Initial Issuance Appeals Process*** | | |
| There would be no Council appeals process on the initial issuance of IFQ, other than that provided by NMFS. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Any proposed revisions to fishtickets would undergo review by state enforcement personnel prior to finalization of the revisions. | | |

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| **B.2.0 Permit/IFQ Holding Requirements and IFQ Acquisition (After Initial Allocation)** | | |
| ***LE Permit and IFQ Holding Requirements*** | | |
| Only vessels with limited entry trawl permits would be allowed to participate in the trawl IFQ fishery.<br>All catch would have to be covered with quota pounds within 30 days of the landing.<br>For quota pounds to be used they would have to be transferred to a quota pound account for a particular limited entry trawl vessel.<br>For any vessel with an overage (catch not covered by quota) there would be no more fishing by the vessel until the overage is covered. An overage may be covered by with quota pounds from subsequent years, but not until such quota pounds have been issued by NMFS.<br>Additionally, for vessels with an overage, the limited entry permit could not be sold or transferred until the deficit is cleared.<br>**Sub-option:** X quota pounds (to be analyzed and amount determined) must be held prior to departure from port. | | |
| ***Annual IFQ Issuance*** | | |
| *Start-of-Year Quota Pound Issuance* | | |
| Quota pounds would be issued annually to quota share holders based on the amount of quota shares they held. (Quota shares would be issued at the time of initial allocation. As specified above, quota share holders would have to transfer their pounds to a vessel's quota pound account in order for the quota pounds to be used.) | | |
| *Carryover of Quota Pounds to a Following Year* (Previously called "rollover." The term rollover is now being used for intersector transfers.)<br>A carryover allowance would allow surplus quota pounds in a vessel's quota pound account to be carried over from one year to the next or allow a deficit in a vessel's quota pound account for one year to be carried over and covered with quota pounds from a subsequent year.<br>A vessel with a quota pound **surplus** at the end of the current year would be able to use some of those quota pounds in the following year. The amount it could use in the following year would be limited to a specified percent of the vessel's total quota pounds (used and unused) from the current year (see options below).<br>A vessel with a quota pound **deficit** in the current year would be able to cover that deficit with quota pounds from the following year without incurring a violation if<br>(1) the amount of quota pounds it needs from the following year is within the carryover allowance, and<br>(2) the quota pounds are acquired within the specified time limit (30 days).<br>The time limit on acquisition of additional shares to avoid a violation implies that subsequent year quota pounds could only be used to avoid a violation if that deficit (catch overage) occurs toward the end of the year.[e]<br><br>The following are the quota pound carryover provisions for each IFQ program alternative. The percentages are calculated based on the total pounds (used and unused) in a vessel's quota pound account for the current year. | | |
| 10% carryover for non-overfished species | 30% carryover for non-overfished species | 5% carryover for non-overfished species |
| 5% carryover for overfished species | Full (30%) carryover for overfished species | No carryover for overfished species |

## IFQ Program Design Detail Alternatives

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| *Quota Share Use-or-Lose Provisions* | | |
| A use-or -lose provision would revoke the quota shares associated with quota pounds that go unused on a repeated basis. Implementing a use-or-lose provision would require that when quota pounds are transferred during the year, information would have to be preserved on the quota shares for which they were originally issued and the quota share usage would have to be tracked across years as quota shares are transferred from one account to another. Given other design elements of the program (e.g. no limit on the number of potential quota share holders) no administratively feasible use-or-lose provisions have been identified. Therefore a use-or-lose provision is not included, but the need for such a provision will be evaluated as part of future program reviews. | | |
| *Entry Level Opportunities for Acquiring Quota Shares and Low Interest Loan Options* | | |
| Under the MSFCMA [(303(d)(5)(C)] the Council is required to consider entry level fishermen, small vessel owners, and crew members, and in particular the possible allocation of a portion of the annual harvest to individuals falling in those categories. The following are the related provisions under each program. | | |
| No special provisions. | No special provisions. | An opportunity would be provided for new entrants to qualify for revoked shares and shares lost due to non-use (if such use-or-lose provisions are created) Qualification and distribution criteria to be determined. Consider as part of a trailing amendment.(?) |
| *Quota Pounds for the Community Stability Program* | | |
| No special provisions. | No special provisions. | A community stability program would be created and up to 20% of the non-whiting shoreside trawl sector allocation would be set aside each year and allocated to quota share/pound holders who have submitted proposals, ranked on the basis of objective criteria that evaluate benefits to local communities. See "Community Stability Program" below. |
| ***Transfer Rules*** | | |
| *Eligible Owners/Holders (Who May Own or Lease QS/QP)* | | |
| Any entity eligible to own or operate a US documented fishing vessel would be eligible to own or lease QS/QP.<br>*The Trawl IQ Committee's intent is to preserve opportunity for existing participants* | | |

## IFQ Program Design Detail Alternatives

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| *Permanent Transfers and Leases of QS/QP* *Consider eliminating provision regarding leasing of QP, too confusing* | | |
| Permanent transfers of quota shares and quota pounds would be allowed.<br>Leasing of quota shares and quota pounds would be allowed. | Permanent transfers of quota shares and quota pounds would be allowed.<br>Leasing of quota shares and quota pounds would be prohibited. | Same as Program A |
| *Temporary Prohibitions on QS Transfer* | | |
| Quota shares would be transferable any time during year. | QS transfers would be limited or prohibited in the last two months in order to facilitate program administration. | Same as Program A |
| *Divisibility* | | |
| The divisibility of quota shares would be unrestricted and the quota pounds would be transferred in whole pound units (i.e. fractions of a pound could not be transferred). | | |
| *Liens* | | |
| Quota shares and quota pounds could be used as collateral but would be subject to modification or revocation without compensation as specified in the MFCMA. Subject to this limit, liens could be placed on quota shares and quota pounds. Liens can and should be facilitated through a central lien registry. Options for the central lien registry are covered in the section on "Program Administration." | | |
| *Accumulation Limits on QS/QP* (ownership, control and vessel use) | | |
| Limits are being considered on the amount of quota pounds that could be fished from a single vessel, the amount of quota shares and pounds that could be owned by a single person, and the amount that could be controlled by a single person. Limits may vary by species/species group, areas, and sector. The following are the range options being considered under each program. Additional data work is needed to more fully develop the suite of options. | | |
| 50% or no limits. | Consider all limits as sub-options | Most restrictive limits (1% or 5%)<br>**OR**<br>Intermediate level limits (10% or 25%) |
| Definition of control needs to be developed. | | |
| *Vertical Integration Limit* | | |
| Vertical integration occurs when one entity operates at multiple levels in the production chain. For example, when one entity operates both a harvesting vessel and a processing facility. The topic of limits on vertical integration has been addressed during the development of these program alternatives. At this time, no limits on vertical integration have been proposed beyond those limits already provided through accumulation limits. | | |

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| **B.3.0 Program Administration** | | |
| ***Tracking Quota Pounds and Quota Shares, Monitoring Landings, and Enforcement*** | | |
| All IFQ programs rely on 100% at-sea monitoring (by observers or cameras) in order to ensure that catch is counted against quota pounds. The need for 100% at-sea monitoring arises because the IFQ programs require quota pounds to cover catch rather than to cover landings.<br>All of the following programs include near real time reporting of landings information (i.e. an electronic landings tracking system). | | |
| Discarding would be allowed. Allowing discarding would require that the timeliness of discard reporting be improved to match that for landings reporting. Such timeliness would be necessary to track quota pound usage. Some costs would be controlled through a requirement that delivery sites be licensed. Site licenses would ensure that certain standards would be met that would facilitate monitoring and would aid work force planning. Any landing not made at a licensed site would be illegal. A central lien registry system would contain only essential ownership information. | There would full retention and 100% shoreside monitoring, so the discard reporting system would not need to be upgraded. The site licensing program would be replaced by a limitation on the ports to which deliveries could be made. Costs would be further controlled by limiting landing hours. A central lien registry system would contain expanded ownership information. | It is proposed that cameras might be used in place of compliance observers (feasibility to be determined. Discards would be allowed (except when cameras are present) so an upgrade to the bycatch reporting system would be required. Instead of creating an electronic state fish ticket system, a Federal system would be created to track trawl landings. Site licensing requirements would be similar to Program A. A central lien registry system would contain expanded ownership information. |
| 100% at-sea compliance observers (possible small vessel exception) | 100% at-sea compliance observers | 100% at-sea compliance observers or cameras |
| Shoreside monitoring opportunity would be provided | 100% shoreside monitoring | Shoreside monitoring opportunity would be provided |
| Discards allowed | Full retention required | Discards allowed if at-sea monitor is present (otherwise full retention) |
| Upgraded discard (bycatch) monitoring and reporting system needed | An upgraded discard monitoring and reporting system is un-needed | Upgraded discard (bycatch) monitoring and reporting system needed |
| Electronic landings tracking (electronic state fish ticket system). | Electronic landings tracking (electronic state fish ticket system). | Parallel federal electronic landings tracking |
| Advance notice of landing required. | Advance notice of landing required | Advance notice of landing required |
| Unlimited landing hours | Limited landing hours (specify) | Unlimited landing hours |

## IFQ Program Design Detail Alternatives

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| Licenses required for delivery sites | Unlimited landings sites | Licenses required for delivery sites |
| VMS required under all programs | VMS required under all programs | VMS required under all programs |
| QS transactions tracked electronically. Create a central lien registry but **exclude all but essential** ownership information. | QS transactions tracked electronically. Create a central lien registry **including all related** ownership information. | QS transactions tracked electronically. Create a central lien registry **including all related** ownership information. |
| ***Cost Recovery/Sharing and Rent Extraction*** The TIQC has provided some general guidance and requested that NMFS provide some options for fee structures. | | |
| Fees would be used to recover costs associated with management of the IFQ program but not for enforcement or science. The limit on fees would be 3% of ex-vessel value, as specified in the MSFCMA. | Same as Program A | There would be full cost recovery. Cost recovery would be achieved through landing fees plus privatization of elements of the management system. In particular, privatization for monitoring of IFQ landings (e.g., industry pays for their own compliance monitors). Stock assessments would not be privatized and the electronic fish ticket system would not be privatized. |
| ***Program Duration and Procedures for Program Performance Monitoring, Review, and Revision (Magnuson-Stevens Act (d)(5)(A))*** | | |
| There would be a four-year review process along with review criteria (possibly review as part of biennial management cycle or framework in for Council direction later on a schedule of five years or less). Among other factors, the review would include evaluation of whether or not there are localized depletion problems and whether or not quota shares are being utilized. Standard fishery management plan and regulatory amendment procedures would be used to modify the program. A community advisory committee would also advise the Council on performance of the IFQ program. | | |
| ***Data Collection*** | | |
| The data collection program would be expanded, but submission of economic data would be voluntary. Information on QS transaction prices would be included in a central QS ownership registry. | The data collection program would be expanded and submission of economic data would be mandatory. Information on QS transaction prices, including leases, would be included in a central QS ownership registry. | Same as Program B |

| IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|
| **B.4.0 Community Stability Holdback Program** | | |
| None | None | A portion of annual quota pounds would be held back and allocated for proposals submitted by quota share/pound holders. The proposals would be evaluated by a Council body, with support of Council or Council and NMFS staff, based on quantitative criteria that place priority on community benefits. The quota pounds held back for this purpose would continue to be "trawl quota pounds" and would have to be used in a manner consistent with the scope of the trawl individual quota program. Quota pounds issued under the community stability holdback program would count toward accumulation limits. The Council may determine that the allocation for some or all proposals should be for periods of longer than one or two years. |

[a] The Council has expressed its interest in considering options that would allocation 90% to permit holders and 10% to processors, and an option that would allocate 100% of nonwhiting species to permit holders and 50% of whiting to permit holders and 50% to processors. These options are not explicitly analyzed but are within the range established by the three analytical options, and therefore could be adopted at the time of final action.

[b] For the non-whiting shoreside fishery only, up to 20% of the quota pounds, will be held back from the allocation (off the top) to support the community holdback. See "Community Holdback."

[c] Applying this approach, if the total sector landings for a species in 1994 were twice the landings in 2003, then a permit would receive the same credit of two pounds landed in 1994 as it would for one pound landed in 2003.

[d] **Stacked permits:** On rare occasions two trawl permits have been assigned to the same vessel. During the time more than one permit is assigned to a single vessel . . . Options: A. Divide landing/delivery history equally among both permits. B. Assign all landing/delivery history to the first permit registered for use with the vessel. This issue will not affect the analysis. Therefore, until the issue is decided Option A will be used.

[e] Regardless of the carry over limits, if a vessel has a deficit in its quota pound account it may cover that deficit with quota pounds from any subsequent year (after the quota pounds for that year have been issued). However, covering current year catch with subsequent year quota pounds would allow the vessel to avoid a violation only if the subsequent year quota pounds are acquired within the rules specified for the carryover provisions.

## 2.4. Decision Points and Options Checklist

### *2.4.1 Decision Points List*

**Main Management Regime Decision**

1. Select the main tool that will be used to manage the groundfish limited entry trawl fishery.

- Status Quo (Cumulative Landing Limits and Seasons for Whiting)
- IFQs for Any or All Trawl Sectors (Catch Based) with some use of cumulative catch limits.
- Permit Stacking for Nonwhiting Sectors (Catch Based)
- Vessel Cooperatives for Whiting Sectors (Catch Based)

**IFQ Management Regime Alternative Decision**

**IFQ Component 1**

1. Choose the IFQ Program to apply (Program A, B or C) (Alt 2, 3 &4) (Element 1.1).
2. Duration of cumulative limit period (2 months or 4), need for a limit on stacking of cumulative limits (Alt 2). (Element 1.3)
3. Whiting season opening dates (whether to open earlier and, if so, when) (Alt 2, 3 &4) (Element 1.7)
4. Whiting season closing dates (whether to close the season based on attainment of bycatch caps) (Alternative 2) (Element 1.8, determined by whether or not bycatch in whiting fishery is managed with bycatch caps or IFQs.)

**IFQ Component 2**

5. Number of trawl sectors (one, three or four). (Alt 2, 3 &4) (Element 2.1)
6. Species managed with IFQs (Alt 2, 3 &4) (Elements 2.2, 2.3, 2.4 and 2.5)
7. Bycatch caps (a single bycatch cap for all three whiting sectors or one for each whiting sector and rollovers) (Alt 2) (Element 2.2 and 2.4)
8. Whiting rollover (allowed or not); if so, specify whiting rollover mechanism (Alt 2) (Element 2.3)

**IFQ Component 3**

9. Groundfish catch of limited entry trawl vessels using gears other than groundfish trawl (whether to allow gear switching). (Alt 2, 3 &4) (Element 3.1 thru 3.4)

**IFQ Component 4**

No decisions

**IFQ Component 5**

10. Area management (Whether or not to have area management on a scale finer than what is in the ABC/OY table). Process Option Refinement: Decision to create a committee to study has been deferred. Decide whether to initiate the study.

### IFQ Component 6

11. Trawl sector allocation formula. Whether or not to eliminate catch history for vessels without recent participation. (Alt 2 & 3) (Element 6.1)
12. Adjust the groundfish trawl/open-access split (Alt 2) (Element 6.3)

## Permit Stacking Management Regime Alternative

### Permit Stacking Component 1

1. Credit for permit stacking (full or partial) method for specifying the amount of credit to be provided for stacked permits (Element 1.2)
2. Nonwhiting endorsement (whether to have) and specify qualifying criteria (Element 1.4)

### Permit Stacking Component 3

3. Allow gear switching (whether to allow trawl limits to be taken with directed open access gear and limited entry longline and fishpot) (Elements 3.1 thru 3.4)

## Vessel Co-op Management Regime Alternative

1. Decide whether or not to adopt for analysis the alternatives developed by the TIQC.

### Co-op Component 1

#### *Catcher Vessels Delivering to Motherships (CV(MS))*

2. Catcher vessels delivering to motherships [CV(MS)] endorsement qualifying requirement (time period options)
3. CV(MS) catch history calculation options (periods and numbers of a permits worst years to drop)
4. Mothership permit qualifying requirement (time period options)
5. Movement between motherships (require 1 year in the non-co-op fishery or allow free movement).
6. Accumulation limit for the share of total fish a mothership may process (decide percent)
7. Accumulation limit for the share of total allocation a person may control through CV(MS) permits (decide percent)

#### *Catcher Vessels Delivering to Shoreside Processors*

8. Catcher vessels delivering to shoreside processors [CV(SS)] endorsement qualifying requirement (time period options)
9. CV(SS) catch history calculation options (periods and numbers of a permits worst years to drop)
10. Shoreside processor permit qualifying requirement (time period options)
11. The basis for determining the processor to which the permit is initially committed (most recent year or majority of landings for the entire allocation time period)
12. Movement between shoreside processors (require 2 years in the non-co-op fishery or allow free movement).
13. Accumulation limit for the share of total fish a mothership may process (decide percent)
14. Accumulation limit for the share of total allocation a person may control through CV(SS) permits (decide percent)

***Catcher-Processors***

There are no Component 1 decisions needed for catcher processors

**Co-op Component 2 (All Whiting Sectors)**

15. Whether or not to have a whiting rollover between whiting sectors and, if so, the mechanism
16. Whether or not to subdivide bycatch species among whiting sectors and have rollovers
17. If there is no subdivision of bycatch species, would there be seasonal releases

**Co-op Components 3, 4, 5 and 6 (All Whiting Sectors)**

For Components 3, 4 5, and 6 there are no options on which decisions are needed.

### IFQ Program Design Detail Programs

#### Initial Allocation

1. Proportion of initial allocation to go to permit owners and proportion to processors. (All programs). (B.1.1)
2. Entities eligible for a processor allocation of IFQ (specify who qualifies for the processing history). (Program A and C). (B.1.1.)
3. Recent participation requirements (yes or no). (Program B). (B.1.2)
4. Recent participation requirements. (Define options in Program A and C). (B.1.2)
5. Elements of allocation formula (for catcher-processors consensus allocation schedule or permit history, may need rule to separate catcher from catcher-processor permits). (All programs). (B.1.3)
6. Elements of allocation formula. (catch history or equal allocation for overfished species?) (All programs). (B.1.3)
7. For what species groups and area subdivisions will QS be issued. (All programs). (B.1.4)
8. How to handle QS for nonIFQ species (species that are to be included in the program but for which an intersector allocation is not completed and species not initially covered). (Whether to allocate now and if later how?). (All programs). (B.1.4)
9. Species/species groups on which the allocation will be based (Use the species being allocated or only target species?). (All programs). (B.1.4)
10. Weighting of catch history between years (weight or don't weight) (All programs). (B.1.5).
11. Treatment of history for stacked trawl permits (options) (All programs). (B.1.6).

#### Permit/IFQ Holding Requirements and IFQ Acquisition (After Initial Allocation)

12. Minimum holdings of IFQ required for departure on a trip. (All programs) (B.2.1)
13. Carryover allowance options (specify amount). (All programs). (B.2.2.2)
14. Entry level opportunities. (Develop criteria or address in trailing amendment?) Program B. (B.2.2.4)
15. Set aside of quota pounds for Community Stability Program (Whether or not to have the program.) (Program C) (B.2.2.5)
16. Resolve uncertainty about "own or operate" in determining who may own QS. (All Programs) (B.2.3.1)
17. Permanent transfers and leases (Prohibit or allow leasing). (All programs). (B.2.3.2)
18. Prohibit or limit QS transfers in the last two months. (Yes/No) (All programs). (B.2.3.3)

19. Accumulation limits (levels for use on a vessel, ownership and control). (All programs). (B.2.3.6)

**Program Administration**

20. Miscellaneous choices on monitoring programs including issues such as (use of cameras, need for full retention, shoreside monitoring, need for upgrading the electronic discard reporting system, electronic fish tickets, limited landing ports, landing site licensing, central ownership and lien registry). Also, need to determine whether there is a feasible way of implementing a small vessel exception. (All programs) (B.3.1)
21. Limited landing times (Limit or not, need to specify hours for the option to limit.) (All programs) (B.3.1)
22. Cost recovery proposals needed (Type of recovery mechanisms and principles to follow. Proposals for privatization needed.) (All programs) (B.3.2)
23. Timing of review vis a vis biennial management cycle. (All programs) (B.3.3)
24. Submission of socio-economic data (voluntary or mandatory, expanded or status quo efforts). (All programs). (B.3.4)

**Community Stability**

25. Criteria for evaluating community stability program. (Proposal evaluation criteria need to be developed. Solicit needed technical expertise.). (Program C) (B.4.0)

### 2.4.2 Options for the IFQ Management Regime Alternatives

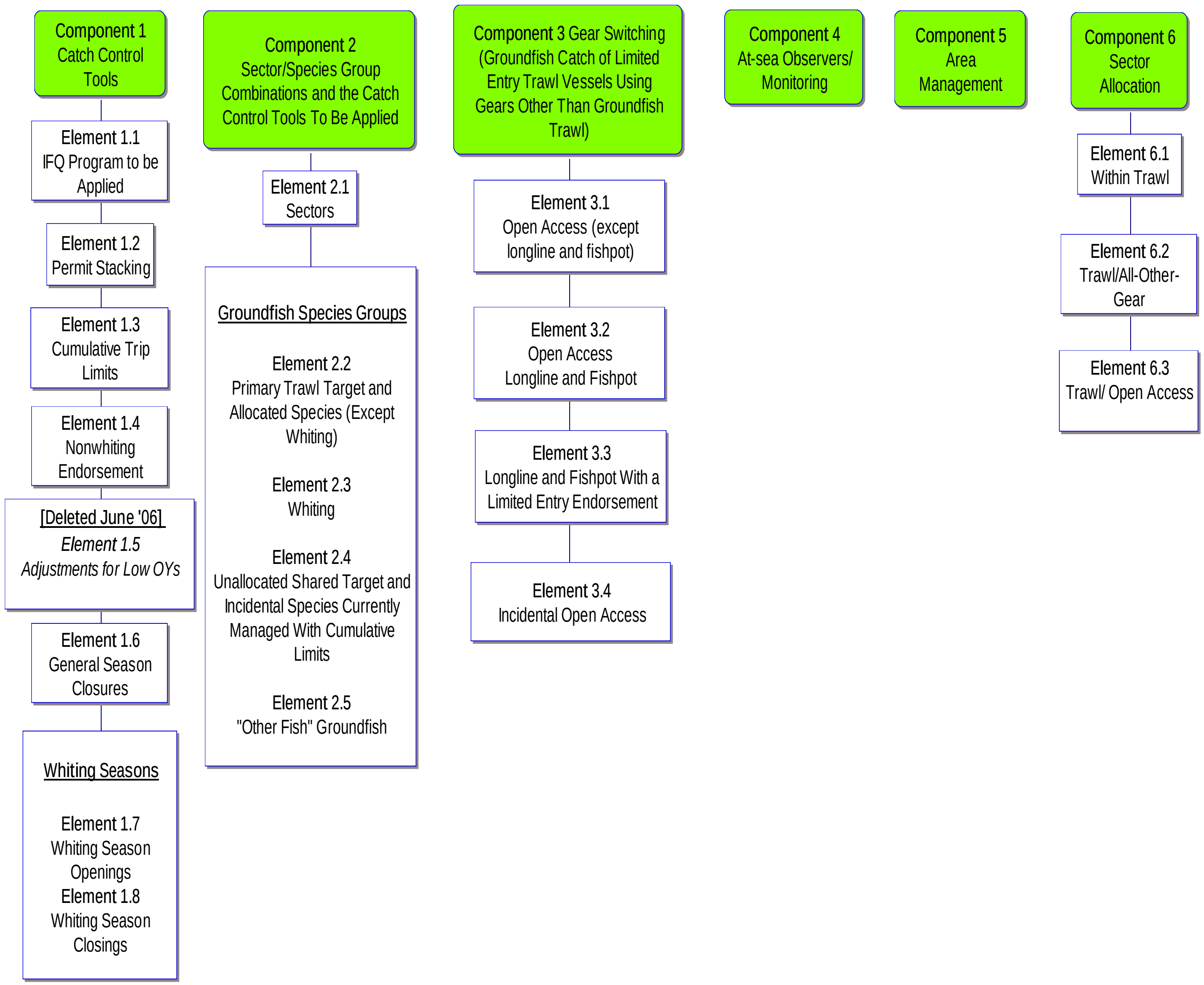
**IFQ Management Regime Alternative Themes and Decision Table.** An overview of the elements of the IFQ management regime alternative is provided in **Figure 2-1.** Options pertaining to the issues identified in the above components are grouped into themed management regimes, as discussed in Section 2.1.1:

| IFQ Alternative 2 | IFQ Alternative 3 | IFQ Alternative 4 |
|---|---|---|
| Most social engineering | - - - Intermediate - - - | Most reliance on markets |

These differences among the IFQ management regime alternatives are highlighted in Table 2-3. Footnotes provide detailed descriptions of how particular elements vary between the alternatives. The element numbering in Table 2-3 correspond to elements in Appendix A and may be used to locate related sections of Table A-1. Table A-1 includes both the elements in the alternatives as well as other elements that were considered but not included in the alternatives currently being analyzed. In Table 2-3, those elements which need further development, or for which an option must be selected before the alternative is adopted for analysis, are highlighted in shaded boxes. Additionally, elements that vary between the alternatives, and which may be particularly amenable to simplification with additional policy guidance from the Council, are highlighted in a box with triple lines.

## Decision Points and Options – Management Regimes -- IFQs

Figure 2-1 Overview of organization of management regime components (Table 2-3).



## Decision Points and Options – Management Regimes -- IFQs

Table 2-3. Decision points for IFQ management regime alternatives (Shaded cells indicate options that will need to be chosen. Cells with a triple line indicate an area that may be particularly amenable to simplification with some additional policy guidance).

| | Alternative 2<br>IFQs for Trawl Target Groundfish | Alternative 3<br>IFQs for All Groundfish Except "Other Fish" | Alternative 4<br>IFQs for<br>All Groundfish |
|---|---|---|---|
| **COMPONENT 1: CATCH CONTROL TOOLS IFQ Program to Control Catch for Non-Whiting and Whiting Trips (See Table 2-2 for Program Summary)** | | | |
| ***IFQ Program to Control Catch for Non-Whiting and Whiting Trips (See Table 2-2 for IFQ Program Summary)*** | | | |
| ***Element 1.1 IFQ Program to Be Applied*** | Program C | Alternative 3A – Program A<br>Alternative 3B - Program B<br>Alternative 3C - Program C | Program C |
| ***Other Catch Control Tools*** | | | |
| ***Element 1.2 Permit Stacking*** | N/A | N/A | N/A |
| ***Element 1.3***<br><br>***Cumulative Trip Limits (Catch Based)*** | Transferable Cumulative Catch Limits[a b]<br>Opt 1: The cumulative limit period will continue to be 2 months and only complete limits may be transferred.[c]<br>Transferable Cumulative Limit Opt 2: The cumulative limit period will be 4 months and partial limits may be transferred.[d]<br>*Consider need for accumulation limit.*) | None (except used for whiting closures and "Other Fish") | None (except used for whiting closures) |
| ***Element 1.4 Non-whiting Endorsement*** | N/A | N/A | N/A |
| ***Element 1.5 Adjustments for Low OYs*** | Eliminated from Consideration June/2006 | | |
| ***Element 1.6 General Season Closures*** -- | Yes | Yes | Yes |
| ***Element 1.7 Whiting Season Openings*** | Option 1. Continue current staggered season openings.[e]<br>Option 2. Set spring openings as needed for all sectors, to control impacts on ESA listed salmon.[f]<br>Option 3. Open the season January 1. | Same as Alt 2 | Same as Alt 2 |
| ***Element 1.8 Whiting Season Closings*** | On attainment of bycatch caps. | None | None |

| | Alternative 2<br>IFQs for Trawl Target Groundfish | Alternative 3<br>IFQs for All Groundfish Except "Other Fish" | Alternative 4<br>IFQs for All Groundfish |
|---|---|---|---|
| **COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied** | | | |
| ***Element 2.1 Sectors*** | Four sectors: SS nonwhiting, SS whiting, deliveries to MS and deliveries to CP (SS=Shoreside; MS=Mothership; CP=Catcher-processor) | Three sectors | One sector |
| ***Element 2.2 Primary Trawl Target and Allocated Species[g] (Except Whiting)*** | SS non-whiting deliveries: IFQs<br>SS, MS, & CP whiting deliveries: bycatch caps for significant bycatch species and cumulative limits.<br>Bycatch cap Option 1: A single bycatch cap for all whiting sectors combined. [h]<br>Bycatch cap Option 2: Each whiting sector has its own bycatch cap and there will be a bycatch rollover provision.[i] | Sector specific IFQs | IFQs |
| ***Element 2.3 Whiting*** | SS non-whiting deliveries: IFQs and year-round nontransferable cumulative whiting catch limits.<br>SS, MS, & CP whiting: IFQs.<br>Whiting Rollover Option 1: Not Allowed;[j]<br>Whiting Rollover Option 2: Allowed[k] | Sector specific IFQs | IFQs |
| ***Element 2.4 Unallocated Shared Target and Incidental Species Currently Managed With Cumulative Limits*** | SS non-whiting deliveries: Transferable cumulative catch limits.<br>SS, MS, & CP whiting deliveries: Same as Element 2.2. | Sector specific IFQs | IFQs |
| ***Element 2.5 "Other Fish" Groundfish[lm]*** | Status quo.[n] | Status quo | IFQs |

| | Alternative 2<br>IFQs for Trawl Target Groundfish | Alternative 3<br>IFQs for All Groundfish Except "Other Fish" | Alternative 4<br>IFQs for<br>All Groundfish |
|---|---|---|---|
| **Component 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl** | | | |
| ***Element 3.1***<br>***Directed Open Access (except fishpot and longline)*** | IFQ **not** required.<br>Open access limits **apply**.<br>Catch counts against open access allocation. | IFQ required.<br>Open access limits **apply**.<br>Catch counts against trawl allocation. | IFQ required.<br>Open access limits **do not apply**.<br>Catch counts against trawl allocation. |
| ***Element 3.2***<br>***Longline and Fish Pot Without an LE Endorsement*** | IFQ required.<br>LE fixed gear limits apply<br>Catch counts against trawl allocation. | IFQ required.<br>Catch counts against trawl allocation. | Same as Alt 3. |
| ***Element 3.3***<br>***Longline and Fish Pot With an LE Endorsement*** | IFQ **not** required.<br>No opportunity to land groundfish in excess of fixed gear limits. Fixed gear catch counts against fixed gear. | IFQ **not** required **but may be used** to catch in excess of fixed gear limits.<br>Catch against fixed gear limits counts against fixed gear.<br>IFQ catch counts against trawl allocation. | Same as Alt 3. |
| ***Element 3.4***<br>***Incidental Open Access*** | IFQ **not** required | Same as Alt 2. | Same as Alt 2. |
| **Component 4. At-sea Observers/ Monitoring** | | | |
| | 100% at-sea compliance observers. | Same as Alt 2. | 100% at-sea compliance observers or cameras (if feasible) |
| **Component 5. Area Management** | | | |
| | **Program Option for All Action Alternatives:** Plan to establish additional regional management areas as needed at a later time. IFQ program alternatives include provisions to allow later subdivision of IFQs by area.<br>**Process Option:** Task a group to begin considering the need for additional regional management areas (biological or socio-economic) and potential boundaries along with a process for identifying and responding to regional management area issues that may develop or become more apparent in the future. **[Decision deferred until additional information is available, e.g. preliminary DEIS is ready.]** | | |

| | Alternative 2 IFQs for Trawl Target Groundfish | Alternative 3 IFQs for All Groundfish Except "Other Fish" | Alternative 4 IFQs for All Groundfish |
|---|---|---|---|
| **Component 6. Sector Allocation** | | | |
| ***Element 6.1 Within Trawl*** | Establish sector specific allocation within trawl allocation based on each sector's relative historic shares.[o] **Option** to eliminate history for permits not meeting recent participation requirements.[p] | Same as Alt 2. | No allocation required within the trawl sector. |
| ***Element 6.2 Trawl/All-Other-Gear*** | Establish needed intersector allocations through the intersector allocation process. | | |
| ***Element 6.3 Trawl/ Open Access*** | Augment the open access allocation.[q] **Linked to Element 3.1 of Alt 2.** | N/A | N/A |

[a] Cumulative Catch Limits: A vessel that reaches its cumulative catch limit for a species would have to stop trawling in strategies that may encounter that species. There may be retention limits within the cumulative catch limits. A season closure would be implemented for the affected species when the fleet reaches its cap for that species. Note: this option requires 100% catch monitoring.

[b] For species managed with cumulative limits, the cumulative limit levels for the trawl fishery would be determined as part of the Council decision on biennial management measures, as under status quo.

[c] Transferable separate from the permit, but nontransferable:-for whiting. A vessels which reaches its initial cumulative limit would be allowed to continue fishing if it acquired additional cumulative limits. All cumulative limit transfers are temporary (i.e. a cumulative limit reverts to the original permit at the end of the year).

[d] Same as Option 1 except the duration of the cumulative limits may be set to four months and mid-period transfers allowed.

[e] Staggered season openings for each whiting sector set during the biennial specifications process.

[f] Continuation of spring opening for the season (possibly use a single opening date for all trawl sectors), to control impacts on ESA-listed salmon.

[g] **"Trawl target species"** are defined as any species for which other sectors have only incidental harvest or, for species sometimes targeted by other sectors, species for which a trawl allocation has been established at the time of implementation. This category may also include incidentally caught species for which a trawl allocation has been established. Section X.X identifies those species which will be assumed to be trawl species for purposes of the analysis.

[h] There will be a single bycatch cap for all whiting sectors combined. All whiting sectors will close when the collective bycatch cap is reached.

[i] Each whiting sector will have a cap for each trawl target and allocated species/species group. A whiting sector will close if it's cap is reached for a non-whiting species. A procedure will be established under which all or a portion of an unused cap species may be rolled-over/transferred to another sector. More specificity needed (timing and criteria similar to that used for the current whiting rollover, rollover to a non-whiting sector)?

[j] Whiting IFQ may not be transferred from one sector to another.

[k] Whiting IFQ may not be transferred from use in one sector to another. However, there may be midseason rollovers, adjustments that would modify the restriction on transfer between trawl sectors or directly reallocate quota pounds from one sector to another.

[l] "**Other Fish"** is a groundfish category that includes sharks, skates, rays, ratfish, morids, genadiers, cabezon (north) and kelp greenling. This category is likely to change over time

[m] Groundfish in the "Other Fish" category are not managed with cumulative trip limits—catch is monitored only. This may change over time, and in 2005 some cumulative trip limits for Other Fish were imposed over part of the year.

[n] If managed by cumulative limits at the time of implementation, manage the same as "Unallocated Shared Target and Incidental Species."

[o] Establish the allocation among trawl sectors based on each sector's relative shares during the time period used for initial IFQ allocation. If different periods are used for different trawl sectors calculate the share for each sector based on its IFQ allocation period, then adjust all percentages proportionately such that they sum to 100%

[p] Apply a recency requirement such that the catch history of any vessel which does not meet the recent participation requirement (if any) for the initial allocation is not included in the calculation of sector shares.

[q] Augment the open access allocation to account for trawl vessels fishing with open access gear on the open access allocation

### *2.4.3 Options for Permit Stacking Management Regime Alternative*

**PERMIT STACKING COMPONENT 1: Catch Control Tools**

**Permit Stacking:** .

- **Credit Option 1:** A vessel will receive full credit for each permit registered to the vessel.
- **Credit Option 2:** A vessel will receive full credit for the base permit and partial credit for each additional permit registered to the vessel. Formula for additional credit to be specified.

**Nonwhiting Endorsement:**

- **Nonwhiting Endorsement Option 1** : No endorsement.
- **Nonwhiting Endorsement Option 2** : Establish a non-whiting endorsement. Develop qualification requirements.

**PERMIT STACKING COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied**

For Component 2 there are no options on which decisions are needed.

**PERMIT STACKING COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Gear Switching)**

**Gear Switching Not Allowed (Option 1):** **Open access fishery cumulative limits** will apply to limited entry trawl vessels **using directed open access gears** (permit stacking does not apply).

**Limited entry fixed gear limits** will apply to limited entry trawl vessels that are also endorsed for and **using longline or fishpot gear**.

**Gear Switching Allowed (Option 2):** **Stacked trawl permit cumulative limits** will apply to limited entry trawl vessels

- using directed **open access gears**, or
- endorsed for and **using longline or fishpot gear (**except that such limits will not apply when a vessel is fishing against its sablefish tier limit.)

**PERMIT STACKING COMPONENT 4, 5 and 6. Sector Allocation**

For Components 4 5, and 6 there are no options on which decisions are needed.

Table 2-4. Decision points for permit stacking management regime alternatives (shaded cells indicate options that will need to be chosen). [NOTE: Numbering from the IFQ program alternative is maintained in order to provide a key to the location of information on permit stacking in Appendix A.]

| Sections and Numbering Correspond to those for the IFQ Management Regime Alternatives | Alternative 5<br>Cumulative Catch Limits and Permit Stacking |
|---|---|
| **COMPONENT 1: Catch Control Tools** | |
| ***Element 1.1 IFQ Program to Be Applied*** | N/A |
| ***Element 1.2 Permit Stacking*** | **Credit Option 1:** Entire set of cumulative limits for each stacked permit.<br>**Credit Stacking Option 2:** The entire set of cumulative limits for first permit, <100% for subsequent permits. |
| ***Element 1.3 Cumulative Trip Limits*** | Cumulative Catch Limits |
| ***Element 1.4 Non-whiting Endorsement*** | **Nonwhiting Endorsement Option 1** : No endorsement.<br>**Nonwhiting Endorsement Option 2 :** Establish a non-whiting endorsement. Only vessels with permits meeting endorsement qualification requirements could participate in the non-whiting fishery.<br>*Develop qualification requirements.* |
| ***Element 1.5 Adjustments for Low OYs*** | N/A |
| ***Element 1.6 General Season Closures*** -- | Status quo |
| ***Element 1.7 Whiting Season Openings*** | Status quo |
| ***Element 1.8 Whiting Season Closings*** | Status quo |
| **COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied** | |
| ***Element 2.1 Sectors*** | Three sectors |
| ***Element 2.2 Primary Trawl Target and Allocated Species***[a] | Cumulative catch limits with permit stacking rules applied for non-whiting trips.<br>Whiting sector bycatch caps for significant bycatch species (status quo). |
| ***Element 2.3 Whiting*** | Status quo whiting management. |
| ***Element 2.4 Unallocated Shared Target and Incidental Species Currently Managed With Cumulative Limits*** | Cumulative catch limits with permit stacking rules applied for non-whiting trips.<br>Whiting sector bycatch caps for significant bycatch species (status quo) |
| ***Element 2.5 "Other Fish" Groundfish***[bc] | Status quo.[d] |
| **COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl** | |
| ***Element 3.1 Directed Open Access (except fishpot and longline)*** | Option 1. Open access limits apply.<br>Option 2. Trawl limits apply (including stacked limits). |
| ***Element 3.2 Longline and Fish Pot Without an LE Endorsement*** | Option 1. Open access limits apply.<br>Option 2. Trawl limits apply (including stacked limits). |
| ***Element 3.3 Longline and Fish Pot With an LE Endorsement*** | Option 1. Fixed gear limits apply.<br>Option 2. Trawl limits apply for catch in excess of fixed gear limits (except when the vessel is fishing on its sablefish tier limit). |
| ***Element 3.4 Incidental Open Access*** | Permit stacking does not apply. |
| **COMPONENT 4. At-sea Observers/ Monitoring** | |
| | 100% at-sea compliance observers or cameras (if feasible) |

| Sections and Numbering Correspond to those for the IFQ Management Regime Alternatives | Alternative 5<br>Cumulative Catch Limits and Permit Stacking |
|---|---|
| **COMPONENT 5. Area Management** | |
| | **No increased need for area management.** |
| **COMPONENT 6. Sector Allocation** | |
| ***Element 6.1 Within Trawl*** | N/A (No new allocations needed) |
| ***Element 6.2 Trawl/All-Other-Gear*** | N/A |
| ***Element 6.3 Trawl/ Open Access*** | N/A |

[a] **"Trawl target species"** are defined as any species for which other sectors have only incidental harvest or, for species sometimes targeted by other sectors, species for which a trawl allocation has been established at the time of implementation. This category may also include incidentally caught species for which a trawl allocation has been established. Section X.X identifies those species which will be assumed to be trawl species for purposes of the analysis.

[b] "**Other Fish"** is a groundfish category that includes sharks, skates, rays, ratfish, morids, genadiers, cabezon (north) and kelp greenling. This category is likely to change over time

[c] Groundfish in the "**Other Fish"** category are not managed with cumulative trip limits—catch is monitored only. This may change over time, and in 2005 some cumulative trip limits for Other Fish were imposed over part of the year.

### 2.4.4 Options for Vessel Cooperative Management Regime Alternatives

**CO-OP COMPONENT 1: Catch Control Tools**

***Catcher Vessels Delivering to Motherships (CV(MS))***

**CV(MS) Endorsement Qualifying Requirement:** More than 500 mt of whiting deliveries to motherships from
**Qualification Option A:** 1998 through 2004
**Qualification Option B**: from 1994 through 2003
**CV(MS) Permit Catch History.** CV(MS)-permit calculated catch history will be based on
**Allocation Option A:** its best 6 out of 7 years from 1998 through 2004
**Allocation Option B**: its best 9 out of 11 years from 1994 through 2004
**Allocation Option C:** its best 6 out of 7 years from 1998 through 2003
**Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

**Movement between Motherships.**
**Option A:** Require one year of participation in the non-co-op fishery (or one year of not fishing in the mothership sector) to move from one mothership to another.
**Option B:** CV(MS) permit owners may move between motherships at any time (if this option is selected, conforming changes will be made to all other sections of the mothership co-op alternative).

**Accumulation Limits.**
**MS Permit Ownership:** No individual or entity owning a MS permit(s) may process more than XX% of the total mothership sector whiting allocation.
**CV(MS) Permit Ownership:** No individual or entity may own CV(MS) permits for which the allocation totals greater than XX% of the total whiting mothership allocation.

***Catcher Vessels Delivering to Shoreside Processors***

**CV(SS) Endorsement Qualifying Requirement.** More than 500 mt of whiting deliveries to shoreside processors from
**Qualification Option A:** 1998 through 2004
**Qualification Option B**: 1998 through 2003
**Qualification Option C**: 1994 through 2004
**Qualification Option D**: 1994 through 2003 (original motion by Larkin was for through 2004. Later modifications were added to provide options just through 2003. This then created four options under the CV(SS) endorsement)
**CV(SS) Permit Catch History.** CV(SS)-permit calculated catch history will be based on
**Allocation Option A:** its best 6 out of 7 years from 1998 through 2004
**Allocation Option B**: its best 9 out of 11 years from 1994 through 2004
**Allocation Option C:** its best 6 out of 7 years from 1998 through 2003
**Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

**Co-op Formation.** Co-ops will be formed among CV(SS) permit owners.
Co-op formation will be based on the shoreside processor where the CV(SS) permit holders

**History Tie Option A:** delivered the majority of their most recent years' catch.
**History Tie Option B:** delivered the majority of the catch for the entire time period from 1994 thought 2003.
**History Tie Option C:** delivered the majority of the catch for the entire time period from 1994 thought 2004.

**Movement between Shoreside Processors.**

**Option A.** Require two years of participation in the non-co-op fishery to move from one mothership to another, and a two year commitment to a processor [Is this the same as two-year advance notice before changing or is this that they stayed with the processor at least two years?]
**Option B:** CV(SS) permit owners may move between motherships at any time (if this option is selected, conforming changes will be made to all other sections of the shoreside co-op alternative).

**Accumulation Limits.**

**Shoreisde Processing Permit Ownership:** No individual or entity of a SSP permit(s) may process more than XX% of the total shoreside sector's whiting allocation.
**CV(SS) Permit Ownership:** No individual or entity may own CV(SS) permits for which the allocation totals greater than XX% of the total whiting shoreside allocation.

***Catcher-Processors***

For Component 1, there are no options within this alternative.

**CO-OP COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied**

Component 2 applies to all three whiting sectors.

## Whiting

**Whiting Rollover Option 1**. There **will not** be a **rollover** of unused whiting from one whiting sector to another.
**Whiting Rollover Option 2.** Rollovers to other sectors may occur if sector participants are surveyed by NMFS and no participants intend to harvest remaining sector allocations.

**Bycatch Species**

**Subdivision Option A:** Subdivide bycatch species allocation among each of the whiting sectors (see Component 6 for basis for allocation).
**Subdivision Option B:** Do not subdivide bycatch species.

**No Bycatch Subdivision** If bycatch species are not allocated among the sectors, then

- **Bycatch Management Option 1:** all sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species, a controlled pace may be established if the sectors choose to work together cooperatively, potentially forming an intersector/interco-op cooperative.
- **Bycatch Management Option 2:** Same as Option 1, including the potential for forming co-ops, except seasonal releases will also be used to ensure some opportunity for all sectors.

All sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species but seasonal releases will be used to preserve some opportunity for all sectors.

**Bycatch Subdivision**

Rollovers. If each sector has its own allocation of bycatch, unused bycatch may be rolled over from one sector to another if the sector's full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.

## CO-OP COMPONENTS 3, 4, 5 and 6

For Components 3, 4 5, and 6 there are no options on which decisions are needed.

### *2.4.5 Options for IFQ Program Design Alternatives*

The IFQ program design details are divided into those having to do with initial allocation (B.1.0), those having to deal with when IFQ are required and rules for acquiring them (B.2.0), those having to do with program administration, evaluation, cost recovery and data collection (B.3.0), and those having to do with providing quota pounds to individuals developing proposals to benefit communities (B.4.0). Some of the central questions for each of these components are illustrated in the accompanying figures..

**IFQ Program Alternatives.** Differences among the IFQ program alternatives are highlighted in Table 2-6. As in Table 2-3, footnotes provide detailed descriptions of how particular elements vary between the alternatives. The labels in Table 2-6 correspond to elements in Appendix B and may be used to locate related sections of Table B-1. An overview of the elements and numbering system is provided in Figure 2-2. Table B-1 includes both the elements in the alternatives as well as other elements that were considered but not included in the alternatives currently being analyzed. In Table 2-6, those elements which need further development or for which an option must be selected before the alternative is adopted for analysis are highlighted in boxes with a thick line or with shaded text. Additionally, for elements that vary between the alternatives and which may be particularly amenable to simplification with additional policy guidance from the Council are highlighted in a box with triple lines. The following is a listing of the decision points contained in Table 2-6 and the current TIQC recommendations on each.

## Decision Points and Options – IFQ Program Design Details

Figure 2-2. Overview of organization of Table 2-5, IFQ program alternatives.

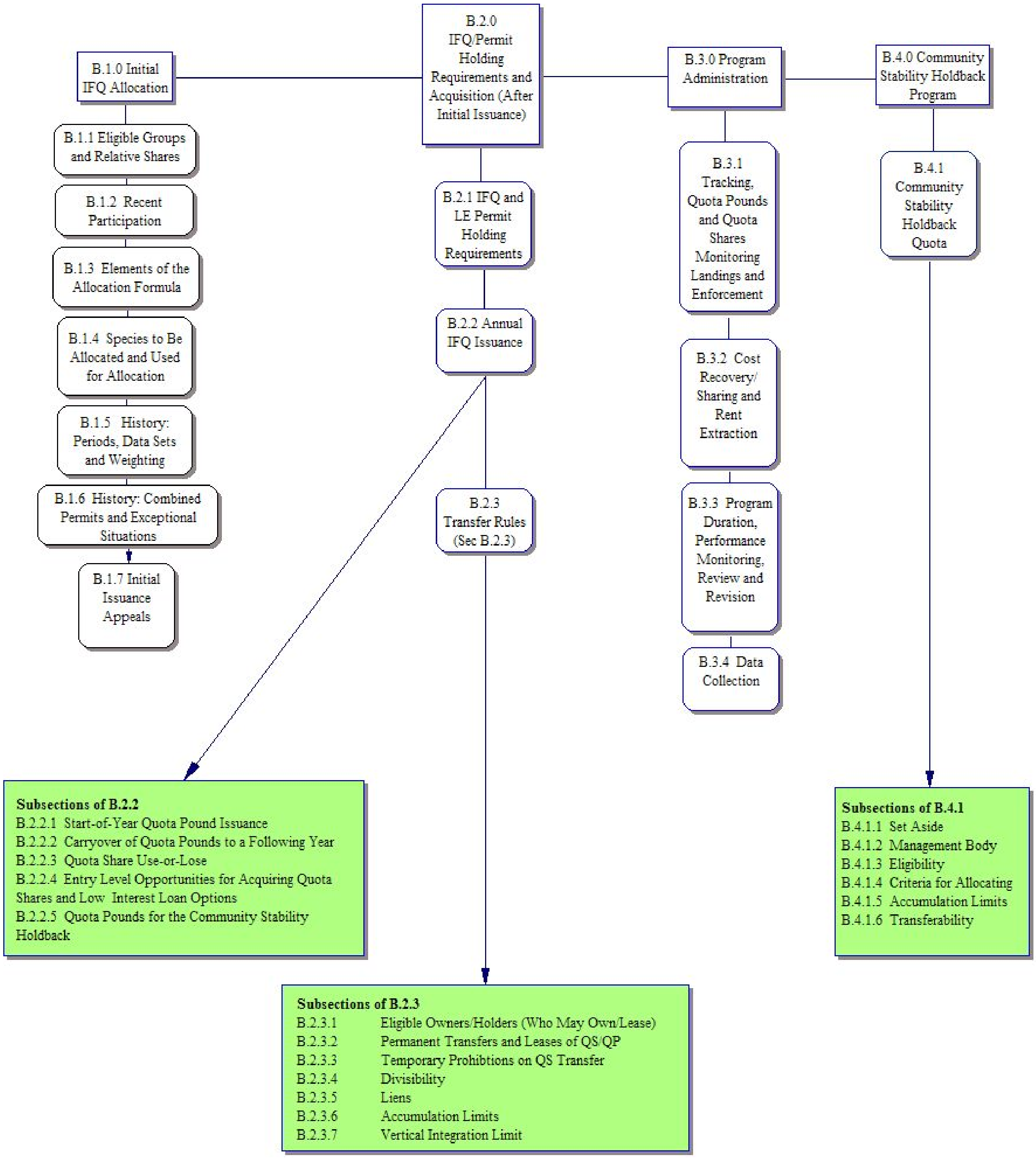


Table 2-5. Decision points for IFQ program alternatives (cells with a dark black border indicate options that will need to be chosen. Cells with a triple line indicate an area that may be particularly amenable to simplification with some additional policy guidance).

| | IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|---|
| **B.1.0 Initial IFQ Allocation** | | | |
| ***B.1.1 Eligible Groups and Relative Shares*** | QS Allocation<br>50% to permits[a]<br>50% to processors | QS Allocation<br>100% to permits<br>0% to processors | QS Allocation[b]<br>75% to permits<br>25% to processors |
| | The processing entity will be considered to be (Options):<br>Option A. the current owner of the facility.[c]<br>Option B: the current owner (unless leased in which case allocation would go to the lease holder,[d] or<br>Option C: the owner at the time processing.[e] | | Same processor entity options as Program A. |
| Processor Definition: | Use special IFQ Program definition for quota share allocation. See footnote. f | N/A | Same as Program A |
| ***B.1.2 Qualifying Criteria: Recent Participation*** | Recent participation required. | Should there be a recent participation requirement? (Yes/No) | Recent participation required. |
| | **Requirement for Permits (including catcher processors).** X deliveries or Y lbs from 1998-2003.<br><br>**Requirement for shoreside processors and motherships:** X deliveries received or Y lbs from 1999-2004. | **Requirement:**<br>1998-2003 participation required (one landing/delivery of any groundfish species) | Same as program A |
| ***B.1.3 Elements of the Allocation "Formula"*** | | | |
| Permit Related Allocation | Catcher vessel permit owners.<br>Species except overfished:<br>Permit catch history plus equal division of the catch history associated with bought-back permits [Rule needed to classify catcher vessel and catcher-processor permits.] | Catcher vessel permit owners: Same as Program A | Same as Program A. |
| | Overfished species,<br>Option A: Permit catch history for overfished species plus an equal division (i.e. same as for all other species).<br>Option B: Equally divide quota shares for incidentally caught overfished species. | | |
| | Catcher-processors permit owners: Schedule developed by that sector (to be provided). | Catcher Processors: Permit catch history. | |

| | IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|---|
| Processor Allocation | Processing history for groundfish received unprocessed. | N/A | Same as Program A. |
| ***B.1.4 Species/Species Groups to Be Allocated and Used for Allocation, Including Post Implementation Subdivision*** | QS species categories and area subdivision:<br>Option A: Use ABC/OY table species, covered by the management regime and for which a trawl allocation exists. [g]<br>Option B: Same as Option A except allocate for all species (leave QS for unallocated species dormant until needed).[h]<br>Option C: Same as Option A or Option B except subdivided into smaller geographic areas.[i]<br>Unallocated species will be issued later based on:<br>Suboption A.1: criteria determined at that time, [j]<br>Suboption A.2: ownership, at that time, of QS for related species[k]<br>Post implementation subdivision of QS:<br>All Programs -- divide proportionally based on ownership of the QS being subdivided.[l]<br>Species History Used for Allocation:<br>Option A: Use history of the QS species/species group.[m]<br>Option B: Use target species history only. Use target species as proxies for overfished and other incidental species.[n] | | |
| ***B.1.5 History: Allocation Periods, Data Sets, and Weighting*** | | | |
| Periods/Years to Drop: | Permits for Shoreside Catcher Vessels: Use fish tickets. 1994-2003. Drop 2 years for whiting trips. Drop 3 years for non-whiting trips.[o]<br>Permits for Mothership Catcher Vessels (Also for catcher processors, under Program B): Use observer data.[o] 1994-2003.<br>Shore Processors: Use fish tickets for 1999-2004. Drop 2 years. [o]<br>Motherships: Use observer data. 1998-2003. No opportunity to drop worst year. [o] | | |
| Weighting Among Years: | Absolute pounds – no weighting between years. | Relative pounds (share of annual catch). | Same as Program B |
| ***B.1.6 History: Combined Permits and Other Exceptional Situations*** | | | |
| : | Permit history for combined permits would include the history for all the permits that have been combined. History for illegal landings/deliveries will not count toward an allocation of quota shares. Landings made under EFPs that are in excess of the cumulative limits in place for the non-EFP fishery will not count toward an allocation of quota shares. Compensation fish will not count toward an allocation of quota shares.[p]. | | |
| ***B.1.7 Initial Issuance Appeals*** | Appeals would occur through processes developed by NMFS. | | |
| **B.2.0 IFQ/Permit Holding Requirements and IFQ Acquisition (After Initial Allocation)** | | | |
| ***B.2.1 IFQ and LE Permit Holding Requirements*** | LE permit required to use IFQ. Catch must be covered with quota pounds within 30 days of the landing. Sub-option: some quota pounds must be held prior to departure from port (to be analyzed and amount determined). | | |
| ***B.2.2 Annual IFQ Issuance*** | | | |
| ***B.2.2.1 Start-of-Year Quota Pound Issuance*** | Quota pounds are issued annually to quota share holders. | | |

## Decision Points and Options – IFQ Program Design Details

| | IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|---|
| ***B.2.2.2 Carryover of Quota Pounds to a Following Year*** | | | |
| Non-overfished Species | 10% carryover | 30% carryover | 5% carryover |
| Overfished Species | 5% carryover | Full (30%) carryover | No carryover |
| ***B.2.2.3 Quota Share Use-or-Lose Provisions*** | Do not include a use-or-lose provision but evaluate need as part of future program reviews. | | |
| ***B.2.2.4 Entry Level Opportunities for Acquiring Quota Shares and Low Interest Loan Options*** | No special provisions. | No special provisions. | Provide new entrants an opportunity to qualify for revoked shares. Trailing amendment.(?) |
| ***B.2.2.5 Quota Pounds for the Community Stability Program*** | No special provisions. | No special provisions. | Set aside up to 20% of the non-whiting shoreside trawl sector allocation each year for community stability program. See Section B.4. |
| ***B.2.3 Transfer Rules*** | | | |
| ***B.2.3.1 Eligible Owners/Holders (Who May Own or Lease QS/QP)*** | Any entity eligible to own or operate a US documented fishing vessel is eligible to own or lease QS/QP. | | |
| ***B.2.3.2 Permanent Transfers and Leases of QS/QP*** | Leasing allowed. *Consider eliminating reference to leasing of QP, too confusing.* | Leasing prohibited. | Leasing allowed. |
| ***B.2.3.3 Temporary Prohibitions on QS Transfer*** | None | Prohibit or limit transfer of quota shares during the last two months of the year. | None. |
| ***B.2.3.4 Divisibility*** | Quota Shares: nearly unrestricted divisibility – "many decimal points." Quota Pounds: divisible to the single pound | | |
| ***B.2.3.5 Liens*** | Allow the use of QS/QP as collateral. Allow liens to be placed on QS/QP. See central lien registry options in Section B.3.1. | | |
| ***B.2.3.6 Accumulation Limits on QS/QP*** (ownership, control and vessel use)[qr] | 50% or No Limits (Option 5). | Consider all limits as sub-options | Most restrictive limits (1% or 5%) **OR** Intermediate level limits (10% or 25%) |
| **B.2.3.7 Vertical Integration Limit** | No additional limits on vertical integration, beyond those already provided through accumulation limits. | | |

| | IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|---|
| **B.3.0 Program Administration** | | | |
| ***B.3.1 Limit Tracking Quota Pounds and Quota Shares, Monitoring Landings, and Enforcement*** | | | |
| | **Linked Provisions in Bold** | | |
| At-Sea Compliance Observers | **100% (possible small vessel exception)** | **100%** | **100% or cameras** |
| Shoreside Monitoring | **Less than 100%** | **100%** | **Less than 100%** |
| Retention and Discards | **Discards allowed** | **Full retention required** | **Discards allowed if at-sea observer is present (otherwise full retention)** |
| Discard Monitoring and Reporting System | **Upgrade** | **No upgrade** | **Upgrade** |
| Electronic Landings Reporting | Electronic fish tickets. | Electronic fish tickets. | Parallel federal electronic landings tracking |
| Advance Landing Notification | Required. | Required | Required |
| Potential Landing Times | **Unlimited** | **Limited (specify)** | **Unlimited** |
| Potential Landing Sites | **Only at licensed sites. No limit on ports.** | **Unlimited landings sites but limited ports.** | **Only at licensed sites. No limit on ports.** |
| Vessel Monitoring System (VMS) | VMS required | VMS required | VMS required |
| Quota Share and Quota Pound Tracking | Electronic transaction tracking.<br>Central lien registry with essential ownership information. | Electronic transaction tracking.<br>Central lien registry with all ownership information | Electronic transaction tracking.<br>Central lien registry with all ownership information.. |
| ***B.3.2 Cost Recovery/Sharing and Rent Extraction***<br>Exact means for fee collection to be specified | Cost recovery for management (not for enforcement or science).<br>Up to 3% of ex-vessel value, the limit specified in the Magnuson-Stevens Act. | Same as Program A | Full cost recovery: Landings fee plus privatization of some elements of the management system. (trailing amendment?) |
| ***B.3.3 Program Duration and Procedures for Program Performance Monitoring, Review, and Revision*** | Duration only limited by future FMP amendments.<br>A four year review process (possible review as part of biennial management cycle).<br>Review factors include localized depletion and quota shares utilization.<br>A community advisory committee will provide advice on performance of the IFQ program. | | |
| ***B.3.4 Data Collection***[s] | Expanded voluntary submission of economic data.[t] | Expanded mandatory submission .[u] | Same as Program B |

| | IFQ Program A | IFQ Program B | IFQ Program C |
|---|---|---|---|
| ***B.4.0 Community Stability Holdback Program*** | None | None | A portion of annual quota pounds would be allocated for proposals submitted by quota share/pound holders. Allocation would be based on quantitative criteria which place priority on community benefits. Criteria options to be determined. |

[a] **Permit owners** at the time of the allocation **including permits used for catcher-processors.**

[b] Note, under Element B.2.2.5 and Component 4, an option is specified under which each year the Council could allocate up to 20% of the available pounds to quota share holders presenting proposals designed to benefit communities. This would not change the amount of quota shares initially issued to permit owners and processors but would change the amount of quota pounds issued each year for those shares

[c] **Processors (including motherships and catcher-processors):** The current **owner of a processing facility**. Processing history accrues to the processing facility.

[d] **Processors (including motherships and catcher-processors):** The **current owner of a processing facility unless leased**, in which case the allocation would go to the lessee. Processing history accrues tot he processing facility.

[e] **Processors (including motherships):** The **person processing** (individual, partnership, corporation or other entity). Processing history accrues to the entity doing the processing and is not conveyed to subsequent owners of the processing facility. Note: Catch processors develop a consensus allocation formula under this options.

[f] **Processors:**

**At-sea processors** are those vessels that operate as motherships in the at sea whiting fishery and those permitted vessels operating as catcher-processors in the whiting fishery.

**A shoreside processor** is an operation, working on US soil, that takes delivery of trawl-caught groundfish that has not been "processed at-sea" and that has not been "processed shoreside"; and that thereafter engages that particular fish in "shoreside processing." Entities that received fish that have not undergone "at-sea processing" or "shoreside processing" (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a "processor" for purposes of QS/QP allocations. The recipient of the groundfish listed on the fishticket is presumed to be the first processor unless evidence is presented to NMFS that some other entity was the processor as defined in this section.

**"Shoreside Processing"** is defined as either of the following:

1. Any activity that takes place shoreside; and that involves:
   cutting groundfish into smaller portions; OR
   freezing, cooking, smoking, drying groundfish; OR
   packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.
2. The purchase and redistribution into a wholesale or retail market of live groundfish from a harvesting vessel.

For the at-sea fishery, observer data and weekly processing reports will be used to document landings. The presumption that the recipient of the groundfish listed on the fishticket is the first processor may potentially result in conflicting claims to the history for a particular landing (e.g. claims by the first receiver and a processing company to the history for same fish ticket). This will create a need for adjudication. Further criteria will need to be developed for use in adjudication.

[g] **Option A: Allocate QS only for those species and species groups which are identified in the OY table and are to be managed using IFQ at the start of the program.**

The species and species groups for which QS will be allocated are those:

i. Which, at the time of implementation are listed in the most recently approved OY table, or the OY table developed to be implemented at the same time as the TIQ program; AND
ii. Are identified for management with IFQs under the scope of the management regime (Section 1 of the component tables, Table 2-3), AND
iii. For which a trawl allocation has been or will be established either as part of an explicit intersector allocation action or as part of the biennial management process.

Separate quota shares will be issued for species and species groups for each geographic subdivision for the species/species group that is listed in the OY table.

Subdivision: There will be no subdivisions of QS for species groups or geographic areas, beyond the subdivisions for which OYs are established in any particular management period. If the OYs in existence at the time of initial allocation are subdivided at a later time, procedures outline here will be followed.

*Note 1: Some direction should be provided as to what happens if the needed allocations are not established. Does the TIQ program go on hold until such allocations are established or does the program begin to operate except with respect to those species for which the an allocation has not been established. Should there be a provision (escape clause) which allows the Council to recommend and NMFS to determine, prior to the start of the program whether or not the failure to establish an allocation for a particular species is sufficient to warrant delay in the start of the program?*

*Note 2: Low OY management provisions have now been eliminated from consideration. If they had been included, or are added back in, then some overfished species might not be managed with IFQ until they are rebuilt to certain levels. Under this provision, as currently specified, QS would not be issued for those species until they recovered to the point that they would be subject to IFQ management.*

[h] **Option B: Allocate QS for all species and species groups.** The species and species groups for which QS will be allocated are those: Which, at the time of implementation are listed in the most recently approved OY table, or the OY table developed to be implemented at the same time as the TIQ program. QS for species not managed under the IFQ program will remain dormant but become active only if ever the Council decides to extend the IFQ program to those species. . If at some future time a management unit is subdivided, quota shares for that unit will be subdivided by issuing quota share owners amount of shares for the subdivisions equivalent to their holdings of the shares being subdivided. Previously Element B.1.8.

**Subdivision:** There will be no subdivisions of QS for species groups or geographic areas, beyond the subdivisions for which OYs are established in any particular management period. If the OYs in existence at the time of initial allocation are subdivided at a later time, procedures outline above will be followed.

[i] **Option C: Same as Option A OR Option B except:** Subdivision: Species groups or geographic areas for species and species groups may be further subdivided (beyond the subdivisions listed in the OY table) at the Council discretion to meet other objectives that may be addressed by those subdivisions. *The primary additional subdivision contemplated at this time would be for area management. At this point, the Council has left open the question of whether there would be further subdivisions for area management. The subdivisions or rules for the subdivision need to be further developed. If the subdivisions are left for a later time, they may be implemented as per other provisions of Component B.1. (See Section 1 of the component table, Table 2-3*

[j] **Suboption A.1.** Future QS for non-IFQ species: Any species or species group for which quota share was not initially allocated may be allocated at a later time based on criteria determined by the Council at that time.

[k] **Suboption A.2.**Future QS for non-IFQ species: Any species or species group for which quota share was not initially allocated may be allocated at a later time based on a persons holding of QS for other species or species group. *The allocation approach suggested here for consideration is intended to eliminate incentive to fish for history for species not initially covered by the TIQ program*

[l] If at some future time a management unit is subdivided, quota shares owners will be issued shares for the subunits that are equivalent to their holdings of the shares being subdivided. This provision for future subdivision was Element B.1.8 of the June 2006 draft.

[m] **Option A:** For the portion of the QS for each species or species groups that will be allocated based on landing/delivery history, the landing/delivery history for that species or species group will be evaluated for each permit/processor to receive an allocation, unless otherwise specified in Element B.1.3. (Under B.1.2 there is an option under which some overfished species may be allocated equally among qualified initial recipients, rather than based on catch history.).
For past years in which the landings/deliveries for particular species or species group to be allocated were aggregated with other species or species groups, catch composition data will be applied to estimate the annual landings/deliveries associated with each permit/processor.

[n] **Option B:** Same as **Option A** except allocate certain incidental catch species (e.g. overfished species) based on incidental catch rates applied to the catch history for target species. The following are the species/species groups and the proxies that would be used for each: (This list needs to be completed and a determination made of the "incidental catch rates" that will be applied. Aggregate observer data from 2002 – 2006 may be available to estimates incidental catch

rates for each target. This data will be less applicable to catch in the 1990s than in more recent years. The rates will be rough approximations and their use would be based on the idea that this approach is more equitable for incidental catch species than relying on historic data for those species.)

If QS for an incidental catch species is allocated based on a co-occurring target species, rather than the actual history for that incidental species, an assumed incidental catch rate will be established based on available data. Such rate will need to be developed and adopted as part of the program. There may be different incidental rates for different co-occurring target species. For example, for darkblotched rockfish in the shoreside non-whiting fishery there may be one incidental rate applied to thornyhead landed and another applied to widow landed. The rates will be multiplied by the history for each target species (in this case thornyhead and widow) and the results summed to develop a single estimate of history for a particular permit or processor. Each permit/processor in a sector would receive allocation based on their history relative to other permits/processors in the sector, as determined in this manner.

[o] *Note: Given that motherships and catch processors have had 100 percent observer coverage for most of the period, the data are likely to indicate catches of incidental species. The following options specify use of observer data for allocating among vessels delivering at-sea. Data completeness for shoreside fisheries depends on full retention rule compliance.*
*Observer data is not likely to have the same quality and completeness as data for shoreside deliveries. The combination of at-sea delivery records and shoreside fishticket records into a single calculation of catch history could result in uneven treatment of shoreside and at-sea quota share recipients. As long as the delivery records are used to divide quota share allocated to the at-sea sectors only among participants in that sector, there should not be any equity issues among the trawl sectors arising from differences in the data quality. Only under Management Regime Alternative 4 would there be a single trawl sector (i.e. quota shares would not be designated for use by a particular sector). Because of the difficulty of developing a dataset with similar quality data for all trawl sectors, it is likely the quota shares would be divided among the sectors for purposes of initial allocation only. There would be no trawl sector specific designations for the quota shares so that after the initial issuance was completed the shares could be traded among the various trawl sectors.*
[p] **Stacked permits:** On rare occasions two trawl permits have been assigned to the same vessel. During the time more than one permit is assigned to a single vessel . . . Options: A. Divide landing/delivery history equally among both permits. B. Assign all landing/delivery history to the first permit registered for use with the vessel. This issue will not affect the analysis. Therefore, until the issue is decided Option A will be used.

[q] *This component deals with the possibility of placing limits on the amount of QS/QP a person (or with respect to use, a vessel) may own, control, or use.*
*Given that current options allow corporate, partnership and other legal entities to own QS/QP, decisions need to be made as to how QS/QP owned by these legal entities count toward caps of the individuals and persons who own those legal entities and how QS/QP owned by individuals and persons owning those legal entities count toward the caps for the legal entities. The first provision of this sub-element addresses how ownership and control will be evaluated with respect to entities such as corporations and partnerships.*
*Following the section defining ownership and control are sections with the options for control caps, ownership caps and vessel (use) caps. Separate sets of options are provided for caps on groundfish in aggregate (except whiting), individual species and species groups, and whiting.*
**Ownership Cap:** An accumulation limit on the ownership of QS/QP. This element would mean that no registered owner of QS/QP could own more than a predetermined percentage of the Quota Share Pool or Quota Pound Pool.

**Control Cap:** An accumulation limit on the control of QS/QP. This element would mean that no person could control more than a predetermined percentage of the quota share pool or quota pound pool, regardless of whether that control was established through ownership, leasing or other means. Control would go beyond ownership and leasing and include any situation where an entity had the ability to independently direct how QS/QP would be used. Enforcement of the provision would be through investigations initiated based on reasonably substantiated complaints of those who believe they are encountering adverse effects from excess control by an individual entity.

**Vessel Use Cap:** An accumulation limit on the QP that may be used on a single vessel during the year. This element would mean that no vessel could use more than a predetermined percentage of the quota pound pool.

[r] **Evaluation of Amounts Owned and Controled:** The TIQC has recommended the following (November 2006). The ownership or control of QS/QP by a particular legal entity will be construed as the combination of (1) all the QS/QP directly owned or controlled by that particular legal entity, and (2) all or a portion of the QS/QP owned by other legal entities that are at least partially owned by that particular legal entity. The QS/SP owned or controlled by the persons who own that particular legal entity will not count toward the cap for that entity. The portion of the QS/QP owned by a particular legal entity through ownership of another entity will be calculated through proration. Under proration, a person's share in ownership of the entity will be multiplied by the total QS or QP owned or controlled by that entity to determine the person's ownership or control of QS or QP owned or controlled by that entity for the purpose of applying accumulation caps. (Note a "particular legal entity" may also be an individual). Other methods considered but rejected included. **Count all:** Every person with an ownership interest in an entity will be considered to fully own or control all QS or QP owned or controlled by that entity (for the purpose of applying accumulation caps). **Count all with at least 10%:** Every person with at least a 10% ownership interest in an entity will be considered to fully own or control all QS or QP owned or controlled by that entity (for the purpose of applying accumulation caps).

[s] **Option C** Status quo data collection:

- Voluntary submission of economic data for LE trawl industry (status quo efforts)
- Voluntary submission of economic data for other sectors of the fishing industry.
- Ad hoc assessment of government costs.

**Voluntary Provisions:** NMFS will continue to support the PSMFC EFIN project attempts to collect economic and social data useful in evaluating the impacts of fishing and fishing regulations.

**Central Registry:** The program will include no new central registries for quota share owners/lessees or limited entry permit owners/lessees other than that necessary to directly support the IFQ tracking and monitoring system, as maintained by the NMFS Permit Office.

**Government Costs:** Data on the monitoring, administration, and enforcement costs related to governance of the IFQ program will be collected and summarized on an ad hoc basis.

[t] **Option A:** Expanded **mandatory** submission of economic data:

- Mandatory submission of economic data for LE trawl industry.
- Voluntary submission of economic data for other sectors of the fishing industry.
- Include transaction value information in a centralized registry of ownership and leases[shaded is added text].

- Formal monitoring or government costs.

**Mandatory Provisions:** The Pacific Fishery Management Council and the National Marine Fisheries Service shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data, compliance with which would be mandatory for members of the West Coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be maintained in a confidential manner and may not be released to any party other than staffs of Federal and state agencies directly involved in the management of the fisheries under the Council's authority and their contractors.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl IFQ program and continued through the life of the program. Cost, revenue, ownership, and employment data will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the IFQ program. This data could also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. This data collection effort is also required to evaluate achievement of goals and objectives associated with the IFQ program. Both statutory and regulatory language shall be developed to ensure the confidentiality of these data. Additional funding (as compared to status quo) will be needed to support the collection of these data.

Any mandatory data collection program shall include: A comprehensive discussion of the enforcement of such a program, including enforcement actions that would be taken if inaccuracies are found in mandatory data submissions. The intent of this action would be to ensure that accurate data are collected without being overly burdensome on industry in the event of unintended errors.

**Voluntary Provisions:** A voluntary data collection program will be used to collect information needed to assess spillover impacts on non-trawl fisheries.

**Central Registry:** Information on transaction prices will be included in a central registry of quota share owners/lessees. Such information would also be included for LE permit owners/lessees.

**Government Costs:** Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the IFQ program.

u **Option B:** Expanded **voluntary** submission of economic data:

- Voluntary submission of economic data for LE trawl industry (expanded survey efforts)
- Voluntary submission of economic data for other sectors of the fishing industry.
- Include transaction value information in a centralized registry of ownership and leases. [Shaded is added text.].
- Formal monitoring or government costs.

**Voluntary Provisions:** Attempts will be made to collect, on a voluntary basis, the same types of data identified for collection through a mandatory program. Additional funding (as compared to status quo) will be needed to support the collection of these data.

**Central Registry:** Information on transaction prices will be included in a central registry of quota share owners/lessees. Such information would also be included for LE permit owners/lessees.

**Government Costs:** Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the IFQ program.

### 2.4.6 Mixing and Matching

When the Council takes final action, it may mix and match between management regime and IFQ program alternatives and select different combinations of provisions within an alternative, to the degree that the final action remains internally consistent and impacts can be projected based on the analysis provided. For example, some Council members have indicated an interest in possibly combining IFQ Program Alternative A and B by specifying an option that would split the initial allocation of whiting shares 50/50 between permit holders and processors but provide all of the shares (100%) for all other groundfish species to permit holder. Other Council members have expressed an interest in a midpoint allocation such as a 90/10 permit holder processor split. To the degree that the effects of this kind of mixing and matching can be projected based on the analysis provided, the Council may select such options at the time of its final action.

Agenda Item E.4.a
Attachment 2
March 2007

# PRELIMINARY QUANTITATIVE ANALYSIS – ALLOCATION FORMULAS AND VESSEL ACCUMULATION LIMITS

The quantitative information in this attachment and Supplemental Attachment 3 is provided to help narrow and focus the allocation and accumulation limit analyses. The focus of the main analysis can be substantially narrowed to the degree that guidance is provided for the issues covered in these attachments. The Trawl Individual Quota Committee (TIQC) is expected to provide its recommendations on these issues in its supplemental report.

The following are the elements of the allocation formulas to be considered for permits and the time frame in which we expect to present supporting quantitative information. Also displayed is a list of some of the information being developed to support consideration of accumulation limits. After completing the analysis of each of these elements of the allocation formulas, the allocation formulas themselves will be quantitatively evaluated.

| **Elements of the Analysis** | **This Document** | **Supplemental Attachment 3** **(Presented at the February TIQC Meeting)** | **In the Spring** |
|---|---|---|---|
| Allocation Formula | | | |
| 1. Recent participation | Page 2 | | |
| 2. Equal sharing of buyback permit history | | X | |
| 3. Use of proxy species as the basis for allocation of overfished species | | | X |
| 4. Allocation period | | | X |
| 5. Dropping every permit's worst years from the calculation | Page 3 | | |
| 6. Use of relative (measured as a percent) or absolute (measured as pounds) history | Page 5 | | |
| 7. History of stacked permits | Page 6 | | |
| Accumulation Limits | | | |
| 8. Permit harvest concentration | Page 7 | | |
| 9. Harvest history of processor owned permits | | X | |
| 10. Horizontal integration (entities owning multiple permits) | | X | |
| 11. Vertical integration (entities owning both permits and processing facilities) | | X | |
| 12. Other information related to ownership and control limits. | | | X |

The use of proxy species and relative/absolute permit history may also apply for the processor allocation formulas. To date, analysis of the processor allocations formulas has been limited pending resolution of the rules that will be used for attributing and accruing processing history. Depending on those rules, and the degree of detail the Council wants to see in the analysis, data may need to be collected before an initial analysis can proceed (e.g., data on processing facility history).

At the February 2007 TIQC meeting, quantitative information will be provided on the amount of catch history associated with permits owned by processors. The TIQC will also be asked to examine ownership information for permits and processors. Information provided at the TIQC meeting will be provided to the Council in Supplemental Attachment 3.

## *Recent Participation*

Recent participation may be required for permits or processors to qualify for an initial allocation, including the equal sharing portion of the permit allocation. Tables and figures have been developed to help explore different recent participation periods under consideration. The individual fishing quota (IFQ) options specify that if a permit meets the recent participation requirement in aggregate then it will qualify for an initial allocation of quota share for each trawl sector for which it has at least some catch history (regardless of whether or not it has met recent participation requirements with respect to that particular sector). Thus a permit that participated in the whiting fishery early in the allocation period but had only participated in the nonwhiting fishery during the recent participation period would still qualify for quota shares based on its early participation in the whiting fishery.

The permit recent participation options that are part of the IFQ program are:

> **Option 1:** Recent participation not required.
> **Option 2:** Recent participation required (one landing/delivery from 1998-2003)
> **Option 3:** Recent participation required (1998-2003) [level of activity to be determined]

Additionally, the TIQC asked that the following option be analyzed in the environmental impact statement (EIS) so that it would be available for consideration, if warranted, based on the results.

> **Reserve Option:** Recent participation required (one landing/delivery from 2000-2003)

A set of tables has been developed for each catcher vessel sector in order to fully explore the available choices (Tables 1 through 3). Each table reports the results for different possible recent participation periods for a particular species or species group. The first column of each table lists a range of periods running from a single year (2003) through six years (1998-2003). Next there are columns reporting data for all the non-buyback permits with "No Landings" or deliveries during the indicated period, with landings/deliveries in only one year of the period, with landings/deliveries in only two years of the period, etc. Next is a column showing totals for all permits, including buyback permits, over the 1994-2003 period. The right half of the table shows similar information as the left side but expressed as a percent of the totals, including buyback permits.

The top series in each table shows numbers of permits, followed by a second series showing total groundfish round weight represented by the non-buyback permits falling into each category listed in the series at the top. In this way, the reader can see in Table 1, for example, that in the non-whiting fishery, for the 2000-2003 period, there were eight permits with landings in only one year and these permits had a total history of 12,652,871 pounds. If a recent participation requirement of more than one year of participation from 2000 through 2003 were required, then these eight permits and associated history would be eliminated from the initial allocation. From the right hand side of the table, the reader can see that these 12,652,871 pounds of groundfish equaled 1.6% of the total history for the period. Moving down in the table, the reader can see the amounts of catch history that would be eliminated for a selection of different species and species groups. Continuing with the same example, the table shows 5,396,466 pounds of DTS complex (Dover sole, thornyhead and sablefish) catch history would be eliminated. Toward the bottom of each table, one can see the number of the eliminated permits that were active in 2005, their total groundfish revenue and average revenue per permit. Again, continuing with the same example, three of the eight permits that would be eliminated from initial allocation were active in 2005, with a total groundfish exvessel revenue of $904,821 and average revenue per permit of $301,607.

In addition to the tables there are a series of figures (Figures 1 through 3) which allow the reader to begin to explore what might happen if more than a single landing/delivery in the recent participation period were required. These figures show the total number of landings/deliveries by each permit (y-axis) with the permits along the x-axis arrayed from those with the greatest number of landings/deliveries to those with the least. There is a separate figure for each of three periods: 1998-2003, 2000-2003, and 2002-2003. To the right of each of these figures is a second figure which zooms in on the segment of the x-axis that approaches the zero landing/delivery level. Looking at the graphs for the shoreside non-whiting sector, the top right hand figure shows that for 1998 through 2003 a relatively large "drop" in the number of landings occurs at about 110 trips, between the 101$^{st}$ and 102$^{nd}$ permits. Also at the lower right end of the distribution, a small break is discernible at around five landings, between the 151$^{st}$ and 152$^{nd}$ permit.

## *Dropping Years*

If every applicant is able to drop one or more of their worst years from the history-based portion of the allocation formula, the need to consider hardships may be lessened, reducing program costs. However, the effect of dropping some years is to reallocate from some permits ("losers") to others ("winners"). In general, those with a consistent year-to-year harvest pattern will lose allocation to those with a more varied harvest pattern. Tables 4 through 6 show for each catcher vessel sector (shoreside nonwhiting, shoreside whiting, and at-sea whiting) the number of winners and losers and the average gain or loss for each, depending on the number of years dropped. To provide a rough sense of the economic effect, exvessel revenue equivalents are provided by applying the 2005 exvessel prices for the species or species group to the change in number of pounds expected, assuming the trawl sector is allocated its 2005 harvest levels, that the permit's quota share allocation is based on the 1994-2003 allocation period, and that there is no equal sharing. Values are provided for both relative and absolute pounds based allocations (see below). Changes in exvessel value for the winners and losers are compared to the average 2005 exvessel revenue projected per permit before application of the drop-year provisions, to provide a sense of the magnitude of the change. This information is provided for selected species and species groups.

In general, the number of winners is several times greater than the number of losers, and consequently, the average reduction for the losers is several times greater than the average increase for the winners. This effect increases with the number of years dropped (1, 2 or 3), and percent change tends to be greater when relative pounds are used rather than when absolute pounds are used.

Also provided in these tables is the number of permits with a particular year as its lowest, 2nd lowest and 3rd lowest. This provides a rough indicator of the years in which more members of the fleet did their worst. Treatment of zero years confounds these results somewhat so an explanation is provided here.

| | |
|---|---|
| "Lowest" Row: | A permit may be counted in more than one year in the "Lowest Row." This occurs if the permit has more than one year with zero landings/deliveries for the species or species group. For example, a permit with nine zero years would show up nine times in the "Lowest" row. |
| 2nd Lowest Row: | The total in the "2nd Lowest" row may be lower than the total in the "3rd Lowest" row. For example, a permit with two zero years and positive values in the other years will not appear in the "2nd Lowest" row, but will in the "3rd Lowest." This is because the two zero years tie for lowest and so both would appear in the "Lowest' row. The lowest non-zero value would then appear in the "3rd Lowest" row. |
| 3nd Lowest Row: | The total in the "3nd Lowest" row may be greater than the total in the "2nd Lowest" row. See the explanation for "2nd Lowest" row. |

## *Relative Pounds vs. Absolute Pounds*

**Allocation Schemes**

Two approaches for calculating the harvest history used for initial allocation of quota shares were recommended by the TIQC--an absolute weight scheme and a relative weight scheme. Under the absolute weight scheme, the actual pounds landed are used in the allocation formulas. In the relative weight scheme, each permit's annual landings/deliveries are expressed as a percent of the total for the sector for the year. The annual percentages are then used in the allocation formula. These two approaches are explained in more detail below.

Limited entry trawl sector annual harvest (1994-2004) of species and species complexes currently managed with an OY are shown in Table 7. The four trawl sectors (at-sea whiting catcher processors, whiting deliveries at-sea to motherships, shoreside whiting, and shoreside non-whiting) are currently managed with different strategies, including varying quotas, seasons, and other management measures, to attain but not exceed established allocations. These data form the analytical basis of the initial quota share allocation schemes considered to date as part of a potential IFQ program.

Allocations Derived Using an Absolute Weight Scheme

The absolute weight scheme sums the landed poundage by species and complex for each individual permit in a given trawl sector during the allocation period and divides by the total catch for that sector during the period to determine each permit's quota share (this may be modified by other allocation factors such as equal sharing with respect to the catch history of buyback permits or the use of proxy species for the allocation of overfished species). In the absolute weight allocation scheme, each year of a permit's catch is weighted equally relative to the total fleet (i.e., sector) catch for the entire allocation period (i.e. a pound in 1994 counts the same as a pound in 2003).

Allocations Derived Using a Relative Weight Scheme

The relative weight allocation scheme bases each permit's quota share on its history each year of the allocation period, measured as a proportion of total fleet history that year. Each permit's quota share for a given species is determined by summing the annual ratios (the permit's history as a percent of the fleet total) across all permits, and then dividing by the sum of the ratios for all permits across all years for that species. The effect of this calculation is to "weight" each year's history by the ratios displayed in Table 8. (Note: While 2003 is the base year used in Table 8, the choice of which year in the period to use as the base year makes no difference with respect to illustrating the relative weights).

**Sample Histories**

Three actual permit histories for each of three trawl sectors are provided in Tables 9, 10 and 11. These show the effect of the alternative allocation schemes on permit holders' potential quota share, depending on the permit's history during the 1994-2004 period. Three representative histories are displayed: (1) relatively strong early year histories (Tables 9a, 10a, and 11a for the shoreside non-whiting, shoreside whiting, and at-sea whiting catcher vessels delivering to motherships, respectively), (2) relatively strong recent year histories (i.e., late year or stronger recent participation) (Tables 9b, 10b, and 11b for the shoreside non-whiting, shoreside whiting, and at-sea whiting catcher vessels delivering to motherships, respectively), and (3) relatively constant histories (Tables 9c, 10c, and 11c for the shoreside non-whiting, shoreside whiting, and at-sea whiting catcher vessels delivering to motherships, respectively). Additionally, total sector histories are shown in Tables 9d, 10d, and 11d for each of these sectors. Sample permit histories are not presented for permits in the at-sea whiting catcher-processor sector because of the cooperative formed by vessels in that sector, which renders a review of individual permit catch histories less meaningful.

In general, the relative weight scheme results in a lower quota share than the absolute weight scheme for permits with a relatively early catch history. This is largely because harvest of most, if not all, groundfish species and complexes during 1994-2004 have declined. A relative weight scheme applied during a period of declining harvest serves to reward permits with greater recent participation. A more detailed analysis is needed to compare and contrast catch history patterns relative to those of the entire fleet, but it appears that catch histories that diverge from the pattern exhibited by the entire fleet tend to be rewarded when determining quota shares using a relative weight scheme compared to an absolute weight scheme. Under a relative catch history approach, a permit with a pattern that is higher when fleet harvest is higher and lower when the fleet harvest is lower will receive less quota share than a permit with an identical number of total pounds distributed such that its higher years are when the fleet harvest is lower, and vice versa.

## *History of Stacked Permits*

Between1994 and 2004 there were 12 occurrences of permit stacking. One of these occurrences spanned two years, so the count of total events on an annual basis was 13. Most of the events occurred early in the period. For these stacking events, options (or a decision) are needed on how history should be attributed to permits during the events.

**Number of occurrences of landings/deliveries by vessels holding two trawl permits simultaneously each year**

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total occurrences of dual permits during the year | 1 | 4 | 3 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Switch from one permit to another during the year | 1 | 3 | 2 | | 2 | | 1 | | | | | |
| Two permits held at end of year | | 1 | 1 | | | | | | 1 | | 1 | |

The following graph indicates the amount of catch history taken during these events. The highest amount taken during a stacking event is omitted to preserve confidentiality.

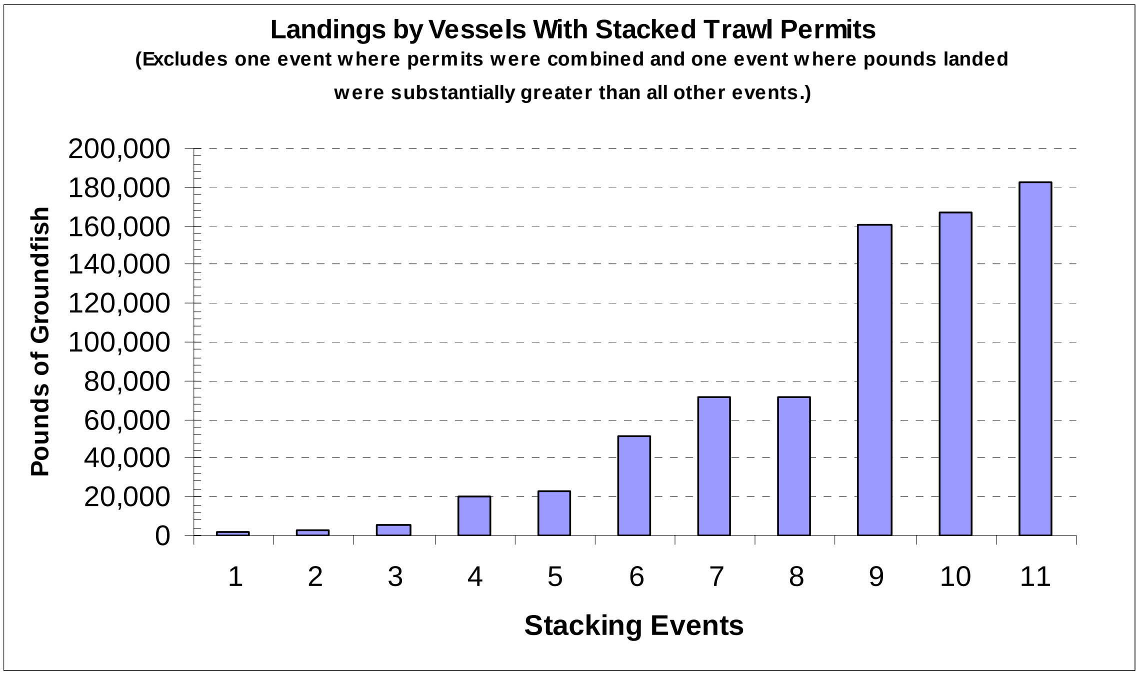



Table 12 is based on public information and tracks the movement of permits on and off vessels during the stacking occurrences. The periods during which two permits were on a single vessel are indicated by the dark cell boarder.

## *Accumulation Limits*

There are three types of accumulation limits to be considered: vessel, ownership, and control. For consideration of vessel accumulation limits, the following information was developed for each sector, year (1994-2005) and species/species group:

1. Averages: The average percent of the sector total landed/delivered by a permit with at least some landings/deliveries of the species.
2. Minimums: The minimum percent of the sector total landed/delivered by a permit with at least some landings/deliveries of the species.
3. Percentile Breakpoints: The percentage of the total landings/deliveries that were made by the permit that landed/delivered more than was landed/delivered by 25% of permits in the sector ($25^{th}$ percentile), 50% of permits in the sector ($50^{th}$ percentile), 75% of permits in the sector ($75^{th}$ percentile), and 90% of permits in the sector ($90^{th}$ percentile).
4. The maximum amount landed/delivered by any single permit
5. The total number of permits with at least one landing/delivery of the species.

After developing this information for each year, summary information was developed covering the entire period. For each of the sectors, there is one summary sheet showing the average of all the annual values across the entire period, another showing the maximum of all the annual values across the entire period, and a third showing the minimum of all the annual values across the entire period. The summary information is displayed in Tables 13 through 17.[1] There is a set of summary tables for each of the following five categories of harvesting vessels

- shoreside nonwhiting
- shoreside whiting
- combined shoreside
- at-sea catcher vessels (delivering to motherships)
- catcher-processors

As an example, let's look at sablefish (coastwide) for the shoreside nonwhiting fishery (page 2 of Table 13). Turning then to the table of maximums for the shoreside nonwhiting fishery, one can see that the greatest single year average over the entire period was 0.86%. The greatest share in any single year by any permit over the entire period was 5.06% of the fleet's total in that year. The greatest percent landed in any one year by the permit in that year that landed more than 90% of the rest of the fleet in that year was 1.40%. The minimum landed in any one year by any permit with at least some landings was 0.006% of the fleet's total. It should be noted that the maximum permit count shown in this table for coastwide sablefish (241 permits) is likely to be closer to the count in the year in which the minimum catch concentrations occurred, and the permit count shown on the page of the table covering minimums (the 116 permits shown in page 3 of Table 13) is likely to be closer to the count in the year in which the maximum catch concentrations occurred.

[1] The TIQC was provided with 65 additional pages of tables at its February 2007 meeting, one for each year and sector. These tables are available on request.

**Table 1. Shoreside non-whiting sector: number of non-buyback permits, rwt lbs or ex-vessel revenue that would be excluded under alternative recent participation requirement periods (Page 1 of 3)**

**Total Groundfish**

| # permits | | Landings In: | | | | | | % of permits | | Landings In: | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) | Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
| 2003 | 83 | | | | | | 302 | 2003 | 27.5% | | | | | |
| 2002-2003 | 78 | 11 | | | | | | 2002-2003 | 25.8% | 3.6% | | | | |
| 2001-2003 | 69 | 12 | 14 | | | | | 2001-2003 | 22.8% | 4.0% | 4.6% | | | |
| 2000-2003 | 62 | 8 | 13 | 18 | | | | 2000-2003 | 20.5% | 2.6% | 4.3% | 6.0% | | |
| 1999-2003 | 51 | 11 | 9 | 12 | 22 | | | 1999-2003 | 16.9% | 3.6% | 3.0% | 4.0% | 7.3% | |
| 1998-2003 | 50 | **W** | 11 | 11 | 13 | 21 | | 1998-2003 | 16.6% | **W** | 3.6% | 3.6% | 4.3% | 7.0% |

| RWT lbs | | Landings In: | | | | | | % of RWT lbs | | Landings In: | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) | Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
| 2003 | 79,794,003 | | | | | | 781,038,117 | 2003 | 10.2% | | | | | |
| 2002-2003 | 59,096,959 | 27,977,521 | | | | | | 2002-2003 | 7.6% | 3.6% | | | | |
| 2001-2003 | 42,854,833 | 19,614,857 | 36,258,765 | | | | | 2001-2003 | 5.5% | 2.5% | 4.6% | | | |
| 2000-2003 | 30,543,036 | 12,652,871 | 20,013,622 | 38,113,247 | | | | 2000-2003 | 3.9% | 1.6% | 2.6% | 4.9% | | |
| 1999-2003 | 19,441,500 | 11,101,536 | 12,666,721 | 19,999,772 | 39,005,902 | | | 1999-2003 | 2.5% | 1.4% | 1.6% | 2.6% | 5.0% | |
| 1998-2003 | 19,175,849 | **W** | 11,066,073 | 15,301,908 | 19,210,964 | 41,446,076 | | 1998-2003 | 2.5% | **W** | 1.4% | 2.0% | 2.5% | 5.3% |

**DTS complex**

| RWT lbs | | Landings In: | | | | | | % of RWT lbs | | Landings In: | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) | Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
| 2003 | 32,541,421 | | | | | | 348,454,116 | 2003 | 9.3% | | | | | |
| 2002-2003 | 23,709,414 | 12,146,813 | | | | | | 2002-2003 | 6.8% | 3.5% | | | | |
| 2001-2003 | 18,255,725 | 7,957,375 | 16,884,745 | | | | | 2001-2003 | 5.2% | 2.3% | 4.8% | | | |
| 2000-2003 | 13,006,088 | 5,396,466 | 8,343,611 | 17,603,853 | | | | 2000-2003 | 3.7% | 1.5% | 2.4% | 5.1% | | |
| 1999-2003 | 7,847,856 | 5,158,232 | 5,396,821 | 8,343,256 | 18,014,475 | | | 1999-2003 | 2.3% | 1.5% | 1.5% | 2.4% | 5.2% | |
| 1998-2003 | 7,708,101 | **W** | 5,144,310 | 6,637,161 | 7,897,123 | 18,487,143 | | 1998-2003 | 2.2% | **W** | 1.5% | 1.9% | 2.3% | 5.3% |

**Petrale sole**

| RWT lbs | | Landings In: | | | | | | % of RWT lbs | | Landings In: | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) | Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
| 2003 | 2,425,564 | | | | | | 37,116,922 | 2003 | 6.5% | | | | | |
| 2002-2003 | 2,070,034 | 687,454 | | | | | | 2002-2003 | 5.6% | 1.9% | | | | |
| 2001-2003 | 1,537,635 | 687,296 | 1,305,022 | | | | | 2001-2003 | 4.1% | 1.9% | 3.5% | | | |
| 2000-2003 | 1,070,248 | 528,865 | 633,879 | 1,440,935 | | | | 2000-2003 | 2.9% | 1.4% | 1.7% | 3.9% | | |
| 1999-2003 | 662,140 | 408,108 | 530,721 | 632,023 | 1,506,659 | | | 1999-2003 | 1.8% | 1.1% | 1.4% | 1.7% | 4.1% | |
| 1998-2003 | 616,573 | **W** | 404,855 | 665,217 | 568,238 | 1,506,790 | | 1998-2003 | 1.7% | **W** | 1.1% | 1.8% | 1.5% | 4.1% |

**"W"- Withheld for possible confidentiality concerns.**

**Table 1. Shoreside non-whiting sector: number of non-buyback permits, rwt lbs or ex-vessel revenue that would be excluded under alternative recent participation requirement periods (Page 2 of 3)**

**Arrowtooth flounder**

| RWT lbs Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 5,107,742 | | | | | | 62,912,166 |
| 2002-2003 | 5,070,003 | 484,070 | | | | | |
| 2001-2003 | 4,069,939 | 1,025,103 | 642,249 | | | | |
| 2000-2003 | 2,454,037 | 1,629,985 | 1,012,497 | 727,813 | | | |
| 1999-2003 | 1,541,790 | 912,247 | 1,629,985 | 1,012,497 | 758,743 | | |
| 1998-2003 | 1,541,618 | **W** | 912,247 | 1,882,594 | 760,889 | 824,984 | |

| % of RWT lbs Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 8.1% | | | | | |
| 2002-2003 | 8.1% | 0.8% | | | | |
| 2001-2003 | 6.5% | 1.6% | 1.0% | | | |
| 2000-2003 | 3.9% | 2.6% | 1.6% | 1.2% | | |
| 1999-2003 | 2.5% | 1.5% | 2.6% | 1.6% | 1.2% | |
| 1998-2003 | 2.5% | **W** | 1.5% | 3.0% | 1.2% | 1.3% |

**Yellowtail rockfish**

| RWT lbs Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 6,804,811 | | | | | | 48,259,667 |
| 2002-2003 | 6,653,389 | 582,562 | | | | | |
| 2001-2003 | 4,814,489 | 1,856,023 | 625,297 | | | | |
| 2000-2003 | 3,671,377 | 1,147,538 | 1,885,274 | 610,932 | | | |
| 1999-2003 | 2,757,479 | 913,898 | 1,147,538 | 1,885,274 | 762,603 | | |
| 1998-2003 | 2,757,057 | **W** | 913,898 | 1,268,937 | 1,763,892 | 1,287,067 | |

| % of RWT lbs Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 14.1% | | | | | |
| 2002-2003 | 13.8% | 1.2% | | | | |
| 2001-2003 | 10.0% | 3.8% | 1.3% | | | |
| 2000-2003 | 7.6% | 2.4% | 3.9% | 1.3% | | |
| 1999-2003 | 5.7% | 1.9% | 2.4% | 3.9% | 1.6% | |
| 1998-2003 | 5.7% | **W** | 1.9% | 2.6% | 3.7% | 2.7% |

**Nearshore Rockfish**

| RWT lbs Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 45,177 | | | | | | 151,579 |
| 2002-2003 | 2,438 | 44,164 | | | | | |
| 2001-2003 | 1,622 | 2,240 | 46,186 | | | | |
| 2000-2003 | 606 | 1,017 | 2,244 | 46,255 | | | |
| 1999-2003 | 74 | 532 | 1,023 | 2,238 | 46,255 | | |
| 1998-2003 | 72 | **W** | 538 | 1,021 | 3,110 | 47,605 | |

| % of RWT lbs Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 29.8% | | | | | |
| 2002-2003 | 1.6% | 29.1% | | | | |
| 2001-2003 | 1.1% | 1.5% | 30.5% | | | |
| 2000-2003 | 0.4% | 0.7% | 1.5% | 30.5% | | |
| 1999-2003 | 0.0% | 0.4% | 0.7% | 1.5% | 30.5% | |
| 1998-2003 | 0.0% | **W** | 0.4% | 0.7% | 2.1% | 31.4% |

**"W"- Withheld for possible confidentiality concerns.**

**Table 1. Shoreside non-whiting sector: number of non-buyback permits, rwt lbs or ex-vessel revenue that would be excluded under alternative recent participation requirement periods (Page 3 of 3)**

**Total Groundfish in 2005**

**# permits**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 17 | | | | | | 122 |
| 2002-2003 | 13 | 6 | | | | | |
| 2001-2003 | 8 | 7 | 8 | | | | |
| 2000-2003 | 5 | 3 | 8 | 12 | | | |
| 1999-2003 | 4 | **W** | 4 | 7 | 14 | | |
| 1998-2003 | 3 | **W** | **W** | 5 | 7 | 14 | |

**% of permits**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 13.9% | | | | | |
| 2002-2003 | 10.7% | 4.9% | | | | |
| 2001-2003 | 6.6% | 5.7% | 6.6% | | | |
| 2000-2003 | 4.1% | 2.5% | 6.6% | 9.8% | | |
| 1999-2003 | 3.3% | **W** | 3.3% | 5.7% | 11.5% | |
| 1998-2003 | 2.5% | **W** | **W** | 4.1% | 5.7% | 11.5% |

**2005 GF REV $**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 3,899,029 | | | | | | 22,302,790 |
| 2002-2003 | 2,899,081 | 1,299,643 | | | | | |
| 2001-2003 | 1,967,433 | 1,231,343 | 1,747,714 | | | | |
| 2000-2003 | 1,062,612 | 904,821 | 1,388,916 | 1,993,379 | | | |
| 1999-2003 | 562,381 | **W** | 916,253 | 1,377,484 | 2,488,714 | | |
| 1998-2003 | 323,651 | **W** | **W** | 1,403,557 | 905,534 | 2,583,801 | |

**% of 2005 GF REV $**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 17.5% | | | | | |
| 2002-2003 | 13.0% | 5.8% | | | | |
| 2001-2003 | 8.8% | 5.5% | 7.8% | | | |
| 2000-2003 | 4.8% | 4.1% | 6.2% | 8.9% | | |
| 1999-2003 | 2.5% | **W** | 4.1% | 6.2% | 11.2% | |
| 1998-2003 | 1.5% | **W** | **W** | 6.3% | 4.1% | 11.6% |

**2005 GF REV per permit ($)**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 229,355 | | | | | |
| 2002-2003 | 223,006 | 216,607 | | | | |
| 2001-2003 | 245,929 | 175,906 | 218,464 | | | |
| 2000-2003 | 212,522 | 301,607 | 173,615 | 166,115 | | |
| 1999-2003 | 140,595 | **W** | 229,063 | 196,783 | 177,765 | |
| 1998-2003 | 107,884 | **W** | **W** | 280,711 | 129,362 | 184,557 |

**"W"- Withheld for possible confidentiality concerns.**

**Table 2. Shoreside whiting sector: number of non-buyback permits, rwt lbs or ex-vessel revenue that would be excluded under alternative recent participation requirement periods (Page 1 of 2)**

**Total Groundfish**

**# permits**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 15 | | | | | | 84 |
| 2002-2003 | 14 | 5 | | | | | |
| 2001-2003 | 11 | 4 | 5 | | | | |
| 2000-2003 | 6 | 5 | 5 | 5 | | | |
| 1999-2003 | 5 | **W** | 5 | 5 | 6 | | |
| 1998-2003 | 5 | 0 | **W** | 6 | 5 | 7 | |

**% of permits**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 17.9% | | | | | |
| 2002-2003 | 16.7% | 6.0% | | | | |
| 2001-2003 | 13.1% | 4.8% | 6.0% | | | |
| 2000-2003 | 7.1% | 6.0% | 6.0% | 6.0% | | |
| 1999-2003 | 6.0% | **W** | 6.0% | 6.0% | 7.1% | |
| 1998-2003 | 6.0% | | **W** | 7.1% | 6.0% | 8.3% |

**RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 268,773,973 | | | | | | 1,654,827,484 |
| 2002-2003 | 216,311,636 | 67,528,648 | | | | | |
| 2001-2003 | 168,923,627 | 53,006,421 | 72,481,891 | | | | |
| 2000-2003 | 55,308,028 | 113,615,599 | 53,567,012 | 109,621,002 | | | |
| 1999-2003 | 20,472,507 | **W** | 113,615,599 | 53,567,012 | 139,237,579 | | |
| 1998-2003 | 20,472,507 | 0 | **W** | 114,176,189 | 63,578,076 | 164,305,656 | |

**% of RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 16.2% | | | | | |
| 2002-2003 | 13.1% | 4.1% | | | | |
| 2001-2003 | 10.2% | 3.2% | 4.4% | | | |
| 2000-2003 | 3.3% | 6.9% | 3.2% | 6.6% | | |
| 1999-2003 | 1.2% | **W** | 6.9% | 3.2% | 8.4% | |
| 1998-2003 | 1.2% | | **W** | 6.9% | 3.8% | 9.9% |

**Whiting**

**RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 265,170,032 | | | | | | 1,642,654,148 |
| 2002-2003 | 213,339,202 | 66,806,373 | | | | | |
| 2001-2003 | 166,462,206 | 52,468,749 | 71,635,567 | | | | |
| 2000-2003 | 54,258,176 | 112,204,030 | 53,028,965 | 108,594,158 | | | |
| 1999-2003 | 19,935,267 | **W** | 112,204,030 | 53,028,965 | 137,840,166 | | |
| 1998-2003 | 19,935,267 | 0 | **W** | 112,764,247 | 62,889,695 | 162,846,747 | |

**% of RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 16.1% | | | | | |
| 2002-2003 | 13.0% | 4.1% | | | | |
| 2001-2003 | 10.1% | 3.2% | 4.4% | | | |
| 2000-2003 | 3.3% | 6.8% | 3.2% | 6.6% | | |
| 1999-2003 | 1.2% | **W** | 6.8% | 3.2% | 8.4% | |
| 1998-2003 | 1.2% | | **W** | 6.9% | 3.8% | 9.9% |

**"W"- Withheld for possible confidentiality concerns.**

**Table 2. Shoreside whiting sector: number of non-buyback permits, rwt lbs or ex-vessel revenue that would be excluded under alternative recent participation requirement periods (Page 2 of 2)**

**Total Groundfish in 2005**

**# permits**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | | 29 |
| 2002-2003 | **W** | **W** | | | | | |
| 2001-2003 | 0 | **W** | **W** | | | | |
| 2000-2003 | 0 | 0 | **W** | **W** | | | |
| 1999-2003 | 0 | 0 | 0 | **W** | **W** | | |
| 1998-2003 | 0 | 0 | 0 | 0 | **W** | 3 | |

**% of permits**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | |
| 2002-2003 | **W** | **W** | | | | |
| 2001-2003 | | **W** | **W** | | | |
| 2000-2003 | | | **W** | **W** | | |
| 1999-2003 | | | | **W** | **W** | |
| 1998-2003 | | | | | **W** | 10.3% |

**2005 GF REV $**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | | 11,715,640 |
| 2002-2003 | **W** | **W** | | | | | |
| 2001-2003 | 0 | **W** | **W** | | | | |
| 2000-2003 | 0 | 0 | **W** | **W** | | | |
| 1999-2003 | 0 | 0 | 0 | **W** | **W** | | |
| 1998-2003 | 0 | 0 | 0 | 0 | **W** | 1,049,743 | |

**% of 2005 GF REV $**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | |
| 2002-2003 | **W** | **W** | | | | |
| 2001-2003 | | **W** | **W** | | | |
| 2000-2003 | | | **W** | **W** | | |
| 1999-2003 | | | | **W** | **W** | |
| 1998-2003 | | | | | **W** | 9.0% |

**2005 GF REV per permit ($)**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | |
| 2002-2003 | **W** | **W** | | | | |
| 2001-2003 | - | **W** | **W** | | | |
| 2000-2003 | - | - | **W** | **W** | | |
| 1999-2003 | - | - | - | **W** | **W** | |
| 1998-2003 | - | - | - | - | **W** | 349,914 |

**"W"- Withheld for possible confidentiality concerns.**

**Table 3. At-sea whiting catcher vessel sector: number of non-buyback permits, rwt lbs or ex-vessel revenue that would be excluded under alternative recent participation requirement periods (Page 1 of 2)**

**Total Groundfish**

**# permits**

| Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 11 | | | | | | 40 |
| 2002-2003 | 11 | 3 | | | | | |
| 2001-2003 | 9 | 3 | 3 | | | | |
| 2000-2003 | 7 | **W** | 3 | 4 | | | |
| 1999-2003 | 6 | **W** | **W** | 3 | 6 | | |
| 1998-2003 | 5 | **W** | **W** | **W** | 5 | 5 | |

**% of permits**

| Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 27.5% | | | | | |
| 2002-2003 | 27.5% | 7.5% | | | | |
| 2001-2003 | 22.5% | 7.5% | 7.5% | | | |
| 2000-2003 | 17.5% | **W** | 7.5% | 10.0% | | |
| 1999-2003 | 15.0% | **W** | **W** | 7.5% | 15.0% | |
| 1998-2003 | 12.5% | **W** | **W** | **W** | 12.5% | 12.5% |

**RWT lbs**

| Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 165,962,323 | | | | | | 909,800,760 |
| 2002-2003 | 165,962,323 | 84,762,881 | | | | | |
| 2001-2003 | 110,419,677 | 89,282,228 | 60,979,912 | | | | |
| 2000-2003 | 68,527,864 | **W** | 89,282,228 | 66,574,908 | | | |
| 1999-2003 | 57,853,947 | **W** | **W** | 89,282,228 | 97,967,759 | | |
| 1998-2003 | 48,918,552 | **W** | **W** | **W** | 129,960,727 | 58,518,986 | |

**% of RWT lbs**

| Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 18.2% | | | | | |
| 2002-2003 | 18.2% | 9.3% | | | | |
| 2001-2003 | 12.1% | 9.8% | 6.7% | | | |
| 2000-2003 | 7.5% | **W** | 9.8% | 7.3% | | |
| 1999-2003 | 6.4% | **W** | **W** | 9.8% | 10.8% | |
| 1998-2003 | 5.4% | **W** | **W** | **W** | 14.3% | 6.4% |

**Whiting**

**RWT lbs**

| Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 162,980,538 | | | | | | 901,070,486 |
| 2002-2003 | 162,980,538 | 83,974,025 | | | | | |
| 2001-2003 | 108,421,523 | 88,083,110 | 60,315,601 | | | | |
| 2000-2003 | 67,428,851 | **W** | 88,083,110 | 65,900,714 | | | |
| 1999-2003 | 56,957,790 | **W** | **W** | 88,083,110 | 97,082,755 | | |
| 1998-2003 | 48,116,172 | **W** | **W** | **W** | 128,460,561 | 57,924,166 | |

**% of RWT lbs**

| Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 18.1% | | | | | |
| 2002-2003 | 18.1% | 9.3% | | | | |
| 2001-2003 | 12.0% | 9.8% | 6.7% | | | |
| 2000-2003 | 7.5% | **W** | 9.8% | 7.3% | | |
| 1999-2003 | 6.3% | **W** | **W** | 9.8% | 10.8% | |
| 1998-2003 | 5.3% | **W** | **W** | **W** | 14.3% | 6.4% |

**"W"- Withheld for possible confidentiality concerns.**

**Table 3. At-sea whiting catcher vessel sector: number of non-buyback permits, rwt lbs or ex-vessel revenue that would be excluded under alternative recent participation requirement periods (Page 2 of 2)**

**Total Groundfish in 2005**

| **# permits** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 3 | | | | | | 16 |
| 2002-2003 | 3 | **W** | | | | | |
| 2001-2003 | **W** | 3 | **W** | | | | |
| 2000-2003 | **W** | 0 | 3 | **W** | | | |
| 1999-2003 | 0 | **W** | 0 | 3 | **W** | | |
| 1998-2003 | 0 | 0 | **W** | 0 | 4 | **W** | |

| **% of permits** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 18.8% | | | | | |
| 2002-2003 | 18.8% | **W** | | | | |
| 2001-2003 | **W** | 18.8% | **W** | | | |
| 2000-2003 | **W** | | 18.8% | **W** | | |
| 1999-2003 | | **W** | | 18.8% | **W** | |
| 1998-2003 | | | **W** | | 25.0% | **W** |

| **2005 GF REV $** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 673,970 | | | | | | 4,785,437 |
| 2002-2003 | 673,970 | **W** | | | | | |
| 2001-2003 | **W** | 505,719 | **W** | | | | |
| 2000-2003 | **W** | 0 | 505,719 | **W** | | | |
| 1999-2003 | 0 | **W** | 0 | 505,719 | **W** | | |
| 1998-2003 | 0 | 0 | **W** | 0 | 802,978 | **W** | |

| **% of 2005 GF REV $** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 14.1% | | | | | |
| 2002-2003 | 14.1% | **W** | | | | |
| 2001-2003 | **W** | 10.6% | **W** | | | |
| 2000-2003 | **W** | | 10.6% | **W** | | |
| 1999-2003 | | **W** | | 10.6% | **W** | |
| 1998-2003 | | | **W** | | 16.8% | **W** |

| **2005 GF REV per permit ($)** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 224,657 | | | | | |
| 2002-2003 | 224,657 | **W** | | | | |
| 2001-2003 | **W** | 168,573 | **W** | | | |
| 2000-2003 | **W** | - | 168,573 | **W** | | |
| 1999-2003 | - | **W** | - | 168,573 | **W** | |
| 1998-2003 | - | - | **W** | - | 200,745 | **W** |

**"W"- Withheld for possible confidentiality concerns.**

**Table 4. Shoreside Non-whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 1 of 6)**

**Species: DTS** — **$34,403** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 156 | 151 | 143 |
| $ average gain | + 500 | + 1,093 | + 1,813 |
| Percent change | 1% | 3% | 5% |
| **# Losers** | 41 | 46 | 54 |
| $ average loss | - 1,903 | - 3,587 | - 4,801 |
| Percent change | -6% | -10% | -14% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 24 | 13 | 6 | 12 | 26 | 19 | 27 | 44 | 51 | 38 |
| 2nd Lowest | 8 | 5 | 3 | 4 | 9 | 7 | 12 | 15 | 14 | 8 |
| 3rd Lowest | 7 | 5 | 4 | 4 | 9 | 8 | 12 | 22 | 10 | 14 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 158 | 151 | 144 |
| $ average gain | + 612 | + 1,284 | + 2,102 |
| Percent change | 2% | 4% | 6% |
| **# Losers** | 39 | 46 | 53 |
| $ average loss | - 2,479 | - 4,216 | - 5,710 |
| Percent change | -7% | -12% | -17% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 25 | 16 | 7 | 14 | 22 | 15 | 23 | 37 | 35 | 34 |
| 2nd Lowest | 12 | 10 | 11 | 9 | 7 | 9 | 7 | 3 | 10 | 7 |
| 3rd Lowest | 10 | 11 | 10 | 10 | 11 | 9 | 14 | 10 | 8 | 2 |

**Species: Sablefish** — **$16,431** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 147 | 146 | 139 |
| $ average gain | + 208 | + 463 | + 809 |
| Percent change | 1% | 3% | 5% |
| **# Losers** | 45 | 46 | 53 |
| $ average loss | - 680 | - 1,469 | - 2,122 |
| Percent change | -4% | -9% | -13% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 27 | 16 | 7 | 12 | 27 | 21 | 31 | 38 | 64 | 38 |
| 2nd Lowest | 10 | 5 | 2 | 1 | 18 | 4 | 4 | 7 | 26 | 7 |
| 3rd Lowest | 9 | 8 | 1 | 1 | 16 | 4 | 15 | 19 | 7 | 13 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 151 | 148 | 139 |
| $ average gain | + 302 | + 627 | + 1,049 |
| Percent change | 2% | 4% | 6% |
| **# Losers** | 41 | 44 | 53 |
| $ average loss | - 1,112 | - 2,110 | - 2,752 |
| Percent change | -7% | -13% | -17% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 30 | 16 | 11 | 14 | 27 | 22 | 30 | 40 | 43 | 36 |
| 2nd Lowest | 13 | 14 | 4 | 6 | 5 | 7 | 12 | 8 | 9 | 8 |
| 3rd Lowest | 9 | 12 | 11 | 14 | 9 | 10 | 7 | 14 | 5 | 8 |

**Table 4. Shoreside Non-whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 2 of 6)**

**Species: Dover sole** — **$16,050** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 153 | 151 | 148 |
| $ average gain | + 238 | + 510 | + 812 |
| Percent change | 1% | 3% | 5% |
| **# Losers** | 41 | 43 | 46 |
| $ average loss | - 887 | - 1,791 | - 2,612 |
| Percent change | -6% | -11% | -16% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 28 | 12 | 7 | 14 | 24 | 18 | 26 | 43 | 47 | 38 |
| 2nd Lowest | 11 | 9 | 5 | 5 | 9 | 3 | 7 | 12 | 15 | 7 |
| 3rd Lowest | 8 | 15 | 9 | 3 | 13 | 6 | 9 | 16 | 12 | 1 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 154 | 149 | 144 |
| $ average gain | + 258 | + 552 | + 881 |
| Percent change | 2% | 3% | 5% |
| **# Losers** | 40 | 45 | 50 |
| Percent change | 0% | 0% | 0% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 26 | 20 | 11 | 16 | 23 | 15 | 26 | 36 | 36 | 35 |
| 2nd Lowest | 13 | 11 | 10 | 8 | 5 | 8 | 8 | 5 | 9 | 6 |
| 3rd Lowest | 9 | 13 | 10 | 10 | 13 | 7 | 10 | 13 | 6 | 1 |

**Species: Petrale sole** — **$14,674** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 166 | 161 | 163 |
| $ average gain | + 113 | + 294 | + 522 |
| Percent change | 1% | 2% | 4% |
| **# Losers** | 34 | 39 | 37 |
| $ average loss | - 553 | - 1,212 | - 2,298 |
| Percent change | -4% | -8% | -16% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 30 | 16 | 12 | 10 | 16 | 21 | 30 | 33 | 36 | 36 |
| 2nd Lowest | 9 | 11 | 9 | 3 | 10 | 7 | 3 | 8 | 10 | 10 |
| 3rd Lowest | 11 | 13 | 6 | 8 | 12 | 10 | 6 | 9 | 8 | 8 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 167 | 161 | 160 |
| $ average gain | + 117 | + 307 | + 551 |
| Percent change | 1% | 2% | 4% |
| **# Losers** | 33 | 39 | 40 |
| $ average loss | - 593 | - 1,267 | - 2,205 |
| Percent change | -4% | -9% | -15% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 26 | 18 | 15 | 13 | 15 | 22 | 34 | 37 | 42 | 39 |
| 2nd Lowest | 11 | 9 | 8 | 5 | 10 | 6 | 4 | 9 | 8 | 10 |
| 3rd Lowest | 8 | 13 | 8 | 10 | 10 | 10 | 5 | 8 | 8 | 11 |

**Table 4. Shoreside Non-whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 3 of 6)**

**Species: Arrowtooth fl.** **$1,507** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 137 | 134 | 127 |
| $ average gain | + 10 | + 23 | + 44 |
| Percent change | 1% | 2% | 3% |
| **# Losers** | 17 | 20 | 27 |
| $ average loss | - 78 | - 157 | - 208 |
| Percent change | -5% | -10% | -14% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 18 | 18 | 17 | 14 | 20 | 15 | 16 | 20 | 29 | 31 |
| 2nd Lowest | 4 | 3 | 4 | 2 | 1 | 0 | 4 | 0 | 12 | 4 |
| 3rd Lowest | 4 | 6 | 5 | 4 | 4 | 1 | 5 | 8 | 3 | 1 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 138 | 134 | 128 |
| $ average gain | + 12 | + 26 | + 47 |
| Percent change | 1% | 2% | 3% |
| **# Losers** | 16 | 20 | 26 |
| $ average loss | - 102 | - 175 | - 230 |
| Percent change | -7% | -12% | -15% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 18 | 16 | 15 | 12 | 21 | 17 | 19 | 19 | 25 | 30 |
| 2nd Lowest | 6 | 4 | 2 | 1 | 2 | 2 | 6 | 1 | 8 | 3 |
| 3rd Lowest | 3 | 5 | 6 | 5 | 5 | 3 | 2 | 5 | 6 | 2 |

**Species: Other Flatfish** **$3,518** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 152 | 153 | 151 |
| $ average gain | + 29 | + 62 | + 116 |
| Percent change | 1% | 2% | 3% |
| **# Losers** | 41 | 40 | 42 |
| $ average loss | - 106 | - 238 | - 418 |
| Percent change | -3% | -7% | -12% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 26 | 16 | 8 | 9 | 18 | 15 | 26 | 25 | 36 | 33 |
| 2nd Lowest | 9 | 11 | 2 | 6 | 9 | 4 | 11 | 16 | 10 | 4 |
| 3rd Lowest | 10 | 6 | 8 | 9 | 9 | 7 | 12 | 10 | 9 | 12 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 153 | 157 | 149 |
| $ average gain | + 31 | + 68 | + 131 |
| Percent change | 1% | 2% | 4% |
| **# Losers** | 40 | 36 | 44 |
| $ average loss | - 120 | - 296 | - 444 |
| Percent change | -3% | -8% | -13% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 31 | 18 | 10 | 8 | 16 | 14 | 22 | 22 | 34 | 31 |
| 2nd Lowest | 9 | 13 | 2 | 8 | 9 | 4 | 8 | 14 | 11 | 4 |
| 3rd Lowest | 10 | 8 | 9 | 8 | 7 | 9 | 15 | 12 | 8 | 8 |

**Table 4. Shoreside Non-whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 4 of 6)**

**Species: Yellowtail rf** — **$114** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 153 | 151 | 147 |
| $ average gain | + 0 | + 1 | + 2 |
| Percent change | 0% | 1% | 2% |
| **# Losers** | 16 | 18 | 22 |
| $ average loss | - 2 | - 9 | - 17 |
| Percent change | -2% | -8% | -14% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 11 | 18 | 12 | 19 | 22 | 26 | 26 | 32 | 49 | 73 |
| 2nd Lowest | 3 | 1 | 2 | 2 | 3 | 0 | 1 | 4 | 14 | 2 |
| 3rd Lowest | 1 | 2 | 2 | 5 | 3 | 4 | 2 | 17 | 6 | 4 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 156 | 153 | 151 |
| $ average gain | + 1 | + 2 | + 4 |
| Percent change | 1% | 2% | 4% |
| **# Losers** | 13 | 16 | 18 |
| **$ average loss** | - 12 | - 24 | - 38 |
| Percent change | -10% | -21% | -33% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 18 | 22 | 13 | 18 | 22 | 23 | 24 | 31 | 49 | 57 |
| 2nd Lowest | 4 | 6 | 4 | 1 | 0 | 1 | 2 | 5 | 5 | 5 |
| 3rd Lowest | 3 | 4 | 11 | 2 | 4 | 5 | 4 | 11 | 2 | 2 |

**Species: Lingcod** — **$310** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 174 | 158 | 147 |
| $ average gain | + 0 | + 2 | + 4 |
| Percent change | 0% | 0% | 1% |
| **# Losers** | 24 | 40 | 51 |
| $ average loss | - 4 | - 6 | - 10 |
| Percent change | -1% | -2% | -3% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 12 | 11 | 7 | 11 | 22 | 26 | 50 | 63 | 54 | 66 |
| 2nd Lowest | 5 | 2 | 0 | 1 | 2 | 0 | 10 | 16 | 9 | 8 |
| 3rd Lowest | 1 | 1 | 1 | 2 | 7 | 2 | 14 | 13 | 11 | 14 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 173 | 170 | 163 |
| $ average gain | + 1 | + 4 | + 8 |
| Percent change | 0% | 1% | 3% |
| **# Losers** | 25 | 28 | 35 |
| $ average loss | - 9 | - 24 | - 36 |
| Percent change | -3% | -8% | -12% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 19 | 13 | 15 | 15 | 19 | 20 | 41 | 55 | 51 | 63 |
| 2nd Lowest | 15 | 3 | 8 | 11 | 2 | 1 | 3 | 5 | 8 | 3 |
| 3rd Lowest | 4 | 16 | 11 | 13 | 8 | 3 | 5 | 7 | 5 | 5 |

**Table 4. Shoreside Non-whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 5 of 6)**

**Species: POP** — **$212** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 150 | 149 | 148 |
| $ average gain | + 1 | + 3 | + 5 |
| Percent change | 0% | 1% | 2% |
| **# Losers** | 14 | 15 | 16 |
| $ average loss | - 11 | - 26 | - 43 |
| Percent change | -5% | -12% | -20% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 15 | 16 | 10 | 17 | 18 | 20 | 29 | 30 | 41 | 41 |
| 2nd Lowest | 0 | 0 | 2 | 1 | 2 | 0 | 9 | 7 | 7 | 7 |
| 3rd Lowest | 3 | 5 | 4 | 1 | 1 | 2 | 3 | 12 | 7 | 7 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 153 | 150 | 149 |
| $ average gain | + 2 | + 5 | + 9 |
| Percent change | 1% | 2% | 4% |
| # Losers | 11 | 14 | 15 |
| $ average loss | - 29 | - 55 | - 89 |
| Percent change | -13% | -26% | -42% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 16 | 17 | 12 | 16 | 19 | 19 | 23 | 25 | 41 | 35 |
| 2nd Lowest | 2 | 1 | 5 | 2 | 2 | 2 | 4 | 9 | 4 | 3 |
| 3rd Lowest | 12 | 5 | 3 | 2 | 2 | 5 | 2 | 5 | 5 | 3 |

**Species: Darkblotched rf** — **$200** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 172 | 164 | 158 |
| $ average gain | + 0 | + 2 | + 3 |
| Percent change | 0% | 1% | 2% |
| **# Losers** | 22 | 30 | 36 |
| $ average loss | - 4 | - 8 | - 14 |
| Percent change | -2% | -4% | -7% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 16 | 10 | 5 | 6 | 12 | 13 | 20 | 30 | 43 | 38 |
| 2nd Lowest | 5 | 2 | 0 | 1 | 1 | 3 | 6 | 17 | 11 | 14 |
| 3rd Lowest | 4 | 5 | 2 | 2 | 2 | 2 | 3 | 17 | 17 | 16 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 167 | 163 | 162 |
| $ average gain | + 1 | + 3 | + 5 |
| | | | |
| **# Losers** | 27 | 31 | 32 |
| $ average loss | - 8 | - 16 | - 25 |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 21 | 13 | 7 | 5 | 12 | 9 | 14 | 23 | 31 | 27 |
| 2nd Lowest | 6 | 8 | 9 | 2 | 9 | 1 | 5 | 9 | 4 | 10 |
| 3rd Lowest | 5 | 8 | 12 | 5 | 13 | 7 | 4 | 10 | 11 | 1 |

**Table 4. Shoreside Non-whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 6 of 6)**

**Species: Canary rf** — **$18** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 181 | 167 | 160 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | 0% | 0% | 0% |
| **# Losers** | 15 | 29 | 36 |
| $ average loss | - 0 | - 0 | - 0 |
| Percent change | -1% | -1% | -2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 14 | 11 | 8 | 15 | 21 | 26 | 38 | 60 | 61 | 85 |
| 2nd Lowest | 0 | 1 | 1 | 0 | 0 | 0 | 8 | 8 | 7 | 6 |
| 3rd Lowest | 4 | 5 | 1 | 0 | 2 | 3 | 8 | 13 | 6 | 5 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 183 | 173 | 169 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | 0% | 1% | 2% |
| **# Losers** | 13 | 23 | 27 |
| $ average loss | - 1 | - 1 | - 2 |
| Percent change | -3% | -5% | -10% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 24 | 19 | 14 | 14 | 20 | 23 | 35 | 53 | 57 | 86 |
| 2nd Lowest | 6 | 7 | 10 | 6 | 1 | 3 | 2 | 4 | 2 | 0 |
| 3rd Lowest | 6 | 12 | 8 | 7 | 4 | 5 | 3 | 6 | 5 | 2 |

**Species: Yelloweye rf** — **$1** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 181 | 178 | 166 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | 0% | 0% | 0% |
| **# Losers** | 4 | 7 | 19 |
| $ average loss | - 0 | - 0 | - 0 |
| Percent change | -1% | -1% | -1% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 17 | 16 | 5 | 13 | 27 | 19 | 68 | 63 | 65 | 78 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| 3rd Lowest | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 2 | 8 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 181 | 176 | 172 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | 0% | 0% | 1% |
| **# Losers** | 4 | 9 | 13 |
| $ average loss | - 0 | - 0 | - 0 |
| Percent change | -1% | -3% | -7% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 21 | 22 | 9 | 21 | 27 | 20 | 72 | 67 | 70 | 86 |
| 2nd Lowest | 2 | 2 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 1 |
| 3rd Lowest | 3 | 3 | 1 | 3 | 1 | 6 | 1 | 2 | 2 | 2 |

**Table 5. Shoreside Whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 1 of 2)**

**Species: Whiting** — **$159,482** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 54 | 52 | 51 |
| $ average gain | + 1,753 | + 4,729 | + 8,383 |
| Percent change | 1% | 3% | 5% |
| **# Losers** | 10 | 12 | 13 |
| $ average loss | - 9,466 | - 20,492 | - 32,887 |
| Percent change | -6% | -13% | -21% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 24 | 20 | 15 | 12 | 17 | 17 | 18 | 20 | 24 | 20 |
| 2nd Lowest | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 5 |
| 3rd Lowest | 1 | 2 | 2 | 0 | 1 | 0 | 0 | 2 | 5 | 6 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 55 | 52 | 51 |
| $ average gain | + 1,893 | + 5,607 | + 9,947 |
| Percent change | 1% | 4% | 6% |
| **# Losers** | 9 | 12 | 13 |
| $ average loss | - 11,570 | - 24,298 | - 39,023 |
| Percent change | -7% | -15% | -24% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 24 | 20 | 15 | 12 | 17 | 17 | 19 | 20 | 22 | 21 |
| 2nd Lowest | 0 | 3 | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 0 |
| 3rd Lowest | 1 | 2 | 4 | 3 | 1 | 3 | 0 | 1 | 1 | 3 |

**Species: Widow rf** — **$1,201** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 52 | 52 | 48 |
| $ average gain | + 1 | + 1 | + 3 |
| Percent change | 0% | 0% | 0% |
| **# Losers** | 2 | 2 | 6 |
| $ average loss | - 15 | - 35 | - 26 |
| Percent change | -1% | -3% | -2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 19 | 19 | 15 | 14 | 15 | 16 | 17 | 23 | 26 | 27 |
| 2nd Lowest | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 4 | 5 |
| 3rd Lowest | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 6 | 4 | 4 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 46 | 48 | 46 |
| $ average gain | + 2 | + 5 | + 11 |
| Percent change | 0% | 0% | 1% |
| **# Losers** | 8 | 6 | 8 |
| $ average loss | - 10 | - 41 | - 61 |
| Percent change | -1% | -3% | -5% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 19 | 20 | 16 | 15 | 15 | 16 | 16 | 24 | 22 | 28 |
| 2nd Lowest | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 4 | 2 |
| 3rd Lowest | 0 | 0 | 1 | 1 | 3 | 1 | 0 | 4 | 4 | 3 |

**Table 5. Shoreside Whiting Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 2 of 2)**

**Species: Canary rf** **$45** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 0 | 45 | 43 |
| $ average gain | - | + 0 | + 0 |
| Percent change | - | 0% | 1% |
| **# Losers** | 0 | 6 | 8 |
| $ average loss | - | - 1 | - 1 |
| Percent change | - | -1% | -3% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 40 | 28 | 24 | 16 | 18 | 14 | 19 | 21 | 25 | 28 |
| 2nd Lowest | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 2 |
| 3rd Lowest | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 0 | 45 | 43 |
| $ average gain | - | + 0 | + 0 |
| Percent change | - | 0% | 1% |
| **# Losers** | 0 | 6 | 8 |
| $ average loss | - | - 1 | - 2 |
| Percent change | - | -1% | -4% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 40 | 28 | 24 | 16 | 18 | 14 | 19 | 21 | 25 | 28 |
| 2nd Lowest | 0 | 1 | 2 | 0 | 2 | 0 | 1 | 1 | 0 | 0 |
| 3rd Lowest | 1 | 0 | 3 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |

**Species: Yellowtail rf** **$2,448** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 53 | 52 | 50 |
| $ average gain | + 6 | + 16 | + 31 |
| Percent change | 0% | 1% | 1% |
| **# Losers** | 4 | 5 | 7 |
| $ average loss | - 86 | - 171 | - 224 |
| Percent change | -3% | -7% | -9% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 21 | 17 | 14 | 15 | 15 | 12 | 16 | 19 | 22 | 24 |
| 2nd Lowest | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 4 | 2 |
| 3rd Lowest | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 6 | 5 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| **# Winners** | 54 | 53 | 52 |
| $ average gain | + 8 | + 30 | + 54 |
| Percent change | 0% | 1% | 2% |
| **# Losers** | 3 | 4 | 5 |
| $ average loss | - 150 | - 402 | - 566 |
| Percent change | -6% | -16% | -23% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 23 | 18 | 15 | 16 | 16 | 13 | 16 | 18 | 22 | 23 |
| 2nd Lowest | 0 | 3 | 0 | 2 | 2 | 2 | 1 | 1 | 1 | 0 |
| 3rd Lowest | 0 | 1 | 3 | 1 | 4 | 0 | 0 | 1 | 5 | 2 |

**Table 6. At Sea Whiting Catcher Vessel Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 1 of 2)**

**Species: Whiting** — **$121,721** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 32 | 29 | 29 |
| $ average gain | + 1,593 | + 4,172 | + 7,189 |
| Percent change | 1% | 3% | 6% |
| # Losers | 5 | 8 | 8 |
| $ average loss | - 10,192 | - 15,123 | - 26,060 |
| Percent change | -8% | -12% | -21% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 11 | 16 | 16 | 12 | 12 | 13 | 14 | 19 | 25 | 24 |
| 2nd Lowest | 1 | 2 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 3rd Lowest | 2 | 0 | 1 | 0 | 0 | 2 | 1 | 4 | 0 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 32 | 29 | 27 |
| $ average gain | + 1,532 | + 3,852 | + 6,988 |
| Percent change | 1% | 3% | 6% |
| # Losers | 5 | 8 | 10 |
| $ average loss | - 9,803 | - 13,964 | - 18,868 |
| Percent change | -8% | -11% | -16% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 13 | 13 | 17 | 12 | 13 | 13 | 14 | 18 | 25 | 24 |
| 2nd Lowest | 2 | 3 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 |
| 3rd Lowest | 1 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 0 | 0 |

**Species: Widow rf** — **$829** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 34 | 32 | 28 |
| $ average gain | + 0 | + 2 | + 9 |
| Percent change | 0% | 0% | 1% |
| # Losers | 3 | 5 | 9 |
| $ average loss | - 1 | - 13 | - 28 |
| Percent change | 0% | -2% | -3% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 10 | 13 | 15 | 13 | 11 | 13 | 14 | 19 | 24 | 27 |
| 2nd Lowest | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 |
| 3rd Lowest | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 1 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 34 | 31 | 29 |
| $ average gain | + 2 | + 8 | + 16 |
| Percent change | 0% | 1% | 2% |
| # Losers | 3 | 6 | 8 |
| $ average loss | - 21 | - 40 | - 59 |
| Percent change | -3% | -5% | -7% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 11 | 14 | 15 | 14 | 11 | 13 | 14 | 19 | 24 | 24 |
| 2nd Lowest | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3rd Lowest | 0 | 1 | 1 | 1 | 3 | 1 | 2 | 0 | 0 | 1 |

**Table 6. At Sea Whiting Catcher Vessel Sector: Comparison of 2005 Ex-vessel Revenue from Selected Groundfish Species Under Different Drop-Year Allocation Options (page 2 of 2)**

**Species: Canary rf** — **$21** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 0 | 32 |
| $ average gain | - | - | + 0 |
| Percent change | - | - | 0% |
| # Losers | 0 | 0 | 1 |
| $ average loss | - | - | - 0 |
| Percent change | - | - | -1% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 17 | 20 | 25 | 18 | 19 | 22 | 20 | 18 | 20 | 26 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3rd Lowest | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 0 | 32 |
| $ average gain | - | - | + 0 |
| Percent change | - | - | 0% |
| # Losers | 0 | 0 | 1 |
| $ average loss | - | - | - 0 |
| Percent change | - | - | -1% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 19 | 20 | 27 | 20 | 21 | 24 | 22 | 20 | 22 | 28 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3rd Lowest | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Species: Yellowtail rf** — **$707** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 34 | 32 |
| $ average gain | - | + 0 | + 2 |
| Percent change | - | 0% | 0% |
| # Losers | 0 | 3 | 5 |
| $ average loss | - | - 3 | - 13 |
| Percent change | - | 0% | -2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 9 | 13 | 20 | 10 | 10 | 11 | 12 | 18 | 23 | 29 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 |
| 3rd Lowest | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 4 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 33 | 31 |
| $ average gain | - | + 1 | + 8 |
| Percent change | - | 0% | 1% |
| # Losers | 0 | 4 | 6 |
| $ average loss | - | - 8 | - 41 |
| Percent change | - | -1% | -6% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 9 | 13 | 20 | 10 | 10 | 11 | 12 | 18 | 23 | 29 |
| 2nd Lowest | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 3rd Lowest | 0 | 3 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |

**Table 7. Landings or deliveries of PFMC-managed groundfish by Westcoast limited entry trawl sectors (mt), 1994 to 2004.**
**(Page 1 of 4)**

**At-Sea Catcher-Processors**

| Stock or Complex | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 1994-2004 TOTAL | 1994-2004 Average | 1994-1998 Average | 1999-2003 Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| N. of 42° (OR & WA) | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| S. of 42° (CA) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pacific Cod | - | - | - | - | - | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | - | 0 |
| Pacific Whiting (Coastwide) | 85,012 | 61,138 | 65,878 | 70,810 | 70,372 | 67,672 | 67,803 | 58,628 | 36,341 | 41,214 | 73,175 | 698,043 | 62,487 | 70,642 | 54,332 |
| Sablefish (Coastwide) | 0 | 4 | 7 | 1 | 27 | 1 | 46 | 21 | 21 | 17 | 19 | 163 | 14 | 8 | 21 |
| N. of 36° (Monterey north) | 0 | 4 | 7 | 1 | 27 | 1 | 46 | 21 | 21 | 17 | 19 | 163 | 14 | 8 | 21 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **PACIFIC OCEAN PERCH** | 31 | 13 | 4 | 2 | 15 | 9 | 7 | 20 | 1 | 5 | 1 | 108 | 11 | 13 | 8 |
| Shortbelly Rockfish | 1 | 5 | 6 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | 14 | 1 | 2 | 0 |
| **WIDOW ROCKFISH** | 194 | 87 | 120 | 73 | 121 | 104 | 70 | 140 | 115 | 12 | 8 | 1,042 | 103 | 119 | 88 |
| **CANARY ROCKFISH** | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 8 | 1 | 1 | 1 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **BOCACCIO** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Splitnose Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | 203 | 81 | 237 | 120 | 64 | 426 | 270 | 33 | 13 | 2 | 6 | 1,456 | 145 | 141 | 149 |
| Shortspine Thornyhead - coastwide | 0 | 6 | 2 | 0 | 2 | 0 | 20 | 15 | 12 | 15 | 5 | 78 | 7 | 2 | 12 |
| N. of 34°27' | 0 | 6 | 2 | 0 | 2 | 0 | 20 | 15 | 12 | 15 | 5 | 78 | 7 | 2 | 12 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Longspine Thornyhead - coastwide | - | 0 | - | - | 0 | - | - | - | - | - | 0 | 0 | 0 | 0 | - |
| N. of 34°27' | - | 0 | - | - | 0 | - | - | - | - | - | 0 | 0 | 0 | 0 | - |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other thornyheads | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **COWCOD** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **DARKBLOTCHED** | 1 | 49 | 6 | 2 | 7 | 7 | 4 | 11 | 2 | 4 | 4 | 98 | 9 | 13 | 6 |
| **YELLOWEYE** | - | - | 0 | 0 | 0 | 0 | 4 | - | 0 | 0 | - | 5 | 0 | 0 | 1 |
| Black Rockfish - coastwide | - | - | - | - | - | 0 | 1 | - | - | - | - | 1 | 0 | - | 0 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Black Rockfish (OR-CA) | - | - | - | - | - | 0 | 1 | - | - | - | - | 1 | 0 | - | 0 |
| **Minor Rockfish North** | 20 | 59 | 14 | 27 | 23 | 12 | 79 | 47 | 22 | 24 | 26 | 354 | 33 | 29 | 37 |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | 13 | 30 | 0 | 0 | 2 | 1 | 1 | 1 | 10 | 8 | 3 | 71 | 7 | 9 | 4 |
| BOCACCIO: N. of Monterrey | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Chilipepper Rockfish: Eureka | 6 | 28 | 0 | - | 0 | - | - | 0 | 3 | 0 | 1 | 38 | 4 | 7 | 1 |
| Redstripe Rockfish | 6 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 5 | 2 | 20 | 2 | 2 | 2 |
| Silvergrey Rockfish | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Other Northern Shelf Rockfish | 0 | 0 | 0 | 0 | 2 | 0 | - | 0 | 4 | 3 | 0 | 10 | 1 | 0 | 1 |
| **Slope Species** | 7 | 29 | 14 | 27 | 20 | 11 | 78 | 46 | 12 | 16 | 23 | 283 | 26 | 19 | 33 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 | - | - | 0 | 0 | 0 | - | 0 |
| Sharpchin Rockfish, north | 0 | 0 | - | 0 | - | 0 | - | 2 | 0 | 2 | 0 | 5 | 0 | 0 | 1 |
| Splitnose Rockfish: N. of Monterrey | 0 | 25 | 5 | 15 | 4 | 6 | 13 | 24 | 11 | 12 | 8 | 124 | 12 | 10 | 13 |
| Yellowmouth Rockfish | 2 | 0 | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 3 | 0 | 0 | 0 |
| Other Northern Slope Rockfish | 5 | 4 | 8 | 12 | 16 | 5 | 65 | 20 | 0 | 2 | 14 | 151 | 14 | 9 | 18 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Redstripe Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Slope Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Bank Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Blackgill Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sharpchin Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| California scorpionfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Cabezon (off CA only) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Dover Sole | - | 0 | 0 | - | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 4 | 0 | 0 | 1 |
| English Sole | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petrale Sole (coastwide) | - | 0 | - | - | - | - | - | - | - | 0 | - | 0 | 0 | 0 | 0 |
| N of 40°10' | - | 0 | - | - | - | - | - | - | - | 0 | - | 0 | 0 | 0 | 0 |
| S of 40°10' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Arrowtooth Flounder | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 3 | 2 | 3 | 1 | 16 | 1 | 0 | 3 |
| Starry Flounder | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Flatfish | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 18 | 12 | 7 | 2 | 44 | 4 | 0 | 8 |
| Kelp Greenling | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Spiny Dogfish | 30 | 145 | 47 | 139 | 58 | 121 | 26 | 68 | 36 | 10 | 332 | 1,012 | 68 | 84 | 52 |
| Other Fish | 1 | - | - | 0 | 1 | 0 | 1 | 0 | - | 0 | 1 | 4 | 0 | 0 | 0 |
| SECTOR TOTALS | 85,496 | 61,589 | 66,322 | 71,175 | 70,690 | 68,357 | 68,340 | 59,006 | 36,580 | 41,315 | 73,582 | 702,453 | 62,887 | 71,054 | 54,720 |

**Table 7. Landings or deliveries of PFMC-managed groundfish by Westcoast limited entry trawl sectors (mt), 1994 to 2004. (Page 2 of 4)**

**At Sea Motherships**

| Stock or Complex | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 1994-2004 TOTAL | 1994-2004 Average | 1994-1998 Average | 1999-2003 Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| N. of 42° (OR & WA) | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| S. of 42° (CA) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pacific Cod | 0 | - | 0 | 0 | - | 0 | - | 0 | - | - | - | 0 | 0 | 0 | 0 |
| Pacific Whiting (Coastwide) | 56,797 | 33,010 | 44,658 | 48,912 | 49,666 | 47,566 | 42,623 | 35,586 | 26,593 | 26,022 | 24,102 | 435,535 | 41,143 | 46,609 | 35,678 |
| Sablefish (Coastwide) | 1 | 3 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 9 | 17 | 1 | 1 | 1 |
| N. of 36° (Monterey north) | 1 | 3 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 9 | 17 | 1 | 1 | 1 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **PACIFIC OCEAN PERCH** | 6 | 28 | 2 | 2 | 8 | 4 | 2 | 0 | 2 | 0 | 0 | 54 | 5 | 9 | 2 |
| Shortbelly Rockfish | 1 | 4 | - | 0 | - | 0 | 0 | 27 | 0 | 0 | 0 | 33 | 3 | 1 | 5 |
| **WIDOW ROCKFISH** | 109 | 95 | 117 | 122 | 174 | 58 | 141 | 28 | 20 | 1 | 11 | 876 | 86 | 123 | 50 |
| **CANARY ROCKFISH** | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 1 | 1 | 0 | 4 | 12 | 1 | 1 | 1 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **BOCACCIO** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Splitnose Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | 268 | 505 | 350 | 146 | 335 | 325 | 228 | 89 | 1 | 1 | 12 | 2,261 | 225 | 321 | 129 |
| Shortspine Thornyhead - coastwide | 0 | 0 | - | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| N. of 34°27' | 0 | 0 | - | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Longspine Thornyhead - coastwide | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N. of 34°27' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other thornyheads | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **COWCOD** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **DARKBLOTCHED** | 3 | 3 | 1 | 1 | 13 | 4 | 5 | 1 | 1 | 0 | 3 | 34 | 3 | 4 | 2 |
| **YELLOWEYE** | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | - |
| Black Rockfish - coastwide | 0 | - | - | - | - | - | - | 0 | - | - | - | 0 | 0 | 0 | 0 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Black Rockfish (OR-CA) | 0 | - | - | - | - | - | - | 0 | - | - | - | 0 | 0 | 0 | 0 |
| **Minor Rockfish North** | 7 | 8 | 17 | 4 | 8 | 11 | 34 | 17 | 3 | 2 | 2 | 113 | 11 | 9 | 13 |
| **Nearshore Species** | - | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0 | - |
| **Shelf Species** | 6 | 4 | 2 | 1 | 1 | 4 | 30 | 15 | 2 | 1 | 1 | 68 | 7 | 3 | 11 |
| BOCACCIO: N. of Monterrey | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | - | 0 | 4 | 0 | 0 | 0 |
| Chilipepper Rockfish: Eureka | 2 | - | - | 0 | 0 | 1 | 9 | 3 | 2 | 1 | 1 | 19 | 2 | 0 | 3 |
| Redstripe Rockfish | 4 | 3 | 0 | 1 | 0 | 2 | 1 | 11 | 0 | 0 | 0 | 23 | 2 | 2 | 3 |
| Silvergrey Rockfish | 0 | - | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | 0 |
| Other Northern Shelf Rockfish | 0 | 1 | 1 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 21 | 2 | 0 | 4 |
| **Slope Species** | 1 | 4 | 15 | 3 | 7 | 7 | 4 | 2 | 1 | 1 | 0 | 45 | 4 | 6 | 3 |
| Bank Rockfish | 0 | - | - | - | - | - | - | 0 | 0 | - | - | 1 | 0 | 0 | 0 |
| Sharpchin Rockfish, north | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| Splitnose Rockfish: N. of Monterrey | 0 | 0 | 15 | 2 | 1 | - | 2 | 2 | 0 | 0 | 0 | 23 | 2 | 4 | 1 |
| Yellowmouth Rockfish | 0 | - | 0 | - | 3 | 0 | 0 | - | - | 0 | - | 3 | 0 | 1 | 0 |
| Other Northern Slope Rockfish | 0 | 4 | 0 | 1 | 3 | 7 | 1 | 1 | 0 | 0 | 0 | 18 | 2 | 2 | 2 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Redstripe Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Slope Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Bank Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Blackgill Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sharpchin Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| California scorpionfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Cabezon (off CA only) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Dover Sole | 0 | - | - | - | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| English Sole | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petrale Sole (coastwide) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N of 40°10' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| S of 40°10' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Arrowtooth Flounder | 0 | 2 | 0 | 0 | 1 | 1 | 3 | 1 | 0 | 0 | 0 | 8 | 1 | 1 | 1 |
| Starry Flounder | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Flatfish | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 |
| Kelp Greenling | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Spiny Dogfish | 11 | 41 | 104 | 65 | 162 | 155 | 48 | 6 | 1 | 1 | 10 | 605 | 60 | 77 | 42 |
| Other Fish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | 0 |
| SECTOR TOTALS | 57,203 | 33,700 | 45,251 | 49,253 | 50,371 | 48,127 | 43,087 | 35,757 | 26,624 | 26,027 | 24,155 | 439,556 | 41,540 | 47,156 | 35,925 |

**Table 7. Landings or deliveries of PFMC-managed groundfish by Westcoast limited entry trawl sectors (mt), 1994 to 2004. (Page 3 of 4)**

**Shoreside Whiting LE Trawl**

| Stock or Complex | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 1994-2004 TOTAL | 1994-2004 Average | 1994-1998 Average | 1999-2003 Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 4 | 9 | 0 | 0 | 1 |
| N. of 42° (OR & WA) | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 4 | 9 | 0 | 0 | 1 |
| S. of 42° (CA) | - | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific Cod | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 |
| Pacific Whiting (Coastwide) | 73,510 | 74,846 | 82,473 | 87,287 | 87,708 | 83,392 | 85,807 | 73,386 | 45,504 | 51,182 | 92,879 | 837,976 | 74,510 | 81,165 | 67,854 |
| Sablefish (Coastwide) | 35 | 43 | 37 | 42 | 28 | 3 | 2 | 47 | 132 | 40 | 131 | 540 | 41 | 37 | 45 |
| N. of 36° (Monterey north) | 35 | 43 | 37 | 42 | 28 | 3 | 2 | 47 | 132 | 40 | 131 | 540 | 41 | 37 | 45 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **PACIFIC OCEAN PERCH** | 11 | 30 | 33 | 6 | 22 | 2 | 0 | 0 | 0 | 0 | 1 | 106 | 11 | 20 | 1 |
| Shortbelly Rockfish | - | - | 0 | 0 | 1 | 5 | 2 | 1 | 0 | 0 | 0 | 10 | 1 | 0 | 2 |
| **WIDOW ROCKFISH** | 241 | 236 | 572 | 163 | 350 | 194 | 83 | 44 | 5 | 13 | 34 | 1,936 | 190 | 312 | 68 |
| **CANARY ROCKFISH** | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 11 | 1 | 1 | 1 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **BOCACCIO** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Splitnose Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | 256 | 294 | 483 | 226 | 500 | 477 | 190 | 103 | 43 | 44 | 127 | 2,744 | 262 | 352 | 171 |
| Shortspine Thornyhead - coastwide | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 7 | 1 | 1 | 1 |
| N. of 34°27' | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 7 | 1 | 1 | 1 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Longspine Thornyhead - coastwide | 3 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | - | 0 | 0 | 7 | 1 | 1 | 0 |
| N. of 34°27' | 3 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | - | 0 | 0 | 7 | 1 | 1 | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other thornyheads | 0 | - | - | - | - | - | - | - | - | - | - | 0 | 0 | 0 | - |
| **COWCOD** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **DARKBLOTCHED** | 0 | 0 | 6 | 0 | 5 | 1 | 4 | 5 | 0 | 0 | 2 | 23 | 2 | 2 | 2 |
| **YELLOWEYE** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 |
| Black Rockfish - coastwide | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | - | - | 1 | 0 | 0 | 0 |
| Black Rockfish (WA) | 0 | 0 | - | - | 1 | - | - | - | - | - | - | 1 | 0 | 0 | - |
| Black Rockfish (OR-CA) | - | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| **Minor Rockfish North** | 19 | 3 | 22 | 23 | 41 | 15 | 45 | 5 | 1 | 10 | 26 | 211 | 18 | 22 | 15 |
| **Nearshore Species** | - | - | 0 | - | - | - | - | - | 0 | - | - | 0 | 0 | 0 | 0 |
| **Shelf Species** | 19 | 2 | 18 | 22 | 23 | 11 | 31 | 2 | 1 | 10 | 22 | 162 | 14 | 17 | 11 |
| BOCACCIO: N. of Monterrey | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | - | 0 | 3 | 0 | 0 | 0 |
| Chilipepper Rockfish: Eureka | - | 0 | 0 | 0 | 0 | 0 | 28 | 1 | 1 | 10 | 21 | 60 | 4 | 0 | 8 |
| Redstripe Rockfish | 0 | 0 | 12 | 0 | 0 | 0 | 0 | - | 0 | - | - | 12 | 1 | 2 | 0 |
| Silvergrey Rockfish | 0 | 0 | 1 | 1 | 2 | 0 | - | - | 0 | - | - | 4 | 0 | 1 | 0 |
| Other Northern Shelf Rockfish | 19 | 2 | 5 | 21 | 20 | 10 | 2 | 1 | 0 | 0 | 2 | 83 | 8 | 13 | 3 |
| **Slope Species** | 0 | 0 | 3 | 1 | 18 | 4 | 15 | 3 | 0 | 1 | 4 | 48 | 4 | 5 | 4 |
| Bank Rockfish | - | 0 | - | 0 | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| Sharpchin Rockfish, north | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 3 | 0 | 0 | 0 |
| Splitnose Rockfish: N. of Monterrey | 0 | 0 | 0 | 0 | 16 | 3 | 10 | 2 | 0 | 0 | 1 | 32 | 3 | 3 | 3 |
| Yellowmouth Rockfish | 0 | - | 0 | 0 | 0 | 0 | - | - | - | - | - | 1 | 0 | 0 | 0 |
| Other Northern Slope Rockfish | 0 | 0 | 1 | 1 | 1 | 1 | 5 | 1 | 0 | 1 | 3 | 13 | 1 | 1 | 1 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Redstripe Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Slope Species** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Bank Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Blackgill Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sharpchin Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| California scorpionfish | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Cabezon (off CA only) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Dover Sole | 2 | 0 | 1 | 2 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 11 | 1 | 2 | 0 |
| English Sole | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 7 | 1 | 0 | 1 |
| Petrale Sole (coastwide) | - | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 6 | 1 | 1 | 1 |
| N of 40°10' | - | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 6 | 1 | 1 | 1 |
| S of 40°10' | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Arrowtooth Flounder | 0 | 0 | 1 | 1 | 0 | 3 | 2 | 1 | 1 | 0 | 1 | 11 | 1 | 1 | 1 |
| Starry Flounder | - | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | 0 |
| Other Flatfish | 0 | 0 | 1 | 3 | 4 | 1 | 1 | 1 | 0 | 0 | 0 | 13 | 1 | 2 | 1 |
| Kelp Greenling | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Spiny Dogfish | 25 | 0 | 4 | 3 | 56 | 40 | 35 | 13 | 11 | 4 | 30 | 222 | 19 | 18 | 21 |
| Other Fish | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 6 | 1 | 1 | 0 |
| SECTOR TOTALS | 74,111 | 75,458 | 83,636 | 87,762 | 88,726 | 84,139 | 86,177 | 73,612 | 45,702 | 51,296 | 93,240 | 843,858 | 75,062 | 81,939 | 68,185 |

**Table 7. Landings or deliveries of PFMC-managed groundfish by Westcoast limited entry trawl sectors (mt), 1994 to 2004. (Page 4 of 4)**

**Shoreside Non-whiting LE Trawl**

| Stock or Complex | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 1994-2004 TOTAL | 1994-2004 Average | 1994-1998 Average | 1999-2003 Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 1,370 | 1,070 | 1,204 | 1,170 | 217 | 217 | 66 | 58 | 102 | 60 | 58 | 5,593 | 503 | 1,006 | 101 |
| N. of 42° (OR & WA) | 1,059 | 775 | 911 | 856 | 143 | 134 | 38 | 31 | 66 | 48 | 42 | 4,105 | 406 | 749 | 64 |
| S. of 42° (CA) | 311 | 295 | 293 | 314 | 74 | 83 | 28 | 27 | 37 | 12 | 16 | 1,488 | 147 | 257 | 37 |
| Pacific Cod | 825 | 491 | 433 | 589 | 406 | 277 | 274 | 315 | 690 | 1,041 | 1,102 | 6,443 | 534 | 549 | 519 |
| Pacific Whiting (Coastwide) | 50 | 71 | 65 | 115 | 111 | 26 | 36 | 25 | 39 | 30 | 15 | 583 | 57 | 82 | 31 |
| Sablefish (Coastwide) | 3,510 | 3,705 | 4,133 | 3,703 | 2,144 | 3,158 | 2,691 | 2,514 | 1,445 | 2,324 | 2,445 | 31,772 | 2,933 | 3,439 | 2,426 |
| N. of 36° (Monterey north) | 3,357 | 3,499 | 3,919 | 3,550 | 2,030 | 3,075 | 2,655 | 2,486 | 1,396 | 2,246 | 2,364 | 30,576 | 2,821 | 3,271 | 2,371 |
| S. of 36° (Conception area) | 153 | 206 | 214 | 154 | 115 | 83 | 36 | 28 | 49 | 78 | 80 | 1,196 | 112 | 168 | 55 |
| **PACIFIC OCEAN PERCH** | 898 | 825 | 820 | 663 | 610 | 520 | 135 | 187 | 147 | 132 | 130 | 5,067 | 494 | 763 | 224 |
| Shortbelly Rockfish | 35 | 30 | 36 | 78 | 19 | 2 | 17 | 4 | 0 | 0 | 0 | 222 | 22 | 40 | 5 |
| **WIDOW ROCKFISH** | 5,738 | 6,165 | 5,403 | 6,213 | 3,347 | 3,691 | 3,718 | 1,730 | 255 | 4 | 9 | 36,273 | 3,626 | 5,373 | 1,880 |
| **CANARY ROCKFISH** | 845 | 675 | 967 | 793 | 903 | 514 | 36 | 24 | 42 | 8 | 7 | 4,813 | 481 | 837 | 125 |
| Chilipepper Rockfish | 1,145 | 1,475 | 1,396 | 1,535 | 1,036 | 783 | 359 | 297 | 154 | 7 | 39 | 8,227 | 819 | 1,317 | 320 |
| **BOCACCIO** | 470 | 326 | 276 | 220 | 56 | 31 | 17 | 13 | 18 | 0 | 6 | 1,434 | 143 | 270 | 16 |
| Splitnose Rockfish | 290 | 275 | 402 | 429 | 1,305 | 206 | 83 | 90 | 56 | 151 | 164 | 3,450 | 329 | 540 | 117 |
| Yellowtail Rockfish | 4,154 | 4,007 | 4,158 | 1,339 | 1,691 | 1,641 | 2,622 | 1,484 | 694 | 100 | 93 | 21,983 | 2,189 | 3,070 | 1,308 |
| Shortspine Thornyhead - coastwide | 3,002 | 1,855 | 1,512 | 1,398 | 1,184 | 713 | 763 | 471 | 666 | 665 | 663 | 12,892 | 1,223 | 1,790 | 655 |
| N. of 34°27' | 2,254 | 1,213 | 1,082 | 996 | 856 | 527 | 482 | 350 | 427 | 462 | 438 | 9,086 | 865 | 1,280 | 449 |
| S. of 34°27' | 748 | 642 | 430 | 402 | 328 | 186 | 281 | 122 | 239 | 203 | 225 | 3,806 | 358 | 510 | 206 |
| Longspine Thornyhead - coastwide | 4,078 | 5,311 | 4,751 | 3,851 | 2,224 | 1,770 | 1,426 | 1,132 | 1,897 | 1,552 | 722 | 28,715 | 2,799 | 4,043 | 1,555 |
| N. of 34°27' | 4,078 | 5,311 | 4,751 | 3,851 | 2,224 | 1,770 | 1,426 | 1,132 | 1,896 | 1,552 | 722 | 28,714 | 2,799 | 4,043 | 1,555 |
| S. of 34°27' | - | - | - | - | - | - | - | - | 0 | - | - | 0 | 0 | - | 0 |
| Other thornyheads | 260 | 5 | 44 | 34 | 17 | 36 | 59 | 22 | 52 | 37 | 1 | 565 | 56 | 72 | 41 |
| **COWCOD** | - | - | 0 | - | - | - | - | - | 0 | - | - | 0 | 0 | 0 | 0 |
| **DARKBLOTCHED** | 780 | 710 | 722 | 810 | 902 | 346 | 239 | 153 | 107 | 79 | 187 | 5,034 | 485 | 785 | 185 |
| **YELLOWEYE** | 83 | 135 | 101 | 83 | 29 | 26 | 1 | 2 | 1 | 1 | 0 | 463 | 46 | 86 | 6 |
| Black Rockfish - coastwide | 45 | 9 | 18 | 24 | 81 | 5 | 2 | 1 | 3 | 1 | 2 | 190 | 19 | 35 | 2 |
| Black Rockfish (WA) | 1 | 3 | - | 1 | 18 | - | - | - | 0 | - | - | 23 | 2 | 5 | 0 |
| Black Rockfish (OR-CA) | 44 | 6 | 18 | 23 | 64 | 5 | 2 | 1 | 3 | 1 | 2 | 167 | 16 | 31 | 2 |
| **Minor Rockfish North** | 2,195 | 1,673 | 1,711 | 1,529 | 1,471 | 734 | 347 | 328 | 124 | 149 | 216 | 10,477 | 1,026 | 1,716 | 336 |
| **Nearshore Species** | 1 | 1 | 0 | 0 | 5 | 0 | 0 | 1 | 1 | 0 | 1 | 9 | 1 | 1 | 0 |
| **Shelf Species** | 1,206 | 963 | 1,073 | 863 | 1,013 | 418 | 53 | 189 | 44 | 19 | 12 | 5,852 | 584 | 1,024 | 145 |
| BOCACCIO: N. of Monterrey | 177 | 183 | 128 | 158 | 89 | 43 | 4 | 12 | 6 | 8 | 4 | 812 | 81 | 147 | 15 |
| Chilipepper Rockfish: Eureka | 93 | 99 | 103 | 59 | 71 | 44 | 14 | 137 | 8 | 1 | 2 | 631 | 63 | 85 | 41 |
| Redstripe Rockfish | 332 | 252 | 207 | 138 | 111 | 33 | 5 | 6 | 3 | 1 | 0 | 1,087 | 109 | 208 | 9 |
| Silvergrey Rockfish | 90 | 92 | 236 | 83 | 183 | 73 | 1 | 4 | 2 | 2 | 1 | 767 | 77 | 137 | 17 |
| Other Northern Shelf Rockfish | 514 | 336 | 399 | 425 | 559 | 225 | 28 | 30 | 25 | 8 | 5 | 2,554 | 255 | 447 | 63 |
| **Slope Species** | 988 | 709 | 638 | 666 | 454 | 316 | 294 | 138 | 80 | 130 | 203 | 4,615 | 441 | 691 | 191 |
| Bank Rockfish | 40 | 23 | 24 | 14 | 3 | 13 | 3 | 0 | 0 | 0 | 5 | 125 | 12 | 21 | 3 |
| Sharpchin Rockfish, north | 368 | 224 | 205 | 218 | 103 | 53 | 12 | 5 | 5 | 4 | 22 | 1,219 | 120 | 224 | 16 |
| Splitnose Rockfish: N. of Monterrey | 148 | 111 | 70 | 132 | 144 | 56 | 34 | 15 | 7 | 5 | 25 | 748 | 72 | 121 | 23 |
| Yellowmouth Rockfish | 224 | 107 | 111 | 84 | 40 | 28 | 11 | 5 | 2 | 3 | 16 | 631 | 62 | 113 | 10 |
| Other Northern Slope Rockfish | 208 | 244 | 228 | 218 | 164 | 165 | 234 | 114 | 65 | 117 | 136 | 1,893 | 176 | 212 | 139 |
| **Minor Rockfish South** | 644 | 701 | 951 | 917 | 815 | 124 | 176 | 215 | 392 | 190 | 240 | 5,363 | 512 | 805 | 219 |
| **Nearshore Species** | 4 | 9 | 19 | 13 | 1 | 13 | 0 | 0 | 1 | 0 | 0 | 61 | 6 | 9 | 3 |
| **Shelf Species** | 180 | 186 | 209 | 262 | 244 | 36 | 30 | 23 | 15 | 3 | 2 | 1,188 | 119 | 216 | 21 |
| Redstripe Rockfish | 3 | 0 | - | 3 | 1 | 0 | - | - | - | - | - | 7 | 1 | 1 | 0 |
| Yellowtail Rockfish | 66 | 43 | 72 | 176 | 123 | 14 | 22 | 1 | 2 | 0 | 0 | 520 | 52 | 96 | 8 |
| Other Southern Shelf Rockfish | 111 | 143 | 137 | 83 | 120 | 21 | 8 | 22 | 13 | 2 | 2 | 662 | 66 | 119 | 13 |
| **Slope Species** | 460 | 506 | 724 | 641 | 570 | 75 | 146 | 192 | 376 | 186 | 238 | 4,114 | 388 | 580 | 195 |
| Bank Rockfish | 258 | 309 | 499 | 371 | 417 | 19 | 79 | 82 | 276 | 86 | 109 | 2,504 | 239 | 371 | 108 |
| Blackgill Rockfish | 111 | 127 | 151 | 130 | 114 | 28 | 53 | 90 | 63 | 55 | 80 | 1,003 | 92 | 127 | 58 |
| Sharpchin Rockfish | 16 | 5 | 20 | 100 | 10 | 1 | 0 | 0 | 0 | - | - | 153 | 15 | 30 | 0 |
| Yellowmouth Rockfish | 5 | - | 0 | 1 | - | - | - | - | - | - | - | 5 | 1 | 1 | - |
| Other Southern Slope Rockfish | 69 | 64 | 54 | 40 | 28 | 28 | 14 | 20 | 37 | 45 | 49 | 448 | 40 | 51 | 29 |
| California scorpionfish | 0 | - | - | 6 | - | - | - | 0 | 0 | - | - | 6 | 1 | 1 | 0 |
| Cabezon (off CA only) | 3 | - | 0 | - | - | 0 | 0 | 0 | 0 | - | - | 3 | 0 | 1 | 0 |
| Dover Sole | 8,685 | 10,377 | 12,161 | 10,114 | 8,059 | 9,129 | 8,813 | 6,830 | 6,318 | 7,458 | 7,128 | 95,072 | 8,794 | 9,879 | 7,710 |
| English Sole | 1,080 | 1,107 | 1,129 | 1,429 | 1,123 | 888 | 744 | 959 | 1,125 | 854 | 887 | 11,322 | 1,044 | 1,173 | 914 |
| Petrale Sole (coastwide) | 1,300 | 1,588 | 1,804 | 1,863 | 1,459 | 1,473 | 1,849 | 1,776 | 1,783 | 1,940 | 1,904 | 18,740 | 1,684 | 1,603 | 1,764 |
| N of 40°10' | 1,006 | 1,248 | 1,357 | 1,390 | 1,204 | 1,225 | 1,614 | 1,508 | 1,562 | 1,693 | 1,639 | 15,444 | 1,380 | 1,241 | 1,520 |
| S of 40°10' | 294 | 341 | 447 | 473 | 255 | 249 | 236 | 267 | 221 | 247 | 265 | 3,296 | 303 | 362 | 244 |
| Arrowtooth Flounder | 3,097 | 2,305 | 2,173 | 2,325 | 3,192 | 5,337 | 3,278 | 2,450 | 2,075 | 2,305 | 2,386 | 30,923 | 2,854 | 2,618 | 3,089 |
| Starry Flounder | 71 | 50 | 28 | 59 | 53 | 22 | 25 | 7 | 18 | 29 | 118 | 481 | 36 | 52 | 20 |
| Other Flatfish | 2,164 | 2,364 | 1,868 | 1,816 | 1,535 | 1,883 | 1,522 | 1,596 | 1,622 | 1,471 | 1,269 | 19,109 | 1,784 | 1,949 | 1,619 |
| Kelp Greenling | 0 | 2 | 0 | - | 0 | - | - | 0 | 0 | 0 | - | 2 | 0 | 0 | 0 |
| Spiny Dogfish | 1,029 | 355 | 195 | 336 | 402 | 430 | 274 | 333 | 447 | 197 | 119 | 4,118 | 400 | 463 | 336 |
| Other Fish | 867 | 849 | 747 | 566 | 622 | 319 | 237 | 234 | 183 | 224 | 110 | 4,957 | 485 | 730 | 239 |
| SECTOR TOTALS | 48,714 | 48,510 | 49,205 | 44,010 | 35,011 | 34,299 | 29,810 | 23,250 | 20,455 | 21,008 | 20,019 | 374,293 | 35,427 | 45,090 | 25,765 |

**Table 8. Relative emphasis for permit history in each year when using relative pounds (sector history in year 2003 divided by annual history), 1994 to 2004. (page 1 of 4)**

| Stock or Complex | At-Sea Catcher-Processors | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
| Lingcod - coastwide | 5.49 | 22.62 | 7.17 | 6.89 | - | 19.17 | - | 2.28 | 2.55 | 1.00 | 1.08 |
| N. of 42° (OR & WA) | 5.49 | 22.62 | 7.17 | 6.89 | - | 19.17 | - | 2.28 | 2.55 | 1.00 | 1.08 |
| S. of 42° (CA) | - | - | - | - | - | - | - | - | - | - | - |
| Pacific Cod | - | - | - | - | - | 5.59 | 1.23 | 67.75 | - | 1.00 | 10.42 |
| Pacific Whiting (Coastwide) | 0.48 | 0.67 | 0.63 | 0.58 | 0.59 | 0.61 | 0.61 | 0.70 | 1.13 | 1.00 | 0.56 |
| Sablefish (Coastwide) | 319.39 | 3.78 | 2.48 | 25.97 | 0.61 | 24.27 | 0.36 | 0.79 | 0.81 | 1.00 | 0.86 |
| N. of 36° (Monterey north) | 319.39 | 3.78 | 2.48 | 25.97 | 0.61 | 24.27 | 0.36 | 0.79 | 0.81 | 1.00 | 0.86 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | - | - | - | - |
| **PACIFIC OCEAN PERCH** | 0.16 | 0.38 | 1.31 | 2.54 | 0.34 | 0.54 | 0.78 | 0.26 | 3.49 | 1.00 | 5.31 |
| Shortbelly Rockfish | 0.58 | 0.10 | 0.08 | 1.01 | 25.40 | - | 0.54 | 11.23 | 1.01 | 1.00 | 97.00 |
| **WIDOW ROCKFISH** | 0.06 | 0.13 | 0.10 | 0.16 | 0.10 | 0.11 | 0.17 | 0.08 | 0.10 | 1.00 | 1.41 |
| **CANARY ROCKFISH** | 0.08 | 1.08 | 1.83 | 0.17 | 0.69 | 0.17 | 0.19 | 0.27 | 0.11 | 1.00 | 0.36 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| **BOCACCIO** | - | - | - | - | - | - | - | - | - | - | - |
| Splitnose Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | 0.01 | 0.02 | 0.01 | 0.01 | 0.03 | 0.00 | 0.01 | 0.05 | 0.14 | 1.00 | 0.28 |
| Shortspine Thornyhead - coastwide | 73.20 | 2.78 | 7.94 | 35.74 | 6.20 | 657.12 | 0.79 | 1.02 | 1.30 | 1.00 | 2.95 |
| N. of 34°27' | 73.20 | 2.78 | 7.94 | 35.74 | 6.20 | 657.12 | 0.79 | 1.02 | 1.30 | 1.00 | 2.95 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - |
| Longspine Thornyhead - coastwide | - | E | - | - | E | - | - | - | - | - | E |
| N. of 34°27' | - | E | - | - | E | - | - | - | - | - | E |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - |
| Other thornyheads | - | - | - | - | - | - | - | - | - | - | - |
| **COWCOD** | - | - | - | - | - | - | - | - | - | - | - |
| **DARKBLOTCHED** | 3.30 | 0.09 | 0.68 | 2.36 | 0.61 | 0.61 | 1.11 | 0.37 | 1.92 | 1.00 | 0.96 |
| **YELLOWEYE** | - | - | 0.01 | 0.28 | 0.20 | 0.20 | 0.00 | - | 0.31 | 1.00 | - |
| Black Rockfish - coastwide | - | - | - | - | - | E | E | - | - | - | - |
| Black Rockfish (WA) | - | - | - | - | - | - | - | - | - | - | - |
| Black Rockfish (OR-CA) | - | - | - | - | - | E | E | - | - | - | - |
| **Minor Rockfish North** | 1.23 | 0.41 | 1.74 | 0.90 | 1.07 | 1.99 | 0.31 | 0.52 | 1.08 | 1.00 | 0.92 |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | 0.62 | 0.27 | 22.67 | 37.41 | 3.42 | 8.36 | 8.20 | 10.27 | 0.80 | 1.00 | 2.57 |
| BOCACCIO: N. of Monterrey | 0.04 | 0.15 | 1.03 | 0.99 | 1.63 | 0.22 | 0.14 | 0.27 | 1.49 | 1.00 | 0.79 |
| Chilipepper Rockfish: Eureka | 0.02 | 0.00 | 10.61 | - | 20.33 | - | - | 0.50 | 0.04 | 1.00 | 0.10 |
| Redstripe Rockfish | 0.82 | 3.33 | 22.77 | 115.76 | 202.05 | 8.79 | 8.40 | 64.61 | 1.53 | 1.00 | 2.55 |
| Silvergrey Rockfish | - | 0.13 | 0.22 | 0.06 | 0.03 | 0.05 | - | 0.05 | 0.13 | 1.00 | 1.09 |
| Other Northern Shelf Rockfish | 19.40 | 23.24 | 58.19 | 131.52 | 1.40 | 65.76 | - | 15.73 | 0.75 | 1.00 | 68.50 |
| **Slope Species** | 2.46 | 0.56 | 1.18 | 0.60 | 0.79 | 1.44 | 0.21 | 0.35 | 1.33 | 1.00 | 0.70 |
| Bank Rockfish | - | - | - | - | - | - | - | E | - | - | E |
| Sharpchin Rockfish, north | 829.05 | 200.88 | - | 307.24 | - | 82.90 | - | 1.41 | 19.06 | 1.00 | 6.98 |
| Splitnose Rockfish: N. of Monterrey | 455.88 | 0.47 | 2.15 | 0.77 | 2.62 | 1.82 | 0.89 | 0.49 | 1.05 | 1.00 | 1.38 |
| Yellowmouth Rockfish | 0.00 | 0.00 | 0.03 | 0.02 | 0.05 | 0.01 | 0.01 | - | 0.00 | 1.00 | 0.18 |
| Other Northern Slope Rockfish | 0.45 | 0.55 | 0.26 | 0.19 | 0.13 | 0.46 | 0.03 | 0.11 | 6.16 | 1.00 | 0.15 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | - | - | - | - |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | - | - | - | - | - | - | - | - | - | - | - |
| Redstripe Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| **Slope Species** | - | - | - | - | - | - | - | - | - | - | - |
| Bank Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Blackgill Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Sharpchin Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| California scorpionfish | - | - | - | - | - | - | - | - | - | - | - |
| Cabezon (off CA only) | - | - | - | - | - | - | - | - | - | - | - |
| Dover Sole | - | 469.00 | 9.43 | - | 117.25 | 625.33 | 2.84 | 0.56 | 1.31 | 1.00 | 6.01 |
| English Sole | 15.00 | 1.67 | 5.00 | - | - | 0.43 | 0.07 | 0.08 | 0.05 | 1.00 | 0.47 |
| Petrale Sole (coastwide) | - | 0.50 | - | - | - | - | - | - | - | 1.00 | - |
| N of 40°10' | - | 0.50 | - | - | - | - | - | - | - | 1.00 | - |
| S of 40°10' | - | - | - | - | - | - | - | - | - | - | - |
| Arrowtooth Flounder | 20.66 | 14.62 | 14.97 | 32.51 | 22.06 | 1.09 | 0.75 | 1.05 | 1.31 | 1.00 | 2.58 |
| Starry Flounder | - | - | - | - | - | - | - | - | - | - | - |
| Other Flatfish | 26.33 | 15.92 | 29.76 | 320.91 | 19.30 | 1,230.17 | 1.31 | 0.37 | 0.58 | 1.00 | 3.99 |
| Kelp Greenling | - | - | - | - | - | - | - | - | - | - | - |
| Spiny Dogfish | 0.33 | 0.07 | 0.22 | 0.07 | 0.17 | 0.08 | 0.39 | 0.15 | 0.28 | 1.00 | 0.03 |
| Other Fish | 0.02 | - | - | 0.12 | 0.02 | 0.09 | 0.02 | 0.03 | - | 1.00 | 0.02 |
| SECTOR TOTALS | 0.48 | 0.67 | 0.62 | 0.58 | 0.58 | 0.60 | 0.60 | 0.70 | 1.13 | 1.00 | 0.56 |

**Note: "E" denotes non-zero catch for that year but zero catch recorded in the base "weighting" year (2003).**

**Table 8. Relative emphasis for permit history in each year when using relative pounds (sector history in year 2003 divided by annual history), 1994 to 2004. (page 2 of 4)**

| Stock or Complex | At Sea Motherships 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 1.17 | - | 3.26 | 0.95 | 0.65 | 4.59 | 0.32 | 0.19 | 0.85 | 1.00 | 0.11 |
| N. of 42° (OR & WA) | 1.17 | - | 3.26 | 0.95 | 0.65 | 4.59 | 0.32 | 0.19 | 0.85 | 1.00 | 0.11 |
| S. of 42° (CA) | - | - | - | - | - | - | - | - | - | - | - |
| Pacific Cod | E | - | E | E | - | E | - | E | - | - | - |
| Pacific Whiting (Coastwide) | 0.46 | 0.79 | 0.58 | 0.53 | 0.52 | 0.55 | 0.61 | 0.73 | 0.98 | 1.00 | 1.08 |
| Sablefish (Coastwide) | 0.58 | 0.11 | 2.74 | 1.64 | 0.58 | 0.23 | 0.35 | 1.25 | 0.82 | 1.00 | 0.03 |
| N. of 36° (Monterey north) | 0.58 | 0.11 | 2.74 | 1.64 | 0.58 | 0.23 | 0.35 | 1.25 | 0.82 | 1.00 | 0.03 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | - | - | - | - |
| **PACIFIC OCEAN PERCH** | 0.02 | 0.00 | 0.04 | 0.06 | 0.01 | 0.02 | 0.05 | 1.79 | 0.04 | 1.00 | 0.91 |
| Shortbelly Rockfish | 0.02 | 0.01 | - | 0.07 | - | 49.00 | 24.50 | 0.00 | 0.22 | 1.00 | 1.26 |
| **WIDOW ROCKFISH** | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.02 | 0.03 | 1.00 | 0.06 |
| **CANARY ROCKFISH** | 0.11 | 0.43 | 0.06 | 0.20 | 0.03 | 0.14 | 0.26 | 0.08 | 0.11 | 1.00 | 0.02 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| **BOCACCIO** | - | - | - | - | - | - | - | - | - | - | - |
| Splitnose Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.40 | 1.00 | 0.05 |
| Shortspine Thornyhead - coastwide | 14.02 | 0.76 | - | 7.44 | 33.50 | - | 0.76 | 8.59 | 47.86 | 1.00 | 10.47 |
| N. of 34°27' | 14.02 | 0.76 | - | 7.44 | 33.50 | - | 0.76 | 8.59 | 47.86 | 1.00 | 10.47 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - |
| Longspine Thornyhead - coastwide | - | - | - | - | - | - | - | - | - | - | - |
| N. of 34°27' | - | - | - | - | - | - | - | - | - | - | - |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - |
| Other thornyheads | - | - | - | - | - | - | - | - | - | - | - |
| **COWCOD** | - | - | - | - | - | - | - | - | - | - | - |
| **DARKBLOTCHED** | 0.04 | 0.03 | 0.16 | 0.12 | 0.01 | 0.03 | 0.02 | 0.19 | 0.11 | 1.00 | 0.04 |
| **YELLOWEYE** | E | - | - | - | - | - | - | - | - | - | E |
| Black Rockfish - coastwide | E | - | - | - | - | - | - | E | - | - | - |
| Black Rockfish (WA) | - | - | - | - | - | - | - | - | - | - | - |
| Black Rockfish (OR-CA) | E | - | - | - | - | - | - | E | - | - | - |
| **Minor Rockfish North** | 0.24 | 0.21 | 0.10 | 0.42 | 0.20 | 0.15 | 0.05 | 0.10 | 0.52 | 1.00 | 1.01 |
| **Nearshore Species** | - | E | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | 0.18 | 0.27 | 0.67 | 0.92 | 1.05 | 0.26 | 0.04 | 0.07 | 0.48 | 1.00 | 0.76 |
| BOCACCIO: N. of Monterrey | E | E | E | E | E | E | E | E | E | - | E |
| Chilipepper Rockfish: Eureka | 0.65 | - | - | 156.20 | 180.23 | 0.91 | 0.12 | 0.32 | 0.55 | 1.00 | 1.21 |
| Redstripe Rockfish | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.17 | 1.00 | 0.00 |
| Silvergrey Rockfish | 0.68 | - | - | 2.20 | 2.06 | 0.05 | 0.15 | 0.97 | - | 1.00 | 0.14 |
| Other Northern Shelf Rockfish | 0.04 | 0.01 | 0.01 | 1.67 | 0.79 | 0.56 | 0.00 | 0.14 | 0.04 | 1.00 | 0.94 |
| **Slope Species** | 0.55 | 0.15 | 0.04 | 0.21 | 0.08 | 0.08 | 0.15 | 0.27 | 0.62 | 1.00 | 2.57 |
| Bank Rockfish | E | - | - | - | - | - | - | E | E | - | - |
| Sharpchin Rockfish, north | 19.33 | - | 11.86 | 52.20 | 1.75 | 52.20 | 43.50 | 18.64 | 7.25 | 1.00 | - |
| Splitnose Rockfish: N. of Monterrey | 0.93 | 2.89 | 0.02 | 0.15 | 0.33 | - | 0.12 | 0.18 | 0.84 | 1.00 | 1.42 |
| Yellowmouth Rockfish | 0.12 | - | 0.03 | - | 0.00 | 0.21 | 0.60 | - | - | 1.00 | - |
| Other Northern Slope Rockfish | 0.65 | 0.04 | 0.62 | 0.22 | 0.05 | 0.02 | 0.11 | 0.31 | 0.36 | 1.00 | 8.44 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | - | - | - | - |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | - | - | - | - | - | - | - | - | - | - | - |
| Redstripe Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| **Slope Species** | - | - | - | - | - | - | - | - | - | - | - |
| Bank Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Blackgill Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Sharpchin Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| California scorpionfish | - | - | - | - | - | - | - | - | - | - | - |
| Cabezon (off CA only) | - | - | - | - | - | - | - | - | - | - | - |
| Dover Sole | 4.62 | - | - | - | 2.00 | - | 0.67 | 0.43 | 1.33 | 1.00 | 2.40 |
| English Sole | 2.20 | - | 6.20 | 31.00 | 31.00 | 2.58 | 0.08 | 0.72 | 1.72 | 1.00 | 1.72 |
| Petrale Sole (coastwide) | - | - | - | - | - | - | - | - | - | - | - |
| N of 40°10' | - | - | - | - | - | - | - | - | - | - | - |
| S of 40°10' | - | - | - | - | - | - | - | - | - | - | - |
| Arrowtooth Flounder | 0.16 | 0.02 | 0.06 | 0.28 | 0.03 | 0.04 | 0.01 | 0.03 | 5.78 | 1.00 | 1.11 |
| Starry Flounder | - | - | - | - | - | - | - | - | - | - | - |
| Other Flatfish | 19.49 | 2.09 | 16.43 | 6.97 | 11.79 | 10.95 | 0.13 | 0.44 | 1.12 | 1.00 | 0.93 |
| Kelp Greenling | - | - | - | - | - | - | - | - | - | - | - |
| Spiny Dogfish | 0.09 | 0.03 | 0.01 | 0.02 | 0.01 | 0.01 | 0.02 | 0.16 | 0.87 | 1.00 | 0.10 |
| Other Fish | 138.64 | 17.29 | 305.00 | 1.56 | 0.55 | 1.24 | 1.02 | 0.84 | - | 1.00 | 0.48 |
| SECTOR TOTALS | 0.45 | 0.77 | 0.58 | 0.53 | 0.52 | 0.54 | 0.60 | 0.73 | 0.98 | 1.00 | 1.08 |

**Note: "E" denotes non-zero catch for that year but zero catch recorded in the base "weighting" year (2003).**

**Table 8. Relative emphasis for permit history in each year when using relative pounds (sector history in year 2003 divided by annual history), 1994 to 2004. (page 3 of 4)**

| Stock or Complex | Shoreside Whiting LE Trawl | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
| Lingcod - coastwide | 1.98 | 2.81 | 0.57 | 0.84 | 1.08 | 0.63 | 0.48 | 0.53 | 1.13 | 1.00 | 0.10 |
| N. of 42° (OR & WA) | 1.97 | 2.79 | 0.57 | 0.88 | 5.52 | 0.64 | 0.48 | 0.52 | 1.13 | 1.00 | 0.10 |
| S. of 42° (CA) | - | - | 0.31 | 0.08 | 0.01 | 0.18 | 0.36 | - | 0.50 | 1.00 | 0.03 |
| Pacific Cod | 0.05 | 0.41 | 0.08 | 0.93 | 0.04 | 0.15 | 0.35 | 0.56 | 0.09 | 1.00 | 0.03 |
| Pacific Whiting (Coastwide) | 0.70 | 0.68 | 0.62 | 0.59 | 0.58 | 0.61 | 0.60 | 0.70 | 1.12 | 1.00 | 0.55 |
| Sablefish (Coastwide) | 1.16 | 0.94 | 1.09 | 0.96 | 1.44 | 11.54 | 24.07 | 0.85 | 0.31 | 1.00 | 0.31 |
| N. of 36° (Monterey north) | 1.16 | 0.94 | 1.09 | 0.96 | 1.44 | 11.54 | 24.07 | 0.85 | 0.31 | 1.00 | 0.31 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | - | - | - | - |
| **PACIFIC OCEAN PERCH** | 0.03 | 0.01 | 0.01 | 0.05 | 0.01 | 0.16 | 1.07 | 5.89 | 1.34 | 1.00 | 0.30 |
| Shortbelly Rockfish | - | - | 4.79 | 3.14 | 0.03 | 0.01 | 0.02 | 0.07 | 0.81 | 1.00 | 5.06 |
| **WIDOW ROCKFISH** | 0.05 | 0.05 | 0.02 | 0.08 | 0.04 | 0.06 | 0.15 | 0.28 | 2.45 | 1.00 | 0.37 |
| **CANARY ROCKFISH** | 0.13 | 0.22 | 0.09 | 0.12 | 0.13 | 0.06 | 0.10 | 0.08 | 0.21 | 1.00 | 0.10 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| **BOCACCIO** | - | - | - | - | - | - | - | - | - | - | - |
| Splitnose Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | 0.17 | 0.15 | 0.09 | 0.19 | 0.09 | 0.09 | 0.23 | 0.43 | 1.03 | 1.00 | 0.34 |
| Shortspine Thornyhead - coastwide | 0.04 | 0.13 | 0.59 | 0.35 | 0.08 | 0.14 | 0.03 | 0.97 | 0.26 | 1.00 | 0.13 |
| N. of 34°27' | 0.04 | 0.13 | 0.59 | 0.35 | 0.08 | 0.14 | 0.03 | 0.97 | 0.26 | 1.00 | 0.13 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - |
| Longspine Thornyhead - coastwide | 0.01 | 0.01 | 2.20 | 0.05 | 0.17 | 0.08 | 0.04 | 0.41 | - | 1.00 | 1.29 |
| N. of 34°27' | 0.01 | 0.01 | 2.20 | 0.05 | 0.17 | 0.08 | 0.04 | 0.41 | - | 1.00 | 1.29 |
| S. of 34°27' | - | - | - | - | - | - | - | - | - | - | - |
| Other thornyheads | E | - | - | - | - | - | - | - | - | - | - |
| **COWCOD** | - | - | - | - | - | - | - | - | - | - | - |
| **DARKBLOTCHED** | 1.55 | 0.53 | 0.04 | 0.57 | 0.05 | 0.42 | 0.07 | 0.06 | 23.16 | 1.00 | 0.14 |
| **YELLOWEYE** | E | E | E | E | E | E | E | E | E | - | E |
| Black Rockfish - coastwide | E | E | E | E | E | E | E | - | - | - | - |
| Black Rockfish (WA) | E | E | - | - | E | - | - | - | - | - | - |
| Black Rockfish (OR-CA) | - | E | E | E | E | E | E | - | - | - | - |
| **Minor Rockfish North** | 0.54 | 3.67 | 0.48 | 0.45 | 0.25 | 0.70 | 0.23 | 2.07 | 10.83 | 1.00 | 0.40 |
| **Nearshore Species** | - | - | E | - | - | - | - | - | E | - | - |
| **Shelf Species** | 0.51 | 4.00 | 0.54 | 0.44 | 0.43 | 0.92 | 0.32 | 4.00 | 12.58 | 1.00 | 0.44 |
| BOCACCIO: N. of Monterrey | E | E | E | E | E | E | E | E | E | - | E |
| Chilipepper Rockfish: Eureka | - | 124.90 | 599.54 | 322.83 | 27.90 | 180.90 | 0.34 | 11.24 | 17.83 | 1.00 | 0.46 |
| Redstripe Rockfish | E | E | E | E | E | E | E | - | E | - | - |
| Silvergrey Rockfish | E | E | E | E | E | E | - | - | E | - | - |
| Other Northern Shelf Rockfish | 0.02 | 0.16 | 0.07 | 0.02 | 0.02 | 0.04 | 0.17 | 0.39 | 2.93 | 1.00 | 0.21 |
| **Slope Species** | 3.35 | 1.41 | 0.16 | 0.66 | 0.03 | 0.13 | 0.04 | 0.21 | 3.04 | 1.00 | 0.14 |
| Bank Rockfish | - | E | - | E | E | E | E | - | - | - | E |
| Sharpchin Rockfish, north | E | E | E | E | E | E | E | E | E | - | - |
| Splitnose Rockfish: N. of Monterrey | 0.05 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 1.00 | 0.00 |
| Yellowmouth Rockfish | E | - | E | E | E | E | - | - | - | - | - |
| Other Northern Slope Rockfish | 9.08 | 11.54 | 0.57 | 0.85 | 0.38 | 0.43 | 0.12 | 0.85 | 3.28 | 1.00 | 0.16 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | - | - | - | - |
| **Nearshore Species** | - | - | - | - | - | - | - | - | - | - | - |
| **Shelf Species** | - | - | - | - | - | - | - | - | - | - | - |
| Redstripe Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowtail Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| **Slope Species** | - | - | - | - | - | - | - | - | - | - | - |
| Bank Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Blackgill Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Sharpchin Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | - | - | - | - |
| California scorpionfish | - | - | - | - | - | - | - | - | - | - | - |
| Cabezon (off CA only) | - | - | - | - | - | - | - | - | - | - | - |
| Dover Sole | 0.02 | 0.09 | 0.02 | 0.02 | 0.01 | 1.90 | 0.10 | 0.10 | 0.02 | 1.00 | 0.96 |
| English Sole | 808.00 | 28.86 | 0.68 | 0.64 | 0.29 | 3.74 | 0.79 | 0.29 | 0.21 | 1.00 | 0.52 |
| Petrale Sole (coastwide) | - | 0.29 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| N of 40°10' | - | 0.29 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| S of 40°10' | - | - | - | - | - | - | - | - | - | - | - |
| Arrowtooth Flounder | 2.03 | 1.15 | 0.21 | 0.27 | 0.74 | 0.07 | 0.12 | 0.18 | 0.36 | 1.00 | 0.37 |
| Starry Flounder | - | - | - | - | - | - | - | - | 24.00 | 1.00 | 8.00 |
| Other Flatfish | 3.00 | 1.40 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.03 | 1.00 | 0.02 |
| Kelp Greenling | - | - | - | - | - | - | - | - | - | - | - |
| Spiny Dogfish | 0.17 | 32.77 | 1.10 | 1.26 | 0.08 | 0.11 | 0.12 | 0.33 | 0.37 | 1.00 | 0.14 |
| Other Fish | E | E | E | E | E | E | E | E | - | - | E |
| SECTOR TOTALS | 0.69 | 0.68 | 0.61 | 0.58 | 0.58 | 0.61 | 0.60 | 0.70 | 1.12 | 1.00 | 0.55 |

**Note: "E" denotes non-zero catch for that year but zero catch recorded in the base "weighting" year (2003).**

**Table 8. Relative emphasis for permit history in each year when using relative pounds (sector history in year 2003 divided by annual history), 1994 to 2004. (page 4 of 4)**

| Stock or Complex | Shoreside Non-whiting LE Trawl | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
| Lingcod - coastwide | 0.04 | 0.06 | 0.05 | 0.05 | 0.28 | 0.28 | 0.91 | 1.04 | 0.59 | 1.00 | 1.04 |
| N. of 42° (OR & WA) | 0.05 | 0.06 | 0.05 | 0.06 | 0.34 | 0.36 | 1.26 | 1.54 | 0.73 | 1.00 | 1.14 |
| S. of 42° (CA) | 0.04 | 0.04 | 0.04 | 0.04 | 0.16 | 0.15 | 0.43 | 0.46 | 0.33 | 1.00 | 0.78 |
| Pacific Cod | 1.26 | 2.12 | 2.40 | 1.77 | 2.57 | 3.76 | 3.80 | 3.30 | 1.51 | 1.00 | 0.94 |
| Pacific Whiting (Coastwide) | 0.60 | 0.43 | 0.46 | 0.26 | 0.27 | 1.17 | 0.84 | 1.20 | 0.77 | 1.00 | 2.06 |
| Sablefish (Coastwide) | 0.66 | 0.63 | 0.56 | 0.63 | 1.08 | 0.74 | 0.86 | 0.92 | 1.61 | 1.00 | 0.95 |
| N. of 36° (Monterey north) | 0.67 | 0.64 | 0.57 | 0.63 | 1.11 | 0.73 | 0.85 | 0.90 | 1.61 | 1.00 | 0.95 |
| S. of 36° (Conception area) | 0.51 | 0.38 | 0.36 | 0.51 | 0.68 | 0.94 | 2.15 | 2.74 | 1.59 | 1.00 | 0.97 |
| **PACIFIC OCEAN PERCH** | 0.15 | 0.16 | 0.16 | 0.20 | 0.22 | 0.25 | 0.97 | 0.70 | 0.89 | 1.00 | 1.01 |
| Shortbelly Rockfish | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.10 | 0.01 | 0.05 | 3.08 | 1.00 | 2.65 |
| **WIDOW ROCKFISH** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 1.00 | 0.46 |
| **CANARY ROCKFISH** | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.21 | 0.32 | 0.18 | 1.00 | 1.17 |
| Chilipepper Rockfish | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.05 | 1.00 | 0.19 |
| **BOCACCIO** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 1.00 | 0.02 |
| Splitnose Rockfish | 0.52 | 0.55 | 0.37 | 0.35 | 0.12 | 0.73 | 1.80 | 1.67 | 2.70 | 1.00 | 0.92 |
| Yellowtail Rockfish | 0.02 | 0.03 | 0.02 | 0.08 | 0.06 | 0.06 | 0.04 | 0.07 | 0.14 | 1.00 | 1.08 |
| Shortspine Thornyhead - coastwide | 0.22 | 0.36 | 0.44 | 0.48 | 0.56 | 0.93 | 0.87 | 1.41 | 1.00 | 1.00 | 1.00 |
| N. of 34°27' | 0.21 | 0.38 | 0.43 | 0.46 | 0.54 | 0.88 | 0.96 | 1.32 | 1.08 | 1.00 | 1.06 |
| S. of 34°27' | 0.27 | 0.32 | 0.47 | 0.50 | 0.62 | 1.09 | 0.72 | 1.67 | 0.85 | 1.00 | 0.90 |
| Longspine Thornyhead - coastwide | 0.38 | 0.29 | 0.33 | 0.40 | 0.70 | 0.88 | 1.09 | 1.37 | 0.82 | 1.00 | 2.15 |
| N. of 34°27' | 0.38 | 0.29 | 0.33 | 0.40 | 0.70 | 0.88 | 1.09 | 1.37 | 0.82 | 1.00 | 2.15 |
| S. of 34°27' | - | - | - | - | - | - | - | - | E | - | - |
| Other thornyheads | 0.14 | 7.87 | 0.85 | 1.10 | 2.24 | 1.03 | 0.63 | 1.73 | 0.71 | 1.00 | 46.94 |
| **COWCOD** | - | - | E | - | - | - | - | - | E | - | - |
| **DARKBLOTCHED** | 0.10 | 0.11 | 0.11 | 0.10 | 0.09 | 0.23 | 0.33 | 0.52 | 0.74 | 1.00 | 0.42 |
| **YELLOWEYE** | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.04 | 0.79 | 0.49 | 1.02 | 1.00 | 2.93 |
| Black Rockfish - coastwide | 0.02 | 0.10 | 0.05 | 0.04 | 0.01 | 0.19 | 0.48 | 0.93 | 0.27 | 1.00 | 0.37 |
| Black Rockfish (WA) | E | E | - | E | E | - | - | - | E | - | - |
| Black Rockfish (OR-CA) | 0.02 | 0.15 | 0.05 | 0.04 | 0.01 | 0.19 | 0.48 | 0.93 | 0.30 | 1.00 | 0.37 |
| **Minor Rockfish North** | 0.07 | 0.09 | 0.09 | 0.10 | 0.10 | 0.20 | 0.43 | 0.45 | 1.20 | 1.00 | 0.69 |
| **Nearshore Species** | 0.40 | 0.30 | 12.02 | 0.94 | 0.05 | 1.73 | 0.76 | 0.47 | 0.36 | 1.00 | 0.20 |
| **Shelf Species** | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.05 | 0.36 | 0.10 | 0.43 | 1.00 | 1.61 |
| BOCACCIO: N. of Monterrey | 0.04 | 0.04 | 0.06 | 0.05 | 0.08 | 0.17 | 1.85 | 0.62 | 1.32 | 1.00 | 1.91 |
| Chilipepper Rockfish: Eureka | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 | 0.00 | 0.07 | 1.00 | 0.33 |
| Redstripe Rockfish | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.14 | 0.11 | 0.26 | 1.00 | 2.89 |
| Silvergrey Rockfish | 0.02 | 0.02 | 0.01 | 0.02 | 0.01 | 0.02 | 1.44 | 0.42 | 0.79 | 1.00 | 2.82 |
| Other Northern Shelf Rockfish | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.04 | 0.29 | 0.28 | 0.33 | 1.00 | 1.60 |
| **Slope Species** | 0.13 | 0.18 | 0.20 | 0.19 | 0.29 | 0.41 | 0.44 | 0.94 | 1.63 | 1.00 | 0.64 |
| Bank Rockfish | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.07 | 2.00 | 1.00 | 0.00 |
| Sharpchin Rockfish, north | 0.01 | 0.02 | 0.02 | 0.02 | 0.03 | 0.07 | 0.29 | 0.75 | 0.66 | 1.00 | 0.16 |
| Splitnose Rockfish: N. of Monterrey | 0.04 | 0.05 | 0.08 | 0.04 | 0.04 | 0.10 | 0.16 | 0.37 | 0.77 | 1.00 | 0.22 |
| Yellowmouth Rockfish | 0.01 | 0.03 | 0.03 | 0.04 | 0.08 | 0.11 | 0.28 | 0.71 | 1.50 | 1.00 | 0.21 |
| Other Northern Slope Rockfish | 0.56 | 0.48 | 0.51 | 0.54 | 0.72 | 0.71 | 0.50 | 1.03 | 1.81 | 1.00 | 0.86 |
| **Minor Rockfish South** | 0.29 | 0.27 | 0.20 | 0.21 | 0.23 | 1.54 | 1.08 | 0.88 | 0.48 | 1.00 | 0.79 |
| **Nearshore Species** | 0.11 | 0.05 | 0.02 | 0.03 | 0.54 | 0.03 | 0.98 | 1.54 | 0.54 | 1.00 | 3.26 |
| **Shelf Species** | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.08 | 0.09 | 0.12 | 0.19 | 1.00 | 1.52 |
| Redstripe Rockfish | E | E | - | E | E | E | - | - | - | - | - |
| Yellowtail Rockfish | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.03 | 0.02 | 0.28 | 0.20 | 1.00 | 1.67 |
| Other Southern Shelf Rockfish | 0.02 | 0.02 | 0.02 | 0.03 | 0.02 | 0.11 | 0.30 | 0.11 | 0.18 | 1.00 | 1.50 |
| **Slope Species** | 0.41 | 0.37 | 0.26 | 0.29 | 0.33 | 2.49 | 1.28 | 0.97 | 0.50 | 1.00 | 0.78 |
| Bank Rockfish | 0.33 | 0.28 | 0.17 | 0.23 | 0.21 | 4.60 | 1.09 | 1.05 | 0.31 | 1.00 | 0.79 |
| Blackgill Rockfish | 0.49 | 0.43 | 0.36 | 0.42 | 0.48 | 1.98 | 1.03 | 0.61 | 0.87 | 1.00 | 0.69 |
| Sharpchin Rockfish | E | E | E | E | E | E | E | E | E | - | - |
| Yellowmouth Rockfish | E | - | E | E | - | - | - | - | - | - | - |
| Other Southern Slope Rockfish | 0.66 | 0.71 | 0.84 | 1.13 | 1.61 | 1.63 | 3.35 | 2.29 | 1.22 | 1.00 | 0.93 |
| California scorpionfish | E | - | - | E | - | - | - | E | E | - | - |
| Cabezon (off CA only) | E | - | E | - | - | E | E | E | E | - | - |
| Dover Sole | 0.86 | 0.72 | 0.61 | 0.74 | 0.93 | 0.82 | 0.85 | 1.09 | 1.18 | 1.00 | 1.05 |
| English Sole | 0.79 | 0.77 | 0.76 | 0.60 | 0.76 | 0.96 | 1.15 | 0.89 | 0.76 | 1.00 | 0.96 |
| Petrale Sole (coastwide) | 1.49 | 1.22 | 1.08 | 1.04 | 1.33 | 1.32 | 1.05 | 1.09 | 1.09 | 1.00 | 1.02 |
| N of 40°10' | 1.68 | 1.36 | 1.25 | 1.22 | 1.41 | 1.38 | 1.05 | 1.12 | 1.08 | 1.00 | 1.03 |
| S of 40°10' | 0.84 | 0.73 | 0.55 | 0.52 | 0.97 | 1.00 | 1.05 | 0.93 | 1.12 | 1.00 | 0.93 |
| Arrowtooth Flounder | 0.74 | 1.00 | 1.06 | 0.99 | 0.72 | 0.43 | 0.70 | 0.94 | 1.11 | 1.00 | 0.97 |
| Starry Flounder | 0.40 | 0.58 | 1.04 | 0.49 | 0.55 | 1.31 | 1.15 | 3.96 | 1.58 | 1.00 | 0.24 |
| Other Flatfish | 0.68 | 0.62 | 0.79 | 0.81 | 0.96 | 0.78 | 0.97 | 0.92 | 0.91 | 1.00 | 1.16 |
| Kelp Greenling | 0.13 | 0.01 | 0.33 | - | 0.35 | - | - | 0.85 | 34.00 | 1.00 | - |
| Spiny Dogfish | 0.19 | 0.55 | 1.01 | 0.59 | 0.49 | 0.46 | 0.72 | 0.59 | 0.44 | 1.00 | 1.65 |
| Other Fish | 0.26 | 0.26 | 0.30 | 0.40 | 0.36 | 0.70 | 0.95 | 0.96 | 1.22 | 1.00 | 2.04 |
| SECTOR TOTALS | 0.43 | 0.43 | 0.43 | 0.48 | 0.60 | 0.61 | 0.70 | 0.90 | 1.03 | 1.00 | 1.05 |

**Note: "E" denotes non-zero catch for that year but zero catch recorded in the base "weighting" year (2003).**

**Table 9a. Example of Quota Share (QS) Allocations for a Selected Shoreside Non-whiting Vessel Permit (catch in lbs) with a Relatively Early Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNW1 | Lingcod - coastwide | 2,162 | 2,969 | 31,230 | 72,004 | 3,143 | 1,810 | 715 | 38 | | | | 114,070 | 0.93% | 7,612 | 0.52% | -0.41% | + 43.79% |
| | N. of 42° (OR & WA) | 2,162 | 2,969 | 25,681 | 47,400 | 3,143 | 1,810 | 715 | 38 | | | | 83,917 | 0.93% | 6,982 | 0.60% | -0.33% | + 35.59% |
| | S. of 42° (CA) | 0 | 0 | 5,549 | 24,604 | 0 | 0 | 0 | 0 | | | | 30,153 | 0.92% | 1,182 | 0.40% | -0.52% | + 56.38% |
| | Pacific Cod | 178 | 11 | 236 | 293 | 558 | 74 | 14 | 275 | | | | 1,639 | 0.01% | 4,002 | 0.02% | 0.00% | - 37.45% |
| | Pacific Whiting (Coastwide) | 1,391 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | | | | 1,437 | 0.11% | 861 | 0.12% | 0.01% | - 5.25% |
| | Sablefish (Coastwide) | 24,065 | 41,773 | 60,763 | 49,192 | 35,528 | 56,317 | 43,925 | 32,718 | | | | 344,280 | 0.49% | 255,295 | 0.45% | -0.04% | + 7.84% |
| | N. of 36° (Monterey north) | 24,065 | 41,773 | 60,763 | 49,192 | 35,528 | 56,317 | 43,925 | 32,718 | | | | 344,280 | 0.51% | 256,058 | 0.47% | -0.04% | + 7.96% |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | 10,683 | 27,419 | 16,565 | 19,623 | 13,205 | 7,175 | 7,062 | 3,600 | | | | 105,331 | 0.94% | 26,549 | 0.83% | -0.11% | + 11.77% |
| | Shortbelly Rockfish | 0 | 1 | 267 | 10 | 0 | 0 | 108 | 0 | | | | 386 | 0.08% | 3 | 0.06% | -0.02% | + 27.25% |
| | **WIDOW ROCKFISH** | 264,370 | 293,456 | 295,570 | 279,832 | 141,522 | 187,317 | 143,919 | 21,673 | | | | 1,627,660 | 2.04% | 1,359 | 1.39% | -0.64% | + 31.59% |
| | **CANARY ROCKFISH** | 12,542 | 10,277 | 82,980 | 31,806 | 33,781 | 18,020 | 0 | 61 | | | | 189,467 | 1.79% | 1,760 | 0.95% | -0.83% | + 46.64% |
| | Chilipepper Rockfish | 0 | 0 | 24,252 | 49,763 | 0 | 0 | 0 | 0 | | | | 74,015 | 0.41% | 368 | 0.21% | -0.20% | + 49.68% |
| | **BOCACCIO** | 0 | 0 | 17,439 | 10,100 | 0 | 0 | 0 | 0 | | | | 27,539 | 0.87% | 12 | 0.45% | -0.42% | + 48.37% |
| | Splitnose Rockfish | 0 | 0 | 9,896 | 289 | 0 | 0 | 0 | 0 | | | | 10,184 | 0.13% | 3,810 | 0.10% | -0.03% | + 22.07% |
| | Yellowtail Rockfish | 54,934 | 15,965 | 129,421 | 28,765 | 44,741 | 54,764 | 75,440 | 18,337 | | | | 422,367 | 0.87% | 17,152 | 0.70% | -0.17% | + 19.20% |
| | Shortspine Thornyhead - coastwide | 10,407 | 16,161 | 19,546 | 16,306 | 12,290 | 11,857 | 8,841 | 7,524 | | | | 102,931 | 0.36% | 60,735 | 0.38% | 0.01% | - 3.99% |
| | N. of 34°27' | 10,407 | 16,161 | 15,014 | 13,647 | 12,290 | 11,857 | 8,841 | 7,524 | | | | 95,741 | 0.48% | 56,514 | 0.50% | 0.03% | - 5.48% |
| | S. of 34°27' | 0 | 0 | 4,531 | 2,659 | 0 | 0 | 0 | 0 | | | | 7,190 | 0.09% | 3,476 | 0.07% | -0.02% | + 17.52% |
| | Longspine Thornyhead - coastwide | 20,578 | 40,458 | 83,410 | 51,451 | 6,493 | 15,680 | 35,705 | 16,861 | | | | 270,634 | 0.43% | 147,893 | 0.39% | -0.03% | + 8.09% |
| | N. of 34°27' | 20,578 | 40,458 | 83,410 | 51,451 | 6,493 | 15,680 | 35,705 | 16,861 | | | | 270,634 | 0.43% | 147,893 | 0.39% | -0.03% | + 8.09% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | 16,357 | 25,059 | 12,492 | 17,685 | 31,525 | 5,105 | 3,502 | 757 | | | | 112,482 | 1.01% | 13,054 | 0.68% | -0.33% | + 32.98% |
| | **YELLOWEYE** | 2,456 | 1,307 | 12,899 | 5,929 | 156 | 350 | 0 | 0 | | | | 23,097 | 2.26% | 249 | 1.06% | -1.20% | + 53.09% |
| | Black Rockfish - coastwide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish (OR-CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Minor Rockfish North** | 13,740 | 33,271 | 41,492 | 27,093 | 28,319 | 14,105 | 9,698 | 3,939 | | | | 171,657 | 0.74% | 21,812 | 0.60% | -0.14% | + 18.69% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 565 | 0 | 0 | 0 | | | | 565 | 2.71% | 30 | 0.50% | -2.20% | + 81.39% |
| | **Shelf Species** | 3,792 | 11,305 | 27,646 | 12,575 | 10,657 | 7,486 | 327 | 4 | | | | 73,793 | 0.57% | 1,696 | 0.37% | -0.20% | + 35.21% |
| | BOCACCIO: N. of Monterrey | 1,012 | 3,712 | 9,959 | 4,881 | 1,271 | 2,883 | 0 | 0 | | | | 23,719 | 1.32% | 1,625 | 0.89% | -0.44% | + 32.92% |
| | Chilipepper Rockfish: Eureka | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | | | 1 | 0.00% | 0 | 0.00% | 0.00% | + 2.62% |
| | Redstripe Rockfish | 1,308 | 3,031 | 1,932 | 1,922 | 4,368 | 302 | 2 | 4 | | | | 12,868 | 0.54% | 60 | 0.37% | -0.17% | + 31.77% |
| | Silvergrey Rockfish | 454 | 1,484 | 14,622 | 1,374 | 1,962 | 2,427 | 0 | 0 | | | | 22,322 | 1.32% | 259 | 0.59% | -0.73% | + 55.11% |
| | Other Northern Shelf Rockfish | 1,018 | 3,078 | 1,133 | 4,397 | 3,057 | 1,875 | 325 | 1 | | | | 14,884 | 0.26% | 410 | 0.20% | -0.06% | + 22.66% |
| | **Slope Species** | 9,947 | 21,966 | 13,846 | 14,519 | 17,096 | 6,619 | 9,371 | 3,935 | | | | 97,299 | 0.96% | 26,401 | 0.84% | -0.12% | + 12.24% |
| | Bank Rockfish | 101 | 701 | 32 | 305 | 73 | 357 | 217 | 3 | | | | 1,789 | 0.65% | 4 | 0.80% | 0.15% | - 22.74% |
| | Sharpchin Rockfish, north | 832 | 1,465 | 5,672 | 1,031 | 803 | 188 | 278 | 105 | | | | 10,373 | 0.39% | 348 | 0.40% | 0.01% | - 3.82% |
| | Splitnose Rockfish: N. of Monterrey | 2,541 | 4,538 | 638 | 1,229 | 3,249 | 995 | 408 | 189 | | | | 13,785 | 0.84% | 776 | 0.58% | -0.25% | + 30.27% |
| | Yellowmouth Rockfish | 5,258 | 13,513 | 4,360 | 4,987 | 8,044 | 1,661 | 1,430 | 338 | | | | 39,591 | 2.85% | 2,274 | 2.93% | 0.08% | - 2.87% |
| | Other Northern Slope Rockfish | 1,216 | 1,749 | 3,144 | 6,968 | 4,926 | 3,418 | 7,039 | 3,301 | | | | 31,761 | 0.76% | 19,792 | 0.69% | -0.07% | + 8.68% |
| | **Minor Rockfish South** | 0 | 0 | 18,197 | 38,167 | 0 | 0 | 0 | 0 | | | | 56,364 | 0.48% | 11,522 | 0.25% | -0.23% | + 47.44% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 0 | 0 | 6,259 | 1,599 | 0 | 0 | 0 | 0 | | | | 7,857 | 0.30% | 98 | 0.15% | -0.15% | + 50.35% |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 0 | 5,683 | 481 | 0 | 0 | 0 | 0 | | | | 6,164 | 0.54% | 30 | 0.34% | -0.20% | + 37.30% |
| | Other Southern Shelf Rockfish | 0 | 0 | 576 | 1,118 | 0 | 0 | 0 | 0 | | | | 1,693 | 0.12% | 42 | 0.07% | -0.04% | + 37.35% |
| | **Slope Species** | 0 | 0 | 11,938 | 36,568 | 0 | 0 | 0 | 0 | | | | 48,506 | 0.53% | 13,704 | 0.30% | -0.23% | + 43.33% |
| | Bank Rockfish | 0 | 0 | 9,736 | 34,626 | 0 | 0 | 0 | 0 | | | | 44,362 | 0.80% | 9,746 | 0.47% | -0.34% | + 42.02% |
| | Blackgill Rockfish | 0 | 0 | 1,470 | 1,526 | 0 | 0 | 0 | 0 | | | | 2,995 | 0.14% | 1,173 | 0.09% | -0.05% | + 34.74% |
| | Sharpchin Rockfish | 0 | 0 | 395 | 416 | 0 | 0 | 0 | 0 | | | | 811 | 0.24% | 0 | 0.00% | -0.24% | + 100.00% |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Slope Rockfish | 0 | 0 | 337 | 1 | 0 | 0 | 0 | 0 | | | | 338 | 0.03% | 285 | 0.03% | -0.01% | + 24.45% |
| | California scorpionfish | 0 | 0 | 0 | 12,408 | 0 | 0 | 0 | 0 | | | | 12,408 | 92.92% | 0 | 0.00% | -92.92% | + 100.00% |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | 42,546 | 51,907 | 54,125 | 83,543 | 58,628 | 109,660 | 64,990 | 105,333 | | | | 570,733 | 0.27% | 482,491 | 0.27% | -0.01% | + 2.03% |
| | Dover Sole (Summer) | 0 | 14,314 | 21,331 | 32,427 | 15,027 | 38,969 | 17,868 | 28,491 | | | | 168,428 | 0.16% | 166,509 | 0.16% | 0.00% | - 0.84% |
| | Dover Sole (Winter) | 42,546 | 37,593 | 32,795 | 51,116 | 43,601 | 70,691 | 47,121 | 76,842 | | | | 402,305 | 0.39% | 287,898 | 0.38% | -0.01% | + 3.51% |
| | English Sole | 2,150 | 847 | 2,046 | 3,697 | 2,176 | 1,589 | 0 | 101 | | | | 12,606 | 0.05% | 9,384 | 0.05% | -0.01% | + 10.27% |
| | Petrale Sole (coastwide) | 3,171 | 12,073 | 7,051 | 5,615 | 7,336 | 2,857 | 5,782 | 6,599 | | | | 50,484 | 0.12% | 59,704 | 0.13% | 0.00% | - 3.85% |
| | N of 40°10' (summer) | 0 | 430 | 367 | 866 | 941 | 193 | 411 | 232 | | | | 3,440 | 0.03% | 3,769 | 0.03% | 0.00% | - 6.93% |
| | N of 40°10' (winter) | 3,171 | 11,643 | 1,472 | 3,156 | 6,395 | 2,664 | 5,371 | 6,366 | | | | 40,239 | 0.19% | 56,781 | 0.20% | 0.01% | - 7.57% |
| | S of 40°10' (summer) | 0 | 0 | 950 | 0 | 0 | 0 | 0 | 0 | | | | 950 | 0.03% | 578 | 0.02% | -0.01% | + 30.72% |
| | S of 40°10' (winter) | 0 | 0 | 4,262 | 1,593 | 0 | 0 | 0 | 0 | | | | 5,855 | 0.13% | 3,071 | 0.09% | -0.04% | + 33.86% |
| | Arrowtooth Flounder (total) | 3,146 | 33 | 832 | 898 | 2,044 | 10,387 | 2,952 | 16,785 | | | | 37,078 | 0.05% | 27,973 | 0.05% | 0.00% | + 7.98% |
| | Arrowtooth Flounder (summer) | 0 | 33 | 832 | 898 | 1,052 | 9,321 | 599 | 11,197 | | | | 23,932 | 0.04% | 18,966 | 0.04% | 0.00% | + 1.73% |
| | Arrowtooth Flounder (winter) | 3,146 | 0 | 0 | 0 | 992 | 1,066 | 2,353 | 5,588 | | | | 13,145 | 0.11% | 10,339 | 0.10% | -0.01% | + 11.21% |
| | Starry Flounder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Flatfish | 1,144 | 343 | 1,139 | 5,431 | 2,260 | 4,025 | 2,064 | 2,352 | | | | 18,758 | 0.04% | 15,757 | 0.04% | 0.00% | + 0.77% |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Fish | 106 | 0 | 0 | 1,238 | 0 | 0 | 0 | 110 | | | | 1,454 | 0.01% | 622 | 0.01% | 0.00% | + 13.86% |
| | Total Groundfish | 487,136 | 573,329 | 921,893 | 811,138 | 423,704 | 501,091 | 404,717 | 237,063 | | | | 4,360,069 | 0.53% | 2,299,754 | 0.45% | -0.08% | + 14.57% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 9b. Example of Quota Share (QS) Allocations for a Selected Shoreside Non-whiting Vessel Permit (catch in lbs) with a Relatively Late Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNW2 | Lingcod - coastwide | 109 | 146 | 102 | 94 | 85 | 129 | 134 | 386 | 466 | 2,152 | 3,263 | 7,066 | 0.06% | 6,429 | 0.44% | 0.38% | - 100.00% |
| | N. of 42° (OR & WA) | 109 | 146 | 102 | 94 | 85 | 129 | 134 | 386 | 466 | 2,152 | 3,263 | 7,066 | 0.08% | 7,069 | 0.60% | 0.53% | - 100.00% |
| | S. of 42° (CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Pacific Cod | 290 | 75 | 179 | 260 | 74 | 102 | 158 | 84 | 1,703 | 21,823 | 35,305 | 60,053 | 0.42% | 60,594 | 0.24% | -0.18% | + 43.21% |
| | Pacific Whiting (Coastwide) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sablefish (Coastwide) | 0 | 0 | 0 | 30 | 0 | 1,318 | 1,872 | 20,897 | 15,124 | 18,694 | 11,184 | 69,119 | 0.10% | 75,578 | 0.13% | 0.04% | - 35.90% |
| | N. of 36° (Monterey north) | 0 | 0 | 0 | 30 | 0 | 1,318 | 1,872 | 20,897 | 15,124 | 18,694 | 11,184 | 69,119 | 0.10% | 75,111 | 0.14% | 0.04% | - 34.48% |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | 2 | 0 | 0 | 0 | 0 | 34 | 2 | 0 | 0 | 0 | 0 | 38 | 0.00% | 11 | 0.00% | 0.00% | + 0.15% |
| | Shortbelly Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **WIDOW ROCKFISH** | 0 | 0 | 0 | 0 | 0 | 2 | 2,816 | 101 | 0 | 0 | 5 | 2,924 | 0.00% | 6 | 0.01% | 0.00% | - 56.04% |
| | **CANARY ROCKFISH** | 21 | 0 | 0 | 4 | 54 | 164 | 402 | 106 | 398 | 11 | 57 | 1,217 | 0.01% | 272 | 0.15% | 0.14% | - 100.00% |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 52 | 14 | 0 | 313 | 491 | 32,850 | 10,301 | 3,825 | 2,184 | 2,907 | 52,937 | 0.11% | 7,886 | 0.32% | 0.21% | - 100.00% |
| | Shortspine Thornyhead - coastwide | 0 | 0 | 0 | 0 | 0 | 131 | 177 | 1,531 | 112 | 1,207 | 3 | 3,160 | 0.01% | 3,757 | 0.02% | 0.01% | - 100.00% |
| | N. of 34°27' | 0 | 0 | 0 | 0 | 0 | 131 | 177 | 1,531 | 112 | 1,207 | 3 | 3,160 | 0.02% | 3,639 | 0.03% | 0.02% | - 100.00% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Longspine Thornyhead - coastwide | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 142 | 2 | 0 | 0 | 145 | 0.00% | 198 | 0.00% | 0.00% | - 100.00% |
| | N. of 34°27' | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 142 | 2 | 0 | 0 | 145 | 0.00% | 198 | 0.00% | 0.00% | - 100.00% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | 15 | 0 | 0 | 1 | 0 | 59 | 32 | 29 | 28 | 4 | 0 | 169 | 0.00% | 66 | 0.00% | 0.00% | - 100.00% |
| | **YELLOWEYE** | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 69 | 0 | 0 | 75 | 0.01% | 72 | 0.31% | 0.30% | - 100.00% |
| | Black Rockfish - coastwide | 1,119 | 584 | 1,060 | 71 | 1,062 | 72 | 216 | 0 | 0 | 7 | 307 | 4,498 | 1.07% | 382 | 1.80% | 0.73% | - 67.91% |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish (OR-CA) | 1,119 | 584 | 1,060 | 71 | 1,062 | 72 | 216 | 0 | 0 | 7 | 307 | 4,498 | 1.22% | 416 | 1.96% | 0.74% | - 60.65% |
| | **Minor Rockfish North** | 87 | 1 | 0 | 4 | 11 | 212 | 494 | 185 | 436 | 243 | 29 | 1,702 | 0.01% | 1,132 | 0.03% | 0.02% | - 100.00% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 26 | 0.12% | 6 | 0.10% | -0.02% | + 18.97% |
| | **Shelf Species** | 51 | 1 | 0 | 3 | 11 | 102 | 181 | 121 | 384 | 105 | 2 | 961 | 0.01% | 356 | 0.08% | 0.07% | - 100.00% |
| | BOCACCIO: N. of Monterey | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 7 | 0.00% | 2 | 0.00% | 0.00% | - 100.00% |
| | Chilipepper Rockfish: Eureka | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 6 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 1 | 0 | 0 | 13 | 0.00% | 1 | 0.00% | 0.00% | - 100.00% |
| | Silvergrey Rockfish | 5 | 0 | 0 | 0 | 5 | 10 | 0 | 2 | 2 | 0 | 0 | 23 | 0.00% | 3 | 0.01% | 0.00% | - 100.00% |
| | Other Northern Shelf Rockfish | 39 | 1 | 0 | 2 | 6 | 86 | 180 | 117 | 381 | 105 | 2 | 918 | 0.02% | 324 | 0.16% | 0.15% | - 100.00% |
| | **Slope Species** | 36 | 0 | 0 | 1 | 0 | 110 | 314 | 64 | 52 | 137 | 2 | 716 | 0.01% | 471 | 0.01% | 0.01% | - 100.00% |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | + 71.71% |
| | Sharpchin Rockfish, north | 4 | 0 | 0 | 0 | 0 | 35 | 0 | 10 | 1 | 0 | 2 | 52 | 0.00% | 11 | 0.01% | 0.01% | - 100.00% |
| | Splitnose Rockfish: N. of Monterrey | 3 | 0 | 0 | 0 | 0 | 57 | 1 | 5 | 0 | 0 | 0 | 67 | 0.00% | 8 | 0.01% | 0.00% | - 45.25% |
| | Yellowmouth Rockfish | 4 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 23 | 0.00% | 5 | 0.01% | 0.01% | - 100.00% |
| | Other Northern Slope Rockfish | 25 | 0 | 0 | 1 | 0 | 17 | 293 | 49 | 51 | 137 | 0 | 574 | 0.01% | 454 | 0.02% | 0.00% | - 16.04% |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Slope Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | 1,723 | 11,937 | 20,387 | 30,256 | 42,804 | 45,137 | 56,592 | 77,677 | 62,350 | 96,197 | 64,059 | 509,119 | 0.24% | 490,890 | 0.27% | 0.03% | - 11.74% |
| | Dover Sole (Summer) | 1,714 | 11,877 | 20,373 | 30,256 | 42,804 | 44,722 | 51,501 | 69,912 | 62,350 | 90,896 | 63,326 | 489,730 | 0.46% | 556,889 | 0.53% | 0.07% | - 15.99% |
| | Dover Sole (Winter) | 9 | 61 | 14 | 0 | 0 | 415 | 5,091 | 7,765 | 0 | 5,301 | 733 | 19,389 | 0.02% | 15,688 | 0.02% | 0.00% | - 9.09% |
| | English Sole | 7,625 | 4,839 | 6,791 | 2,925 | 852 | 9,688 | 26,200 | 15,606 | 29,294 | 25,371 | 27,947 | 157,136 | 0.63% | 145,131 | 0.70% | 0.07% | - 11.33% |
| | Petrale Sole (coastwide) | 1,709 | 1,816 | 3,271 | 2,807 | 6,308 | 5,613 | 15,090 | 7,473 | 12,539 | 24,520 | 42,459 | 123,606 | 0.30% | 132,416 | 0.28% | -0.02% | + 5.93% |
| | N of 40°10' (summer) | 1,596 | 1,604 | 3,164 | 2,797 | 6,308 | 5,563 | 11,535 | 6,505 | 12,539 | 15,269 | 33,421 | 100,303 | 0.80% | 91,275 | 0.71% | -0.09% | + 11.17% |
| | N of 40°10' (winter) | 112 | 212 | 107 | 0 | 0 | 50 | 3,555 | 968 | 0 | 9,251 | 9,038 | 23,293 | 0.11% | 26,657 | 0.09% | -0.01% | + 12.76% |
| | S of 40°10' (summer) | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0.00% | 5 | 0.00% | 0.00% | + 41.84% |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | 41 | 0 | 0 | 0 | 0 | 7,445 | 10,744 | 18,051 | 799 | 730 | 19 | 37,828 | 0.06% | 29,415 | 0.05% | 0.00% | + 5.15% |
| | Arrowtooth Flounder (summer) | 41 | 0 | 0 | 0 | 0 | 7,445 | 9,042 | 16,417 | 799 | 701 | 16 | 34,461 | 0.06% | 29,219 | 0.06% | 0.00% | - 5.14% |
| | Arrowtooth Flounder (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 1,702 | 1,634 | 0 | 28 | 3 | 3,367 | 0.03% | 2,134 | 0.02% | -0.01% | + 28.44% |
| | Starry Flounder | 3,132 | 7,258 | 7,411 | 1,984 | 2,311 | 622 | 1,042 | 1,666 | 5,728 | 17,540 | 7,494 | 56,188 | 5.30% | 52,420 | 7.47% | 2.18% | - 41.07% |
| | Other Flatfish | 31,080 | 26,590 | 21,399 | 10,340 | 10,547 | 8,791 | 7,233 | 22,517 | 47,133 | 46,636 | 39,267 | 271,532 | 0.64% | 242,470 | 0.68% | 0.04% | - 5.48% |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 0 | 0 | 0 | 122 | 0.00% | 88 | 0.00% | 0.00% | - 36.38% |
| | Other Fish | 0 | 20 | 0 | 0 | 24 | 0 | 38 | 0 | 0 | 0 | 0 | 82 | 0.00% | 50 | 0.00% | 0.00% | - 22.42% |
| | Total Groundfish | 46,954 | 53,320 | 60,616 | 48,775 | 64,444 | 80,009 | 156,214 | 176,756 | 180,003 | 257,319 | 234,304 | 1,358,714 | 0.16% | 1,138,045 | 0.22% | 0.06% | - 35.66% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 9c. Example of Quota Share (QS) Allocations for a Selected Shoreside Non-whiting Vessel Permit (catch in lbs) with a Relatively Constant Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNW3 | Lingcod - coastwide | 5,020 | 2,789 | 2,195 | 3,029 | 2,321 | 2,817 | 1,332 | 1,011 | 1,128 | 2,234 | 2,586 | 26,460 | 0.21% | 9,934 | 0.68% | 0.46% | - 100.00% |
| | N. of 42° (OR & WA) | 5,020 | 2,789 | 2,195 | 3,029 | 2,321 | 2,817 | 1,332 | 1,011 | 1,128 | 2,234 | 2,586 | 26,460 | 0.29% | 11,722 | 1.00% | 0.71% | - 100.00% |
| | S. of 42° (CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Pacific Cod | 8,599 | 830 | 1,245 | 4,732 | 24,488 | 4,612 | 1,012 | 1,074 | 13,115 | 55,591 | 90,774 | 206,071 | 1.45% | 272,579 | 1.08% | -0.37% | + 25.55% |
| | Pacific Whiting (Coastwide) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sablefish (Coastwide) | 2,992 | 2,344 | 9,913 | 8,631 | 12,169 | 15,392 | 7,997 | 33,450 | 16,335 | 19,848 | 14,136 | 143,207 | 0.20% | 136,348 | 0.24% | 0.04% | - 18.33% |
| | N. of 36° (Monterey north) | 2,992 | 2,344 | 9,913 | 8,631 | 12,169 | 15,392 | 7,997 | 33,450 | 16,335 | 19,848 | 14,136 | 143,207 | 0.21% | 135,922 | 0.25% | 0.04% | - 17.45% |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | 288 | 34 | 268 | 21 | 1,245 | 2,606 | 478 | 217 | 515 | 1 | 0 | 5,673 | 0.05% | 2,101 | 0.07% | 0.02% | - 29.63% |
| | Shortbelly Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | + 35.75% |
| | **WIDOW ROCKFISH** | 44 | 77 | 2 | 10 | 416 | 1,257 | 16 | 2,939 | 0 | 0 | 4 | 4,765 | 0.01% | 11 | 0.01% | 0.00% | - 82.22% |
| | **CANARY ROCKFISH** | 2,077 | 2,104 | 1,957 | 1,639 | 3,296 | 3,659 | 903 | 771 | 479 | 299 | 0 | 17,184 | 0.16% | 980 | 0.53% | 0.37% | - 100.00% |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 3,497 | 1,418 | 2,207 | 2,737 | 17,180 | 49,853 | 2,938 | 1,901 | 15,906 | 3,079 | 1,920 | 102,637 | 0.21% | 12,147 | 0.50% | 0.29% | - 100.00% |
| | Shortspine Thornyhead - coastwide | 13 | 69 | 94 | 328 | 259 | 1,222 | 377 | 794 | 213 | 730 | 480 | 4,578 | 0.02% | 4,382 | 0.03% | 0.01% | - 68.72% |
| | N. of 34°27' | 13 | 69 | 94 | 328 | 255 | 1,222 | 377 | 794 | 213 | 730 | 480 | 4,574 | 0.02% | 4,309 | 0.04% | 0.02% | - 68.37% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0.00% | 2 | 0.00% | 0.00% | - 5.38% |
| | Longspine Thornyhead - coastwide | 0 | 79 | 101 | 178 | 8 | 13 | 412 | 138 | 874 | 0 | 1 | 1,805 | 0.00% | 1,500 | 0.00% | 0.00% | - 39.83% |
| | N. of 34°27' | 0 | 79 | 101 | 178 | 8 | 13 | 412 | 138 | 874 | 0 | 1 | 1,805 | 0.00% | 1,501 | 0.00% | 0.00% | - 39.85% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | 1,372 | 92 | 123 | 81 | 113 | 602 | 388 | 69 | 960 | 12 | 3 | 3,814 | 0.03% | 1,208 | 0.06% | 0.03% | - 82.86% |
| | **YELLOWEYE** | 106 | 4 | 10 | 5 | 39 | 3 | 0 | 33 | 0 | 4 | 0 | 202 | 0.02% | 23 | 0.10% | 0.08% | - 100.00% |
| | Black Rockfish - coastwide | 7,616 | 3,728 | 5,903 | 20,314 | 9,552 | 359 | 399 | 5 | 356 | 20 | 114 | 48,366 | 11.54% | 2,074 | 9.78% | -1.76% | + 15.24% |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish (OR-CA) | 7,616 | 3,728 | 5,903 | 20,314 | 9,552 | 359 | 399 | 5 | 356 | 20 | 114 | 48,366 | 13.13% | 2,339 | 11.03% | -2.10% | + 15.99% |
| | **Minor Rockfish North** | 7,809 | 277 | 521 | 298 | 438 | 1,207 | 1,426 | 725 | 1,081 | 96 | 109 | 13,986 | 0.06% | 3,325 | 0.09% | 0.03% | - 52.12% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 84 | 13 | 6 | 118 | 0.57% | 51 | 0.87% | 0.30% | - 52.93% |
| | **Shelf Species** | 4,682 | 172 | 316 | 208 | 323 | 585 | 143 | 161 | 764 | 17 | 88 | 7,457 | 0.06% | 672 | 0.15% | 0.09% | - 100.00% |
| | BOCACCIO: N. of Monterey | 142 | 24 | 13 | 45 | 6 | 22 | 0 | 15 | 0 | 0 | 12 | 278 | 0.02% | 45 | 0.02% | 0.01% | - 59.45% |
| | Chilipepper Rockfish: Eureka | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 636 | 63 | 114 | 36 | 37 | 49 | 0 | 0 | 8 | 0 | 0 | 943 | 0.04% | 6 | 0.03% | -0.01% | + 14.54% |
| | Silvergrey Rockfish | 349 | 3 | 35 | 2 | 108 | 89 | 0 | 14 | 3 | 0 | 6 | 608 | 0.04% | 34 | 0.08% | 0.04% | - 100.00% |
| | Other Northern Shelf Rockfish | 3,555 | 82 | 154 | 125 | 172 | 425 | 143 | 132 | 754 | 17 | 70 | 5,629 | 0.10% | 541 | 0.27% | 0.17% | - 100.00% |
| | **Slope Species** | 3,127 | 106 | 204 | 90 | 115 | 622 | 1,283 | 550 | 233 | 66 | 16 | 6,411 | 0.06% | 2,314 | 0.07% | 0.01% | - 16.76% |
| | Bank Rockfish | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 15 | 0.01% | 0 | 0.03% | 0.03% | - 100.00% |
| | Sharpchin Rockfish, north | 454 | 57 | 96 | 27 | 60 | 304 | 14 | 31 | 3 | 1 | 0 | 1,047 | 0.04% | 61 | 0.07% | 0.03% | - 79.27% |
| | Splitnose Rockfish: N. of Monterrey | 263 | 11 | 36 | 6 | 26 | 126 | 41 | 18 | 1 | 4 | 3 | 534 | 0.03% | 45 | 0.03% | 0.00% | - 5.15% |
| | Yellowmouth Rockfish | 264 | 3 | 15 | 9 | 2 | 19 | 3 | 14 | 0 | 0 | 1 | 329 | 0.02% | 17 | 0.02% | 0.00% | + 4.67% |
| | Other Northern Slope Rockfish | 2,132 | 35 | 58 | 48 | 27 | 173 | 1,226 | 484 | 229 | 61 | 12 | 4,486 | 0.11% | 3,021 | 0.11% | 0.00% | + 1.30% |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.00% | 0 | 0.00% | 0.00% | + 40.14% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.00% | 0 | 0.00% | 0.00% | + 34.35% |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Slope Rockfish | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.00% | 1 | 0.00% | 0.00% | - 44.00% |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | 26,976 | 73,153 | 135,963 | 85,605 | 84,875 | 80,744 | 89,472 | 84,550 | 86,597 | 106,408 | 84,778 | 939,120 | 0.45% | 832,131 | 0.46% | 0.01% | - 2.69% |
| | Dover Sole (Summer) | 26,868 | 64,674 | 129,648 | 71,468 | 71,621 | 71,029 | 70,883 | 41,149 | 60,777 | 91,855 | 70,618 | 770,589 | 0.72% | 770,135 | 0.74% | 0.01% | - 1.95% |
| | Dover Sole (Winter) | 108 | 8,478 | 6,316 | 14,137 | 13,254 | 9,715 | 18,589 | 43,401 | 25,820 | 14,553 | 14,160 | 168,531 | 0.16% | 135,225 | 0.18% | 0.01% | - 8.18% |
| | English Sole | 103,035 | 78,142 | 91,788 | 104,506 | 106,866 | 85,202 | 72,028 | 73,208 | 84,369 | 92,620 | 50,600 | 942,364 | 3.78% | 790,220 | 3.82% | 0.04% | - 1.08% |
| | Petrale Sole (coastwide) | 19,075 | 29,765 | 27,273 | 21,273 | 31,578 | 38,102 | 80,061 | 43,886 | 37,926 | 62,384 | 55,579 | 446,902 | 1.08% | 500,708 | 1.06% | -0.02% | + 1.62% |
| | N of 40°10' (summer) | 13,606 | 19,220 | 22,803 | 16,370 | 23,741 | 27,486 | 52,485 | 27,269 | 25,703 | 36,719 | 44,650 | 310,052 | 2.46% | 311,466 | 2.42% | -0.05% | + 1.94% |
| | N of 40°10' (winter) | 5,469 | 10,545 | 4,470 | 4,884 | 7,675 | 10,616 | 27,576 | 16,617 | 12,223 | 25,665 | 10,929 | 136,669 | 0.64% | 171,861 | 0.61% | -0.03% | + 4.14% |
| | S of 40°10' (summer) | 0 | 0 | 0 | 19 | 162 | 0 | 0 | 0 | 0 | 0 | 0 | 181 | 0.01% | 177 | 0.01% | 0.00% | - 11.27% |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | 3,354 | 1,521 | 0 | 13 | 0 | 17,696 | 29,815 | 29,025 | 7,046 | 678 | 13 | 89,161 | 0.13% | 68,455 | 0.12% | -0.01% | + 6.35% |
| | Arrowtooth Flounder (summer) | 3,354 | 1,521 | 0 | 9 | 0 | 17,694 | 21,990 | 28,617 | 5,170 | 627 | 7 | 78,988 | 0.14% | 64,725 | 0.14% | 0.00% | - 1.61% |
| | Arrowtooth Flounder (winter) | 0 | 0 | 0 | 4 | 0 | 2 | 7,826 | 408 | 1,876 | 51 | 6 | 10,173 | 0.09% | 7,470 | 0.07% | -0.02% | + 17.10% |
| | Starry Flounder | 41,478 | 42,383 | 19,723 | 21,303 | 58,756 | 19,173 | 36,421 | 3,560 | 10,382 | 7,607 | 19,644 | 280,429 | 26.43% | 214,234 | 30.54% | 4.10% | - 15.52% |
| | Other Flatfish | 139,182 | 119,999 | 65,424 | 49,835 | 34,276 | 62,048 | 46,593 | 49,312 | 86,045 | 88,354 | 70,359 | 811,425 | 1.93% | 680,795 | 1.91% | -0.02% | + 0.89% |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0.03% | 34 | 9.09% | 9.07% | - 100.00% |
| | Spiny Dogfish | 1,782 | 0 | 0 | 96 | 659 | 1,220 | 3,070 | 12 | 0 | 0 | 0 | 6,839 | 0.08% | 3,490 | 0.07% | 0.00% | + 3.03% |
| | Other Fish | 381 | 333 | 1,772 | 307 | 341 | 2 | 63 | 0 | 71 | 26 | 0 | 3,296 | 0.03% | 1,135 | 0.02% | -0.01% | + 30.66% |
| | Total Groundfish | 374,693 | 359,140 | 366,482 | 324,940 | 388,872 | 387,789 | 375,201 | 326,680 | 363,398 | 439,990 | 391,100 | 4,098,285 | 0.50% | 2,882,789 | 0.57% | 0.07% | - 13.93% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 9d. Annual Fleetwide Landings (catch in lbs) by Species and Complex for Permitted Shoreside Non-whiting Vessels, 1994-2004.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | TOTAL Relative lbs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL SNW | Lingcod - coastwide | 3,020,438 | 2,358,361 | 2,654,569 | 2,579,931 | 479,010 | 477,484 | 145,636 | 127,761 | 225,578 | 133,057 | 127,858 | 12,329,683 | 1,463,631 |
| | N. of 42° (OR & WA) | 2,335,726 | 1,708,671 | 2,008,422 | 1,887,121 | 315,666 | 295,567 | 84,013 | 69,208 | 145,056 | 106,256 | 93,345 | 9,049,051 | 1,168,820 |
| | S. of 42° (CA) | 684,712 | 649,690 | 646,147 | 692,810 | 163,344 | 181,918 | 61,623 | 58,553 | 80,522 | 26,801 | 34,513 | 3,280,633 | 294,811 |
| | Pacific Cod | 1,819,661 | 1,081,740 | 954,705 | 1,299,346 | 894,446 | 610,311 | 603,968 | 694,791 | 1,521,904 | 2,294,415 | 2,429,669 | 14,204,955 | 25,238,560 |
| | Pacific Whiting (Coastwide) | 110,170 | 155,791 | 143,582 | 253,703 | 245,087 | 56,877 | 78,964 | 55,339 | 86,813 | 66,529 | 32,228 | 1,285,083 | 731,820 |
| | Sablefish (Coastwide) | 7,738,353 | 8,168,976 | 9,110,963 | 8,164,662 | 4,727,566 | 6,962,904 | 5,932,166 | 5,542,225 | 3,184,970 | 5,123,456 | 5,389,323 | 70,045,564 | 56,358,012 |
| | N. of 36° (Monterey north) | 7,401,728 | 7,714,061 | 8,638,994 | 7,826,238 | 4,475,134 | 6,779,663 | 5,852,344 | 5,479,686 | 3,076,850 | 4,952,052 | 5,212,575 | 67,409,324 | 54,472,567 |
| | S. of 36° (Conception area) | 336,625 | 454,915 | 471,969 | 338,424 | 252,432 | 183,242 | 79,822 | 62,539 | 108,120 | 171,404 | 176,749 | 2,636,240 | 1,885,445 |
| | **PACIFIC OCEAN PERCH** | 1,978,949 | 1,818,255 | 1,807,121 | 1,461,653 | 1,344,840 | 1,146,888 | 298,577 | 412,828 | 324,724 | 290,100 | 286,986 | 11,170,920 | 3,191,096 |
| | Shortbelly Rockfish | 77,291 | 65,842 | 79,151 | 172,471 | 41,528 | 4,910 | 37,766 | 9,651 | 167 | 515 | 194 | 489,487 | 5,668 |
| | **WIDOW ROCKFISH** | 12,649,045 | 13,592,034 | 11,912,070 | 13,698,015 | 7,378,195 | 8,137,526 | 8,197,828 | 3,813,161 | 562,052 | 8,872 | 19,421 | 79,968,218 | 97,591 |
| | **CANARY ROCKFISH** | 1,862,487 | 1,489,081 | 2,131,040 | 1,749,339 | 1,989,807 | 1,132,678 | 79,486 | 52,104 | 93,286 | 16,791 | 14,359 | 10,610,458 | 184,699 |
| | Chilipepper Rockfish | 2,525,030 | 3,251,471 | 3,076,853 | 3,384,429 | 2,284,329 | 1,726,385 | 792,491 | 655,499 | 338,969 | 16,280 | 86,386 | 18,138,123 | 179,079 |
| | **BOCACCIO** | 1,036,340 | 719,072 | 607,853 | 486,031 | 123,283 | 68,998 | 37,939 | 29,405 | 39,002 | 247 | 13,377 | 3,161,547 | 2,717 |
| | Splitnose Rockfish | 639,507 | 605,243 | 885,606 | 946,722 | 2,876,570 | 453,398 | 184,059 | 199,117 | 122,807 | 331,951 | 360,875 | 7,605,853 | 3,651,456 |
| | Yellowtail Rockfish | 9,157,232 | 8,833,764 | 9,166,615 | 2,951,318 | 3,727,930 | 3,618,554 | 5,780,232 | 3,271,926 | 1,530,670 | 221,425 | 204,818 | 48,464,485 | 2,435,676 |
| | Shortspine Thornyhead - coastwide | 6,617,329 | 4,089,619 | 3,333,441 | 3,082,871 | 2,610,476 | 1,571,878 | 1,681,095 | 1,039,179 | 1,467,341 | 1,466,058 | 1,462,347 | 28,421,632 | 16,126,633 |
| | N. of 34°27' | 4,969,238 | 2,673,313 | 2,384,462 | 2,196,357 | 1,886,581 | 1,160,941 | 1,062,361 | 770,788 | 941,386 | 1,018,986 | 965,687 | 20,030,101 | 11,208,843 |
| | S. of 34°27' | 1,648,091 | 1,416,306 | 948,979 | 886,514 | 723,895 | 410,937 | 618,734 | 268,391 | 525,955 | 447,072 | 496,660 | 8,391,531 | 4,917,790 |
| | Longspine Thornyhead - coastwide | 8,990,903 | 11,709,713 | 10,474,398 | 8,490,633 | 4,902,221 | 3,902,456 | 3,144,596 | 2,494,923 | 4,181,552 | 3,421,745 | 1,592,168 | 63,305,308 | 37,639,196 |
| | N. of 34°27' | 8,990,903 | 11,709,713 | 10,474,398 | 8,490,633 | 4,902,221 | 3,902,456 | 3,144,596 | 2,494,923 | 4,180,553 | 3,421,745 | 1,592,168 | 63,304,309 | 37,639,196 |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 999 | 0 | 0 | 999 | 0 |
| | **COWCOD** | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 34 | 0 |
| | **DARKBLOTCHED** | 1,720,411 | 1,565,119 | 1,590,772 | 1,786,656 | 1,988,113 | 762,122 | 526,867 | 336,233 | 235,869 | 174,699 | 411,417 | 11,098,277 | 1,921,690 |
| | **YELLOWEYE** | 184,074 | 297,780 | 221,805 | 183,777 | 64,887 | 56,275 | 2,686 | 4,351 | 2,090 | 2,129 | 726 | 1,020,578 | 23,419 |
| | Black Rockfish - coastwide | 98,750 | 20,283 | 38,586 | 52,392 | 178,816 | 10,164 | 3,980 | 2,072 | 7,035 | 1,928 | 5,257 | 419,261 | 21,209 |
| | Black Rockfish (WA) | 2,204 | 7,148 | 0 | 2,123 | 38,806 | 0 | 0 | 0 | 611 | 0 | 0 | 50,891 | 0 |
| | Black Rockfish (OR-CA) | 96,546 | 13,134 | 38,586 | 50,269 | 140,010 | 10,164 | 3,980 | 2,072 | 6,424 | 1,928 | 5,257 | 368,370 | 21,209 |
| | **Minor Rockfish North** | 4,839,357 | 3,688,381 | 3,771,895 | 3,371,877 | 3,243,175 | 1,618,169 | 765,613 | 722,307 | 273,799 | 328,174 | 475,962 | 23,098,710 | 3,609,918 |
| | **Nearshore Species** | 1,361 | 1,787 | 45 | 573 | 10,202 | 312 | 713 | 1,148 | 1,505 | 541 | 2,705 | 20,890 | 5,946 |
| | **Shelf Species** | 2,658,851 | 2,123,851 | 2,364,607 | 1,903,236 | 2,232,923 | 922,193 | 116,276 | 416,064 | 96,988 | 41,616 | 25,864 | 12,902,468 | 457,771 |
| | BOCACCIO: N. of Monterrey | 390,820 | 404,127 | 282,338 | 348,225 | 196,327 | 95,529 | 9,007 | 26,676 | 12,633 | 16,629 | 8,694 | 1,791,006 | 182,922 |
| | Chilipepper Rockfish: Eureka | 205,628 | 219,320 | 226,755 | 129,938 | 156,577 | 97,573 | 31,221 | 301,107 | 18,694 | 1,277 | 3,818 | 1,391,907 | 14,043 |
| | Redstripe Rockfish | 731,988 | 555,919 | 456,063 | 304,730 | 243,785 | 72,465 | 10,522 | 13,442 | 5,735 | 1,494 | 517 | 2,396,660 | 16,437 |
| | Silvergrey Rockfish | 197,644 | 202,949 | 519,564 | 183,590 | 404,003 | 160,907 | 2,772 | 9,500 | 5,050 | 3,982 | 1,414 | 1,691,375 | 43,799 |
| | Other Northern Shelf Rockfish | 1,132,770 | 741,536 | 879,887 | 936,753 | 1,232,230 | 495,719 | 62,754 | 65,339 | 54,876 | 18,234 | 11,421 | 5,631,519 | 200,570 |
| | **Slope Species** | 2,179,146 | 1,562,743 | 1,407,243 | 1,468,069 | 1,000,050 | 695,664 | 648,625 | 305,096 | 175,306 | 286,018 | 447,393 | 10,175,353 | 3,146,202 |
| | Bank Rockfish | 88,508 | 50,849 | 53,379 | 29,766 | 6,012 | 29,229 | 6,584 | 650 | 24 | 48 | 10,348 | 275,397 | 529 |
| | Sharpchin Rockfish, north | 811,049 | 494,296 | 450,985 | 480,804 | 226,773 | 117,164 | 27,123 | 10,464 | 11,918 | 7,894 | 48,504 | 2,686,976 | 86,836 |
| | Splitnose Rockfish: N. of Monterrey | 326,868 | 245,205 | 155,190 | 290,347 | 317,849 | 123,313 | 74,566 | 32,691 | 15,807 | 12,097 | 54,299 | 1,648,232 | 133,069 |
| | Yellowmouth Rockfish | 494,294 | 235,045 | 244,759 | 185,467 | 87,946 | 62,155 | 25,069 | 9,931 | 4,719 | 7,061 | 34,336 | 1,390,780 | 77,671 |
| | Other Northern Slope Rockfish | 458,427 | 537,348 | 502,930 | 481,685 | 361,470 | 363,803 | 515,283 | 251,359 | 142,840 | 258,918 | 299,906 | 4,173,968 | 2,848,097 |
| | **Minor Rockfish South** | 1,419,581 | 1,545,496 | 2,097,575 | 2,020,673 | 1,795,666 | 272,318 | 387,332 | 473,836 | 863,790 | 418,032 | 528,832 | 11,823,131 | 4,598,349 |
| | **Nearshore Species** | 8,704 | 19,738 | 40,997 | 29,197 | 1,785 | 28,583 | 987 | 630 | 1,805 | 968 | 297 | 133,691 | 10,646 |
| | **Shelf Species** | 397,397 | 410,689 | 459,830 | 577,477 | 538,048 | 78,892 | 65,149 | 50,477 | 32,211 | 6,004 | 3,942 | 2,620,116 | 66,043 |
| | Redstripe Rockfish | 6,124 | 534 | 0 | 6,554 | 1,361 | 481 | 0 | 0 | 0 | 0 | 0 | 15,055 | 0 |
| | Yellowtail Rockfish | 146,595 | 94,461 | 158,490 | 387,333 | 271,273 | 31,888 | 47,572 | 2,917 | 4,135 | 813 | 488 | 1,145,964 | 8,943 |
| | Other Southern Shelf Rockfish | 244,678 | 315,694 | 301,340 | 183,590 | 265,414 | 46,523 | 17,577 | 47,561 | 28,076 | 5,191 | 3,454 | 1,459,097 | 57,100 |
| | **Slope Species** | 1,013,480 | 1,115,068 | 1,596,748 | 1,414,000 | 1,255,834 | 164,843 | 321,197 | 422,728 | 829,774 | 411,060 | 524,593 | 9,069,324 | 4,521,660 |
| | Bank Rockfish | 569,568 | 681,959 | 1,099,134 | 816,980 | 918,674 | 41,315 | 173,703 | 180,604 | 607,702 | 190,198 | 241,387 | 5,521,224 | 2,092,179 |
| | Blackgill Rockfish | 245,553 | 281,050 | 333,993 | 286,500 | 252,306 | 60,828 | 116,730 | 198,303 | 139,317 | 120,582 | 175,801 | 2,210,962 | 1,326,401 |
| | Sharpchin Rockfish | 35,595 | 11,135 | 44,597 | 220,061 | 22,449 | 1,192 | 850 | 100 | 571 | 0 | 0 | 336,550 | 0 |
| | Yellowmouth Rockfish | 10,646 | 0 | 13 | 1,409 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12,067 | 0 |
| | Other Southern Slope Rockfish | 152,119 | 140,924 | 119,011 | 89,050 | 62,405 | 61,509 | 29,914 | 43,720 | 82,184 | 100,280 | 107,405 | 988,521 | 1,103,080 |
| | California scorpionfish | 471 | 0 | 0 | 12,766 | 0 | 0 | 0 | 20 | 96 | 0 | 0 | 13,353 | 0 |
| | Cabezon (off CA only) | 6,026 | 0 | 16 | 0 | 0 | 170 | 9 | 28 | 98 | 0 | 0 | 6,347 | 0 |
| | Dover sole (total) | 19,146,564 | 22,877,170 | 26,809,497 | 22,298,567 | 17,766,530 | 20,126,174 | 19,430,381 | 15,058,347 | 13,928,099 | 16,442,111 | 15,714,372 | 209,597,813 | 180,863,225 |
| | Dover Sole (Summer) | 9,933,257 | 13,531,780 | 13,815,023 | 11,514,634 | 9,968,774 | 9,650,596 | 7,927,685 | 6,577,323 | 6,734,829 | 9,488,201 | 7,321,740 | 106,463,841 | 104,370,215 |
| | Dover Sole (Winter) | 9,213,307 | 9,345,390 | 12,994,475 | 10,783,933 | 7,797,756 | 10,475,579 | 11,502,696 | 8,481,024 | 7,193,270 | 6,953,910 | 8,392,633 | 103,133,972 | 76,493,010 |
| | English Sole | 2,380,278 | 2,439,999 | 2,489,217 | 3,149,848 | 2,475,116 | 1,957,615 | 1,639,275 | 2,113,243 | 2,479,825 | 1,882,578 | 1,954,548 | 24,961,542 | 20,708,355 |
| | Petrale Sole (coastwide) | 2,866,722 | 3,501,931 | 3,976,221 | 4,106,947 | 3,216,408 | 3,247,886 | 4,077,288 | 3,915,019 | 3,931,119 | 4,277,381 | 4,197,683 | 41,314,605 | 47,051,190 |
| | N of 40°10' (summer) | 806,471 | 1,015,196 | 969,861 | 1,023,888 | 1,108,533 | 1,017,272 | 1,289,219 | 1,097,123 | 1,470,917 | 1,171,549 | 1,609,742 | 12,579,772 | 12,887,043 |
| | N of 40°10' (winter) | 1,411,793 | 1,735,494 | 2,021,791 | 2,039,590 | 1,544,925 | 1,682,306 | 2,268,263 | 2,228,335 | 1,972,018 | 2,560,196 | 2,002,804 | 21,467,516 | 28,162,158 |
| | S of 40°10' (summer) | 306,815 | 292,551 | 369,536 | 440,161 | 217,888 | 251,506 | 160,557 | 252,082 | 69,184 | 224,763 | 231,085 | 2,816,126 | 2,472,388 |
| | S of 40°10' (winter) | 341,643 | 458,691 | 615,034 | 603,308 | 345,062 | 296,802 | 359,249 | 337,478 | 419,000 | 320,873 | 354,052 | 4,451,191 | 3,529,601 |
| | Arrowtooth Flounder (total) | 6,828,200 | 5,081,202 | 4,790,398 | 5,125,890 | 7,036,822 | 11,765,673 | 7,225,865 | 5,401,761 | 4,575,241 | 5,081,114 | 5,260,848 | 68,173,014 | 55,892,251 |
| | Arrowtooth Flounder (summer) | 6,014,908 | 4,240,442 | 4,018,367 | 4,369,253 | 6,174,242 | 10,682,969 | 5,903,580 | 3,727,599 | 3,536,339 | 4,151,366 | 3,808,058 | 56,627,122 | 45,665,029 |
| | Arrowtooth Flounder (winter) | 813,292 | 840,760 | 772,031 | 756,638 | 862,579 | 1,082,705 | 1,322,285 | 1,674,162 | 1,038,902 | 929,747 | 1,452,790 | 11,545,892 | 10,227,221 |
| | Starry Flounder | 157,542 | 109,762 | 61,502 | 129,931 | 116,798 | 48,859 | 55,424 | 16,091 | 40,473 | 63,779 | 260,697 | 1,060,858 | 701,565 |
| | Other Flatfish | 4,770,487 | 5,211,566 | 4,119,057 | 4,002,941 | 3,383,055 | 4,150,923 | 3,354,898 | 3,519,564 | 3,575,281 | 3,242,295 | 2,798,244 | 42,128,310 | 35,665,249 |
| | Kelp Greenling | 266 | 3,347 | 102 | 0 | 97 | 0 | 0 | 40 | 1 | 34 | 0 | 3,887 | 374 |
| | Spiny Dogfish | 2,268,701 | 783,324 | 430,238 | 739,918 | 886,912 | 947,059 | 605,116 | 733,965 | 985,525 | 434,351 | 262,681 | 9,077,791 | 4,777,864 |
| | Other Fish | 1,912,383 | 1,870,639 | 1,646,158 | 1,247,822 | 1,372,185 | 702,746 | 521,477 | 516,085 | 403,207 | 493,193 | 241,580 | 10,927,475 | 5,425,121 |
| | Total Groundfish | 107,395,946 | 106,945,378 | 108,477,976 | 97,025,298 | 77,186,483 | 75,616,985 | 65,720,086 | 51,258,368 | 45,096,410 | 46,315,187 | 44,134,600 | 825,172,717 | 509,467,061 |

**Table 10a. Example of Quota Share (QS) Allocations for a Selected Shoreside Whiting Vessel Permit (catch in lbs) with a Relatively Early Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SW1 | Lingcod - coastwide | 11 | 0 | 0 | 10 | 6 | 34 | 58 | 8 | | | | 127 | 0.64% | 90 | 0.93% | 0.29% | - 45.61% |
| | N. of 42° (OR & WA) | 11 | 0 | 0 | 10 | 6 | 34 | 58 | 8 | | | | 127 | 0.67% | 117 | 1.22% | 0.55% | - 81.54% |
| | S. of 42° (CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Pacific Cod | 5 | 46 | 74 | 14 | 0 | 42 | 1 | 3 | | | | 185 | 2.13% | 46 | 5.68% | 3.55% | - 100.00% |
| | Pacific Whiting (Coastwide) | 11,653,576 | 6,853,676 | 6,838,035 | 5,577,055 | 4,395,212 | 5,894,719 | 5,611,505 | 5,007,052 | | | | 51,830,830 | 2.81% | 33,336,552 | 2.69% | -0.12% | + 4.28% |
| | Sablefish (Coastwide) | 13,031 | 5,616 | 11,061 | 8,071 | 4,008 | 212 | 21 | 7,898 | | | | 49,918 | 4.19% | 55,689 | 5.70% | 1.51% | - 35.91% |
| | N. of 36° (Monterey north) | 13,031 | 5,616 | 11,061 | 8,071 | 4,008 | 212 | 21 | 7,898 | | | | 49,918 | 4.19% | 55,689 | 5.70% | 1.51% | - 35.91% |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | 5,732 | 476 | 946 | 300 | 872 | 889 | 10 | 0 | | | | 9,225 | 3.95% | 350 | 4.82% | 0.87% | - 21.98% |
| | Shortbelly Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **WIDOW ROCKFISH** | 61,839 | 29,986 | 36,582 | 53,265 | 4,470 | 20,168 | 3,375 | 130 | | | | 209,815 | 4.92% | 11,710 | 3.85% | -1.07% | + 21.70% |
| | **CANARY ROCKFISH** | 5 | 121 | 17 | 30 | 31 | 194 | 371 | 0 | | | | 768 | 3.28% | 85 | 3.13% | -0.16% | + 4.84% |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 109,922 | 61,403 | 64,037 | 22,466 | 1,579 | 48,672 | 26,866 | 3,880 | | | | 338,824 | 5.60% | 50,674 | 4.76% | -0.84% | + 15.06% |
| | Shortspine Thornyhead - coastwide | 30 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | | | | 37 | 0.26% | 2 | 0.11% | -0.15% | + 58.70% |
| | N. of 34°27' | 30 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | | | | 37 | 0.26% | 2 | 0.11% | -0.15% | + 58.70% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Longspine Thornyhead - coastwide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | 10 | 0 | 305 | 0 | 0 | 0 | 0 | 0 | | | | 315 | 0.61% | 29 | 0.45% | -0.16% | + 26.50% |
| | **YELLOWEYE** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.02% | 0 | 0.00% | -0.02% | + 100.00% |
| | Black Rockfish - coastwide | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | | | | 50 | 2.05% | 0 | 0.00% | -2.05% | + 100.00% |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.02% | 0 | 0.00% | -0.02% | + 100.00% |
| | **Black Rockfish (OR-CA)** | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | | | | 50 | 7.35% | 0 | 0.00% | -7.35% | + 100.00% |
| | **Minor Rockfish North** | 3,794 | 198 | 153 | 618 | 8,701 | 767 | 404 | 15 | | | | 14,650 | 3.16% | 5,970 | 2.37% | -0.79% | + 25.01% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 3,789 | 198 | 126 | 618 | 8,701 | 767 | 7 | 15 | | | | 14,221 | 3.98% | 7,580 | 3.16% | -0.81% | + 20.47% |
| | BOCACCIO: N. of Monterrey | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | | | | 9 | 0.14% | 0 | 0.00% | -0.14% | + 100.00% |
| | Chilipepper Rockfish: Eureka | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 2 | 0 | 126 | 0 | 0 | 0 | 0 | 0 | | | | 128 | 0.47% | 0 | 0.00% | -0.47% | + 100.00% |
| | Silvergrey Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | + 100.00% |
| | Other Northern Shelf Rockfish | 3,786 | 198 | 0 | 618 | 8,701 | 767 | 7 | 6 | | | | 14,084 | 7.71% | 302 | 3.44% | -4.27% | + 55.40% |
| | **Slope Species** | 6 | 0 | 26 | 0 | 0 | 0 | 397 | 0 | | | | 429 | 0.40% | 38 | 0.30% | -0.10% | + 25.39% |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish, north | 1 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | | | | 24 | 0.43% | 0 | 0.00% | -0.43% | + 100.00% |
| | Splitnose Rockfish: N. of Monterrey | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | | | | 4 | 0.01% | 0 | 0.28% | 0.27% | - 100.00% |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Northern Slope Rockfish** | 5 | 0 | 0 | 0 | 0 | 0 | 397 | 0 | | | | 402 | 1.37% | 87 | 0.68% | -0.68% | + 49.94% |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Southern Slope Rockfish** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | 1 | 0 | 0 | 49 | 5 | 0 | 0 | 0 | | | | 55 | 0.22% | 1 | 0.13% | -0.09% | + 39.47% |
| | Dover Sole (Summer) | 1 | 0 | 0 | 49 | 5 | 0 | 0 | 0 | | | | 55 | 0.29% | 1 | 0.16% | -0.13% | + 46.34% |
| | Dover Sole (Winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | English Sole | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | | | | 25 | 0.16% | 16 | 0.18% | 0.02% | - 10.17% |
| | Petrale Sole (coastwide) | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | | | | 59 | 0.47% | 0 | 0.43% | -0.05% | + 9.67% |
| | N of 40°10' (summer) | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | | | | 59 | 0.72% | 0 | 0.43% | -0.29% | + 40.13% |
| | N of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | 19 | 50 | 23 | 88 | 23 | 312 | 124 | 23 | | | | 662 | 2.79% | 183 | 3.21% | 0.42% | - 14.99% |
| | Arrowtooth Flounder (summer) | 19 | 50 | 23 | 88 | 23 | 312 | 124 | 23 | | | | 662 | 2.81% | 186 | 3.28% | 0.46% | - 16.52% |
| | Arrowtooth Flounder (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Starry Flounder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Flatfish | 0 | 0 | 0 | 657 | 2 | 0 | 0 | 0 | | | | 659 | 2.39% | 2 | 0.83% | -1.56% | + 65.43% |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | 769 | 4 | 675 | 323 | 1,058 | 712 | 791 | 1,799 | | | | 6,130 | 1.25% | 2,262 | 2.21% | 0.96% | - 76.38% |
| | Other Fish | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | | | | 2 | 0.01% | 0 | 0.00% | -0.01% | + 100.00% |
| | Total Groundfish | 11,848,745 | 6,951,576 | 6,951,908 | 5,663,080 | 4,415,976 | 5,966,720 | 5,643,526 | 5,020,807 | | | | 52,462,337 | 2.82% | 33,548,932 | 2.70% | -0.12% | + 4.38% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 10b. Example of Quota Share (QS) Allocations for a Selected Shoreside Whiting Vessel Permit (catch in lbs) with a Relatively Late Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SW2 | Lingcod - coastwide | | | | 129 | 0 | 34 | 9 | 53 | 59 | | 302 | 586 | 3.04% | 277 | 2.86% | -0.18% | + 6.07% |
| | N. of 42° (OR & WA) | | | | 129 | 0 | 34 | 9 | 53 | 59 | 19 | 273 | 576 | 3.04% | 280 | 2.90% | -0.13% | + 4.40% |
| | S. of 42° (CA) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 | 3.14% | 1 | 1.66% | -1.48% | + 47.23% |
| | Pacific Cod | | | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 17 | 0.19% | 11 | 1.38% | 1.18% | - 100.00% |
| | Pacific Whiting (Coastwide) | | | | 4,950,039 | 9,330,821 | 6,838,681 | 9,102,768 | 10,420,478 | 4,918,564 | 4,830,002 | 12,749,410 | 63,140,762 | 3.42% | 42,630,175 | 3.43% | 0.02% | - 0.48% |
| | Sablefish (Coastwide) | | | | 3,146 | 416 | 198 | 0 | 1,007 | 23,903 | 10,435 | 18,816 | 57,921 | 4.87% | 30,287 | 3.10% | -1.77% | + 36.30% |
| | N. of 36° (Monterey north) | | | | 3,146 | 416 | 198 | 0 | 1,007 | 23,903 | 10,435 | 18,816 | 57,921 | 4.87% | 30,287 | 3.10% | -1.77% | + 36.30% |
| | S. of 36° (Conception area) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | | | | 226 | 235 | 0 | 0 | 0 | 0 | 0 | 149 | 610 | 0.26% | 60 | 0.83% | 0.57% | - 100.00% |
| | Shortbelly Rockfish | | | | 0 | 0 | 0 | 4,886 | 1 | 0 | 0 | 4 | 4,891 | 22.42% | 107 | 10.66% | -11.76% | + 52.44% |
| | **WIDOW ROCKFISH** | | | | 6,219 | 56,682 | 13,901 | 4,050 | 25,136 | 1,826 | 10 | 8,061 | 115,885 | 2.72% | 18,567 | 6.10% | 3.39% | - 100.00% |
| | **CANARY ROCKFISH** | | | | 436 | 37 | 77 | 89 | 87 | 89 | 4 | 70 | 889 | 3.80% | 106 | 3.90% | 0.10% | - 2.72% |
| | Chilipepper Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | | | | 30,815 | 3,636 | 4,739 | 3,428 | 5,602 | 74 | 159 | 486 | 48,938 | 0.81% | 10,314 | 0.97% | 0.16% | - 19.70% |
| | Shortspine Thornyhead - coastwide | | | | 0 | 111 | 0 | 0 | 2 | 0 | 0 | 12 | 125 | 0.87% | 12 | 0.82% | -0.05% | + 5.90% |
| | N. of 34°27' | | | | 0 | 111 | 0 | 0 | 2 | 0 | 0 | 12 | 125 | 0.87% | 12 | 0.82% | -0.05% | + 5.90% |
| | S. of 34°27' | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Longspine Thornyhead - coastwide | | | | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0.03% | 0 | 0.08% | 0.05% | - 100.00% |
| | N. of 34°27' | | | | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0.03% | 0 | 0.08% | 0.05% | - 100.00% |
| | S. of 34°27' | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | | | | 0 | 0 | 0 | 425 | 101 | 1 | 0 | 911 | 1,438 | 2.80% | 183 | 2.87% | 0.07% | - 2.36% |
| | **YELLOWEYE** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish - coastwide | | | | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0.98% | 0 | 0.00% | -0.98% | + 100.00% |
| | Black Rockfish (WA) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Black Rockfish (OR-CA)** | | | | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 3.53% | 0 | 0.00% | -3.53% | + 100.00% |
| | **Minor Rockfish North** | | | | 152 | 322 | 2,089 | 11,395 | 2,527 | 41 | 12 | 14,102 | 30,640 | 6.60% | 9,936 | 3.94% | -2.66% | + 40.33% |
| | **Nearshore Species** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | | | | 152 | 322 | 2,089 | 11,018 | 2,094 | 41 | 9 | 12,755 | 28,480 | 7.97% | 20,231 | 8.44% | 0.48% | - 5.99% |
| | BOCACCIO: N. of Monterrey | | | | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 2 | 11 | 0.18% | 0 | 0.00% | -0.18% | + 100.00% |
| | Chilipepper Rockfish: Eureka | | | | 0 | 0 | 0 | 10,976 | 1,709 | 0 | 0 | 10,727 | 23,412 | 17.73% | 27,913 | 12.09% | -5.63% | + 31.78% |
| | Redstripe Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Silvergrey Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Northern Shelf Rockfish | | | | 152 | 322 | 2,089 | 42 | 375 | 41 | 9 | 2,026 | 5,056 | 2.77% | 788 | 8.98% | 6.21% | - 100.00% |
| | **Slope Species** | | | | 0 | 0 | 0 | 377 | 433 | 0 | 3 | 1,347 | 2,160 | 2.02% | 288 | 2.26% | 0.24% | - 11.93% |
| | Bank Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 75 | 25.93% | 0 | 0.00% | -25.93% | + 100.00% |
| | Sharpchin Rockfish, north | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish: N. of Monterrey | | | | 0 | 0 | 0 | 360 | 432 | 0 | 0 | 1,230 | 2,022 | 2.88% | 1 | 10.07% | 7.19% | - 100.00% |
| | Yellowmouth Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Northern Slope Rockfish** | | | | 0 | 0 | 0 | 17 | 1 | 0 | 3 | 42 | 63 | 0.21% | 13 | 0.10% | -0.12% | + 53.96% |
| | **Minor Rockfish South** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Nearshore Species** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Bank Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Southern Slope Rockfish** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | California scorpionfish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | | | | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 11 | 0.04% | 1 | 0.13% | 0.09% | - 100.00% |
| | Dover Sole (Summer) | | | | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 11 | 0.06% | 1 | 0.13% | 0.07% | - 100.00% |
| | Dover Sole (Winter) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | English Sole | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Petrale Sole (coastwide) | | | | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0.02% | 0 | 0.04% | 0.03% | - 100.00% |
| | N of 40°10' (summer) | | | | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0.02% | 0 | 0.04% | 0.02% | - 71.52% |
| | N of 40°10' (winter) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (summer) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (winter) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | | | | 18 | 0 | 23 | 16 | 35 | 0 | 8 | 29 | 129 | 0.54% | 33 | 0.59% | 0.04% | - 7.79% |
| | Arrowtooth Flounder (summer) | | | | 18 | 0 | 23 | 16 | 35 | 0 | 8 | 29 | 129 | 0.55% | 33 | 0.59% | 0.04% | - 7.48% |
| | Arrowtooth Flounder (winter) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Starry Flounder | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Flatfish | | | | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0.01% | 0 | 0.04% | 0.03% | - 100.00% |
| | Kelp Greenling | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | | | | 2,396 | 8,477 | 0 | 927 | 134 | 182 | 4 | 2,084 | 14,204 | 2.90% | 4,184 | 4.09% | 1.18% | - 40.82% |
| | Other Fish | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 57 | 0.43% | 0 | 0.00% | -0.43% | + 100.00% |
| | Total Groundfish | | | | 4,993,611 | 9,400,737 | 6,859,747 | 9,127,994 | 10,455,173 | 4,944,742 | 4,840,653 | 12,794,498 | 63,417,155 | 3.41% | 42,683,894 | 3.43% | 0.02% | - 0.64% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 10c. Example of Quota Share (QS) Allocations for a Selected Shoreside Whiting Vessel Permit (catch in lbs) with a Relatively Constant Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SW3 | Lingcod - coastwide | 7 | 4 | 0 | 0 | 5 | 45 | 50 | 77 | 24 | 43 | 132 | 387 | 1.95% | 206 | 2.13% | 0.18% | - 9.33% |
| | N. of 42° (OR & WA) | 7 | 4 | 0 | 0 | 5 | 45 | 50 | 77 | 16 | 43 | 120 | 367 | 1.93% | 218 | 2.26% | 0.33% | - 17.04% |
| | S. of 42° (CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 12 | 20 | 2.17% | 4 | 9.78% | 7.61% | - 100.00% |
| | Pacific Cod | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0.06% | 0 | 0.03% | -0.03% | + 51.29% |
| | Pacific Whiting (Coastwide) | 6,083,563 | 7,707,621 | 5,766,042 | 5,653,143 | 6,801,511 | 3,205,991 | 4,884,968 | 6,873,493 | 6,103,150 | 5,223,036 | 8,728,851 | 67,031,369 | 3.63% | 46,941,992 | 3.78% | 0.15% | - 4.22% |
| | Sablefish (Coastwide) | 1,655 | 5,934 | 15 | 730 | 370 | 16 | 74 | 2,487 | 5,256 | 5,289 | 4,871 | 26,697 | 2.24% | 21,243 | 2.17% | -0.07% | + 3.06% |
| | N. of 36° (Monterey north) | 1,655 | 5,934 | 15 | 730 | 370 | 16 | 74 | 2,487 | 5,256 | 5,289 | 4,871 | 26,697 | 2.24% | 21,243 | 2.17% | -0.07% | + 3.06% |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | 0 | 0 | 0 | 0 | 360 | 0 | 2 | 0 | 0 | 0 | 8 | 370 | 0.16% | 9 | 0.13% | -0.03% | + 18.40% |
| | Shortbelly Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 3 | 0.01% | 1 | 0.10% | 0.09% | - 100.00% |
| | **WIDOW ROCKFISH** | 4,358 | 7,731 | 23,954 | 2,125 | 6,854 | 1,972 | 4,520 | 622 | 1,972 | 771 | 2,511 | 57,389 | 1.34% | 9,081 | 2.99% | 1.64% | - 100.00% |
| | **CANARY ROCKFISH** | 0 | 0 | 0 | 0 | 121 | 9 | 69 | 75 | 54 | 11 | 55 | 394 | 1.68% | 57 | 2.09% | 0.41% | - 24.21% |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 4,532 | 18,771 | 9,845 | 600 | 1,339 | 3,202 | 1,557 | 7,666 | 1,157 | 32 | 111 | 48,812 | 0.81% | 9,899 | 0.93% | 0.12% | - 15.17% |
| | Shortspine Thornyhead - coastwide | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 61 | 76 | 0.53% | 14 | 0.90% | 0.38% | - 70.98% |
| | N. of 34°27' | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 61 | 76 | 0.53% | 14 | 0.90% | 0.38% | - 70.98% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Longspine Thornyhead - coastwide | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.01% | 0 | 0.04% | 0.03% | - 100.00% |
| | N. of 34°27' | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.01% | 0 | 0.04% | 0.03% | - 100.00% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 3,198 | 24 | 0 | 51 | 3,283 | 6.40% | 740 | 11.62% | 5.22% | - 81.61% |
| | **YELLOWEYE** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish - coastwide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Black Rockfish (OR-CA)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Minor Rockfish North** | 725 | 77 | 121 | 3,790 | 317 | 888 | 38 | 2,478 | 1,121 | 1,639 | 16,853 | 28,047 | 6.04% | 22,049 | 8.74% | 2.70% | - 44.66% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 35.20% | 0 | 0.00% | -35.20% | + 100.00% |
| | **Shelf Species** | 725 | 77 | 121 | 3,790 | 317 | 888 | 10 | 21 | 1,103 | 1,596 | 16,540 | 25,188 | 7.05% | 26,251 | 10.96% | 3.91% | - 55.50% |
| | BOCACCIO: N. of Monterrey | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 101 | 0 | 11 | 132 | 2.09% | 0 | 0.00% | -2.09% | + 100.00% |
| | Chilipepper Rockfish: Eureka | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 994 | 1,591 | 16,525 | 19,110 | 14.47% | 26,950 | 11.68% | -2.79% | + 19.31% |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Silvergrey Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Northern Shelf Rockfish | 725 | 77 | 121 | 3,790 | 317 | 888 | 10 | 1 | 8 | 5 | 4 | 5,946 | 3.25% | 169 | 1.93% | -1.32% | + 40.72% |
| | **Slope Species** | 0 | 0 | 1 | 0 | 0 | 0 | 28 | 2,457 | 11 | 43 | 313 | 2,852 | 2.67% | 623 | 4.90% | 2.23% | - 83.56% |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish, north | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.01% | 0 | 0.00% | -0.01% | + 100.00% |
| | Splitnose Rockfish: N. of Monterrey | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,426 | 0 | 0 | 0 | 2,426 | 3.46% | 1 | 5.16% | 1.70% | - 49.28% |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Northern Slope Rockfish** | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 31 | 11 | 43 | 313 | 426 | 1.45% | 158 | 1.25% | -0.20% | + 14.10% |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Southern Slope Rockfish** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | 0 | 610 | 0 | 0 | 10 | 0 | 0 | 4 | 0 | 0 | 0 | 624 | 2.49% | 58 | 7.09% | 4.60% | - 100.00% |
| | Dover Sole (Summer) | 0 | 610 | 0 | 0 | 10 | 0 | 0 | 4 | 0 | 0 | 0 | 624 | 3.28% | 58 | 7.13% | 3.86% | - 100.00% |
| | Dover Sole (Winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | English Sole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Petrale Sole (coastwide) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0.01% | 0 | 0.01% | 0.00% | + 16.91% |
| | N of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0.01% | 0 | 0.01% | -0.01% | + 44.93% |
| | N of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | 0 | 0 | 0 | 3 | 0 | 53 | 7 | 16 | 2 | 0 | 24 | 105 | 0.44% | 18 | 0.31% | -0.13% | + 29.54% |
| | Arrowtooth Flounder (summer) | 0 | 0 | 0 | 3 | 0 | 53 | 7 | 16 | 2 | 0 | 24 | 105 | 0.45% | 18 | 0.31% | -0.13% | + 29.79% |
| | Arrowtooth Flounder (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Starry Flounder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Flatfish | 0 | 0 | 0 | 2 | 3 | 12 | 0 | 0 | 21 | 0 | 5 | 43 | 0.16% | 1 | 0.36% | 0.20% | - 100.00% |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | 5,998 | 41 | 20 | 0 | 3,687 | 159 | 32 | 590 | 158 | 30 | 277 | 10,992 | 2.25% | 2,981 | 2.91% | 0.67% | - 29.65% |
| | Other Fish | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 62 | 0.46% | 0 | 0.00% | -0.46% | + 100.00% |
| | Total Groundfish | 6,100,843 | 7,740,799 | 5,800,068 | 5,660,393 | 6,814,579 | 3,212,346 | 4,891,318 | 6,890,711 | 6,112,940 | 5,230,852 | 8,753,812 | 67,208,661 | 3.61% | 46,869,639 | 3.77% | 0.15% | - 4.28% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 10d. Annual Fleetwide Landings (catch in lbs) by Species and Complex for Permitted Shoreside Whiting Vessels, 1994-2004.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | TOTAL Relative lbs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL SW | Lingcod - coastwide | 445 | 314 | 1,557 | 1,047 | 813 | 1,390 | 1,849 | 1,673 | 783 | 881 | 9,140 | 19,892 | 9,691 |
| | N. of 42° (OR & WA) | 445 | 314 | 1,544 | 995 | 159 | 1,368 | 1,838 | 1,673 | 775 | 877 | 8,981 | 18,969 | 9,647 |
| | S. of 42° (CA) | 0 | 0 | 13 | 52 | 654 | 22 | 11 | 0 | 8 | 4 | 159 | 923 | 44 |
| | Pacific Cod | 1,620 | 181 | 900 | 80 | 1,782 | 510 | 211 | 131 | 855 | 74 | 2,336 | 8,680 | 814 |
| | Pacific Whiting (Coastwide) | 162,061,469 | 165,007,641 | 181,821,371 | 192,435,676 | 193,362,330 | 183,848,719 | 189,172,750 | 161,788,579 | 100,318,131 | 112,837,482 | 204,763,420 | 1,847,417,568 | 1,241,212,304 |
| | Sablefish (Coastwide) | 76,350 | 94,339 | 81,616 | 92,578 | 61,618 | 7,692 | 3,690 | 103,899 | 290,880 | 88,803 | 288,596 | 1,190,060 | 976,832 |
| | N. of 36° (Monterey north) | 76,350 | 94,339 | 81,616 | 92,578 | 61,618 | 7,692 | 3,690 | 103,899 | 290,880 | 88,803 | 288,596 | 1,190,060 | 976,832 |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **PACIFIC OCEAN PERCH** | 24,097 | 66,014 | 72,240 | 14,070 | 49,077 | 4,112 | 615 | 112 | 491 | 660 | 2,176 | 233,663 | 7,259 |
| | Shortbelly Rockfish | 0 | 0 | 19 | 29 | 2,913 | 12,124 | 5,137 | 1,372 | 113 | 91 | 18 | 21,816 | 1,001 |
| | **WIDOW ROCKFISH** | 531,744 | 520,494 | 1,259,977 | 359,980 | 770,675 | 428,486 | 183,544 | 97,693 | 11,276 | 27,650 | 75,626 | 4,267,145 | 304,150 |
| | **CANARY ROCKFISH** | 1,890 | 1,149 | 2,662 | 2,110 | 1,925 | 4,176 | 2,426 | 3,078 | 1,161 | 248 | 2,572 | 23,395 | 2,728 |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Yellowtail Rockfish | 564,591 | 648,547 | 1,063,942 | 499,334 | 1,101,745 | 1,052,331 | 419,384 | 226,937 | 93,788 | 96,819 | 281,037 | 6,048,456 | 1,065,011 |
| | Shortspine Thornyhead - coastwide | 3,938 | 1,093 | 235 | 391 | 1,703 | 960 | 4,126 | 143 | 534 | 138 | 1,101 | 14,362 | 1,518 |
| | N. of 34°27' | 3,938 | 1,093 | 235 | 391 | 1,703 | 960 | 4,126 | 143 | 534 | 138 | 1,101 | 14,362 | 1,518 |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Longspine Thornyhead - coastwide | 6,554 | 6,084 | 20 | 950 | 257 | 541 | 1,237 | 108 | 0 | 44 | 34 | 15,829 | 484 |
| | N. of 34°27' | 6,554 | 6,084 | 20 | 950 | 257 | 541 | 1,237 | 108 | 0 | 44 | 34 | 15,829 | 484 |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **DARKBLOTCHED** | 373 | 1,094 | 12,922 | 1,018 | 11,169 | 1,378 | 8,163 | 10,339 | 25 | 579 | 4,268 | 51,329 | 6,366 |
| | **YELLOWEYE** | 28 | 12 | 296 | 284 | 424 | 233 | 25 | 1 | 4 | 0 | 7 | 1,313 | 0 |
| | Black Rockfish - coastwide | 50 | 194 | 72 | 516 | 1,549 | 2 | 71 | 0 | 0 | 0 | 0 | 2,453 | 0 |
| | Black Rockfish (WA) | 50 | 190 | 0 | 0 | 1,533 | 0 | 0 | 0 | 0 | 0 | 0 | 1,773 | 0 |
| | Black Rockfish (OR-CA) | 0 | 4 | 72 | 516 | 16 | 2 | 71 | 0 | 0 | 0 | 0 | 681 | 0 |
| | **Minor Rockfish North** | 42,800 | 6,256 | 47,478 | 50,997 | 90,929 | 32,578 | 99,321 | 11,084 | 2,118 | 22,936 | 0 | 406,497 | 252,297 |
| | **Nearshore Species** | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 20 | 0 |
| | **Shelf Species** | 42,455 | 5,440 | 40,411 | 49,250 | 50,781 | 23,606 | 67,349 | 5,451 | 1,732 | 21,782 | 49,222 | 357,480 | 239,598 |
| | BOCACCIO: N. of Monterrey | 37 | 4 | 1,533 | 1,129 | 560 | 306 | 1,066 | 1,523 | 156 | 0 | 13 | 6,326 | 0 |
| | Chilipepper Rockfish: Eureka | 0 | 168 | 35 | 65 | 752 | 116 | 61,503 | 1,867 | 1,177 | 20,984 | 45,406 | 132,072 | 230,820 |
| | Redstripe Rockfish | 110 | 256 | 25,630 | 444 | 770 | 170 | 8 | 0 | 1 | 0 | 0 | 27,389 | 0 |
| | Silvergrey Rockfish | 120 | 1 | 1,548 | 2,344 | 4,511 | 265 | 0 | 0 | 125 | 0 | 0 | 8,915 | 0 |
| | Other Northern Shelf Rockfish | 42,188 | 5,012 | 11,666 | 45,268 | 44,189 | 22,750 | 4,772 | 2,061 | 272 | 798 | 3,803 | 182,779 | 8,778 |
| | **Slope Species** | 345 | 816 | 7,054 | 1,747 | 40,147 | 8,972 | 31,972 | 5,633 | 379 | 1,155 | 8,533 | 106,752 | 12,700 |
| | Bank Rockfish | 0 | 2 | 0 | 16 | 3 | 1 | 193 | 0 | 0 | 0 | 75 | 290 | 0 |
| | Sharpchin Rockfish, north | 78 | 557 | 3,658 | 178 | 962 | 123 | 95 | 2 | 14 | 0 | 0 | 5,666 | 0 |
| | Splitnose Rockfish: N. of Monterrey | 19 | 158 | 346 | 141 | 36,075 | 6,149 | 21,733 | 4,274 | 14 | 1 | 1,242 | 70,151 | 11 |
| | Yellowmouth Rockfish | 120 | 0 | 1,036 | 52 | 77 | 1 | 0 | 0 | 0 | 0 | 0 | 1,286 | 0 |
| | Other Northern Slope Rockfish | 127 | 100 | 2,014 | 1,360 | 3,031 | 2,699 | 9,951 | 1,358 | 352 | 1,154 | 7,215 | 29,359 | 12,689 |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Slope Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Southern Slope Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dover sole (total) | 4,800 | 789 | 3,131 | 3,561 | 7,621 | 39 | 751 | 755 | 3,441 | 74 | 77 | 25,039 | 814 |
| | Dover Sole (Summer) | 4,800 | 789 | 3,131 | 3,561 | 1,622 | 39 | 751 | 755 | 3,441 | 74 | 77 | 19,040 | 814 |
| | Dover Sole (Winter) | 0 | 0 | 0 | 0 | 5,999 | 0 | 0 | 0 | 0 | 0 | 0 | 5,999 | 0 |
| | English Sole | 1 | 28 | 1,189 | 1,270 | 2,742 | 216 | 1,020 | 2,798 | 3,768 | 808 | 1,551 | 15,391 | 8,888 |
| | Petrale Sole (coastwide) | 0 | 7 | 1,314 | 1,252 | 3,082 | 353 | 437 | 4,066 | 1,361 | 2 | 566 | 12,440 | 22 |
| | N of 40°10' (summer) | 0 | 7 | 1,314 | 1,252 | 2,591 | 353 | 437 | 362 | 1,361 | 2 | 566 | 8,245 | 22 |
| | N of 40°10' (winter) | 0 | 0 | 0 | 0 | 491 | 0 | 0 | 3,704 | 0 | 0 | 0 | 4,195 | 0 |
| | S of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Arrowtooth Flounder (total) | 255 | 451 | 2,496 | 1,907 | 694 | 7,427 | 4,249 | 2,861 | 1,440 | 517 | 1,415 | 23,713 | 5,687 |
| | Arrowtooth Flounder (summer) | 255 | 445 | 2,496 | 1,907 | 593 | 7,427 | 4,249 | 2,796 | 1,440 | 517 | 1,415 | 23,541 | 5,687 |
| | Arrowtooth Flounder (winter) | 0 | 6 | 0 | 0 | 101 | 0 | 0 | 65 | 0 | 0 | 0 | 172 | 0 |
| | Starry Flounder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 24 | 3 | 28 | 264 |
| | Other Flatfish | 7 | 15 | 3,264 | 7,244 | 9,031 | 3,229 | 1,415 | 1,775 | 719 | 21 | 843 | 27,563 | 231 |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Spiny Dogfish | 56,175 | 284 | 8,451 | 7,367 | 123,845 | 87,834 | 76,338 | 27,892 | 25,130 | 9,308 | 66,865 | 489,489 | 102,388 |
| | Other Fish | 10,488 | 236 | 60 | 141 | 719 | 363 | 699 | 288 | 0 | 0 | 343 | 13,337 | 0 |
| | Total Groundfish | 163,387,694 | 166,355,221 | 184,385,213 | 193,481,801 | 195,606,642 | 185,494,694 | 189,987,457 | 162,285,583 | 100,756,020 | 113,087,159 | 205,559,749 | 1,860,387,233 | 1,243,958,749 |

**Table 11a. Example of Quota Share (QS) Allocations for a Selected At-Sea Whiting Catcher Vessel Permit (catch in lbs) with a Relatively Early Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASCV1 | Lingcod - coastwide | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 17 | 0.36% | 20 | 0.89% | 0.53% | - 100.00% |
| | N. of 42° (OR & WA) | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 17 | 0.36% | 20 | 0.89% | 0.53% | - 100.00% |
| | S. of 42° (CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Pacific Cod | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 45 | 12.57% | 0 | 0.00% | -12.57% | + 100.00% |
| | Pacific Whiting (Coastwide) | 5,665,216 | 2,785,185 | 3,710,529 | 4,069,774 | 4,186,370 | 3,725,105 | 2,961,072 | 2,624,932 | | | | 29,728,182 | 3.10% | 17,076,632 | 2.71% | -0.39% | + 12.60% |
| | Sablefish (Coastwide) | 0 | 1,311 | 2 | 12 | 0 | 0 | 1,817 | 0 | | | | 3,142 | 8.59% | 809 | 10.93% | 2.35% | - 27.34% |
| | N. of 36° (Monterey north) | 0 | 1,311 | 2 | 12 | 0 | 0 | 1,817 | 0 | | | | 3,142 | 8.59% | 809 | 10.93% | 2.35% | - 27.34% |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | 828 | 373 | 14 | 117 | 621 | 18 | 0 | 0 | | | | 1,971 | 1.64% | 30 | 1.31% | -0.33% | + 20.34% |
| | Shortbelly Rockfish | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 2 | 0.00% | 0 | 0.01% | 0.00% | - 100.00% |
| | **WIDOW ROCKFISH** | 4,124 | 3,571 | 9,820 | 2,710 | 2,510 | 2,644 | 19,737 | 1,821 | | | | 46,937 | 2.43% | 307 | 1.84% | -0.59% | + 24.15% |
| | **CANARY ROCKFISH** | 33 | 0 | 0 | 42 | 0 | 66 | 0 | 0 | | | | 141 | 0.52% | 21 | 1.00% | 0.48% | - 93.30% |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 31,310 | 145,829 | 32,347 | 8,398 | 23,907 | 22,063 | 15,048 | 9,290 | | | | 288,192 | 5.78% | 495 | 3.57% | -2.21% | + 38.30% |
| | Shortspine Thornyhead - coastwide | 0 | 0 | 0 | 0 | 0 | 0 | 318 | 0 | | | | 318 | 23.87% | 242 | 6.55% | -17.32% | + 72.55% |
| | N. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 318 | 0 | | | | 318 | 23.87% | 242 | 6.55% | -17.32% | + 72.55% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Longspine Thornyhead - coastwide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | 239 | 43 | 150 | 227 | 228 | 1,159 | 0 | 0 | | | | 2,045 | 2.72% | 93 | 3.59% | 0.87% | - 32.16% |
| | **YELLOWEYE** | 148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 148 | 26.24% | 0 | 0.00% | -26.24% | + 100.00% |
| | Black Rockfish - coastwide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Black Rockfish (OR-CA)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Minor Rockfish North** | 573 | 512 | 3,203 | 2,786 | 658 | 1,916 | 2,013 | 748 | | | | 12,409 | 5.00% | 2,326 | 5.78% | 0.78% | - 15.59% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 573 | 15 | 16 | 55 | 40 | 1,853 | 196 | 0 | | | | 2,749 | 1.84% | 701 | 2.66% | 0.82% | - 44.80% |
| | BOCACCIO: N. of Monterrey | 15 | 0 | 0 | 39 | 40 | 0 | 0 | 0 | | | | 94 | 1.13% | 0 | 0.00% | -1.13% | + 100.00% |
| | Chilipepper Rockfish: Eureka | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 558 | 8 | 16 | 15 | 0 | 1,828 | 196 | 0 | | | | 2,622 | 5.07% | 1 | 5.04% | -0.03% | + 0.58% |
| | Silvergrey Rockfish | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | | | | 25 | 1.86% | 1 | 0.32% | -1.55% | + 83.05% |
| | Other Northern Shelf Rockfish | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | | | | 8 | 0.02% | 1 | 0.69% | 0.67% | - 100.00% |
| | **Slope Species** | 0 | 496 | 3,187 | 2,732 | 617 | 63 | 1,817 | 748 | | | | 9,660 | 9.78% | 1,300 | 9.32% | -0.46% | + 4.71% |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish, north | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 53 | 9.36% | 252 | 8.76% | -0.60% | + 6.44% |
| | Splitnose Rockfish: N. of Monterrey | 0 | 18 | 3,107 | 2,693 | 425 | 0 | 1,817 | 0 | | | | 8,059 | 16.03% | 856 | 12.20% | -3.82% | + 23.86% |
| | Yellowmouth Rockfish | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | | | | 36 | 0.53% | 1 | 1.67% | 1.14% | - 100.00% |
| | **Other Northern Slope Rockfish** | 0 | 426 | 45 | 39 | 192 | 63 | 0 | 748 | | | | 1,512 | 3.78% | 301 | 7.54% | 3.76% | - 99.54% |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Southern Slope Rockfish** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover Sole (Summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover Sole (Winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | English Sole | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | | | | 7 | 1.28% | 35 | 10.27% | 8.99% | - 100.00% |
| | Petrale Sole (coastwide) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | 157 | 0 | 173 | 66 | 42 | 340 | 2,153 | 0 | | | | 2,930 | 17.65% | 85 | 14.86% | -2.79% | + 15.83% |
| | Arrowtooth Flounder (summer) | 137 | 0 | 173 | 66 | 42 | 340 | 2,153 | 0 | | | | 2,910 | 22.13% | 94 | 16.40% | -5.73% | + 25.89% |
| | Arrowtooth Flounder (winter) | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 20 | 0.59% | 0 | 0.00% | -0.59% | + 100.00% |
| | Starry Flounder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Flatfish | 14 | 2 | 0 | 1 | 0 | 0 | 3,222 | 453 | | | | 3,692 | 58.24% | 895 | 17.69% | -40.54% | + 69.62% |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | 882 | 55 | 4,129 | 7,516 | 11,197 | 13,520 | 4,459 | 0 | | | | 41,758 | 3.13% | 493 | 2.00% | -1.13% | + 36.16% |
| | Other Fish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Total Groundfish | 5,703,588 | 2,936,886 | 3,760,367 | 4,091,650 | 4,225,533 | 3,766,829 | 3,009,838 | 2,637,243 | | | | 30,131,934 | 3.11% | 17,146,246 | 2.72% | -0.39% | + 12.63% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 11b. Example of Quota Share (QS) Allocations for a Selected At-Sea Whiting Catcher Vessel Permit (catch in lbs) with a Relatively Late Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASCV2 | Lingcod - coastwide | | | | | 0 | 0 | 0 | 231 | 17 | 0 | 174 | 422 | 8.92% | 78 | 3.51% | -5.41% | + 60.63% |
| | N. of 42° (OR & WA) | | | | | 0 | 0 | 0 | 231 | 17 | 0 | 174 | 422 | 8.92% | 78 | 3.51% | -5.41% | + 60.63% |
| | S. of 42° (CA) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Pacific Cod | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Pacific Whiting (Coastwide) | | | | | 5,397,879 | 4,537,096 | 4,497,109 | 7,514,685 | 6,643,701 | 6,325,811 | 8,334,827 | 43,251,108 | 4.50% | 35,375,839 | 5.61% | 1.10% | - 24.45% |
| | Sablefish (Coastwide) | | | | | 0 | 0 | 7 | 112 | 0 | 28 | 7,372 | 7,519 | 20.55% | 411 | 5.55% | -15.00% | + 72.98% |
| | N. of 36° (Monterey north) | | | | | 0 | 0 | 7 | 112 | 0 | 28 | 7,372 | 7,519 | 20.55% | 411 | 5.55% | -15.00% | + 72.98% |
| | S. of 36° (Conception area) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | | | | | 0 | 496 | 37 | 0 | 885 | 0 | 147 | 1,565 | 1.30% | 186 | 8.12% | 6.81% | - 100.00% |
| | Shortbelly Rockfish | | | | | 0 | 0 | 0 | 58,529 | 61 | 2 | 34 | 58,625 | 80.50% | 106 | 19.64% | -60.86% | + 75.60% |
| | **WIDOW ROCKFISH** | | | | | 8,696 | 1,680 | 19,878 | 9,888 | 10,395 | 253 | 5,904 | 56,694 | 2.93% | 1,353 | 8.13% | 5.20% | - 100.00% |
| | **CANARY ROCKFISH** | | | | | 0 | 0 | 38 | 69 | 70 | 0 | 127 | 304 | 1.11% | 25 | 1.21% | 0.10% | - 8.59% |
| | Chilipepper Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | | | | | 60,889 | 25,593 | 33,602 | 25,159 | 175 | 12 | 14,663 | 160,093 | 3.21% | 1,170 | 8.43% | 5.21% | - 100.00% |
| | Shortspine Thornyhead - coastwide | | | | | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0.17% | 12 | 0.33% | 0.17% | - 100.00% |
| | N. of 34°27' | | | | | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0.17% | 12 | 0.33% | 0.17% | - 100.00% |
| | S. of 34°27' | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Longspine Thornyhead - coastwide | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N. of 34°27' | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S. of 34°27' | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | | | | | 0 | 0 | 625 | 12 | 330 | 44 | 4,635 | 5,646 | 7.51% | 262 | 10.13% | 2.62% | - 34.90% |
| | **YELLOWEYE** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish - coastwide | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Black Rockfish (WA) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Black Rockfish (OR-CA)** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Minor Rockfish North** | | | | | 4,701 | 0 | 11,974 | 727 | 339 | 37 | 1,258 | 19,036 | 7.66% | 3,076 | 7.64% | -0.03% | + 0.35% |
| | **Nearshore Species** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | | | | | 0 | 0 | 11,912 | 727 | 38 | 31 | 1,209 | 13,918 | 9.31% | 1,450 | 5.51% | -3.81% | + 40.88% |
| | BOCACCIO: N. of Monterrey | | | | | 0 | 0 | 95 | 86 | 0 | 0 | 18 | 199 | 2.39% | 0 | 0.00% | -2.39% | + 100.00% |
| | Chilipepper Rockfish: Eureka | | | | | 0 | 0 | 0 | 635 | 36 | 29 | 479 | 1,179 | 2.84% | 833 | 3.23% | 0.39% | - 13.80% |
| | Redstripe Rockfish | | | | | 0 | 0 | 0 | 6 | 0 | 2 | 697 | 706 | 1.36% | 4 | 17.29% | 15.93% | - 100.00% |
| | Silvergrey Rockfish | | | | | 0 | 0 | 168 | 0 | 0 | 0 | 13 | 181 | 13.63% | 28 | 7.62% | -6.01% | + 44.06% |
| | Other Northern Shelf Rockfish | | | | | 0 | 0 | 11,649 | 0 | 2 | 0 | 2 | 11,653 | 25.05% | 6 | 3.81% | -21.25% | + 84.80% |
| | **Slope Species** | | | | | 4,701 | 0 | 62 | 0 | 301 | 6 | 49 | 5,118 | 5.18% | 699 | 5.01% | -0.18% | + 3.38% |
| | Bank Rockfish | | | | | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 34 | 2.76% | 0 | 0.00% | -2.76% | + 100.00% |
| | Sharpchin Rockfish, north | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish: N. of Monterrey | | | | | 0 | 0 | 0 | 0 | 194 | 6 | 6 | 206 | 0.41% | 177 | 2.52% | 2.11% | - 100.00% |
| | Yellowmouth Rockfish | | | | | 4,701 | 0 | 0 | 0 | 0 | 0 | 0 | 4,701 | 70.85% | 5 | 6.74% | -64.11% | + 90.49% |
| | **Other Northern Slope Rockfish** | | | | | 0 | 0 | 62 | 0 | 72 | 0 | 43 | 177 | 0.44% | 395 | 9.91% | 9.46% | - 100.00% |
| | **Minor Rockfish South** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Nearshore Species** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Bank Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Southern Slope Rockfish** | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | California scorpionfish | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | | | | | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 6.33% | 2 | 1.82% | -4.52% | + 71.29% |
| | Dover Sole (Summer) | | | | | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 7.04% | 2 | 1.82% | -5.22% | + 74.16% |
| | Dover Sole (Winter) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | English Sole | | | | | 0 | 0 | 41 | 0 | 0 | 0 | 0 | 41 | 7.44% | 3 | 1.02% | -6.42% | + 86.28% |
| | Petrale Sole (coastwide) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N of 40°10' (summer) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N of 40°10' (winter) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (summer) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (winter) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | | | | | 0 | 0 | 248 | 110 | 0 | 2 | 0 | 359 | 2.16% | 6 | 1.09% | -1.08% | + 49.76% |
| | Arrowtooth Flounder (summer) | | | | | 0 | 0 | 248 | 110 | 0 | 2 | 0 | 359 | 2.73% | 6 | 1.09% | -1.65% | + 60.21% |
| | Arrowtooth Flounder (winter) | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Starry Flounder | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Flatfish | | | | | 0 | 0 | 132 | 2 | 0 | 3 | 0 | 137 | 2.16% | 21 | 0.41% | -1.75% | + 80.86% |
| | Kelp Greenling | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | | | | | 47,213 | 6,932 | 6,784 | 2,773 | 309 | 110 | 1,406 | 65,527 | 4.91% | 1,463 | 5.93% | 1.01% | - 20.66% |
| | Other Fish | | | | | 0 | 0 | 0 | 100 | 0 | 0 | 139 | 239 | 9.10% | 151 | 4.48% | -4.62% | + 50.72% |
| | Total Groundfish | | | | | 5,519,377 | 4,571,797 | 4,570,474 | 7,612,404 | 6,656,281 | 6,326,303 | 8,370,686 | 43,627,322 | 4.50% | 35,478,350 | 5.62% | 1.12% | - 24.86% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 11c. Example of Quota Share (QS) Allocations for a Selected At-Sea Whiting Catcher Vessel Permit (catch in lbs) with a Relatively Constant Catch History.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | Actual lbs QS (1) | TOTAL Relative lbs | Relative lbs QS (2) | Difference in QS (2) - (1) | Percent Difference in QS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASCV3 | Lingcod - coastwide | 0 | 0 | 0 | 0 | 0 | 44 | 43 | 11 | 103 | 0 | 197 | 396 | 8.39% | 327 | 14.70% | 6.32% | Table |
| | N. of 42° (OR & WA) | 0 | 0 | 0 | 0 | 0 | 44 | 43 | 11 | 103 | 0 | 197 | 396 | 8.39% | 327 | 14.70% | 6.32% | - 75.29% |
| | S. of 42° (CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Pacific Cod | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 11.43% | 0 | 0.00% | -11.43% | + 100.00% |
| | Pacific Whiting (Coastwide) | 3,987,703 | 3,553,222 | 3,865,142 | 5,046,016 | 4,240,344 | 5,166,103 | 6,273,123 | 4,569,594 | 4,414,950 | 3,910,514 | 3,351,242 | 48,377,950 | 5.04% | 33,632,230 | 5.33% | 0.29% | - 5.78% |
| | Sablefish (Coastwide) | 13 | 73 | 21 | 78 | 218 | 1,263 | 18 | 24 | 8 | 0 | 41 | 1,756 | 4.80% | 657 | 8.88% | 4.08% | - 84.96% |
| | N. of 36° (Monterey north) | 13 | 73 | 21 | 78 | 218 | 1,263 | 18 | 24 | 8 | 0 | 41 | 1,756 | 4.80% | 657 | 8.88% | 4.08% | - 84.96% |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **PACIFIC OCEAN PERCH** | 0 | 139 | 399 | 6 | 9 | 53 | 65 | 6 | 36 | 0 | 0 | 714 | 0.59% | 36 | 1.57% | 0.98% | - 100.00% |
| | Shortbelly Rockfish | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 13 | 8 | 0 | 0 | 23 | 0.03% | 20 | 3.69% | 3.66% | - 100.00% |
| | **WIDOW ROCKFISH** | 2,216 | 2,274 | 4,151 | 12,860 | 29,179 | 3,718 | 4,048 | 10,003 | 6,230 | 27 | 89 | 74,793 | 3.87% | 796 | 4.78% | 0.91% | - 23.50% |
| | **CANARY ROCKFISH** | 0 | 49 | 0 | 135 | 8 | 46 | 106 | 40 | 353 | 0 | 44 | 781 | 2.86% | 126 | 6.03% | 3.17% | - 100.00% |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 6,389 | 16,613 | 58,226 | 5,239 | 1,442 | 2,409 | 8,797 | 4,012 | 1,364 | 0 | 61 | 104,553 | 2.10% | 757 | 5.45% | 3.36% | - 100.00% |
| | Shortspine Thornyhead - coastwide | 0 | 168 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | 8 | 24 | 207 | 15.57% | 430 | 11.67% | -3.90% | + 25.04% |
| | N. of 34°27' | 0 | 168 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | 8 | 24 | 207 | 15.57% | 430 | 11.67% | -3.90% | + 25.04% |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Longspine Thornyhead - coastwide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **DARKBLOTCHED** | 229 | 127 | 0 | 0 | 178 | 632 | 1,133 | 46 | 8 | 10 | 61 | 2,425 | 3.22% | 78 | 3.01% | -0.21% | + 6.65% |
| | **YELLOWEYE** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 1.61% | 0 | 0.00% | -1.61% | + 100.00% |
| | Black Rockfish - coastwide | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 38.86% | 0 | 0.00% | -38.86% | + 100.00% |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Black Rockfish (OR-CA)** | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 38.86% | 0 | 0.00% | -38.86% | + 100.00% |
| | **Minor Rockfish North** | 40 | 832 | 241 | 223 | 103 | 1,155 | 156 | 617 | 560 | 81 | 147 | 4,154 | 1.67% | 1,080 | 2.68% | 1.01% | - 60.35% |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 26 | 2 | 221 | 218 | 45 | 1,060 | 76 | 321 | 394 | 59 | 144 | 2,566 | 1.72% | 1,061 | 4.03% | 2.31% | - 100.00% |
| | BOCACCIO: N. of Monterrey | 0 | 0 | 0 | 0 | 45 | 0 | 68 | 0 | 119 | 0 | 11 | 244 | 2.93% | 0 | 0.00% | -2.93% | + 100.00% |
| | Chilipepper Rockfish: Eureka | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 321 | 266 | 44 | 15 | 662 | 1.59% | 321 | 1.25% | -0.35% | + 21.86% |
| | Redstripe Rockfish | 2 | 0 | 0 | 211 | 0 | 990 | 0 | 0 | 3 | 0 | 15 | 1,221 | 2.36% | 1 | 5.19% | 2.83% | - 100.00% |
| | Silvergrey Rockfish | 0 | 0 | 0 | 5 | 0 | 70 | 8 | 0 | 0 | 0 | 100 | 183 | 13.77% | 29 | 7.98% | -5.78% | + 42.02% |
| | Other Northern Shelf Rockfish | 7 | 2 | 221 | 3 | 0 | 0 | 0 | 0 | 5 | 15 | 3 | 257 | 0.55% | 24 | 14.56% | 14.01% | - 100.00% |
| | **Slope Species** | 14 | 830 | 20 | 5 | 58 | 95 | 80 | 296 | 166 | 22 | 4 | 1,588 | 1.61% | 374 | 2.68% | 1.07% | - 66.67% |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish, north | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 12 | 0 | 22 | 3.86% | 534 | 18.58% | 14.72% | - 100.00% |
| | Splitnose Rockfish: N. of Monterrey | 0 | 40 | 20 | 0 | 58 | 0 | 24 | 296 | 1 | 11 | 4 | 452 | 0.90% | 173 | 2.46% | 1.56% | - 100.00% |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 0.15% | 6 | 9.09% | 8.94% | - 100.00% |
| | **Other Northern Slope Rockfish** | 14 | 790 | 0 | 0 | 0 | 89 | 45 | 0 | 165 | 0 | 0 | 1,104 | 2.76% | 111 | 2.79% | 0.03% | - 0.95% |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Slope Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | **Other Southern Slope Rockfish** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Dover sole (total) | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 5 | 5.20% | 5 | 4.01% | -1.19% | + 22.92% |
| | Dover Sole (Summer) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1.76% | 1 | 0.71% | -1.05% | + 59.57% |
| | Dover Sole (Winter) | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 36.29% | 0 | 0.00% | -36.29% | + 100.00% |
| | English Sole | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 3 | 5 | 0 | 5 | 21 | 3.84% | 23 | 6.70% | 2.86% | - 74.45% |
| | Petrale Sole (coastwide) | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 81.65% | 0 | 0.00% | -81.65% | + 100.00% |
| | N of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | N of 40°10' (winter) | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 81.65% | 0 | 0.00% | -81.65% | + 100.00% |
| | S of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Arrowtooth Flounder (total) | 0 | 4 | 99 | 3 | 0 | 174 | 270 | 117 | 0 | 4 | 10 | 681 | 4.10% | 34 | 6.02% | 1.91% | - 46.59% |
| | Arrowtooth Flounder (summer) | 0 | 0 | 99 | 3 | 0 | 174 | 270 | 117 | 0 | 4 | 10 | 677 | 5.15% | 34 | 6.00% | 0.85% | - 16.60% |
| | Arrowtooth Flounder (winter) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0.12% | 0 | 0.00% | -0.12% | + 100.00% |
| | Starry Flounder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Other Flatfish | 0 | 65 | 0 | 1 | 3 | 0 | 1 | 57 | 17 | 49 | 346 | 538 | 8.49% | 707 | 13.97% | 5.48% | - 64.53% |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00% | 0 | 0.00% | 0.00% | - |
| | Spiny Dogfish | 229 | 147 | 3,887 | 7,718 | 1,110 | 1,246 | 1,389 | 613 | 191 | 369 | 3,079 | 19,978 | 1.50% | 1,182 | 4.79% | 3.29% | - 100.00% |
| | Other Fish | 0 | 0 | 0 | 196 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 234 | 8.91% | 323 | 9.62% | 0.71% | - 8.02% |
| | Total Groundfish | 3,996,867 | 3,573,723 | 3,932,165 | 5,072,477 | 4,272,594 | 5,176,841 | 6,289,159 | 4,585,160 | 4,423,830 | 3,911,062 | 3,355,394 | 48,589,272 | 5.01% | 33,515,152 | 5.31% | 0.30% | - 5.90% |

* "+" sign denotes Relative lbs QS less than Actual lbs QS; "-" sign denotes Relative lbs QS greater than Actual lbs QS; Percent Difference = -100% means that Relative lbs QS is at least twice Actual lbs QS.

**Table 11d. Annual Fleetwide Landings (catch in lbs) by Species and Complex for Permitted At-Sea Whiting Catcher Vessels, 1994-2004.**

| Permit | Species Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | TOTAL Actual lbs | TOTAL Relative lbs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL ASCV | Lingcod - coastwide | 173 | 0 | 62 | 212 | 313 | 44 | 633 | 1,064 | 239 | 202 | 1,786 | 4,726 | 2,223 |
| | N. of 42° (OR & WA) | 173 | 0 | 62 | 212 | 313 | 44 | 633 | 1,064 | 239 | 202 | 1,786 | 4,726 | 2,223 |
| | S. of 42° (CA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Pacific Cod | 169 | 57 | 99 | 18 | 0 | 14 | 0 | 1 | 0 | 0 | 0 | 358 | 0 |
| | Pacific Whiting (Coastwide) | 125,215,233 | 72,775,483 | 98,454,152 | 107,831,729 | 109,495,516 | 104,863,862 | 93,967,274 | 78,454,703 | 58,628,247 | 57,367,530 | 53,135,743 | 960,189,472 | 631,042,834 |
| | Sablefish (Coastwide) | 1,154 | 6,063 | 246 | 411 | 1,166 | 2,954 | 1,913 | 540 | 825 | 673 | 20,641 | 36,585 | 7,400 |
| | N. of 36° (Monterey north) | 1,154 | 6,063 | 246 | 411 | 1,166 | 2,954 | 1,913 | 540 | 825 | 673 | 20,641 | 36,585 | 7,400 |
| | S. of 36° (Conception area) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **PACIFIC OCEAN PERCH** | 12,740 | 62,040 | 4,688 | 3,456 | 18,393 | 9,014 | 4,525 | 116 | 4,798 | 208 | 228 | 120,205 | 2,292 |
| | Shortbelly Rockfish | 2,691 | 9,202 | 0 | 674 | 0 | 1 | 2 | 59,944 | 222 | 49 | 39 | 72,823 | 539 |
| | **WIDOW ROCKFISH** | 239,329 | 210,054 | 258,580 | 268,930 | 382,844 | 128,150 | 311,361 | 61,032 | 45,034 | 1,513 | 25,180 | 1,932,005 | 16,639 |
| | **CANARY ROCKFISH** | 1,687 | 386 | 3,114 | 971 | 5,517 | 1,402 | 732 | 2,447 | 1,789 | 190 | 9,063 | 27,298 | 2,091 |
| | Chilipepper Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **BOCACCIO** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Splitnose Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Yellowtail Rockfish | 590,285 | 1,114,010 | 772,404 | 322,949 | 738,096 | 717,320 | 502,471 | 195,767 | 3,122 | 1,262 | 26,789 | 4,984,475 | 13,886 |
| | Shortspine Thornyhead - coastwide | 24 | 399 | 0 | 45 | 10 | 0 | 441 | 39 | 7 | 335 | 32 | 1,332 | 3,687 |
| | N. of 34°27' | 24 | 399 | 0 | 45 | 10 | 0 | 441 | 39 | 7 | 335 | 32 | 1,332 | 3,687 |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Longspine Thornyhead - coastwide | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| | N. of 34°27' | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| | S. of 34°27' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **COWCOD** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **DARKBLOTCHED** | 6,265 | 7,366 | 1,468 | 1,943 | 28,361 | 9,320 | 10,323 | 1,219 | 2,061 | 235 | 6,656 | 75,216 | 2,584 |
| | **YELLOWEYE** | 465 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 564 | 0 |
| | Black Rockfish - coastwide | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 19 | 0 |
| | Black Rockfish (WA) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Black Rockfish (OR-CA) | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 19 | 0 |
| | **Minor Rockfish North** | 15,301 | 17,434 | 36,916 | 8,642 | 18,254 | 25,078 | 75,109 | 37,275 | 7,037 | 3,661 | 3,641 | 248,350 | 40,275 |
| | **Nearshore Species** | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190 | 0 |
| | **Shelf Species** | 13,006 | 8,904 | 3,589 | 2,589 | 2,281 | 9,220 | 66,711 | 32,607 | 4,977 | 2,393 | 3,147 | 149,424 | 26,327 |
| | BOCACCIO: N. of Monterrey | 311 | 304 | 211 | 435 | 2,139 | 446 | 3,756 | 197 | 337 | 0 | 196 | 8,332 | 0 |
| | Chilipepper Rockfish: Eureka | 3,621 | 0 | 0 | 15 | 13 | 2,586 | 19,411 | 7,373 | 4,242 | 2,343 | 1,929 | 41,533 | 25,771 |
| | Redstripe Rockfish | 8,663 | 7,496 | 523 | 2,115 | 94 | 5,450 | 1,697 | 24,898 | 12 | 2 | 773 | 51,723 | 25 |
| | Silvergrey Rockfish | 49 | 20 | 0 | 15 | 16 | 711 | 214 | 34 | 0 | 33 | 233 | 1,326 | 367 |
| | Other Northern Shelf Rockfish | 362 | 1,085 | 2,855 | 9 | 19 | 27 | 41,632 | 105 | 387 | 15 | 16 | 46,511 | 164 |
| | **Slope Species** | 2,296 | 8,340 | 33,327 | 6,053 | 15,974 | 15,859 | 8,399 | 4,667 | 2,060 | 1,268 | 493 | 98,736 | 13,948 |
| | Bank Rockfish | 989 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 244 | 0 | 0 | 1,245 | 0 |
| | Sharpchin Rockfish, north | 14 | 55 | 22 | 5 | 149 | 5 | 6 | 14 | 36 | 261 | 0 | 567 | 2,874 |
| | Splitnose Rockfish: N. of Monterrey | 683 | 320 | 32,531 | 4,372 | 1,917 | 0 | 5,132 | 3,486 | 761 | 638 | 450 | 50,290 | 7,016 |
| | Yellowmouth Rockfish | 52 | 4 | 193 | 0 | 6,342 | 28 | 10 | 0 | 0 | 6 | 0 | 6,636 | 67 |
| | Other Northern Slope Rockfish | 558 | 7,961 | 581 | 1,676 | 7,566 | 15,825 | 3,250 | 1,156 | 1,020 | 363 | 43 | 39,999 | 3,991 |
| | **Minor Rockfish South** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Nearshore Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Shelf Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Redstripe Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Yellowtail Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Southern Shelf Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Slope Species** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Bank Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Blackgill Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Sharpchin Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Yellowmouth Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Southern Slope Rockfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | California scorpionfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cabezon (off CA only) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Dover sole (total) | 3 | 9 | 0 | 0 | 6 | 0 | 18 | 28 | 9 | 12 | 5 | 88 | 128 |
| | Dover Sole (Summer) | 3 | 0 | 0 | 0 | 6 | 0 | 18 | 28 | 9 | 12 | 5 | 80 | 128 |
| | Dover Sole (Winter) | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 |
| | English Sole | 14 | 44 | 5 | 1 | 1 | 12 | 368 | 43 | 18 | 31 | 18 | 555 | 337 |
| | Petrale Sole (coastwide) | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| | N of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | N of 40°10' (winter) | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| | S of 40°10' (summer) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S of 40°10' (winter) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Arrowtooth Flounder (total) | 335 | 3,331 | 860 | 187 | 1,637 | 1,227 | 6,916 | 2,001 | 9 | 52 | 47 | 16,601 | 572 |
| | Arrowtooth Flounder (summer) | 215 | 0 | 860 | 187 | 1,637 | 1,227 | 6,916 | 2,001 | 9 | 52 | 47 | 13,149 | 572 |
| | Arrowtooth Flounder (winter) | 121 | 3,331 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,452 | 0 |
| | Starry Flounder | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Flatfish | 24 | 117 | 28 | 66 | 39 | 42 | 3,625 | 1,037 | 410 | 460 | 493 | 6,340 | 5,059 |
| | Kelp Greenling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Spiny Dogfish | 24,478 | 89,772 | 229,530 | 144,000 | 357,757 | 342,675 | 105,544 | 13,687 | 2,594 | 2,245 | 21,659 | 1,333,941 | 24,691 |
| | Other Fish | 2 | 18 | 1 | 196 | 556 | 245 | 298 | 362 | 0 | 305 | 639 | 2,622 | 3,358 |
| | Total Groundfish | 126,110,380 | 74,295,884 | 99,762,153 | 108,584,428 | 111,048,465 | 106,101,360 | 94,991,553 | 78,831,315 | 58,696,421 | 57,378,963 | 53,252,664 | 969,053,584 | 631,168,595 |

**Table 12. Instances of vessels holding two trawl permits simultaneously during the year (vessels, permits, and dates).**

Incident and Vessel — Dates and Permits Assigned (bold boarders indicate period of permit stacking)

| A | 01/01 - 03/21/1994 | 03/22 - 04/03/1994 | 04/04 - 11/09/1994 | 11/10 - 12/31/1994 |
|---|---|---|---|---|
| VID 250385 | GF0608 | NONE | GF0608 | GF0608 |
| VID 634144 | GF0970 | **GF0608:GF0970** | GF0970 | GF0970 |

*GF0970 length = 58. GF0608 length = 50.

| B and G | 01/01 - 08/14/1995 | 08/15 - 12/31/1995 | 01/01/1996 -12/31/1996 | 01/01/1997 - 12/31/2003 | 01/01/2004 - 12/31/2005 |
|---|---|---|---|---|---|
| VID 278435 | GF0946 | **GF0185:GF0946** | **GF0185:GF0946** | GF0946 | NONE |
| VID 531323 | NONE | NONE | NONE | GF0185 | GF0185 |
| No Record | GF0185 | | | | |

*GF0946 length = 38.16. GF0185 length = 43.

| C | 01/01 - 03/22/1995 | 03/23 - 07/31/1995 | 08/01 - 11/01/1995 | 11/02 - 11/21/1995 | 11/22 - 12/31/1995 | 01/01 - 02/27/1996 | 02/28/1996 - 12/31/1996 |
|---|---|---|---|---|---|---|---|
| VID 570036 | GF0397 | GF0397 | NONE | NONE | GF0397 | GF0397 | GF0397 |
| VID 558072 | NONE | GF0502 | GF0502 | NONE | NONE | NONE | GF0502 |
| VID 600788 | GF0502 | NONE | GF0397 | **GF0397:GF0502** | GF0502 | GF0502 | GF0897 |

*GF0397 length = 72.11. GF0502 length = 68. GF0897 length = 68.

| D | 01/01 - 07/05/1995 | 07/06 - 07/19/1995 | 07/20 - 12/31/1995 | 01/01 - 12/31/1996 |
|---|---|---|---|---|
| VID 240804 | GF0660 | **GF0592:GF0660** | GF0592 | GF0592 |
| VID 505444 | NONE | NONE | GF0660 | GF0660 |
| VID 584521 | GF0592 | NONE | NONE | NONE |

*GF0660 length = 60. GF0592 length = 53.

| E | 01/01 - 01/12/1995 | 01/13 - 02/07/1995 | 02/08 - 04/10/1995 | 04/11 - 04/23/1995 | 04/24 - 06/19/1995 | 06/20 - 08/24/1995 | 08/25 - 08/28/1995 | 08/29 to 09/05/1995 | 09/06 - 12/31/1995 | 01/01 - 04/29/1996 | 04/30 - 10/14/1996 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VID 550828 | NONE | GF0904 | GF0904 | NONE | NONE | GF0956 | **GF0904:GF0956** | **GF0904:GF0956** | GF0904 | GF0904 | NONE |
| VID 603820 | GF0904 | NONE | NONE | GF0904 | GF0904 | GF0904 | NONE | NONE | NONE | NONE | GF0904 |
| VID 573944 | GF0662 | GF0662 | GF0662 | GF0662 | GF0662 | GF0662 | GF0662 | NONE | GF0956 | GF0956 | GF0956 |
| VID 226281 | NONE | NONE | GF0956 | GF0956 | GF0956 | NONE | NONE | NONE | NONE | NONE | NONE |

*GF0904 length = 75. GF0956 length = 73.

| F | 01/01 - 12/31/1995 | 01/01 - 05/15/1996 | 05/16 - 10/31/1996 | 11/01 - 12/31/1996 | 01/01/1997 - 6/11/1997 | 06/12/1997 - 03/01/2000 |
|---|---|---|---|---|---|---|
| VID 536502 | GF0176 | GF0176 | **GF0152:GF0176** | GF0152 | GF0152 | GF0152 |
| VID 276152 | GF0152 | GF0152 | NONE | NONE | NONE | |
| VID 1048304 | | | | | | GF0176 |
| Unidentified | | | | GF0176 | GF0176 | |

*GF0176 length = 53. GF0125 length = 47.8.

| H | 09/06 - 12/31/1995 | 01/01 - 10/07/1996; | 10/08 - 10/14/1996 | 10/15 - 12/31/1996 | 01/01 - 05/21/1997 | 05/22/1997 - 10/14/1997 |
|---|---|---|---|---|---|---|
| VID 618797 | GF0662 | GF0662 | NONE | NONE | GF0412 | GF0412 |
| VID 573944 | GF0956 | GF0956 | **GF0662:GF0956** | GF0662 | GF0662 | GF0662 |
| VID 226281 | NONE | NONE | NONE | GF0956 | NONE | NONE |
| VID 593695 | | | | | GF0956 | GF0956 |

*GF0662 length = 76. GF0956 length = 73.

| I | 06/13 - 12/31/1997 | 01/1/1998 | 01/02 - 01/01/25/1998 | 01/26/1998 - 04/15/1998 | 04/16 - 12/31/1998 | 01/01 - 03/30/1999 | 03/31 - 12/31/1999 |
|---|---|---|---|---|---|---|---|
| VID 942548 | GF0051 | GF0051 | **GF0051:GF0053** | GF0053 | GF0053 | GF0053 | NONE |
| VID 542651 | NONE | NONE | NONE | NONE | GF0051 | GF0051 | GF0051 |
| VID 626220 | GF0053 | GF0053 | NONE | NONE | NONE | NONE | NONE |
| Unidentified | | | | GF0051 | | | |

*GF0053 length = 82.42. GF0051 length went from 87.08 to 106 after 04/15/98.

| J | 01/01 - 12/31/1997 | 01/01 - 09/24/1998 | 09/25 - 11/10/1998 | 11/11 - 12/22/1998 | 12/23 - 12/31/1998 | 01/01 - 12/31/1999 |
|---|---|---|---|---|---|---|
| VID 531055 | GF0612 | GF0612 | NONE | NONE | NONE | NONE |
| VID 600788 | GF0897 | GF0897 | **GF0612:GF0897** | GF0612 | GF0612 | GF0612 |
| VID 589552 | NONE | NONE | NONE | NONE | GF0897 | GF0897 |
| Unidentified | | | | GF0897 | | |

*GF0612 length = 67. GF0897 length = 68.

| K | 01/01 - 12/31/1999 | 01/01 - 09/01/2000 | 09/02 - 09/14/2000 | 09/15 - 09/30/2000 | 10/01 - 12/31/2000 | 01/01 - 12/31/2001 |
|---|---|---|---|---|---|---|
| VID 621170 | GF0053 | GF0053 | GF0053 | **GF0053:GF0593** | GF0593 | GF0593 |
| VID 595879 | GF0593 | GF0593 | NONE | NONE | NONE | NONE |
| Unidentified | | | | | GF0053 | GF0053 |
| No Record | | | GF0593 | | | |

*GF0593 length = 83. GF0053 length = 82.42.

| L | 01/01 - 12/31/1999 | 01/01 - 08/31/2000 | 09/01 - 12/31/2000 | 01/01 - 08/14/2001 | 08/15 - 12/31/2001 | 01/01 - 12/31/2002 | 01/01 - 12/31/2003 |
|---|---|---|---|---|---|---|---|
| VID 516428 | GF0714 | GF0714 | GF0714 | NONE | GF0216 | **GF0216:GF0714** | GF0714 |
| VID 593809 | GF0216 | NONE | GF0216 | GF0216 | NONE | NONE | GF0216 |
| Unidentified | | | | GF0714 | GF0714 | | |

*GF0216 length = 90. GF0714 length = 55.25.

| M | 01/01 - 12/31/2003 | 01/01 - 12/31/2003 | 01/01 - 02/12/2004 | 02/13 - 12/31/2004 | 01/01 - 02/12/2005 |
|---|---|---|---|---|---|
| VID 611524 | GF0795 | GF0795 | GF0795 | **GF0176:GF0795** | GF0795 |

*Combined permits to incr. length endorsement of GF0795 from 90 to 99. GF0176 (length = 53) went away after 12/31/2004

**Table 13. Shoreside non-whiting catch concentration statistics and permit count, 1994 - 2005, average. (Page 1 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0.62% | 0.002% | 0.16% | 0.45% | 0.89% | 1.35% | 4.20% | 181 |
| N. of 42° (OR & WA) | 1.00% | 0.005% | 0.32% | 0.77% | 1.36% | 2.07% | 5.87% | 111 |
| S. of 42° (CA) | 1.38% | 0.010% | 0.20% | 0.88% | 1.86% | 3.46% | 7.89% | 86 |
| Pacific Cod | 1.24% | 0.000% | 0.01% | 0.17% | 0.83% | 4.03% | 15.26% | 87 |
| Pacific non-whiting (Coastwide) | 9.66% | 2.020% | 3.80% | 6.87% | 12.34% | 18.26% | 34.08% | 20 |
| Sablefish (Coastwide) | 0.53% | 0.001% | 0.27% | 0.56% | 0.78% | 0.90% | 1.73% | 199 |
| N. of 36° (Monterey north) | 0.55% | 0.001% | 0.28% | 0.57% | 0.81% | 0.94% | 1.79% | 192 |
| S. of 36° (Conception area) | 6.93% | 0.078% | 1.14% | 4.55% | 10.40% | 17.18% | 22.03% | 16 |
| **PACIFIC OCEAN PERCH** | 0.75% | 0.000% | 0.01% | 0.14% | 1.08% | 2.34% | 5.65% | 146 |
| Shortbelly Rockfish | 9.06% | 3.323% | 4.06% | 5.11% | 6.81% | 16.71% | 48.22% | 61 |
| **WIDOW ROCKFISH** | 1.06% | 0.001% | 0.01% | 0.14% | 1.05% | 2.11% | 16.50% | 162 |
| **CANARY ROCKFISH** | 0.87% | 0.004% | 0.13% | 0.41% | 1.15% | 2.33% | 7.21% | 161 |
| Chilipepper Rockfish | 2.11% | 0.003% | 0.13% | 0.69% | 2.30% | 5.71% | 17.78% | 57 |
| **BOCACCIO** | 4.85% | 0.211% | 0.55% | 1.76% | 4.82% | 13.46% | 23.85% | 46 |
| Splitnose Rockfish | 1.90% | 0.002% | 0.15% | 0.67% | 2.15% | 4.60% | 16.42% | 59 |
| Yellowtail Rockfish | 0.92% | 0.000% | 0.04% | 0.30% | 1.36% | 2.70% | 5.73% | 136 |
| Shortspine Thornyhead - coastwide | 0.56% | 0.000% | 0.22% | 0.54% | 0.80% | 1.05% | 2.14% | 191 |
| N. of 34°27' | 0.69% | 0.000% | 0.25% | 0.65% | 1.04% | 1.30% | 2.77% | 155 |
| S. of 34°27' | 1.76% | 0.007% | 0.33% | 1.52% | 2.87% | 3.85% | 5.75% | 65 |
| Longspine Thornyhead - coastwide | 0.60% | 0.000% | 0.11% | 0.48% | 0.95% | 1.42% | 2.20% | 178 |
| N. of 34°27' | 0.60% | 0.000% | 0.11% | 0.48% | 0.95% | 1.42% | 2.20% | 178 |
| S. of 34°27' | 50.00% | 35.636% | 42.82% | 50.00% | 57.18% | 61.49% | 64.36% | 0 |
| Other thornyheads | 12.98% | 8.559% | 9.01% | 10.39% | 13.12% | 19.80% | 33.36% | 30 |
| **COWCOD** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **DARKBLOTCHED** | 0.59% | 0.000% | 0.05% | 0.25% | 0.77% | 1.55% | 8.15% | 186 |
| **YELLOWEYE** | 1.91% | 0.034% | 0.24% | 0.65% | 2.11% | 4.19% | 15.37% | 119 |
| Black Rockfish - coastwide | 4.13% | 0.106% | 0.47% | 1.40% | 4.54% | 10.21% | 28.83% | 31 |
| Black Rockfish (WA) | 38.76% | 24.739% | 30.46% | 36.36% | 44.90% | 53.16% | 61.33% | 4 |
| Black Rockfish (OR-CA) | 4.36% | 0.110% | 0.50% | 1.46% | 4.62% | 10.81% | 30.72% | 27 |
| **Minor Rockfish North** | 0.62% | 0.001% | 0.07% | 0.29% | 0.86% | 1.69% | 5.70% | 179 |
| **Nearshore Species** | 14.02% | 1.937% | 4.02% | 8.28% | 17.42% | 31.16% | 42.70% | 16 |
| **Shelf Species** | 0.68% | 0.000% | 0.03% | 0.17% | 0.68% | 1.97% | 7.78% | 172 |
| BOCACCIO: N. of Monterrey | 1.79% | 0.004% | 0.09% | 0.41% | 1.78% | 5.05% | 16.39% | 108 |
| Chilipepper Rockfish: Eureka | 2.50% | 0.004% | 0.14% | 0.35% | 1.42% | 5.91% | 25.71% | 72 |
| Redstripe Rockfish | 1.58% | 0.083% | 0.27% | 0.96% | 1.60% | 3.19% | 13.54% | 115 |
| Silvergrey Rockfish | 1.84% | 0.003% | 0.14% | 0.50% | 1.83% | 5.02% | 15.65% | 90 |
| Other Northern Shelf Rockfish | 0.71% | 0.000% | 0.03% | 0.17% | 0.72% | 2.10% | 7.92% | 169 |
| **Slope Species** | 0.70% | 0.000% | 0.09% | 0.36% | 0.98% | 1.79% | 6.26% | 154 |
| Bank Rockfish | 2.20% | 0.055% | 0.33% | 0.93% | 2.08% | 5.22% | 23.00% | 83 |
| Sharpchin Rockfish, north | 0.92% | 0.001% | 0.06% | 0.36% | 1.19% | 2.47% | 9.64% | 134 |
| Splitnose Rockfish: N. of Monterrey | 0.74% | 0.001% | 0.08% | 0.31% | 0.87% | 1.99% | 7.87% | 146 |
| Yellowmouth Rockfish | 1.24% | 0.002% | 0.05% | 0.36% | 1.26% | 3.43% | 12.28% | 97 |
| Other Northern Slope Rockfish | 0.71% | 0.000% | 0.07% | 0.31% | 0.96% | 1.88% | 6.31% | 152 |
| **Minor Rockfish South** | 1.58% | 0.000% | 0.09% | 0.53% | 1.64% | 4.71% | 15.23% | 71 |
| **Nearshore Species** | 15.87% | 8.543% | 8.85% | 10.35% | 15.09% | 27.85% | 55.65% | 16 |
| **Shelf Species** | 2.06% | 0.004% | 0.14% | 0.59% | 1.91% | 4.93% | 23.07% | 62 |
| Redstripe Rockfish | 6.14% | 0.142% | 1.28% | 4.18% | 6.83% | 13.92% | 31.06% | 7 |
| Yellowtail Rockfish | 8.96% | 0.100% | 2.49% | 5.30% | 11.09% | 21.79% | 36.72% | 32 |
| Other Southern Shelf Rockfish | 2.11% | 0.007% | 0.18% | 0.76% | 2.10% | 4.58% | 24.19% | 61 |
| **Slope Species** | 1.72% | 0.001% | 0.11% | 0.54% | 1.81% | 5.10% | 16.93% | 66 |
| Bank Rockfish | 2.22% | 0.000% | 0.09% | 0.48% | 2.16% | 6.59% | 22.25% | 54 |
| Blackgill Rockfish | 2.10% | 0.001% | 0.09% | 0.58% | 1.93% | 5.56% | 22.44% | 54 |
| Sharpchin Rockfish | 5.42% | 0.044% | 0.74% | 2.12% | 5.48% | 13.46% | 31.19% | 23 |
| Yellowmouth Rockfish | 41.56% | 31.276% | 35.41% | 40.08% | 44.87% | 51.60% | 60.89% | 2 |
| Other Southern Slope Rockfish | 1.83% | 0.002% | 0.12% | 0.50% | 1.66% | 4.58% | 20.01% | 62 |
| California scorpionfish | 75.00% | 58.238% | 66.62% | 75.00% | 83.38% | 88.41% | 91.76% | 1 |
| Cabezon (off CA only) | 91.67% | 89.796% | 90.73% | 91.67% | 92.60% | 93.16% | 93.54% | 1 |
| Dover sole (total) | 0.53% | 0.000% | 0.23% | 0.51% | 0.79% | 1.00% | 2.11% | 200 |
| Dover Sole (Summer) | 0.55% | 0.000% | 0.26% | 0.57% | 0.78% | 0.96% | 1.82% | 193 |
| Dover Sole (Winter) | 0.59% | 0.000% | 0.17% | 0.52% | 0.92% | 1.22% | 2.53% | 179 |
| English Sole | 0.56% | 0.000% | 0.06% | 0.26% | 0.72% | 1.45% | 6.46% | 190 |
| Petrale Sole (coastwide) | 0.54% | 0.000% | 0.07% | 0.28% | 0.72% | 1.32% | 4.55% | 197 |
| N of 40°10' (summer) | 0.76% | 0.000% | 0.04% | 0.33% | 0.91% | 1.95% | 6.90% | 142 |
| N of 40°10' (winter) | 0.80% | 0.000% | 0.06% | 0.33% | 1.08% | 2.23% | 6.32% | 134 |
| S of 40°10' (summer) | 2.08% | 0.004% | 0.12% | 0.64% | 2.18% | 5.90% | 17.88% | 56 |
| S of 40°10' (winter) | 1.92% | 0.001% | 0.12% | 0.75% | 2.47% | 5.17% | 11.78% | 59 |
| Arrowtooth Flounder (total) | 0.74% | 0.000% | 0.03% | 0.16% | 0.54% | 1.78% | 13.09% | 141 |
| Arrowtooth Flounder (summer) | 0.80% | 0.000% | 0.02% | 0.12% | 0.49% | 1.85% | 14.48% | 130 |
| Arrowtooth Flounder (winter) | 0.91% | 0.000% | 0.06% | 0.30% | 0.96% | 2.17% | 11.71% | 114 |
| Starry Flounder | 3.03% | 0.007% | 0.13% | 0.61% | 2.28% | 7.47% | 34.79% | 35 |
| Other Flatfish | 0.53% | 0.000% | 0.10% | 0.24% | 0.57% | 1.22% | 9.48% | 200 |
| Kelp Greenling | 55.83% | 44.748% | 48.18% | 52.38% | 57.99% | 68.89% | 79.96% | 3 |
| Spiny Dogfish | 5.55% | 0.010% | 0.36% | 1.24% | 5.65% | 16.28% | 34.34% | 27 |
| Other Fish | 1.01% | 0.001% | 0.04% | 0.32% | 1.20% | 2.89% | 8.48% | 123 |
| Nearshore spp | 0.61% | 0.002% | 0.13% | 0.35% | 0.73% | 1.21% | 9.12% | 182 |
| Shelf spp | 0.51% | 0.000% | 0.17% | 0.36% | 0.60% | 0.99% | 4.86% | 210 |
| Slope spp | 0.52% | 0.000% | 0.13% | 0.42% | 0.80% | 1.13% | 2.32% | 207 |
| DTS spp | 0.52% | 0.000% | 0.23% | 0.53% | 0.79% | 0.95% | 1.82% | 202 |
| | | | | | | | | 210 |

**Table 13. Shoreside non-whiting catch concentration statistics and permit count, 1994 - 2005, maximum. (Page 2 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 1.15% | 0.008% | 0.36% | 0.87% | 1.95% | 2.43% | 9.12% | 252 |
| N. of 42° (OR & WA) | 1.75% | 0.011% | 0.57% | 1.50% | 2.84% | 3.36% | 12.37% | 168 |
| S. of 42° (CA) | 2.86% | 0.043% | 0.51% | 2.11% | 4.16% | 8.00% | 14.67% | 121 |
| Pacific Cod | 2.00% | 0.000% | 0.03% | 0.53% | 2.51% | 6.53% | 22.71% | 130 |
| Pacific non-whiting (Coastwide) | 50.00% | 24.065% | 37.03% | 50.00% | 62.97% | 70.75% | 75.94% | 37 |
| Sablefish (Coastwide) | 0.86% | 0.006% | 0.47% | 0.95% | 1.21% | 1.40% | 5.06% | 241 |
| N. of 36° (Monterey north) | 0.88% | 0.006% | 0.50% | 0.96% | 1.24% | 1.43% | 5.23% | 231 |
| S. of 36° (Conception area) | 11.11% | 0.204% | 3.93% | 7.43% | 13.78% | 30.95% | 38.36% | 23 |
| **PACIFIC OCEAN PERCH** | 1.35% | 0.000% | 0.03% | 0.45% | 1.86% | 3.73% | 10.13% | 194 |
| Shortbelly Rockfish | 50.00% | 36.038% | 43.02% | 50.00% | 56.98% | 61.17% | 97.03% | 135 |
| **WIDOW ROCKFISH** | 2.86% | 0.011% | 0.07% | 0.32% | 2.33% | 5.61% | 80.97% | 247 |
| **CANARY ROCKFISH** | 2.17% | 0.021% | 0.58% | 1.29% | 3.25% | 6.30% | 19.72% | 227 |
| Chilipepper Rockfish | 4.35% | 0.027% | 0.40% | 1.29% | 3.51% | 15.05% | 46.75% | 83 |
| **BOCACCIO** | 25.00% | 2.429% | 2.73% | 9.31% | 31.58% | 60.00% | 78.95% | 73 |
| Splitnose Rockfish | 3.57% | 0.016% | 0.50% | 1.87% | 4.78% | 7.93% | 26.87% | 80 |
| Yellowtail Rockfish | 2.00% | 0.002% | 0.21% | 0.81% | 2.49% | 6.41% | 14.30% | 198 |
| Shortspine Thornyhead - coastwide | 0.90% | 0.001% | 0.36% | 0.89% | 1.34% | 1.88% | 5.27% | 232 |
| N. of 34°27' | 1.16% | 0.001% | 0.47% | 1.10% | 1.63% | 2.10% | 7.99% | 194 |
| S. of 34°27' | 3.57% | 0.076% | 0.75% | 3.91% | 6.03% | 7.15% | 10.69% | 114 |
| Longspine Thornyhead - coastwide | 0.99% | 0.001% | 0.19% | 0.61% | 1.48% | 3.32% | 7.30% | 217 |
| N. of 34°27' | 0.99% | 0.001% | 0.19% | 0.61% | 1.48% | 3.32% | 7.30% | 217 |
| S. of 34°27' | 50.00% | 35.636% | 42.82% | 50.00% | 57.18% | 61.49% | 64.36% | 2 |
| Other thornyheads | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 110 |
| **COWCOD** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| **DARKBLOTCHED** | 1.05% | 0.000% | 0.10% | 0.54% | 1.94% | 3.19% | 15.77% | 234 |
| **YELLOWEYE** | 7.14% | 0.360% | 1.12% | 2.97% | 9.58% | 14.48% | 35.88% | 209 |
| Black Rockfish - coastwide | 8.33% | 0.712% | 2.16% | 5.87% | 12.88% | 19.70% | 52.65% | 64 |
| Black Rockfish (WA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 30 |
| Black Rockfish (OR-CA) | 8.33% | 0.712% | 2.16% | 5.87% | 12.88% | 19.70% | 52.65% | 47 |
| **Minor Rockfish North** | 1.14% | 0.007% | 0.27% | 0.61% | 1.48% | 3.05% | 15.10% | 244 |
| **Nearshore Species** | 50.00% | 12.391% | 31.20% | 50.00% | 68.80% | 80.09% | 98.24% | 52 |
| **Shelf Species** | 1.35% | 0.001% | 0.05% | 0.30% | 1.79% | 4.18% | 19.42% | 243 |
| BOCACCIO: N. of Monterrey | 5.26% | 0.035% | 0.47% | 1.55% | 9.62% | 16.13% | 36.18% | 190 |
| Chilipepper Rockfish: Eureka | 11.11% | 0.031% | 0.98% | 1.60% | 4.83% | 25.36% | 83.97% | 114 |
| Redstripe Rockfish | 7.69% | 0.970% | 2.62% | 8.39% | 9.58% | 10.95% | 25.39% | 182 |
| Silvergrey Rockfish | 5.88% | 0.013% | 0.68% | 1.70% | 7.27% | 12.98% | 49.32% | 157 |
| Other Northern Shelf Rockfish | 1.47% | 0.001% | 0.05% | 0.31% | 1.93% | 5.19% | 15.77% | 240 |
| **Slope Species** | 1.18% | 0.002% | 0.23% | 0.62% | 1.41% | 3.17% | 16.02% | 198 |
| Bank Rockfish | 8.33% | 0.424% | 2.44% | 3.81% | 7.44% | 16.90% | 44.49% | 146 |
| Sharpchin Rockfish, north | 2.33% | 0.003% | 0.12% | 0.88% | 3.06% | 6.97% | 21.77% | 191 |
| Splitnose Rockfish: N. of Monterrey | 1.32% | 0.003% | 0.19% | 0.49% | 1.28% | 4.27% | 16.50% | 182 |
| Yellowmouth Rockfish | 2.44% | 0.018% | 0.21% | 0.86% | 2.24% | 7.27% | 21.84% | 161 |
| Other Northern Slope Rockfish | 1.20% | 0.001% | 0.20% | 0.58% | 1.42% | 3.32% | 15.79% | 195 |
| **Minor Rockfish South** | 3.03% | 0.002% | 0.24% | 1.67% | 3.61% | 10.99% | 23.84% | 120 |
| **Nearshore Species** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 25 |
| **Shelf Species** | 5.26% | 0.025% | 1.09% | 3.15% | 6.95% | 11.22% | 46.58% | 109 |
| Redstripe Rockfish | 8.33% | 0.426% | 2.76% | 7.29% | 13.45% | 19.75% | 50.75% | 23 |
| Yellowtail Rockfish | 33.33% | 0.615% | 20.80% | 40.98% | 49.75% | 70.53% | 84.38% | 68 |
| Other Southern Shelf Rockfish | 5.26% | 0.043% | 1.25% | 3.60% | 6.99% | 8.91% | 48.55% | 109 |
| **Slope Species** | 3.45% | 0.002% | 0.26% | 1.80% | 4.14% | 12.23% | 24.82% | 110 |
| Bank Rockfish | 4.55% | 0.002% | 0.27% | 1.29% | 6.52% | 18.78% | 33.61% | 77 |
| Blackgill Rockfish | 3.70% | 0.004% | 0.15% | 1.66% | 4.77% | 14.09% | 33.18% | 75 |
| Sharpchin Rockfish | 20.00% | 0.218% | 3.30% | 7.89% | 16.08% | 50.01% | 72.63% | 59 |
| Yellowmouth Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 14 |
| Other Southern Slope Rockfish | 3.45% | 0.008% | 0.34% | 1.03% | 2.64% | 7.24% | 38.34% | 107 |
| California scorpionfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| Cabezon (off CA only) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| Dover sole (total) | 0.85% | 0.000% | 0.33% | 0.81% | 1.27% | 1.56% | 5.62% | 243 |
| Dover Sole (Summer) | 0.86% | 0.001% | 0.35% | 0.99% | 1.31% | 1.48% | 3.64% | 236 |
| Dover Sole (Winter) | 0.95% | 0.001% | 0.30% | 0.77% | 1.61% | 2.01% | 7.36% | 217 |
| English Sole | 0.93% | 0.001% | 0.10% | 0.62% | 1.37% | 2.58% | 13.90% | 238 |
| Petrale Sole (coastwide) | 0.88% | 0.000% | 0.12% | 0.55% | 1.20% | 2.33% | 8.04% | 252 |
| N of 40°10' (summer) | 1.27% | 0.001% | 0.09% | 1.14% | 1.96% | 2.95% | 9.22% | 178 |
| N of 40°10' (winter) | 1.41% | 0.002% | 0.12% | 0.67% | 1.81% | 4.06% | 10.31% | 175 |
| S of 40°10' (summer) | 3.85% | 0.016% | 0.23% | 1.62% | 6.34% | 16.49% | 28.26% | 93 |
| S of 40°10' (winter) | 3.85% | 0.004% | 0.19% | 1.40% | 3.97% | 9.99% | 25.86% | 86 |
| Arrowtooth Flounder (total) | 1.14% | 0.000% | 0.08% | 0.46% | 1.50% | 3.81% | 25.46% | 164 |
| Arrowtooth Flounder (summer) | 1.19% | 0.000% | 0.06% | 0.30% | 1.32% | 4.25% | 28.73% | 155 |
| Arrowtooth Flounder (winter) | 1.41% | 0.001% | 0.16% | 0.46% | 1.52% | 3.60% | 15.66% | 133 |
| Starry Flounder | 5.00% | 0.029% | 0.35% | 1.09% | 2.90% | 13.16% | 65.71% | 47 |
| Other Flatfish | 0.83% | 0.002% | 0.21% | 0.51% | 1.10% | 2.07% | 16.36% | 239 |
| Kelp Greenling | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 12 |
| Spiny Dogfish | 16.67% | 0.051% | 2.85% | 8.41% | 19.77% | 40.59% | 60.21% | 52 |
| Other Fish | 2.94% | 0.004% | 0.11% | 0.92% | 2.73% | 9.04% | 21.31% | 162 |
| Nearshore spp | 1.15% | 0.005% | 0.24% | 0.68% | 1.30% | 1.92% | 36.79% | 256 |
| Shelf spp | 0.82% | 0.001% | 0.26% | 0.62% | 1.07% | 1.80% | 8.69% | 270 |
| Slope spp | 0.85% | 0.000% | 0.22% | 0.66% | 1.33% | 1.94% | 6.13% | 267 |
| DTS spp | 0.84% | 0.001% | 0.41% | 0.83% | 1.22% | 1.46% | 5.37% | 251 |
| | | | | | | | | 270 |

**Table 13. Shoreside non-whiting catch concentration statistics and permit count, 1994 - 2005, minimum. (Page 3 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0.40% | 0.0000% | 0.0239% | 0.13% | 0.43% | 0.85% | 1.43% | 87 |
| N. of 42° (OR & WA) | 0.60% | 0.0001% | 0.0524% | 0.22% | 0.58% | 1.29% | 1.82% | 57 |
| S. of 42° (CA) | 0.83% | 0.0001% | 0.0263% | 0.17% | 0.64% | 2.11% | 3.43% | 35 |
| Pacific Cod | 0.77% | 0.0001% | 0.0034% | 0.03% | 0.14% | 1.78% | 9.64% | 50 |
| Pacific non-whiting (Coastwide) | 2.70% | 0.0013% | 0.1265% | 0.91% | 1.93% | 5.14% | 12.59% | 2 |
| Sablefish (Coastwide) | 0.42% | 0.0000% | 0.0616% | 0.35% | 0.62% | 0.70% | 0.86% | 116 |
| N. of 36° (Monterey north) | 0.43% | 0.0000% | 0.0657% | 0.35% | 0.64% | 0.73% | 0.91% | 113 |
| S. of 36° (Conception area) | 4.35% | 0.0030% | 0.2177% | 1.24% | 7.06% | 10.08% | 12.31% | 9 |
| **PACIFIC OCEAN PERCH** | 0.52% | 0.0000% | 0.0025% | 0.05% | 0.65% | 1.66% | 2.95% | 74 |
| Shortbelly Rockfish | 0.74% | 0.0001% | 0.0016% | 0.01% | 0.15% | 0.42% | 11.93% | 0 |
| **WIDOW ROCKFISH** | 0.40% | 0.0000% | 0.0013% | 0.04% | 0.63% | 1.33% | 2.24% | 35 |
| **CANARY ROCKFISH** | 0.44% | 0.0000% | 0.0085% | 0.09% | 0.49% | 1.16% | 3.17% | 46 |
| Chilipepper Rockfish | 1.20% | 0.0000% | 0.0187% | 0.21% | 1.12% | 2.76% | 7.81% | 23 |
| **BOCACCIO** | 1.37% | 0.0000% | 0.0405% | 0.21% | 0.84% | 2.92% | 6.47% | 4 |
| Splitnose Rockfish | 1.25% | 0.0000% | 0.0426% | 0.35% | 1.14% | 2.73% | 10.00% | 28 |
| Yellowtail Rockfish | 0.51% | 0.0000% | 0.0022% | 0.08% | 0.97% | 1.54% | 2.22% | 50 |
| Shortspine Thornyhead - coastwide | 0.43% | 0.0000% | 0.0231% | 0.31% | 0.65% | 0.75% | 1.20% | 111 |
| N. of 34°27' | 0.52% | 0.0000% | 0.0135% | 0.24% | 0.80% | 1.00% | 1.42% | 86 |
| S. of 34°27' | 0.88% | 0.0000% | 0.0052% | 0.03% | 1.66% | 2.64% | 4.03% | 28 |
| Longspine Thornyhead - coastwide | 0.46% | 0.0000% | 0.0376% | 0.23% | 0.71% | 0.82% | 0.96% | 101 |
| N. of 34°27' | 0.46% | 0.0000% | 0.0376% | 0.23% | 0.71% | 0.82% | 0.96% | 101 |
| S. of 34°27' | 50.00% | 35.6356% | 42.8178% | 50.00% | 57.18% | 61.49% | 64.36% | 0 |
| Other thornyheads | 0.91% | 0.0003% | 0.0329% | 0.28% | 0.83% | 3.43% | 4.69% | 1 |
| **COWCOD** | 100.00% | 100.0000% | 100.0000% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **DARKBLOTCHED** | 0.43% | 0.0000% | 0.0076% | 0.06% | 0.32% | 0.82% | 4.28% | 95 |
| **YELLOWEYE** | 0.48% | 0.0000% | 0.0136% | 0.10% | 0.49% | 1.20% | 5.13% | 14 |
| Black Rockfish - coastwide | 1.56% | 0.0004% | 0.0185% | 0.09% | 0.95% | 3.79% | 18.55% | 12 |
| Black Rockfish (WA) | 3.33% | 0.0042% | 0.1819% | 0.80% | 4.44% | 9.32% | 18.90% | 0 |
| Black Rockfish (OR-CA) | 2.13% | 0.0008% | 0.0236% | 0.07% | 0.78% | 4.39% | 19.57% | 12 |
| **Minor Rockfish North** | 0.41% | 0.0000% | 0.0079% | 0.08% | 0.41% | 1.20% | 2.29% | 88 |
| **Nearshore Species** | 1.92% | 0.0066% | 0.0808% | 0.15% | 1.45% | 5.11% | 9.00% | 2 |
| **Shelf Species** | 0.41% | 0.0000% | 0.0080% | 0.04% | 0.33% | 1.17% | 2.48% | 74 |
| BOCACCIO: N. of Monterrey | 0.53% | 0.0000% | 0.0144% | 0.06% | 0.51% | 1.10% | 5.72% | 19 |
| Chilipepper Rockfish: Eureka | 0.88% | 0.0000% | 0.0072% | 0.03% | 0.43% | 1.78% | 5.09% | 9 |
| Redstripe Rockfish | 0.55% | 0.0000% | 0.0094% | 0.07% | 0.45% | 1.42% | 5.80% | 13 |
| Silvergrey Rockfish | 0.64% | 0.0000% | 0.0148% | 0.12% | 0.56% | 1.61% | 4.96% | 17 |
| Other Northern Shelf Rockfish | 0.42% | 0.0000% | 0.0110% | 0.04% | 0.31% | 1.27% | 2.84% | 68 |
| **Slope Species** | 0.51% | 0.0000% | 0.0133% | 0.12% | 0.50% | 1.35% | 2.43% | 85 |
| Bank Rockfish | 0.68% | 0.0001% | 0.0022% | 0.01% | 0.10% | 1.01% | 10.09% | 12 |
| Sharpchin Rockfish, north | 0.52% | 0.0000% | 0.0112% | 0.07% | 0.38% | 1.13% | 4.41% | 43 |
| Splitnose Rockfish: N. of Monterrey | 0.55% | 0.0000% | 0.0207% | 0.12% | 0.52% | 1.29% | 3.20% | 76 |
| Yellowmouth Rockfish | 0.62% | 0.0000% | 0.0040% | 0.09% | 0.48% | 1.36% | 8.61% | 41 |
| Other Northern Slope Rockfish | 0.51% | 0.0000% | 0.0118% | 0.10% | 0.52% | 1.28% | 3.15% | 83 |
| **Minor Rockfish South** | 0.83% | 0.0000% | 0.0081% | 0.10% | 0.77% | 2.56% | 8.95% | 33 |
| **Nearshore Species** | 4.00% | 0.0003% | 0.0174% | 0.10% | 0.30% | 5.45% | 19.55% | 1 |
| **Shelf Species** | 0.92% | 0.0000% | 0.0053% | 0.10% | 0.50% | 1.68% | 10.60% | 19 |
| Redstripe Rockfish | 4.35% | 0.0016% | 0.2995% | 1.57% | 2.68% | 9.19% | 16.04% | 0 |
| Yellowtail Rockfish | 1.47% | 0.0001% | 0.0206% | 0.21% | 0.65% | 3.49% | 15.55% | 3 |
| Other Southern Shelf Rockfish | 0.92% | 0.0000% | 0.0106% | 0.07% | 0.65% | 1.60% | 10.41% | 19 |
| **Slope Species** | 0.91% | 0.0000% | 0.0094% | 0.05% | 0.92% | 2.50% | 10.32% | 29 |
| Bank Rockfish | 1.30% | 0.0000% | 0.0198% | 0.10% | 0.82% | 3.23% | 10.50% | 22 |
| Blackgill Rockfish | 1.33% | 0.0000% | 0.0284% | 0.19% | 0.72% | 2.49% | 14.96% | 27 |
| Sharpchin Rockfish | 1.69% | 0.0000% | 0.0237% | 0.20% | 1.29% | 4.60% | 14.34% | 0 |
| Yellowmouth Rockfish | 7.14% | 0.0142% | 0.0497% | 1.53% | 4.14% | 14.56% | 24.90% | 0 |
| Other Southern Slope Rockfish | 0.93% | 0.0001% | 0.0180% | 0.11% | 0.74% | 2.43% | 11.34% | 29 |
| California scorpionfish | 50.00% | 2.8043% | 26.4022% | 50.00% | 59.93% | 65.88% | 69.85% | 0 |
| Cabezon (off CA only) | 50.00% | 38.7755% | 44.3878% | 50.00% | 55.61% | 58.98% | 61.22% | 0 |
| Dover sole (total) | 0.41% | 0.0000% | 0.0536% | 0.34% | 0.60% | 0.81% | 1.29% | 118 |
| Dover Sole (Summer) | 0.42% | 0.0000% | 0.0927% | 0.36% | 0.62% | 0.71% | 1.31% | 116 |
| Dover Sole (Winter) | 0.46% | 0.0000% | 0.0865% | 0.37% | 0.70% | 0.89% | 1.40% | 105 |
| English Sole | 0.42% | 0.0000% | 0.0352% | 0.14% | 0.38% | 1.09% | 3.46% | 107 |
| Petrale Sole (coastwide) | 0.40% | 0.0000% | 0.0443% | 0.17% | 0.51% | 1.01% | 2.41% | 113 |
| N of 40°10' (summer) | 0.56% | 0.0001% | 0.0152% | 0.15% | 0.57% | 1.42% | 5.18% | 79 |
| N of 40°10' (winter) | 0.57% | 0.0000% | 0.0222% | 0.16% | 0.65% | 1.61% | 4.03% | 71 |
| S of 40°10' (summer) | 1.08% | 0.0000% | 0.0017% | 0.20% | 0.90% | 2.43% | 10.72% | 26 |
| S of 40°10' (winter) | 1.16% | 0.0000% | 0.0047% | 0.29% | 1.31% | 3.09% | 6.93% | 26 |
| Arrowtooth Flounder (total) | 0.61% | 0.0000% | 0.0109% | 0.08% | 0.33% | 0.90% | 7.49% | 88 |
| Arrowtooth Flounder (summer) | 0.65% | 0.0000% | 0.0075% | 0.07% | 0.20% | 0.87% | 6.56% | 84 |
| Arrowtooth Flounder (winter) | 0.75% | 0.0001% | 0.0305% | 0.20% | 0.66% | 1.55% | 5.06% | 71 |
| Starry Flounder | 2.13% | 0.0009% | 0.0349% | 0.21% | 1.72% | 4.27% | 14.19% | 20 |
| Other Flatfish | 0.42% | 0.0000% | 0.0240% | 0.12% | 0.35% | 0.85% | 3.51% | 121 |
| Kelp Greenling | 8.33% | 0.1128% | 1.0904% | 3.05% | 7.28% | 13.80% | 49.99% | 0 |
| Spiny Dogfish | 1.92% | 0.0003% | 0.0130% | 0.06% | 0.50% | 2.84% | 23.44% | 6 |
| Other Fish | 0.62% | 0.0001% | 0.0033% | 0.04% | 0.70% | 1.64% | 4.11% | 34 |
| Nearshore spp | 0.39% | 0.0001% | 0.0296% | 0.14% | 0.43% | 0.68% | 3.11% | 87 |
| Shelf spp | 0.37% | 0.0000% | 0.0477% | 0.24% | 0.47% | 0.80% | 2.18% | 122 |
| Slope spp | 0.37% | 0.0000% | 0.0339% | 0.26% | 0.63% | 0.90% | 1.52% | 118 |
| DTS spp | 0.40% | 0.0000% | 0.0296% | 0.35% | 0.63% | 0.72% | 1.05% | 119 |
| | | | | | | | | 122 |

**Table 14. Shoreside whiting harvest concentration statistics and permit count, 1994 - 2005, average. (Page 1 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 4.48% | 0.403% | 1.33% | 2.75% | 5.11% | 8.69% | 24.46% | 24 |
| N. of 42° (OR & WA) | 4.85% | 0.603% | 1.60% | 3.22% | 6.08% | 9.05% | 22.78% | 22 |
| S. of 42° (CA) | 62.41% | 52.872% | 55.86% | 59.26% | 66.00% | 72.55% | 76.92% | 2 |
| Pacific Cod | 11.38% | 1.885% | 3.97% | 6.71% | 13.38% | 24.41% | 38.95% | 11 |
| Pacific Whiting (Coastwide) | 2.81% | 0.062% | 1.19% | 2.74% | 4.19% | 5.26% | 7.09% | 36 |
| Sablefish (Coastwide) | 3.56% | 0.011% | 0.31% | 1.42% | 4.96% | 9.38% | 21.65% | 29 |
| N. of 36° (Monterey north) | 3.56% | 0.011% | 0.31% | 1.42% | 4.96% | 9.38% | 21.65% | 29 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 5.39% | 0.063% | 0.39% | 1.07% | 3.80% | 15.45% | 36.52% | 22 |
| Shortbelly Rockfish | 38.86% | 24.332% | 26.36% | 30.07% | 38.48% | 58.79% | 81.79% | 4 |
| **WIDOW ROCKFISH** | 3.18% | 0.017% | 0.43% | 1.58% | 3.95% | 8.69% | 17.31% | 32 |
| **CANARY ROCKFISH** | 4.66% | 0.198% | 0.86% | 2.07% | 5.65% | 10.85% | 26.21% | 26 |
| Chilipepper Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **BOCACCIO** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Splitnose Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Yellowtail Rockfish | 3.27% | 0.006% | 0.49% | 1.62% | 5.00% | 8.77% | 14.28% | 31 |
| Shortspine Thornyhead - coastwide | 16.81% | 0.444% | 2.94% | 6.19% | 17.04% | 39.73% | 71.61% | 8 |
| N. of 34°27' | 16.81% | 0.444% | 2.94% | 6.19% | 17.04% | 39.73% | 71.61% | 8 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 45.93% | 32.329% | 35.55% | 40.83% | 49.72% | 63.11% | 72.24% | 4 |
| N. of 34°27' | 45.93% | 32.329% | 35.55% | 40.83% | 49.72% | 63.11% | 72.24% | 4 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | 25.00% | 4.762% | 11.90% | 26.19% | 39.29% | 41.43% | 42.86% | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 11.73% | 0.280% | 1.05% | 3.60% | 15.77% | 29.22% | 52.76% | 14 |
| **YELLOWEYE** | 46.55% | 30.172% | 34.90% | 41.98% | 54.71% | 65.80% | 71.22% | 4 |
| Black Rockfish - coastwide | 45.63% | 30.801% | 31.27% | 33.30% | 52.52% | 66.14% | 79.69% | 2 |
| Black Rockfish (WA) | 55.56% | 34.289% | 42.38% | 51.27% | 66.31% | 77.89% | 85.76% | 1 |
| Black Rockfish (OR-CA) | 64.35% | 54.252% | 57.76% | 62.69% | 68.72% | 73.49% | 81.81% | 2 |
| **Minor Rockfish North** | 3.41% | 0.012% | 0.18% | 0.54% | 2.20% | 8.19% | 38.34% | 30 |
| **Nearshore Species** | 83.33% | 67.192% | 75.26% | 83.33% | 91.40% | 96.25% | 99.48% | 0 |
| **Shelf Species** | 3.94% | 0.010% | 0.18% | 0.53% | 2.31% | 8.44% | 40.88% | 28 |
| BOCACCIO: N. of Monterrey | 28.65% | 3.972% | 13.30% | 23.91% | 38.17% | 53.50% | 69.54% | 5 |
| Chilipepper Rockfish: Eureka | 31.83% | 4.790% | 13.52% | 22.80% | 39.54% | 61.75% | 80.78% | 4 |
| Redstripe Rockfish | 27.69% | 13.352% | 14.47% | 16.41% | 29.69% | 50.59% | 68.90% | 5 |
| Silvergrey Rockfish | 48.25% | 37.594% | 38.00% | 43.10% | 51.21% | 64.22% | 76.18% | 3 |
| Other Northern Shelf Rockfish | 4.21% | 0.051% | 0.39% | 0.94% | 3.30% | 8.64% | 36.97% | 27 |
| **Slope Species** | 8.07% | 0.187% | 0.55% | 1.39% | 8.53% | 20.38% | 51.09% | 17 |
| Bank Rockfish | 59.38% | 38.899% | 46.26% | 53.10% | 68.57% | 80.30% | 88.12% | 2 |
| Sharpchin Rockfish, north | 46.99% | 38.749% | 40.04% | 41.44% | 48.18% | 58.44% | 75.55% | 6 |
| Splitnose Rockfish: N. of Monterrey | 23.85% | 10.017% | 10.40% | 12.20% | 23.55% | 46.00% | 74.65% | 8 |
| Yellowmouth Rockfish | 38.49% | 19.547% | 25.02% | 33.02% | 47.75% | 60.62% | 69.39% | 2 |
| Other Northern Slope Rockfish | 10.65% | 0.244% | 0.72% | 2.28% | 10.97% | 28.19% | 51.69% | 14 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 17.01% | 0.580% | 1.66% | 3.98% | 17.93% | 40.90% | 72.15% | 7 |
| Dover Sole (Summer) | 17.18% | 0.584% | 1.68% | 4.12% | 18.18% | 42.22% | 70.99% | 7 |
| Dover Sole (Winter) | 50.00% | 0.050% | 25.03% | 50.00% | 74.97% | 89.96% | 99.95% | 0 |
| English Sole | 32.87% | 10.461% | 14.23% | 20.32% | 40.43% | 62.51% | 79.74% | 4 |
| Petrale Sole (coastwide) | 34.70% | 17.415% | 20.61% | 25.98% | 36.78% | 58.48% | 75.81% | 4 |
| N of 40°10' (summer) | 39.40% | 25.698% | 27.03% | 30.57% | 39.53% | 60.80% | 77.40% | 4 |
| N of 40°10' (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 5.01% | 0.324% | 1.02% | 2.28% | 5.56% | 10.76% | 30.78% | 22 |
| Arrowtooth Flounder (summer) | 5.04% | 0.331% | 1.03% | 2.31% | 5.64% | 10.79% | 30.93% | 22 |
| Arrowtooth Flounder (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Starry Flounder | 75.00% | 65.597% | 70.30% | 75.00% | 79.70% | 82.52% | 84.40% | 1 |
| Other Flatfish | 16.71% | 4.201% | 6.60% | 9.68% | 17.26% | 33.90% | 61.31% | 10 |
| Kelp Greenling | - | - | - | - | - | - | - | 0 |
| Spiny Dogfish | 4.69% | 0.070% | 0.43% | 1.76% | 5.33% | 11.78% | 27.41% | 23 |
| Other Fish | 32.94% | 12.788% | 20.83% | 29.91% | 40.60% | 52.18% | 63.34% | 4 |
| Nearshore spp | 4.27% | 0.306% | 1.22% | 2.46% | 4.72% | 7.70% | 26.74% | 25 |
| Shelf spp | 3.01% | 0.019% | 0.44% | 1.72% | 4.46% | 8.06% | 13.30% | 34 |
| Slope spp | 3.02% | 0.021% | 0.41% | 1.67% | 3.96% | 7.59% | 15.89% | 34 |
| DTS spp | 3.44% | 0.010% | 0.31% | 1.37% | 4.39% | 9.14% | 23.23% | 30 |
| | | | | | | | | 36 |

**Table 14. Shoreside whiting harvest concentration statistics and permit count, 1994 - 2005, maximum. (Page 2 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 6.67% | 1.348% | 2.09% | 4.46% | 8.65% | 14.08% | 73.73% | 31 |
| N. of 42° (OR & WA) | 9.09% | 2.516% | 3.46% | 7.55% | 13.84% | 15.72% | 74.35% | 30 |
| S. of 42° (CA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 5 |
| Pacific Cod | 25.00% | 10.811% | 20.95% | 27.70% | 41.53% | 50.82% | 89.33% | 16 |
| Pacific Whiting (Coastwide) | 3.45% | 0.647% | 2.39% | 3.58% | 5.46% | 7.43% | 8.52% | 46 |
| Sablefish (Coastwide) | 4.55% | 0.054% | 0.57% | 3.03% | 6.30% | 14.35% | 44.99% | 36 |
| N. of 36° (Monterey north) | 4.55% | 0.054% | 0.57% | 3.03% | 6.30% | 14.35% | 44.99% | 36 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 10.00% | 0.245% | 1.78% | 3.11% | 6.87% | 24.16% | 82.35% | 38 |
| Shortbelly Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| **WIDOW ROCKFISH** | 3.85% | 0.091% | 1.04% | 2.42% | 5.21% | 13.14% | 37.97% | 39 |
| **CANARY ROCKFISH** | 14.29% | 1.210% | 1.92% | 3.23% | 16.17% | 41.56% | 65.27% | 35 |
| Chilipepper Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| **BOCACCIO** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| Splitnose Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| Yellowtail Rockfish | 3.85% | 0.024% | 1.08% | 3.09% | 7.56% | 18.45% | 21.28% | 37 |
| Shortspine Thornyhead - coastwide | 50.00% | 1.507% | 25.75% | 50.00% | 74.25% | 88.79% | 98.49% | 15 |
| N. of 34°27' | 50.00% | 1.507% | 25.75% | 50.00% | 74.25% | 88.79% | 98.49% | 15 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | 25.00% | 4.762% | 11.90% | 26.19% | 39.29% | 41.43% | 42.86% | 4 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 33.33% | 2.600% | 3.24% | 12.75% | 49.80% | 77.27% | 95.58% | 32 |
| **YELLOWEYE** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| Black Rockfish - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| Black Rockfish (WA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Black Rockfish (OR-CA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| **Minor Rockfish North** | 4.76% | 0.047% | 0.74% | 1.41% | 4.33% | 15.31% | 84.72% | 42 |
| **Nearshore Species** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| **Shelf Species** | 7.69% | 0.058% | 0.62% | 1.31% | 3.80% | 18.68% | 89.03% | 40 |
| BOCACCIO: N. of Monterrey | 50.00% | 15.385% | 32.69% | 50.00% | 74.71% | 89.54% | 99.43% | 17 |
| Chilipepper Rockfish: Eureka | 50.00% | 18.683% | 30.08% | 50.00% | 72.76% | 86.42% | 96.55% | 8 |
| Redstripe Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 18 |
| Silvergrey Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 13 |
| Other Northern Shelf Rockfish | 8.33% | 0.367% | 2.11% | 2.76% | 7.62% | 16.53% | 89.60% | 40 |
| **Slope Species** | 16.67% | 1.684% | 2.61% | 4.17% | 33.32% | 43.90% | 81.71% | 32 |
| Bank Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Sharpchin Rockfish, north | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 31 |
| Splitnose Rockfish: N. of Monterrey | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 27 |
| Yellowmouth Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 7 |
| Other Northern Slope Rockfish | 20.00% | 1.810% | 3.78% | 7.82% | 28.51% | 55.66% | 83.93% | 26 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 33.33% | 2.564% | 10.26% | 23.08% | 49.99% | 79.96% | 99.94% | 12 |
| Dover Sole (Summer) | 33.33% | 2.564% | 10.26% | 23.08% | 49.99% | 79.96% | 99.94% | 12 |
| Dover Sole (Winter) | 50.00% | 0.050% | 25.03% | 50.00% | 74.97% | 89.96% | 99.95% | 2 |
| English Sole | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 8 |
| Petrale Sole (coastwide) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 8 |
| N of 40°10' (summer) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 8 |
| N of 40°10' (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 8.33% | 1.176% | 1.96% | 4.21% | 10.88% | 21.88% | 56.68% | 36 |
| Arrowtooth Flounder (summer) | 8.33% | 1.176% | 1.96% | 4.27% | 10.88% | 21.88% | 56.68% | 36 |
| Arrowtooth Flounder (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| Starry Flounder | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| Other Flatfish | 50.00% | 28.571% | 39.29% | 50.00% | 60.71% | 67.14% | 95.49% | 17 |
| Kelp Greenling | - | - | - | - | - | - | - | 0 |
| Spiny Dogfish | 9.09% | 0.704% | 2.46% | 6.69% | 14.96% | 18.30% | 55.93% | 32 |
| Other Fish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 10 |
| Nearshore spp | 6.25% | 1.213% | 2.12% | 4.75% | 7.72% | 10.92% | 69.93% | 32 |
| Shelf spp | 3.57% | 0.082% | 0.91% | 2.95% | 6.57% | 16.69% | 18.64% | 43 |
| Slope spp | 3.57% | 0.110% | 0.89% | 2.60% | 5.43% | 12.17% | 34.85% | 42 |
| DTS spp | 4.17% | 0.043% | 0.93% | 3.08% | 6.09% | 13.77% | 50.97% | 41 |
| | | | | | | | | 46 |

**Table 14. Shoreside whiting harvest concentration statistics and permit count, 1994 - 2005, minimum. (Page 3 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 3.23% | 0.120% | 0.48% | 0.77% | 1.99% | 3.59% | 7.19% | 15 |
| N. of 42° (OR & WA) | 3.33% | 0.120% | 0.68% | 0.78% | 2.20% | 3.86% | 7.29% | 11 |
| S. of 42° (CA) | 20.00% | 4.281% | 6.88% | 10.00% | 19.88% | 40.24% | 49.06% | 0 |
| Pacific Cod | 6.25% | 0.076% | 0.22% | 1.00% | 3.06% | 11.61% | 16.66% | 4 |
| Pacific Whiting (Coastwide) | 2.17% | 0.000% | 0.26% | 1.78% | 3.43% | 4.21% | 5.63% | 29 |
| Sablefish (Coastwide) | 2.78% | 0.000% | 0.08% | 0.28% | 2.41% | 6.36% | 13.04% | 22 |
| N. of 36° (Monterey north) | 2.78% | 0.000% | 0.08% | 0.28% | 2.41% | 6.36% | 13.04% | 22 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 2.63% | 0.000% | 0.02% | 0.22% | 1.22% | 6.50% | 21.23% | 10 |
| Shortbelly Rockfish | 11.11% | 0.014% | 0.03% | 0.25% | 1.29% | 24.91% | 55.25% | 0 |
| **WIDOW ROCKFISH** | 2.56% | 0.000% | 0.03% | 0.06% | 2.07% | 5.18% | 8.84% | 26 |
| **CANARY ROCKFISH** | 2.86% | 0.004% | 0.37% | 0.99% | 2.13% | 5.29% | 13.04% | 7 |
| Chilipepper Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **BOCACCIO** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Splitnose Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Yellowtail Rockfish | 2.70% | 0.000% | 0.02% | 0.19% | 2.24% | 6.30% | 9.36% | 26 |
| Shortspine Thornyhead - coastwide | 6.67% | 0.018% | 0.10% | 0.63% | 4.76% | 7.05% | 24.34% | 2 |
| N. of 34°27' | 6.67% | 0.018% | 0.10% | 0.63% | 4.76% | 7.05% | 24.34% | 2 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 11.11% | 0.105% | 0.11% | 1.12% | 11.40% | 25.43% | 27.56% | 0 |
| N. of 34°27' | 11.11% | 0.105% | 0.11% | 1.12% | 11.40% | 25.43% | 27.56% | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | 25.00% | 4.762% | 11.90% | 26.19% | 39.29% | 41.43% | 42.86% | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 3.13% | 0.001% | 0.04% | 0.11% | 0.80% | 5.94% | 20.65% | 3 |
| **YELLOWEYE** | 11.11% | 0.024% | 0.12% | 0.74% | 12.03% | 34.23% | 34.23% | 0 |
| Black Rockfish - coastwide | 11.11% | 0.129% | 0.52% | 0.90% | 8.72% | 19.13% | 46.48% | 0 |
| Black Rockfish (WA) | 16.67% | 0.604% | 1.01% | 3.82% | 25.05% | 45.47% | 59.56% | 0 |
| Black Rockfish (OR-CA) | 11.11% | 1.744% | 4.07% | 5.04% | 8.72% | 19.13% | 46.48% | 0 |
| **Minor Rockfish North** | 2.38% | 0.000% | 0.02% | 0.06% | 0.43% | 3.30% | 17.93% | 21 |
| **Nearshore Species** | 50.00% | 1.575% | 25.79% | 50.00% | 74.21% | 88.74% | 98.43% | 0 |
| **Shelf Species** | 2.50% | 0.000% | 0.00% | 0.03% | 0.06% | 3.87% | 15.30% | 13 |
| BOCACCIO: N. of Monterrey | 5.88% | 0.007% | 0.03% | 0.08% | 1.85% | 10.74% | 37.32% | 0 |
| Chilipepper Rockfish: Eureka | 12.50% | 0.007% | 0.27% | 0.46% | 8.25% | 28.24% | 36.39% | 0 |
| Redstripe Rockfish | 5.56% | 0.004% | 0.08% | 0.98% | 4.68% | 18.25% | 27.50% | 0 |
| Silvergrey Rockfish | 7.69% | 0.006% | 0.04% | 0.08% | 1.01% | 24.87% | 43.10% | 0 |
| Other Northern Shelf Rockfish | 2.50% | 0.000% | 0.04% | 0.18% | 1.17% | 1.75% | 15.87% | 12 |
| **Slope Species** | 3.13% | 0.001% | 0.01% | 0.18% | 1.32% | 2.45% | 15.23% | 6 |
| Bank Rockfish | 16.67% | 0.052% | 1.22% | 2.38% | 21.67% | 26.67% | 30.00% | 0 |
| Sharpchin Rockfish, north | 3.23% | 0.003% | 0.03% | 0.19% | 1.92% | 3.81% | 48.81% | 0 |
| Splitnose Rockfish: N. of Monterrey | 3.70% | 0.000% | 0.02% | 0.12% | 0.36% | 3.10% | 38.13% | 1 |
| Yellowmouth Rockfish | 14.29% | 0.019% | 0.35% | 0.81% | 17.00% | 36.95% | 42.64% | 0 |
| Other Northern Slope Rockfish | 3.85% | 0.002% | 0.07% | 0.20% | 2.77% | 4.63% | 17.80% | 5 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 8.33% | 0.013% | 0.02% | 0.03% | 0.08% | 12.38% | 30.75% | 3 |
| Dover Sole (Summer) | 8.33% | 0.021% | 0.02% | 0.03% | 0.08% | 12.38% | 30.75% | 3 |
| Dover Sole (Winter) | 50.00% | 0.050% | 25.03% | 50.00% | 74.97% | 89.96% | 99.95% | 0 |
| English Sole | 12.50% | 0.027% | 0.05% | 0.08% | 12.82% | 24.36% | 51.28% | 1 |
| Petrale Sole (coastwide) | 12.50% | 0.065% | 0.07% | 0.11% | 2.52% | 26.75% | 45.17% | 0 |
| N of 40°10' (summer) | 12.50% | 0.073% | 0.07% | 0.11% | 2.52% | 26.75% | 47.60% | 0 |
| N of 40°10' (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 2.78% | 0.040% | 0.28% | 0.84% | 1.28% | 5.14% | 9.51% | 12 |
| Arrowtooth Flounder (summer) | 2.78% | 0.040% | 0.28% | 0.84% | 1.28% | 5.14% | 9.51% | 12 |
| Arrowtooth Flounder (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Starry Flounder | 50.00% | 29.167% | 39.58% | 50.00% | 58.39% | 63.42% | 66.78% | 0 |
| Other Flatfish | 5.88% | 0.011% | 0.02% | 0.30% | 0.67% | 10.53% | 24.94% | 2 |
| Kelp Greenling | - | - | - | - | - | - | - | 0 |
| Spiny Dogfish | 3.13% | 0.000% | 0.03% | 0.06% | 0.37% | 7.15% | 16.38% | 11 |
| Other Fish | 10.00% | 0.029% | 0.50% | 1.13% | 14.46% | 15.84% | 16.74% | 0 |
| Nearshore spp | 3.13% | 0.085% | 0.31% | 0.73% | 1.77% | 4.39% | 7.17% | 16 |
| Shelf spp | 2.33% | 0.000% | 0.09% | 0.38% | 2.42% | 5.78% | 9.16% | 28 |
| Slope spp | 2.38% | 0.000% | 0.09% | 0.33% | 2.06% | 4.90% | 10.41% | 28 |
| DTS spp | 2.44% | 0.001% | 0.10% | 0.22% | 2.42% | 5.80% | 13.14% | 24 |
| | | | | | | | | 29 |

**Table 15. Shoreside (whiting and nonwhiting) harvest concentration statistics and permit count, 1994 - 2005, average. (Page 1 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0.53% | 0.002% | 0.08% | 0.34% | 0.76% | 1.26% | 4.15% | 205 |
| N. of 42° (OR & WA) | 0.80% | 0.003% | 0.13% | 0.51% | 1.15% | 1.84% | 5.76% | 133 |
| S. of 42° (CA) | 1.33% | 0.008% | 0.16% | 0.79% | 1.83% | 3.42% | 7.88% | 88 |
| Pacific Cod | 1.08% | 0.000% | 0.01% | 0.08% | 0.61% | 3.44% | 15.24% | 97 |
| Pacific Whiting (Coastwide) | 1.92% | 0.000% | 0.27% | 1.22% | 3.31% | 4.84% | 7.09% | 57 |
| Sablefish (Coastwide) | 0.46% | 0.000% | 0.14% | 0.46% | 0.73% | 0.87% | 1.68% | 227 |
| N. of 36° (Monterey north) | 0.47% | 0.000% | 0.13% | 0.47% | 0.76% | 0.90% | 1.74% | 220 |
| S. of 36° (Conception area) | 6.93% | 0.078% | 1.14% | 4.55% | 10.40% | 17.18% | 22.03% | 16 |
| **PACIFIC OCEAN PERCH** | 0.65% | 0.000% | 0.01% | 0.09% | 0.84% | 2.20% | 5.59% | 168 |
| Shortbelly Rockfish | 4.43% | 0.023% | 0.08% | 0.50% | 3.75% | 11.25% | 43.26% | 65 |
| **WIDOW ROCKFISH** | 0.71% | 0.000% | 0.01% | 0.10% | 0.72% | 2.34% | 6.69% | 194 |
| **CANARY ROCKFISH** | 0.67% | 0.003% | 0.07% | 0.27% | 0.85% | 1.85% | 6.55% | 186 |
| Chilipepper Rockfish | 2.09% | 0.003% | 0.12% | 0.68% | 2.27% | 5.68% | 17.78% | 57 |
| **BOCACCIO** | 4.77% | 0.211% | 0.53% | 1.67% | 4.81% | 13.35% | 23.84% | 47 |
| Splitnose Rockfish | 1.89% | 0.002% | 0.14% | 0.66% | 2.11% | 4.55% | 16.42% | 59 |
| Yellowtail Rockfish | 0.69% | 0.000% | 0.02% | 0.20% | 1.03% | 2.13% | 4.89% | 167 |
| Shortspine Thornyhead - coastwide | 0.53% | 0.000% | 0.17% | 0.50% | 0.79% | 1.03% | 2.14% | 198 |
| N. of 34°27' | 0.65% | 0.000% | 0.18% | 0.60% | 1.01% | 1.28% | 2.77% | 163 |
| S. of 34°27' | 1.75% | 0.007% | 0.33% | 1.52% | 2.87% | 3.85% | 5.75% | 65 |
| Longspine Thornyhead - coastwide | 0.59% | 0.000% | 0.09% | 0.47% | 0.94% | 1.41% | 2.20% | 181 |
| N. of 34°27' | 0.59% | 0.000% | 0.09% | 0.47% | 0.94% | 1.41% | 2.20% | 181 |
| S. of 34°27' | 50.00% | 35.636% | 42.82% | 50.00% | 57.18% | 61.49% | 64.36% | 0 |
| Other thornyheads | 12.98% | 8.559% | 9.01% | 10.39% | 13.12% | 19.80% | 33.36% | 30 |
| **COWCOD** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **DARKBLOTCHED** | 0.53% | 0.000% | 0.03% | 0.20% | 0.66% | 1.43% | 8.06% | 200 |
| **YELLOWEYE** | 1.82% | 0.032% | 0.21% | 0.65% | 2.00% | 4.08% | 15.24% | 122 |
| Black Rockfish - coastwide | 3.96% | 0.104% | 0.47% | 1.30% | 4.29% | 9.59% | 28.72% | 33 |
| Black Rockfish (WA) | 36.81% | 24.736% | 27.98% | 33.57% | 41.62% | 51.36% | 60.50% | 5 |
| Black Rockfish (OR-CA) | 4.21% | 0.108% | 0.50% | 1.37% | 4.39% | 10.28% | 30.64% | 28 |
| **Minor Rockfish North** | 0.52% | 0.000% | 0.03% | 0.19% | 0.68% | 1.49% | 6.40% | 210 |
| **Nearshore Species** | 13.27% | 1.223% | 3.75% | 7.53% | 16.34% | 30.10% | 41.79% | 17 |
| **Shelf Species** | 0.57% | 0.000% | 0.01% | 0.09% | 0.44% | 1.37% | 14.05% | 200 |
| BOCACCIO: N. of Monterrey | 1.69% | 0.003% | 0.09% | 0.42% | 1.66% | 4.61% | 15.96% | 113 |
| Chilipepper Rockfish: Eureka | 2.11% | 0.000% | 0.03% | 0.14% | 2.20% | 4.24% | 30.90% | 76 |
| Redstripe Rockfish | 1.56% | 0.083% | 0.27% | 0.94% | 1.56% | 3.15% | 13.50% | 120 |
| Silvergrey Rockfish | 1.82% | 0.003% | 0.13% | 0.49% | 1.81% | 4.95% | 15.60% | 93 |
| Other Northern Shelf Rockfish | 0.59% | 0.000% | 0.02% | 0.12% | 0.58% | 1.72% | 7.53% | 195 |
| **Slope Species** | 0.61% | 0.000% | 0.05% | 0.27% | 0.86% | 1.66% | 6.24% | 171 |
| Bank Rockfish | 2.13% | 0.055% | 0.30% | 0.92% | 2.03% | 5.11% | 22.92% | 85 |
| Sharpchin Rockfish, north | 0.90% | 0.001% | 0.05% | 0.35% | 1.16% | 2.44% | 9.63% | 140 |
| Splitnose Rockfish: N. of Monterrey | 0.71% | 0.001% | 0.07% | 0.28% | 0.80% | 1.87% | 9.30% | 154 |
| Yellowmouth Rockfish | 1.23% | 0.002% | 0.05% | 0.35% | 1.25% | 3.42% | 12.28% | 99 |
| Other Northern Slope Rockfish | 0.63% | 0.000% | 0.05% | 0.24% | 0.87% | 1.74% | 6.24% | 166 |
| **Minor Rockfish South** | 1.58% | 0.000% | 0.09% | 0.53% | 1.63% | 4.70% | 15.23% | 72 |
| **Nearshore Species** | 15.85% | 8.543% | 8.85% | 10.34% | 15.05% | 27.83% | 55.65% | 16 |
| **Shelf Species** | 2.06% | 0.004% | 0.14% | 0.59% | 1.91% | 4.93% | 23.07% | 62 |
| Redstripe Rockfish | 6.14% | 0.142% | 1.28% | 4.18% | 6.83% | 13.92% | 31.06% | 7 |
| Yellowtail Rockfish | 8.96% | 0.100% | 2.49% | 5.30% | 11.09% | 21.79% | 36.72% | 32 |
| Other Southern Shelf Rockfish | 2.11% | 0.007% | 0.18% | 0.76% | 2.09% | 4.58% | 24.19% | 61 |
| **Slope Species** | 1.72% | 0.001% | 0.11% | 0.54% | 1.80% | 5.10% | 16.93% | 66 |
| Bank Rockfish | 2.22% | 0.000% | 0.09% | 0.47% | 2.16% | 6.59% | 22.25% | 54 |
| Blackgill Rockfish | 2.10% | 0.001% | 0.09% | 0.58% | 1.93% | 5.56% | 22.44% | 54 |
| Sharpchin Rockfish | 5.42% | 0.044% | 0.74% | 2.12% | 5.48% | 13.46% | 31.19% | 23 |
| Yellowmouth Rockfish | 41.56% | 31.276% | 35.41% | 40.08% | 44.87% | 51.60% | 60.89% | 2 |
| Other Southern Slope Rockfish | 1.83% | 0.002% | 0.12% | 0.50% | 1.66% | 4.58% | 20.01% | 62 |
| California scorpionfish | 75.00% | 58.238% | 66.62% | 75.00% | 83.38% | 88.41% | 91.76% | 1 |
| Cabezon (off CA only) | 91.67% | 89.796% | 90.73% | 91.67% | 92.60% | 93.16% | 93.54% | 1 |
| Dover sole (total) | 0.51% | 0.000% | 0.18% | 0.49% | 0.78% | 1.00% | 2.11% | 207 |
| Dover Sole (Summer) | 0.52% | 0.000% | 0.22% | 0.55% | 0.78% | 0.95% | 1.82% | 200 |
| Dover Sole (Winter) | 0.59% | 0.000% | 0.17% | 0.52% | 0.92% | 1.22% | 2.53% | 179 |
| English Sole | 0.55% | 0.000% | 0.05% | 0.23% | 0.68% | 1.43% | 6.46% | 194 |
| Petrale Sole (coastwide) | 0.53% | 0.000% | 0.06% | 0.27% | 0.71% | 1.31% | 4.55% | 201 |
| N of 40°10' (summer) | 0.73% | 0.000% | 0.03% | 0.30% | 0.89% | 1.92% | 6.89% | 146 |
| N of 40°10' (winter) | 0.80% | 0.000% | 0.06% | 0.33% | 1.08% | 2.22% | 6.31% | 134 |
| S of 40°10' (summer) | 2.08% | 0.004% | 0.12% | 0.64% | 2.18% | 5.90% | 17.88% | 56 |
| S of 40°10' (winter) | 1.92% | 0.001% | 0.12% | 0.75% | 2.47% | 5.17% | 11.78% | 59 |
| Arrowtooth Flounder (total) | 0.63% | 0.000% | 0.01% | 0.09% | 0.43% | 1.49% | 13.09% | 163 |
| Arrowtooth Flounder (summer) | 0.68% | 0.000% | 0.01% | 0.07% | 0.37% | 1.57% | 14.47% | 152 |
| Arrowtooth Flounder (winter) | 0.91% | 0.000% | 0.06% | 0.30% | 0.96% | 2.17% | 11.71% | 114 |
| Starry Flounder | 3.00% | 0.006% | 0.13% | 0.59% | 2.27% | 7.37% | 34.78% | 36 |
| Other Flatfish | 0.50% | 0.000% | 0.08% | 0.22% | 0.54% | 1.17% | 9.48% | 210 |
| Kelp Greenling | 55.83% | 44.748% | 48.18% | 52.38% | 57.99% | 68.89% | 79.96% | 3 |
| Spiny Dogfish | 2.27% | 0.000% | 0.02% | 0.13% | 1.13% | 5.06% | 30.07% | 50 |
| Other Fish | 0.96% | 0.001% | 0.03% | 0.27% | 1.13% | 2.84% | 8.47% | 127 |
| Nearshore spp | 0.52% | 0.001% | 0.07% | 0.27% | 0.65% | 1.12% | 9.01% | 207 |
| Shelf spp | 0.43% | 0.000% | 0.09% | 0.29% | 0.54% | 0.89% | 4.76% | 244 |
| Slope spp | 0.44% | 0.000% | 0.05% | 0.31% | 0.73% | 1.07% | 2.29% | 241 |
| DTS spp | 0.45% | 0.000% | 0.09% | 0.42% | 0.74% | 0.93% | 1.81% | 232 |
| | | | | | | | | 244 |

**Table 15. Shoreside (whiting and nonwhiting) harvest concentration statistics and permit count, 1994 - 2005, maximum. (Page 2 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0.87% | 0.007% | 0.20% | 0.66% | 1.28% | 2.15% | 9.06% | 267 |
| N. of 42° (OR & WA) | 1.20% | 0.010% | 0.29% | 1.01% | 1.94% | 2.89% | 12.11% | 183 |
| S. of 42° (CA) | 2.56% | 0.035% | 0.25% | 1.69% | 4.11% | 7.96% | 14.61% | 122 |
| Pacific Cod | 1.56% | 0.000% | 0.02% | 0.14% | 1.67% | 6.30% | 22.70% | 139 |
| Pacific Whiting (Coastwide) | 3.23% | 0.003% | 2.19% | 3.53% | 4.22% | 6.51% | 8.52% | 83 |
| Sablefish (Coastwide) | 0.70% | 0.000% | 0.28% | 0.71% | 1.12% | 1.34% | 4.80% | 268 |
| N. of 36° (Monterey north) | 0.71% | 0.000% | 0.29% | 0.70% | 1.15% | 1.37% | 4.96% | 260 |
| S. of 36° (Conception area) | 11.11% | 0.204% | 3.93% | 7.43% | 13.78% | 30.95% | 38.36% | 23 |
| **PACIFIC OCEAN PERCH** | 1.11% | 0.000% | 0.02% | 0.24% | 1.45% | 3.58% | 10.05% | 216 |
| Shortbelly Rockfish | 14.29% | 0.165% | 0.47% | 1.93% | 21.15% | 41.33% | 82.47% | 137 |
| **WIDOW ROCKFISH** | 1.61% | 0.003% | 0.05% | 0.37% | 1.17% | 5.63% | 28.75% | 280 |
| **CANARY ROCKFISH** | 1.39% | 0.018% | 0.21% | 0.65% | 1.94% | 3.73% | 14.07% | 253 |
| Chilipepper Rockfish | 4.17% | 0.027% | 0.31% | 1.29% | 3.51% | 14.71% | 46.75% | 83 |
| **BOCACCIO** | 25.00% | 2.429% | 2.73% | 9.31% | 31.58% | 60.00% | 78.95% | 73 |
| Splitnose Rockfish | 3.57% | 0.016% | 0.50% | 1.87% | 4.78% | 7.76% | 26.87% | 80 |
| Yellowtail Rockfish | 1.32% | 0.000% | 0.06% | 0.32% | 1.79% | 4.65% | 10.78% | 226 |
| Shortspine Thornyhead - coastwide | 0.81% | 0.000% | 0.25% | 0.74% | 1.27% | 1.75% | 5.27% | 240 |
| N. of 34°27' | 1.02% | 0.000% | 0.30% | 0.83% | 1.54% | 2.07% | 7.98% | 202 |
| S. of 34°27' | 3.57% | 0.076% | 0.75% | 3.91% | 6.03% | 7.15% | 10.69% | 114 |
| Longspine Thornyhead - coastwide | 0.98% | 0.000% | 0.15% | 0.60% | 1.46% | 3.30% | 7.30% | 222 |
| N. of 34°27' | 0.98% | 0.000% | 0.15% | 0.60% | 1.46% | 3.30% | 7.30% | 222 |
| S. of 34°27' | 50.00% | 35.636% | 42.82% | 50.00% | 57.18% | 61.49% | 64.36% | 2 |
| Other thornyheads | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 114 |
| **COWCOD** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| **DARKBLOTCHED** | 0.85% | 0.000% | 0.08% | 0.35% | 1.37% | 2.94% | 15.64% | 265 |
| **YELLOWEYE** | 6.67% | 0.348% | 1.13% | 3.30% | 8.96% | 13.74% | 35.78% | 216 |
| Black Rockfish - coastwide | 8.33% | 0.712% | 2.16% | 5.87% | 12.88% | 19.70% | 52.55% | 70 |
| Black Rockfish (WA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 36 |
| Black Rockfish (OR-CA) | 8.33% | 0.712% | 2.16% | 5.87% | 12.88% | 19.70% | 52.55% | 56 |
| **Minor Rockfish North** | 0.86% | 0.001% | 0.10% | 0.38% | 1.11% | 2.35% | 13.46% | 272 |
| **Nearshore Species** | 50.00% | 12.391% | 31.20% | 50.00% | 68.80% | 80.09% | 98.24% | 52 |
| **Shelf Species** | 0.99% | 0.000% | 0.03% | 0.18% | 0.60% | 2.71% | 49.29% | 271 |
| BOCACCIO: N. of Monterrey | 5.26% | 0.034% | 0.50% | 1.61% | 9.62% | 14.99% | 36.13% | 193 |
| Chilipepper Rockfish: Eureka | 7.69% | 0.002% | 0.07% | 0.35% | 17.23% | 21.36% | 87.12% | 119 |
| Redstripe Rockfish | 7.69% | 0.970% | 2.62% | 8.39% | 9.58% | 10.95% | 25.39% | 197 |
| Silvergrey Rockfish | 5.88% | 0.013% | 0.68% | 1.70% | 7.27% | 12.98% | 49.32% | 163 |
| Other Northern Shelf Rockfish | 1.05% | 0.001% | 0.05% | 0.23% | 1.25% | 3.30% | 15.70% | 268 |
| **Slope Species** | 0.93% | 0.001% | 0.12% | 0.43% | 1.19% | 2.95% | 15.72% | 218 |
| Bank Rockfish | 7.69% | 0.420% | 2.10% | 3.78% | 7.44% | 16.90% | 44.12% | 146 |
| Sharpchin Rockfish, north | 2.33% | 0.003% | 0.12% | 0.86% | 3.06% | 6.97% | 21.77% | 215 |
| Splitnose Rockfish: N. of Monterrey | 1.27% | 0.003% | 0.18% | 0.47% | 1.19% | 4.14% | 18.01% | 209 |
| Yellowmouth Rockfish | 2.44% | 0.018% | 0.21% | 0.86% | 2.24% | 7.27% | 21.84% | 168 |
| Other Northern Slope Rockfish | 0.94% | 0.001% | 0.13% | 0.45% | 1.28% | 2.90% | 15.42% | 201 |
| **Minor Rockfish South** | 3.03% | 0.002% | 0.24% | 1.67% | 3.61% | 10.99% | 23.84% | 120 |
| **Nearshore Species** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 25 |
| **Shelf Species** | 5.26% | 0.025% | 1.09% | 3.15% | 6.95% | 11.22% | 46.58% | 109 |
| Redstripe Rockfish | 8.33% | 0.426% | 2.76% | 7.29% | 13.45% | 19.75% | 50.75% | 23 |
| Yellowtail Rockfish | 33.33% | 0.615% | 20.80% | 40.98% | 49.75% | 70.53% | 84.38% | 68 |
| Other Southern Shelf Rockfish | 5.26% | 0.043% | 1.25% | 3.60% | 6.99% | 8.91% | 48.55% | 109 |
| **Slope Species** | 3.45% | 0.002% | 0.26% | 1.80% | 4.14% | 12.23% | 24.82% | 110 |
| Bank Rockfish | 4.55% | 0.002% | 0.27% | 1.29% | 6.52% | 18.78% | 33.61% | 77 |
| Blackgill Rockfish | 3.70% | 0.004% | 0.15% | 1.66% | 4.77% | 14.09% | 33.18% | 76 |
| Sharpchin Rockfish | 20.00% | 0.218% | 3.30% | 7.89% | 16.08% | 50.01% | 72.63% | 59 |
| Yellowmouth Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 14 |
| Other Southern Slope Rockfish | 3.45% | 0.008% | 0.34% | 1.03% | 2.64% | 7.24% | 38.34% | 107 |
| California scorpionfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| Cabezon (off CA only) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| Dover sole (total) | 0.78% | 0.000% | 0.32% | 0.76% | 1.24% | 1.55% | 5.62% | 251 |
| Dover Sole (Summer) | 0.80% | 0.000% | 0.30% | 0.93% | 1.28% | 1.46% | 3.64% | 242 |
| Dover Sole (Winter) | 0.95% | 0.001% | 0.30% | 0.77% | 1.61% | 2.01% | 7.36% | 219 |
| English Sole | 0.90% | 0.000% | 0.07% | 0.44% | 1.31% | 2.57% | 13.90% | 239 |
| Petrale Sole (coastwide) | 0.85% | 0.000% | 0.09% | 0.52% | 1.20% | 2.30% | 8.04% | 252 |
| N of 40°10' (summer) | 1.20% | 0.001% | 0.08% | 1.06% | 1.95% | 2.88% | 9.22% | 182 |
| N of 40°10' (winter) | 1.41% | 0.002% | 0.12% | 0.67% | 1.81% | 4.06% | 10.31% | 175 |
| S of 40°10' (summer) | 3.85% | 0.016% | 0.23% | 1.62% | 6.34% | 16.49% | 28.26% | 93 |
| S of 40°10' (winter) | 3.85% | 0.004% | 0.19% | 1.40% | 3.97% | 9.99% | 25.86% | 86 |
| Arrowtooth Flounder (total) | 0.88% | 0.000% | 0.02% | 0.17% | 0.90% | 2.86% | 25.46% | 200 |
| Arrowtooth Flounder (summer) | 0.92% | 0.000% | 0.02% | 0.15% | 0.73% | 3.51% | 28.72% | 191 |
| Arrowtooth Flounder (winter) | 1.41% | 0.001% | 0.16% | 0.46% | 1.52% | 3.60% | 15.66% | 133 |
| Starry Flounder | 5.00% | 0.029% | 0.35% | 1.09% | 2.90% | 13.16% | 65.71% | 49 |
| Other Flatfish | 0.76% | 0.000% | 0.13% | 0.42% | 1.03% | 1.86% | 16.35% | 248 |
| Kelp Greenling | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 12 |
| Spiny Dogfish | 3.57% | 0.001% | 0.05% | 0.28% | 4.29% | 15.32% | 46.70% | 80 |
| Other Fish | 2.78% | 0.002% | 0.11% | 0.65% | 2.53% | 8.97% | 21.31% | 166 |
| Nearshore spp | 0.87% | 0.005% | 0.17% | 0.43% | 1.09% | 1.69% | 35.96% | 272 |
| Shelf spp | 0.66% | 0.000% | 0.13% | 0.44% | 0.90% | 1.45% | 8.50% | 301 |
| Slope spp | 0.68% | 0.000% | 0.07% | 0.42% | 1.23% | 1.73% | 6.09% | 300 |
| DTS spp | 0.68% | 0.000% | 0.18% | 0.66% | 1.12% | 1.43% | 5.30% | 275 |
| | | | | | | | | 301 |

**Table 15. Shoreside (whiting and nonwhiting) harvest concentration statistics and permit count, 1994 - 2005, minimum. (Page 3 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 0.37% | 0.0000% | 0.0172% | 0.11% | 0.41% | 0.82% | 1.42% | 115 |
| N. of 42° (OR & WA) | 0.55% | 0.0001% | 0.0241% | 0.16% | 0.55% | 1.20% | 1.82% | 83 |
| S. of 42° (CA) | 0.82% | 0.0001% | 0.0263% | 0.17% | 0.63% | 2.10% | 3.42% | 39 |
| Pacific Cod | 0.72% | 0.0001% | 0.0018% | 0.02% | 0.11% | 1.62% | 9.64% | 64 |
| Pacific Whiting (Coastwide) | 1.20% | 0.0000% | 0.0006% | 0.02% | 2.38% | 3.91% | 5.63% | 31 |
| Sablefish (Coastwide) | 0.37% | 0.0000% | 0.0401% | 0.29% | 0.59% | 0.68% | 0.86% | 143 |
| N. of 36° (Monterey north) | 0.38% | 0.0000% | 0.0443% | 0.28% | 0.62% | 0.71% | 0.90% | 140 |
| S. of 36° (Conception area) | 4.35% | 0.0030% | 0.2177% | 1.24% | 7.06% | 10.08% | 12.31% | 9 |
| **PACIFIC OCEAN PERCH** | 0.46% | 0.0000% | 0.0022% | 0.04% | 0.55% | 1.59% | 2.84% | 90 |
| Shortbelly Rockfish | 0.73% | 0.0001% | 0.0015% | 0.01% | 0.05% | 0.12% | 11.93% | 0 |
| **WIDOW ROCKFISH** | 0.36% | 0.0000% | 0.0017% | 0.03% | 0.43% | 1.21% | 2.15% | 62 |
| **CANARY ROCKFISH** | 0.40% | 0.0000% | 0.0051% | 0.06% | 0.41% | 1.05% | 3.16% | 72 |
| Chilipepper Rockfish | 1.20% | 0.0000% | 0.0187% | 0.21% | 1.12% | 2.70% | 7.81% | 24 |
| **BOCACCIO** | 1.37% | 0.0000% | 0.0405% | 0.21% | 0.84% | 2.87% | 6.47% | 4 |
| Splitnose Rockfish | 1.25% | 0.0000% | 0.0426% | 0.34% | 1.14% | 2.72% | 10.00% | 28 |
| Yellowtail Rockfish | 0.44% | 0.0000% | 0.0030% | 0.09% | 0.80% | 1.24% | 2.07% | 76 |
| Shortspine Thornyhead - coastwide | 0.42% | 0.0000% | 0.0151% | 0.26% | 0.64% | 0.75% | 1.20% | 123 |
| N. of 34°27' | 0.50% | 0.0000% | 0.0116% | 0.20% | 0.80% | 1.00% | 1.42% | 98 |
| S. of 34°27' | 0.88% | 0.0000% | 0.0052% | 0.03% | 1.66% | 2.64% | 4.03% | 28 |
| Longspine Thornyhead - coastwide | 0.45% | 0.0000% | 0.0334% | 0.21% | 0.71% | 0.82% | 0.96% | 102 |
| N. of 34°27' | 0.45% | 0.0000% | 0.0334% | 0.21% | 0.71% | 0.82% | 0.96% | 102 |
| S. of 34°27' | 50.00% | 35.6356% | 42.8178% | 50.00% | 57.18% | 61.49% | 64.36% | 0 |
| Other thornyheads | 0.88% | 0.0002% | 0.0262% | 0.27% | 0.79% | 3.42% | 4.69% | 1 |
| **COWCOD** | 100.00% | 100.0000% | 100.0000% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **DARKBLOTCHED** | 0.38% | 0.0000% | 0.0062% | 0.05% | 0.29% | 0.79% | 4.22% | 117 |
| **YELLOWEYE** | 0.46% | 0.0000% | 0.0102% | 0.09% | 0.45% | 1.14% | 5.10% | 15 |
| Black Rockfish - coastwide | 1.43% | 0.0003% | 0.0145% | 0.09% | 0.76% | 3.34% | 18.39% | 12 |
| Black Rockfish (WA) | 2.78% | 0.0041% | 0.1240% | 0.65% | 2.27% | 8.33% | 18.48% | 0 |
| Black Rockfish (OR-CA) | 1.79% | 0.0008% | 0.0192% | 0.07% | 0.44% | 3.82% | 19.57% | 12 |
| **Minor Rockfish North** | 0.37% | 0.0000% | 0.0063% | 0.06% | 0.32% | 1.04% | 2.25% | 116 |
| **Nearshore Species** | 1.92% | 0.0066% | 0.0808% | 0.15% | 1.45% | 5.11% | 9.00% | 2 |
| **Shelf Species** | 0.37% | 0.0000% | 0.0050% | 0.02% | 0.18% | 1.08% | 2.42% | 101 |
| BOCACCIO: N. of Monterrey | 0.52% | 0.0000% | 0.0142% | 0.06% | 0.51% | 1.09% | 5.69% | 19 |
| Chilipepper Rockfish: Eureka | 0.84% | 0.0000% | 0.0007% | 0.00% | 0.31% | 1.13% | 5.06% | 13 |
| Redstripe Rockfish | 0.51% | 0.0000% | 0.0069% | 0.06% | 0.45% | 1.33% | 5.79% | 13 |
| Silvergrey Rockfish | 0.61% | 0.0000% | 0.0129% | 0.11% | 0.52% | 1.55% | 4.95% | 17 |
| Other Northern Shelf Rockfish | 0.37% | 0.0000% | 0.0082% | 0.04% | 0.28% | 1.06% | 2.82% | 95 |
| **Slope Species** | 0.46% | 0.0000% | 0.0097% | 0.10% | 0.48% | 1.28% | 2.56% | 108 |
| Bank Rockfish | 0.68% | 0.0001% | 0.0018% | 0.01% | 0.10% | 0.99% | 9.80% | 13 |
| Sharpchin Rockfish, north | 0.47% | 0.0000% | 0.0092% | 0.06% | 0.35% | 1.09% | 4.40% | 43 |
| Splitnose Rockfish: N. of Monterrey | 0.48% | 0.0000% | 0.0130% | 0.11% | 0.51% | 1.25% | 4.76% | 79 |
| Yellowmouth Rockfish | 0.60% | 0.0000% | 0.0039% | 0.08% | 0.43% | 1.35% | 8.61% | 41 |
| Other Northern Slope Rockfish | 0.50% | 0.0000% | 0.0110% | 0.09% | 0.50% | 1.18% | 3.09% | 106 |
| **Minor Rockfish South** | 0.83% | 0.0000% | 0.0081% | 0.10% | 0.77% | 2.56% | 8.95% | 33 |
| **Nearshore Species** | 4.00% | 0.0003% | 0.0174% | 0.10% | 0.30% | 5.45% | 19.55% | 1 |
| **Shelf Species** | 0.92% | 0.0000% | 0.0053% | 0.10% | 0.50% | 1.68% | 10.60% | 19 |
| Redstripe Rockfish | 4.35% | 0.0016% | 0.2995% | 1.57% | 2.68% | 9.19% | 16.04% | 0 |
| Yellowtail Rockfish | 1.47% | 0.0001% | 0.0206% | 0.21% | 0.65% | 3.49% | 15.55% | 3 |
| Other Southern Shelf Rockfish | 0.92% | 0.0000% | 0.0106% | 0.07% | 0.65% | 1.60% | 10.41% | 19 |
| **Slope Species** | 0.91% | 0.0000% | 0.0094% | 0.05% | 0.92% | 2.50% | 10.32% | 29 |
| Bank Rockfish | 1.30% | 0.0000% | 0.0198% | 0.10% | 0.82% | 3.20% | 10.50% | 22 |
| Blackgill Rockfish | 1.32% | 0.0000% | 0.0284% | 0.19% | 0.72% | 2.49% | 14.96% | 27 |
| Sharpchin Rockfish | 1.69% | 0.0000% | 0.0237% | 0.20% | 1.29% | 4.60% | 14.34% | 0 |
| Yellowmouth Rockfish | 7.14% | 0.0142% | 0.0497% | 1.53% | 4.14% | 14.56% | 24.90% | 0 |
| Other Southern Slope Rockfish | 0.93% | 0.0001% | 0.0180% | 0.11% | 0.74% | 2.43% | 11.34% | 29 |
| California scorpionfish | 50.00% | 2.8043% | 26.4022% | 50.00% | 59.93% | 65.88% | 69.85% | 0 |
| Cabezon (off CA only) | 50.00% | 38.7755% | 44.3878% | 50.00% | 55.61% | 58.98% | 61.22% | 0 |
| Dover sole (total) | 0.40% | 0.0000% | 0.0369% | 0.32% | 0.59% | 0.80% | 1.29% | 129 |
| Dover Sole (Summer) | 0.41% | 0.0000% | 0.0634% | 0.33% | 0.61% | 0.71% | 1.31% | 125 |
| Dover Sole (Winter) | 0.46% | 0.0000% | 0.0865% | 0.37% | 0.70% | 0.89% | 1.40% | 105 |
| English Sole | 0.42% | 0.0000% | 0.0345% | 0.14% | 0.36% | 1.05% | 3.46% | 111 |
| Petrale Sole (coastwide) | 0.40% | 0.0000% | 0.0360% | 0.17% | 0.51% | 1.01% | 2.41% | 117 |
| N of 40°10' (summer) | 0.55% | 0.0000% | 0.0088% | 0.14% | 0.52% | 1.32% | 5.18% | 83 |
| N of 40°10' (winter) | 0.57% | 0.0000% | 0.0222% | 0.16% | 0.65% | 1.61% | 4.03% | 71 |
| S of 40°10' (summer) | 1.08% | 0.0000% | 0.0017% | 0.20% | 0.90% | 2.43% | 10.72% | 26 |
| S of 40°10' (winter) | 1.16% | 0.0000% | 0.0047% | 0.29% | 1.31% | 3.09% | 6.93% | 26 |
| Arrowtooth Flounder (total) | 0.50% | 0.0000% | 0.0019% | 0.03% | 0.28% | 0.79% | 7.49% | 114 |
| Arrowtooth Flounder (summer) | 0.52% | 0.0000% | 0.0026% | 0.03% | 0.19% | 0.75% | 6.56% | 109 |
| Arrowtooth Flounder (winter) | 0.75% | 0.0001% | 0.0294% | 0.20% | 0.66% | 1.52% | 5.06% | 71 |
| Starry Flounder | 2.04% | 0.0009% | 0.0256% | 0.15% | 1.72% | 4.27% | 14.18% | 20 |
| Other Flatfish | 0.40% | 0.0000% | 0.0230% | 0.12% | 0.34% | 0.77% | 3.50% | 131 |
| Kelp Greenling | 8.33% | 0.1128% | 1.0904% | 3.05% | 7.28% | 13.80% | 49.99% | 0 |
| Spiny Dogfish | 1.25% | 0.0001% | 0.0013% | 0.03% | 0.12% | 1.76% | 22.95% | 28 |
| Other Fish | 0.60% | 0.0001% | 0.0033% | 0.04% | 0.67% | 1.63% | 4.11% | 36 |
| Nearshore spp | 0.37% | 0.0000% | 0.0196% | 0.12% | 0.40% | 0.65% | 3.07% | 115 |
| Shelf spp | 0.33% | 0.0000% | 0.0283% | 0.21% | 0.43% | 0.73% | 2.13% | 151 |
| Slope spp | 0.33% | 0.0000% | 0.0221% | 0.17% | 0.55% | 0.85% | 1.51% | 147 |
| DTS spp | 0.36% | 0.0000% | 0.0139% | 0.22% | 0.61% | 0.71% | 1.05% | 146 |
| | | | | | | | | 151 |

**Table 16. At-sea whiting catcher vessel harvest concentration statistics and permit count, 1994 - 2005, average. (Page 1 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 28.70% | 16.011% | 20.49% | 25.17% | 34.41% | 41.93% | 47.81% | 6 |
| N. of 42° (OR & WA) | 28.70% | 16.011% | 20.49% | 25.17% | 34.41% | 41.93% | 47.81% | 6 |
| S. of 42° (CA) | - | - | - | - | - | - | - | 0 |
| Pacific Cod | 73.81% | 68.715% | 70.98% | 73.95% | 76.60% | 77.89% | 78.77% | 1 |
| Pacific Whiting (Coastwide) | 5.71% | 2.283% | 4.23% | 5.23% | 6.10% | 7.88% | 14.05% | 20 |
| Sablefish (Coastwide) | 11.41% | 1.287% | 3.42% | 7.01% | 11.14% | 26.12% | 41.11% | 9 |
| N. of 36° (Monterey north) | 11.41% | 1.287% | 3.42% | 7.01% | 11.14% | 26.12% | 41.11% | 9 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 9.19% | 0.816% | 1.69% | 3.94% | 8.58% | 21.12% | 46.53% | 13 |
| Shortbelly Rockfish | 30.53% | 18.657% | 20.49% | 23.93% | 32.49% | 45.08% | 66.24% | 5 |
| **WIDOW ROCKFISH** | 5.91% | 0.534% | 1.66% | 3.75% | 7.45% | 12.77% | 24.31% | 19 |
| **CANARY ROCKFISH** | 9.94% | 1.701% | 3.50% | 6.47% | 10.58% | 19.88% | 37.49% | 11 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | 0 |
| **BOCACCIO** | - | - | - | - | - | - | - | 0 |
| Splitnose Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | 6.90% | 0.341% | 1.57% | 3.29% | 6.47% | 16.74% | 30.58% | 18 |
| Shortspine Thornyhead - coastwide | 27.44% | 15.624% | 17.16% | 21.52% | 28.47% | 43.63% | 61.04% | 5 |
| N. of 34°27' | 27.44% | 15.624% | 17.16% | 21.52% | 28.47% | 43.63% | 61.04% | 5 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | - | - | - | - | - | - | - | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 8.23% | 0.301% | 1.22% | 3.96% | 7.68% | 19.07% | 42.23% | 14 |
| **YELLOWEYE** | 73.33% | 67.470% | 70.21% | 73.23% | 77.29% | 78.00% | 78.47% | 1 |
| Black Rockfish - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | 0 |
| Black Rockfish (OR-CA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **Minor Rockfish North** | 6.68% | 0.305% | 1.14% | 2.46% | 6.87% | 15.46% | 39.60% | 16 |
| **Nearshore Species** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **Shelf Species** | 7.77% | 0.183% | 0.88% | 2.22% | 6.46% | 16.66% | 52.17% | 14 |
| BOCACCIO: N. of Monterey | 19.12% | 4.972% | 10.17% | 14.84% | 24.24% | 36.18% | 44.40% | 6 |
| Chilipepper Rockfish: Eureka | 46.00% | 40.119% | 40.52% | 42.11% | 46.94% | 54.17% | 68.82% | 5 |
| Redstripe Rockfish | 21.25% | 10.070% | 11.48% | 14.16% | 21.78% | 36.20% | 64.59% | 8 |
| Silvergrey Rockfish | 49.78% | 41.884% | 43.98% | 46.66% | 49.97% | 59.21% | 69.72% | 3 |
| Other Northern Shelf Rockfish | 25.73% | 12.895% | 17.05% | 20.71% | 29.82% | 42.49% | 51.38% | 6 |
| **Slope Species** | 8.06% | 0.094% | 0.71% | 2.11% | 9.35% | 18.89% | 47.75% | 13 |
| Bank Rockfish | 55.00% | 44.213% | 48.18% | 53.03% | 57.05% | 66.34% | 72.53% | 1 |
| Sharpchin Rockfish, north | 54.09% | 32.153% | 41.67% | 52.71% | 64.17% | 74.12% | 80.41% | 2 |
| Splitnose Rockfish: N. of Monterey | 11.09% | 0.153% | 0.60% | 2.48% | 11.72% | 30.66% | 54.40% | 9 |
| Yellowmouth Rockfish | 73.81% | 67.872% | 69.96% | 72.30% | 75.67% | 80.42% | 84.42% | 1 |
| Other Northern Slope Rockfish | 20.15% | 8.675% | 10.01% | 11.95% | 23.87% | 37.76% | 55.09% | 8 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 60.85% | 50.368% | 55.14% | 59.14% | 65.53% | 70.41% | 73.74% | 2 |
| Dover Sole (Summer) | 64.29% | 54.372% | 59.12% | 62.99% | 68.61% | 73.17% | 76.29% | 2 |
| Dover Sole (Winter) | 33.33% | 18.333% | 23.33% | 28.33% | 40.83% | 48.33% | 53.33% | 0 |
| English Sole | 42.22% | 30.341% | 34.09% | 38.95% | 46.74% | 55.34% | 63.23% | 4 |
| Petrale Sole (coastwide) | 50.00% | 30.769% | 40.38% | 50.00% | 59.62% | 65.38% | 69.23% | 0 |
| N of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| N of 40°10' (winter) | 50.00% | 30.769% | 40.38% | 50.00% | 59.62% | 65.38% | 69.23% | 0 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 14.16% | 2.161% | 5.46% | 9.14% | 16.55% | 29.21% | 46.92% | 10 |
| Arrowtooth Flounder (summer) | 18.65% | 6.281% | 10.17% | 14.28% | 22.42% | 34.31% | 44.95% | 9 |
| Arrowtooth Flounder (winter) | 42.26% | 33.560% | 35.02% | 36.28% | 38.57% | 53.50% | 82.76% | 1 |
| Starry Flounder | - | - | - | - | - | - | - | 0 |
| Other Flatfish | 16.78% | 1.934% | 3.57% | 7.73% | 16.74% | 38.51% | 61.48% | 7 |
| Kelp Greenling | - | - | - | - | - | - | - | 0 |
| Spiny Dogfish | 6.15% | 0.873% | 2.18% | 3.69% | 6.65% | 12.04% | 29.13% | 18 |
| Other Fish | 57.58% | 51.584% | 53.38% | 56.34% | 60.42% | 64.11% | 66.63% | 3 |
| Nearshore spp | 27.86% | 15.650% | 19.89% | 25.26% | 33.48% | 40.78% | 46.45% | 6 |
| Shelf spp | 5.81% | 0.481% | 2.18% | 3.79% | 8.16% | 12.55% | 20.00% | 19 |
| Slope spp | 5.78% | 0.519% | 1.85% | 3.41% | 6.92% | 12.22% | 25.59% | 19 |
| DTS spp | 9.78% | 0.759% | 2.47% | 5.51% | 9.83% | 22.61% | 40.66% | 11 |
| | | | | | | | | 20 |

**Table 16. At-sea whiting catcher vessel harvest concentration statistics and permit count, 1994 - 2005, maximum. (Page 2 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 15 |
| N. of 42° (OR & WA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 15 |
| S. of 42° (CA) | - | - | - | - | - | - | - | 0 |
| Pacific Cod | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Pacific Whiting (Coastwide) | 10.00% | 5.880% | 7.78% | 8.35% | 10.09% | 16.42% | 28.87% | 27 |
| Sablefish (Coastwide) | 16.67% | 5.383% | 10.77% | 15.10% | 19.61% | 48.98% | 94.96% | 13 |
| N. of 36° (Monterey north) | 16.67% | 5.383% | 10.77% | 15.10% | 19.61% | 48.98% | 94.96% | 13 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 20.00% | 3.717% | 6.14% | 10.20% | 15.85% | 49.30% | 75.77% | 22 |
| Shortbelly Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 12 |
| **WIDOW ROCKFISH** | 10.00% | 1.236% | 4.38% | 10.43% | 13.57% | 26.58% | 54.80% | 27 |
| **CANARY ROCKFISH** | 20.00% | 12.415% | 17.73% | 18.41% | 24.89% | 33.34% | 96.41% | 16 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | 0 |
| **BOCACCIO** | - | - | - | - | - | - | - | 0 |
| Splitnose Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | 20.00% | 1.165% | 4.00% | 5.64% | 13.01% | 53.04% | 79.73% | 27 |
| Shortspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 12 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 12 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | - | - | - | - | - | - | - | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 16.67% | 1.533% | 5.40% | 11.49% | 17.53% | 35.63% | 83.39% | 23 |
| **YELLOWEYE** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 5 |
| Black Rockfish - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | 0 |
| Black Rockfish (OR-CA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| **Minor Rockfish North** | 10.00% | 1.978% | 4.35% | 7.57% | 13.91% | 26.65% | 79.86% | 24 |
| **Nearshore Species** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| **Shelf Species** | 10.00% | 0.604% | 2.59% | 7.91% | 14.14% | 27.91% | 78.62% | 23 |
| BOCACCIO: N. of Monterrey | 33.33% | 15.534% | 27.22% | 38.91% | 48.47% | 62.37% | 82.48% | 13 |
| Chilipepper Rockfish: Eureka | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 11 |
| Redstripe Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 18 |
| Silvergrey Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| Other Northern Shelf Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 11 |
| **Slope Species** | 11.11% | 0.369% | 2.81% | 6.14% | 18.21% | 38.92% | 88.43% | 19 |
| Bank Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 5 |
| Sharpchin Rockfish, north | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Splitnose Rockfish: N. of Monterrey | 16.67% | 0.433% | 1.09% | 6.13% | 27.81% | 49.11% | 90.07% | 15 |
| Yellowmouth Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Other Northern Slope Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 13 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 7 |
| Dover Sole (Summer) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 7 |
| Dover Sole (Winter) | 33.33% | 18.333% | 23.33% | 28.33% | 40.83% | 48.33% | 53.33% | 3 |
| English Sole | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 8 |
| Petrale Sole (coastwide) | 50.00% | 30.769% | 40.38% | 50.00% | 59.62% | 65.38% | 69.23% | 2 |
| N of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| N of 40°10' (winter) | 50.00% | 30.769% | 40.38% | 50.00% | 59.62% | 65.38% | 69.23% | 2 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 50.00% | 13.793% | 31.90% | 50.00% | 68.10% | 78.97% | 96.72% | 17 |
| Arrowtooth Flounder (summer) | 50.00% | 44.674% | 47.34% | 50.00% | 68.10% | 78.97% | 86.21% | 17 |
| Arrowtooth Flounder (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 8 |
| Starry Flounder | - | - | - | - | - | - | - | 0 |
| Other Flatfish | 33.33% | 7.774% | 9.36% | 18.38% | 46.11% | 67.21% | 88.90% | 11 |
| Kelp Greenling | - | - | - | - | - | - | - | 0 |
| Spiny Dogfish | 10.00% | 4.824% | 6.96% | 7.88% | 11.69% | 25.49% | 68.86% | 26 |
| Other Fish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 11 |
| Nearshore spp | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 15 |
| Shelf spp | 10.00% | 2.379% | 5.07% | 7.79% | 13.88% | 29.09% | 32.96% | 27 |
| Slope spp | 10.00% | 1.753% | 4.33% | 8.09% | 12.15% | 34.48% | 53.87% | 27 |
| DTS spp | 14.29% | 5.383% | 8.43% | 11.73% | 14.23% | 38.07% | 89.98% | 16 |
| | | | | | | | | 27 |

**Table 16. At-sea whiting catcher vessel harvest concentration statistics and permit count, 1994 - 2005, minimum. (Page 3 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 6.67% | 0.337% | 2.35% | 4.50% | 9.89% | 13.72% | 20.76% | 1 |
| N. of 42° (OR & WA) | 6.67% | 0.337% | 2.35% | 4.50% | 9.89% | 13.72% | 20.76% | 1 |
| S. of 42° (CA) | - | - | - | - | - | - | - | 0 |
| Pacific Cod | 16.67% | 5.740% | 9.26% | 17.66% | 23.80% | 25.41% | 26.63% | 0 |
| Pacific Whiting (Coastwide) | 3.70% | 0.028% | 2.63% | 3.48% | 4.28% | 4.61% | 7.54% | 10 |
| Sablefish (Coastwide) | 7.69% | 0.081% | 0.15% | 0.51% | 1.52% | 15.67% | 18.87% | 6 |
| N. of 36° (Monterey north) | 7.69% | 0.081% | 0.15% | 0.51% | 1.52% | 15.67% | 18.87% | 6 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 4.55% | 0.020% | 0.08% | 0.29% | 3.93% | 6.76% | 25.58% | 5 |
| Shortbelly Rockfish | 8.33% | 0.008% | 0.03% | 0.11% | 0.34% | 0.93% | 27.30% | 0 |
| **WIDOW ROCKFISH** | 3.70% | 0.138% | 0.69% | 1.70% | 4.67% | 6.38% | 14.87% | 10 |
| **CANARY ROCKFISH** | 6.25% | 0.105% | 0.28% | 0.50% | 0.75% | 8.66% | 12.77% | 5 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | 0 |
| **BOCACCIO** | - | - | - | - | - | - | - | 0 |
| Splitnose Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | 3.70% | 0.003% | 0.21% | 1.05% | 2.20% | 6.83% | 10.35% | 5 |
| Shortspine Thornyhead - coastwide | 8.33% | 0.025% | 0.84% | 2.39% | 6.17% | 16.83% | 34.74% | 0 |
| N. of 34°27' | 8.33% | 0.025% | 0.84% | 2.39% | 6.17% | 16.83% | 34.74% | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | - | - | - | - | - | - | - | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 4.35% | 0.044% | 0.27% | 0.71% | 1.55% | 12.87% | 19.87% | 6 |
| **YELLOWEYE** | 20.00% | 2.411% | 10.63% | 19.69% | 31.86% | 33.99% | 35.41% | 0 |
| Black Rockfish - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | 0 |
| Black Rockfish (OR-CA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **Minor Rockfish North** | 4.17% | 0.008% | 0.13% | 0.38% | 0.75% | 7.18% | 21.14% | 10 |
| **Nearshore Species** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| **Shelf Species** | 4.35% | 0.023% | 0.11% | 0.15% | 1.76% | 6.67% | 28.79% | 10 |
| BOCACCIO: N. of Monterrey | 7.69% | 0.463% | 1.26% | 1.55% | 2.16% | 20.33% | 22.71% | 0 |
| Chilipepper Rockfish: Eureka | 9.09% | 0.019% | 0.25% | 1.71% | 3.38% | 8.62% | 26.28% | 0 |
| Redstripe Rockfish | 5.56% | 0.008% | 0.02% | 0.03% | 1.17% | 6.63% | 36.62% | 1 |
| Silvergrey Rockfish | 11.11% | 1.181% | 1.41% | 2.85% | 6.09% | 22.20% | 37.92% | 0 |
| Other Northern Shelf Rockfish | 9.09% | 0.007% | 0.02% | 0.10% | 9.83% | 19.24% | 26.99% | 1 |
| **Slope Species** | 5.26% | 0.009% | 0.04% | 0.09% | 0.34% | 6.94% | 20.02% | 9 |
| Bank Rockfish | 20.00% | 5.051% | 6.82% | 12.11% | 14.09% | 42.79% | 61.93% | 0 |
| Sharpchin Rockfish, north | 16.67% | 0.606% | 3.46% | 6.61% | 8.54% | 36.70% | 37.69% | 0 |
| Splitnose Rockfish: N. of Monterrey | 6.67% | 0.007% | 0.02% | 0.06% | 4.53% | 11.91% | 28.58% | 0 |
| Yellowmouth Rockfish | 16.67% | 2.593% | 3.45% | 6.07% | 15.96% | 40.92% | 53.36% | 0 |
| Other Northern Slope Rockfish | 7.69% | 0.027% | 0.13% | 0.55% | 5.25% | 11.31% | 25.24% | 1 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 14.29% | 1.786% | 6.76% | 11.00% | 22.18% | 24.90% | 27.31% | 0 |
| Dover Sole (Summer) | 14.29% | 1.786% | 6.76% | 11.00% | 22.18% | 24.90% | 27.31% | 0 |
| Dover Sole (Winter) | 33.33% | 18.333% | 23.33% | 28.33% | 40.83% | 48.33% | 53.33% | 0 |
| English Sole | 12.50% | 0.266% | 1.95% | 3.47% | 14.19% | 23.31% | 31.07% | 1 |
| Petrale Sole (coastwide) | 50.00% | 30.769% | 40.38% | 50.00% | 59.62% | 65.38% | 69.23% | 0 |
| N of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| N of 40°10' (winter) | 50.00% | 30.769% | 40.38% | 50.00% | 59.62% | 65.38% | 69.23% | 0 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 5.88% | 0.099% | 0.23% | 0.28% | 0.66% | 10.96% | 19.39% | 2 |
| Arrowtooth Flounder (summer) | 5.88% | 0.139% | 1.61% | 2.60% | 6.61% | 10.96% | 20.05% | 2 |
| Arrowtooth Flounder (winter) | 12.50% | 0.100% | 0.17% | 0.25% | 0.52% | 30.14% | 50.70% | 0 |
| Starry Flounder | - | - | - | - | - | - | - | 0 |
| Other Flatfish | 9.09% | 0.033% | 0.23% | 1.23% | 2.42% | 20.69% | 32.12% | 3 |
| Kelp Greenling | - | - | - | - | - | - | - | 0 |
| Spiny Dogfish | 3.85% | 0.002% | 0.06% | 0.12% | 0.27% | 1.02% | 13.90% | 10 |
| Other Fish | 9.09% | 1.553% | 3.42% | 6.87% | 11.76% | 19.62% | 23.90% | 0 |
| Nearshore spp | 6.67% | 0.336% | 2.32% | 4.49% | 9.87% | 13.70% | 20.73% | 1 |
| Shelf spp | 3.70% | 0.003% | 0.22% | 1.35% | 5.20% | 7.15% | 12.12% | 10 |
| Slope spp | 3.70% | 0.136% | 0.54% | 2.11% | 4.46% | 6.53% | 16.54% | 10 |
| DTS spp | 6.25% | 0.022% | 0.17% | 0.53% | 1.54% | 14.49% | 18.87% | 7 |
| | | | | | | | | 10 |

**Table A17. Catcher-processor harvest concentration statistics and permit count, 1994 - 2005, average. (Page 1 of 3)**

| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 45.76% | 29.936% | 35.10% | 41.01% | 52.66% | 62.12% | 68.53% | 3 |
| N. of 42° (OR & WA) | 45.76% | 29.936% | 35.10% | 41.01% | 52.66% | 62.12% | 68.53% | 3 |
| S. of 42° (CA) | - | - | - | - | - | - | - | 0 |
| Pacific Cod | 60.00% | 46.541% | 48.97% | 51.41% | 66.73% | 75.92% | 82.05% | 1 |
| Pacific Whiting (Coastwide) | 14.31% | 5.945% | 9.27% | 11.17% | 14.83% | 24.16% | 33.06% | 7 |
| Sablefish (Coastwide) | 19.12% | 0.994% | 2.73% | 6.14% | 15.14% | 48.46% | 77.42% | 6 |
| N. of 36° (Monterey north) | 19.12% | 0.994% | 2.73% | 6.14% | 15.14% | 48.46% | 77.42% | 6 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 15.14% | 1.488% | 2.90% | 6.93% | 17.49% | 36.49% | 54.94% | 7 |
| Shortbelly Rockfish | 30.69% | 3.998% | 12.35% | 20.22% | 39.57% | 61.55% | 76.71% | 4 |
| **WIDOW ROCKFISH** | 14.31% | 1.151% | 5.52% | 10.00% | 15.47% | 30.30% | 42.98% | 7 |
| **CANARY ROCKFISH** | 20.43% | 5.490% | 8.92% | 15.85% | 24.82% | 38.23% | 52.56% | 6 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | 0 |
| **BOCACCIO** | - | - | - | - | - | - | - | 0 |
| Splitnose Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | 17.49% | 2.072% | 6.21% | 12.04% | 19.73% | 36.92% | 52.94% | 7 |
| Shortspine Thornyhead - coastwide | 29.14% | 10.250% | 12.86% | 16.22% | 30.54% | 55.77% | 77.64% | 5 |
| N. of 34°27' | 29.14% | 10.250% | 12.86% | 16.22% | 30.54% | 55.77% | 77.64% | 5 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | - | - | - | - | - | - | - | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 16.14% | 0.525% | 2.98% | 7.61% | 19.81% | 37.99% | 58.98% | 7 |
| **YELLOWEYE** | 92.86% | 87.306% | 90.08% | 92.86% | 95.63% | 97.30% | 98.41% | 1 |
| Black Rockfish - coastwide | 75.00% | 59.163% | 67.08% | 75.00% | 82.92% | 87.67% | 90.84% | 0 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | 0 |
| Black Rockfish (OR-CA) | 75.00% | 59.163% | 67.08% | 75.00% | 82.92% | 87.67% | 90.84% | 0 |
| **Minor Rockfish North** | 14.88% | 1.541% | 2.72% | 5.61% | 15.54% | 37.13% | 56.01% | 7 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | 17.43% | 1.535% | 3.02% | 7.38% | 25.24% | 41.62% | 52.71% | 6 |
| BOCACCIO: N. of Monterrey | 48.47% | 31.927% | 40.01% | 48.07% | 55.16% | 62.61% | 68.11% | 3 |
| Chilipepper Rockfish: Eureka | 34.07% | 3.497% | 11.52% | 21.15% | 47.36% | 69.24% | 83.82% | 3 |
| Redstripe Rockfish | 27.08% | 2.370% | 9.75% | 18.03% | 38.71% | 55.13% | 65.92% | 4 |
| Silvergrey Rockfish | 48.48% | 34.239% | 38.14% | 43.33% | 53.69% | 65.28% | 73.00% | 3 |
| Other Northern Shelf Rockfish | 36.94% | 13.696% | 19.82% | 27.32% | 45.72% | 63.50% | 75.35% | 3 |
| **Slope Species** | 15.26% | 1.560% | 2.82% | 5.25% | 13.94% | 37.94% | 62.27% | 7 |
| Bank Rockfish | 52.08% | 29.638% | 37.35% | 48.21% | 63.77% | 73.89% | 80.63% | 1 |
| Sharpchin Rockfish, north | 64.17% | 54.282% | 57.27% | 60.23% | 66.60% | 76.33% | 83.70% | 2 |
| Splitnose Rockfish: N. of Monterrey | 20.02% | 2.286% | 3.97% | 7.19% | 18.14% | 47.74% | 78.38% | 6 |
| Yellowmouth Rockfish | 57.50% | 39.983% | 44.97% | 49.66% | 65.28% | 76.82% | 84.50% | 2 |
| Other Northern Slope Rockfish | 17.00% | 1.265% | 5.21% | 9.64% | 22.91% | 37.45% | 53.21% | 6 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 40.67% | 13.272% | 24.63% | 36.85% | 49.29% | 67.27% | 80.60% | 3 |
| Dover Sole (Summer) | 45.67% | 20.296% | 30.89% | 42.74% | 53.19% | 70.02% | 82.58% | 2 |
| Dover Sole (Winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| English Sole | 52.00% | 37.649% | 42.19% | 48.64% | 56.61% | 68.16% | 76.37% | 2 |
| Petrale Sole (coastwide) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N of 40°10' (summer) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N of 40°10' (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 19.82% | 2.783% | 4.71% | 9.64% | 23.04% | 44.22% | 63.52% | 5 |
| Arrowtooth Flounder (summer) | 23.08% | 5.908% | 8.09% | 13.49% | 26.24% | 46.87% | 65.71% | 5 |
| Arrowtooth Flounder (winter) | 73.33% | 61.623% | 67.28% | 72.02% | 79.76% | 84.00% | 86.29% | 1 |
| Starry Flounder | - | - | - | - | - | - | - | 0 |
| Other Flatfish | 20.92% | 3.836% | 6.20% | 8.86% | 19.82% | 46.57% | 70.97% | 5 |
| Kelp Greenling | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Spiny Dogfish | 14.58% | 1.390% | 2.86% | 6.28% | 17.61% | 35.50% | 51.27% | 7 |
| Other Fish | 47.59% | 34.787% | 39.09% | 42.31% | 54.09% | 60.92% | 65.72% | 2 |
| Nearshore spp | 41.21% | 24.219% | 29.58% | 35.33% | 47.56% | 59.82% | 68.71% | 3 |
| Shelf spp | 14.31% | 1.725% | 3.81% | 8.76% | 16.45% | 33.33% | 45.02% | 7 |
| Slope spp | 14.31% | 2.165% | 5.33% | 8.86% | 15.15% | 30.05% | 45.86% | 7 |
| DTS spp | 16.71% | 0.228% | 1.23% | 4.03% | 14.37% | 44.44% | 72.30% | 6 |
| | | | | | | | | 7 |

**Table 17. Catcher-processor harvest concentration statistics and permit count, 1994 - 2005, maximum. (Page 2 of 3)**

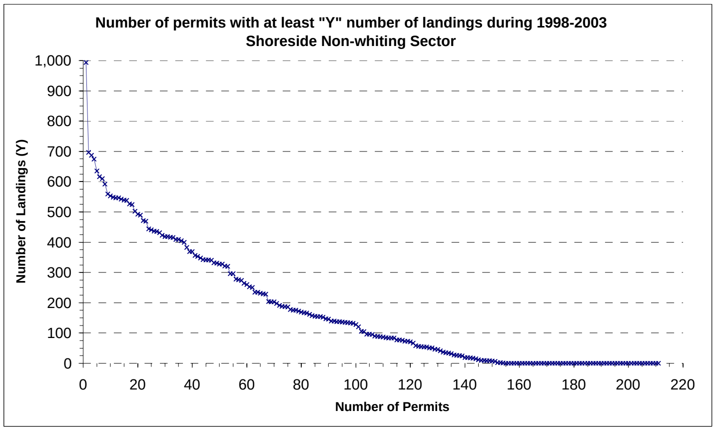
| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| N. of 42° (OR & WA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| S. of 42° (CA) | - | - | - | - | - | - | - | 0 |
| Pacific Cod | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 3 |
| Pacific Whiting (Coastwide) | 20.00% | 9.978% | 10.47% | 15.16% | 24.01% | 37.28% | 49.50% | 10 |
| Sablefish (Coastwide) | 33.33% | 9.225% | 24.02% | 38.82% | 45.39% | 63.63% | 97.90% | 8 |
| N. of 36° (Monterey north) | 33.33% | 9.225% | 24.02% | 38.82% | 45.39% | 63.63% | 97.90% | 8 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 20.00% | 6.185% | 10.72% | 19.52% | 30.24% | 49.87% | 84.94% | 9 |
| Shortbelly Rockfish | 50.00% | 17.735% | 33.87% | 50.00% | 74.94% | 89.90% | 99.88% | 7 |
| **WIDOW ROCKFISH** | 20.00% | 2.752% | 12.42% | 18.96% | 23.52% | 53.72% | 89.96% | 10 |
| **CANARY ROCKFISH** | 50.00% | 21.832% | 35.92% | 50.00% | 64.08% | 72.53% | 92.94% | 8 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | 0 |
| **BOCACCIO** | - | - | - | - | - | - | - | 0 |
| Splitnose Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | 50.00% | 6.848% | 25.46% | 50.00% | 74.54% | 89.27% | 99.09% | 10 |
| Shortspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 9 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | - | - | - | - | - | - | - | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 25.00% | 2.547% | 10.49% | 15.20% | 39.04% | 57.68% | 94.15% | 10 |
| **YELLOWEYE** | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| Black Rockfish - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | 0 |
| Black Rockfish (OR-CA) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 2 |
| **Minor Rockfish North** | 20.00% | 8.110% | 9.65% | 13.84% | 35.58% | 51.16% | 89.13% | 10 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | 25.00% | 5.084% | 9.18% | 14.15% | 40.78% | 65.37% | 92.10% | 8 |
| BOCACCIO: N. of Monterrey | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Chilipepper Rockfish: Eureka | 50.00% | 18.966% | 34.48% | 50.00% | 74.12% | 88.59% | 98.75% | 5 |
| Redstripe Rockfish | 50.00% | 9.765% | 25.15% | 50.00% | 74.85% | 89.77% | 99.71% | 6 |
| Silvergrey Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 4 |
| Other Northern Shelf Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 5 |
| **Slope Species** | 20.00% | 9.125% | 10.07% | 13.97% | 26.39% | 53.72% | 89.82% | 10 |
| Bank Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 4 |
| Sharpchin Rockfish, north | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Splitnose Rockfish: N. of Monterrey | 50.00% | 25.490% | 37.75% | 50.00% | 62.25% | 78.75% | 98.99% | 8 |
| Yellowmouth Rockfish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 4 |
| Other Northern Slope Rockfish | 33.33% | 4.049% | 21.25% | 39.96% | 48.73% | 53.99% | 84.02% | 10 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 50.00% | 38.078% | 44.04% | 50.00% | 74.84% | 89.74% | 99.67% | 6 |
| Dover Sole (Summer) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Dover Sole (Winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| English Sole | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Petrale Sole (coastwide) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| N of 40°10' (summer) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| N of 40°10' (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 33.33% | 12.365% | 16.42% | 25.70% | 47.21% | 70.50% | 97.01% | 7 |
| Arrowtooth Flounder (summer) | 50.00% | 38.743% | 44.37% | 50.00% | 55.63% | 70.50% | 97.01% | 7 |
| Arrowtooth Flounder (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Starry Flounder | - | - | - | - | - | - | - | 0 |
| Other Flatfish | 33.33% | 23.109% | 27.08% | 35.83% | 49.31% | 76.64% | 98.59% | 8 |
| Kelp Greenling | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 1 |
| Spiny Dogfish | 20.00% | 7.434% | 10.87% | 17.66% | 25.77% | 58.04% | 93.20% | 10 |
| Other Fish | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Nearshore spp | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 6 |
| Shelf spp | 20.00% | 4.654% | 7.37% | 14.88% | 26.28% | 46.08% | 76.95% | 10 |
| Slope spp | 20.00% | 8.436% | 10.76% | 15.68% | 24.62% | 53.59% | 83.57% | 10 |
| DTS spp | 25.00% | 1.078% | 4.18% | 9.87% | 30.42% | 63.76% | 94.49% | 9 |
| | | | | | | | | 10 |

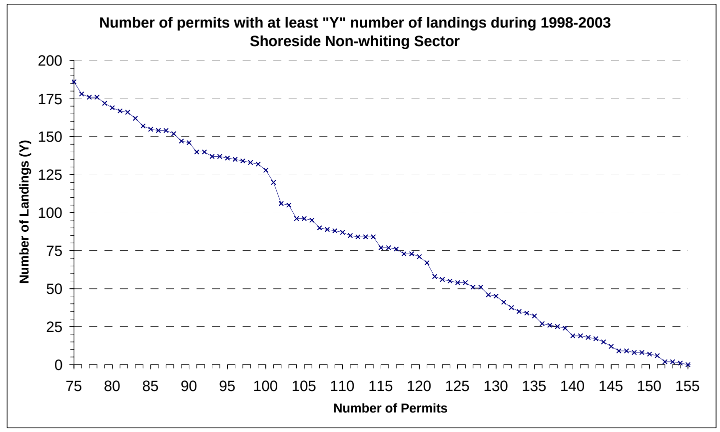
**Table 17. Catcher-processor harvest concentration statistics and permit count, 1994 - 2005, minimum. (Page 3 of 3)**

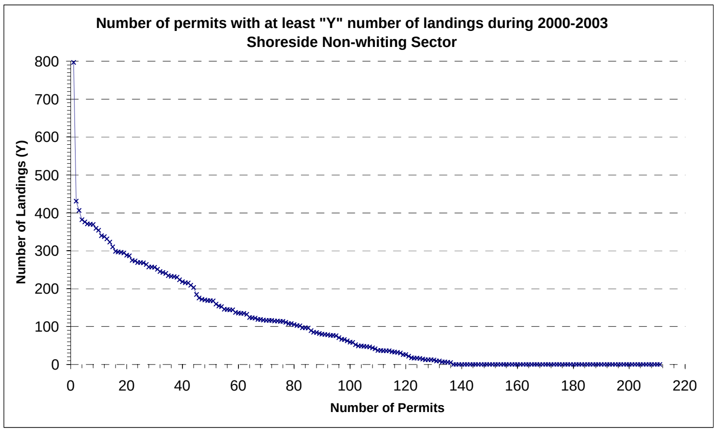
| Species Group | AVG | MIN | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile | MAX | Count |
|---|---|---|---|---|---|---|---|---|
| Lingcod - coastwide | 16.67% | 1.701% | 1.72% | 1.75% | 17.12% | 25.81% | 28.52% | 0 |
| N. of 42° (OR & WA) | 16.67% | 1.701% | 1.72% | 1.75% | 17.12% | 25.81% | 28.52% | 0 |
| S. of 42° (CA) | - | - | - | - | - | - | - | 0 |
| Pacific Cod | 33.33% | 0.472% | 3.78% | 7.08% | 38.92% | 40.79% | 42.03% | 0 |
| Pacific Whiting (Coastwide) | 10.00% | 0.664% | 7.03% | 9.43% | 10.84% | 11.21% | 12.18% | 5 |
| Sablefish (Coastwide) | 12.50% | 0.011% | 0.09% | 0.29% | 0.69% | 25.79% | 27.30% | 3 |
| N. of 36° (Monterey north) | 12.50% | 0.011% | 0.09% | 0.29% | 0.69% | 25.79% | 27.30% | 3 |
| S. of 36° (Conception area) | - | - | - | - | - | - | - | 0 |
| **PACIFIC OCEAN PERCH** | 11.11% | 0.005% | 0.03% | 0.12% | 6.55% | 22.60% | 24.54% | 5 |
| Shortbelly Rockfish | 14.29% | 0.015% | 0.10% | 0.12% | 16.51% | 30.26% | 44.74% | 0 |
| **WIDOW ROCKFISH** | 10.00% | 0.002% | 0.09% | 1.62% | 5.80% | 13.14% | 20.22% | 5 |
| **CANARY ROCKFISH** | 12.50% | 0.306% | 0.66% | 1.24% | 1.51% | 28.21% | 33.95% | 2 |
| Chilipepper Rockfish | - | - | - | - | - | - | - | 0 |
| **BOCACCIO** | - | - | - | - | - | - | - | 0 |
| Splitnose Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | 10.00% | 0.029% | 0.19% | 0.99% | 5.78% | 13.90% | 15.93% | 2 |
| Shortspine Thornyhead - coastwide | 11.11% | 0.002% | 0.14% | 0.26% | 0.83% | 21.73% | 26.39% | 1 |
| N. of 34°27' | 11.11% | 0.002% | 0.14% | 0.26% | 0.83% | 21.73% | 26.39% | 1 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Longspine Thornyhead - coastwide | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N. of 34°27' | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S. of 34°27' | - | - | - | - | - | - | - | 0 |
| Other thornyheads | - | - | - | - | - | - | - | 0 |
| **COWCOD** | - | - | - | - | - | - | - | 0 |
| **DARKBLOTCHED** | 10.00% | 0.016% | 0.17% | 0.33% | 2.05% | 21.79% | 28.95% | 4 |
| **YELLOWEYE** | 50.00% | 11.139% | 30.57% | 50.00% | 69.43% | 81.09% | 88.86% | 0 |
| Black Rockfish - coastwide | 50.00% | 18.326% | 34.16% | 50.00% | 65.84% | 75.34% | 81.67% | 0 |
| Black Rockfish (WA) | - | - | - | - | - | - | - | 0 |
| Black Rockfish (OR-CA) | 50.00% | 18.326% | 34.16% | 50.00% | 65.84% | 75.34% | 81.67% | 0 |
| **Minor Rockfish North** | 10.00% | 0.013% | 0.10% | 0.59% | 2.77% | 22.60% | 27.62% | 5 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | 12.50% | 0.015% | 0.14% | 0.24% | 5.50% | 30.75% | 31.84% | 4 |
| BOCACCIO: N. of Monterrey | 16.67% | 1.052% | 2.51% | 8.70% | 16.55% | 24.73% | 27.17% | 1 |
| Chilipepper Rockfish: Eureka | 20.00% | 0.021% | 0.62% | 1.15% | 3.42% | 47.68% | 49.64% | 0 |
| Redstripe Rockfish | 16.67% | 0.013% | 0.20% | 0.28% | 19.30% | 24.97% | 29.71% | 2 |
| Silvergrey Rockfish | 25.00% | 1.606% | 4.60% | 6.39% | 26.03% | 39.94% | 45.82% | 0 |
| Other Northern Shelf Rockfish | 20.00% | 0.291% | 2.26% | 4.11% | 9.69% | 36.94% | 40.64% | 1 |
| **Slope Species** | 10.00% | 0.013% | 0.38% | 0.55% | 3.41% | 23.69% | 27.78% | 5 |
| Bank Rockfish | 25.00% | 2.535% | 3.35% | 16.09% | 37.74% | 53.73% | 60.48% | 0 |
| Sharpchin Rockfish, north | 16.67% | 0.032% | 0.07% | 0.63% | 11.98% | 49.33% | 51.54% | 0 |
| Splitnose Rockfish: N. of Monterrey | 12.50% | 0.003% | 0.06% | 0.28% | 0.42% | 28.77% | 48.75% | 2 |
| Yellowmouth Rockfish | 25.00% | 1.023% | 2.92% | 3.11% | 26.67% | 53.20% | 54.00% | 0 |
| Other Northern Slope Rockfish | 10.00% | 0.070% | 0.34% | 1.37% | 5.73% | 17.75% | 27.30% | 3 |
| **Minor Rockfish South** | - | - | - | - | - | - | - | 0 |
| **Nearshore Species** | - | - | - | - | - | - | - | 0 |
| **Shelf Species** | - | - | - | - | - | - | - | 0 |
| Redstripe Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowtail Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Shelf Rockfish | - | - | - | - | - | - | - | 0 |
| **Slope Species** | - | - | - | - | - | - | - | 0 |
| Bank Rockfish | - | - | - | - | - | - | - | 0 |
| Blackgill Rockfish | - | - | - | - | - | - | - | 0 |
| Sharpchin Rockfish | - | - | - | - | - | - | - | 0 |
| Yellowmouth Rockfish | - | - | - | - | - | - | - | 0 |
| Other Southern Slope Rockfish | - | - | - | - | - | - | - | 0 |
| California scorpionfish | - | - | - | - | - | - | - | 0 |
| Cabezon (off CA only) | - | - | - | - | - | - | - | 0 |
| Dover sole (total) | 16.67% | 0.329% | 0.42% | 1.38% | 3.02% | 43.53% | 55.78% | 0 |
| Dover Sole (Summer) | 16.67% | 0.329% | 0.43% | 1.43% | 3.13% | 35.52% | 43.30% | 0 |
| Dover Sole (Winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| English Sole | 16.67% | 0.218% | 0.62% | 2.31% | 19.50% | 41.02% | 47.40% | 0 |
| Petrale Sole (coastwide) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N of 40°10' (summer) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| N of 40°10' (winter) | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| S of 40°10' (summer) | - | - | - | - | - | - | - | 0 |
| S of 40°10' (winter) | - | - | - | - | - | - | - | 0 |
| Arrowtooth Flounder (total) | 14.29% | 0.045% | 0.35% | 1.04% | 2.90% | 27.77% | 33.36% | 3 |
| Arrowtooth Flounder (summer) | 14.29% | 0.045% | 0.35% | 1.07% | 2.90% | 27.77% | 33.36% | 2 |
| Arrowtooth Flounder (winter) | 16.67% | 2.886% | 8.80% | 10.10% | 26.43% | 34.19% | 36.68% | 0 |
| Starry Flounder | - | - | - | - | - | - | - | 0 |
| Other Flatfish | 12.50% | 0.008% | 0.01% | 0.34% | 0.73% | 26.28% | 41.12% | 3 |
| Kelp Greenling | 100.00% | 100.000% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 0 |
| Spiny Dogfish | 10.00% | 0.025% | 0.14% | 0.24% | 5.31% | 16.89% | 21.93% | 5 |
| Other Fish | 16.67% | 1.524% | 2.24% | 2.95% | 18.91% | 26.53% | 33.79% | 0 |
| Nearshore spp | 16.67% | 0.897% | 1.37% | 1.73% | 13.78% | 29.87% | 36.86% | 0 |
| Shelf spp | 10.00% | 0.059% | 0.19% | 1.72% | 6.81% | 14.41% | 20.01% | 5 |
| Slope spp | 10.00% | 0.023% | 0.42% | 1.04% | 8.63% | 12.61% | 23.50% | 5 |
| DTS spp | 11.11% | 0.011% | 0.09% | 0.24% | 2.34% | 22.57% | 30.85% | 4 |
| | | | | | | | | 5 |

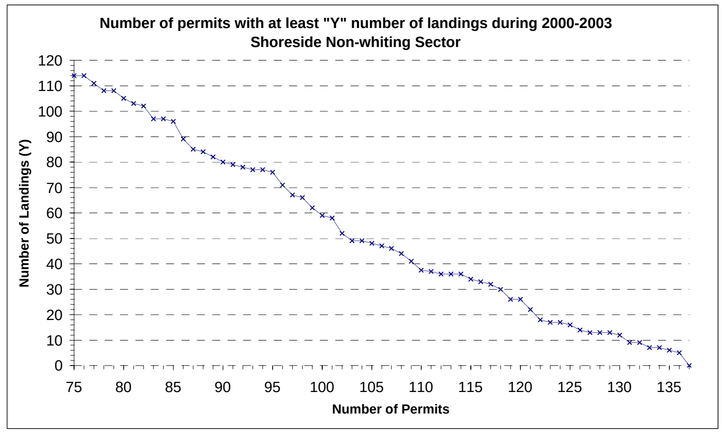
**Figure 1. Shoreside Non-whiting Sector: Number of Permits Landing During Alternative Recent Participation Periods**

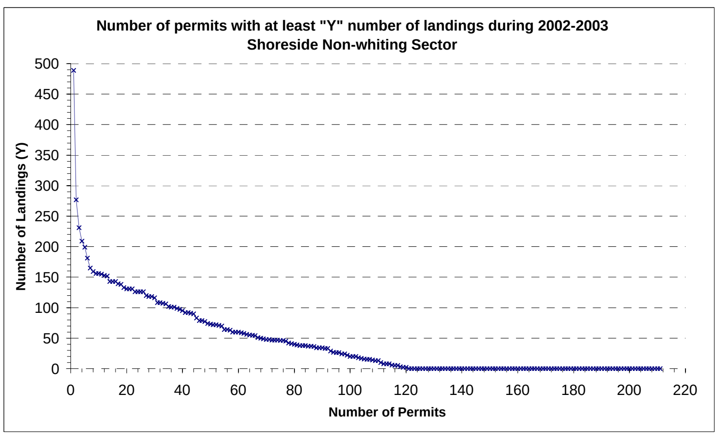
| Entire Sector | Detailed View |
| --- | --- |

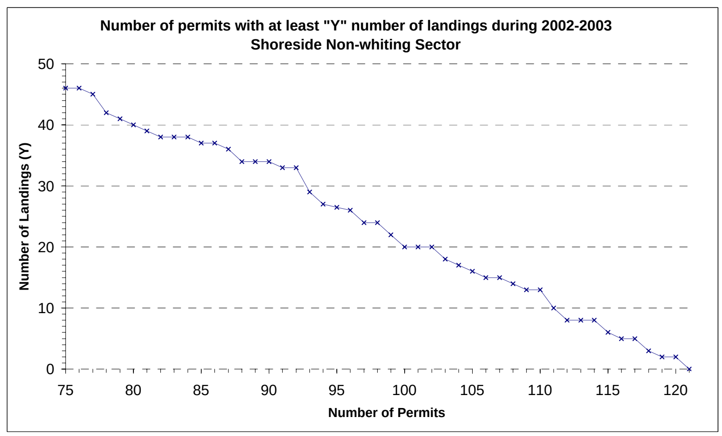


## Figure 2. Shoreside Whiting Sector: Number of Permits Landing During Alternative Recent Participation Periods

**Entire Sector** | **Detailed View**

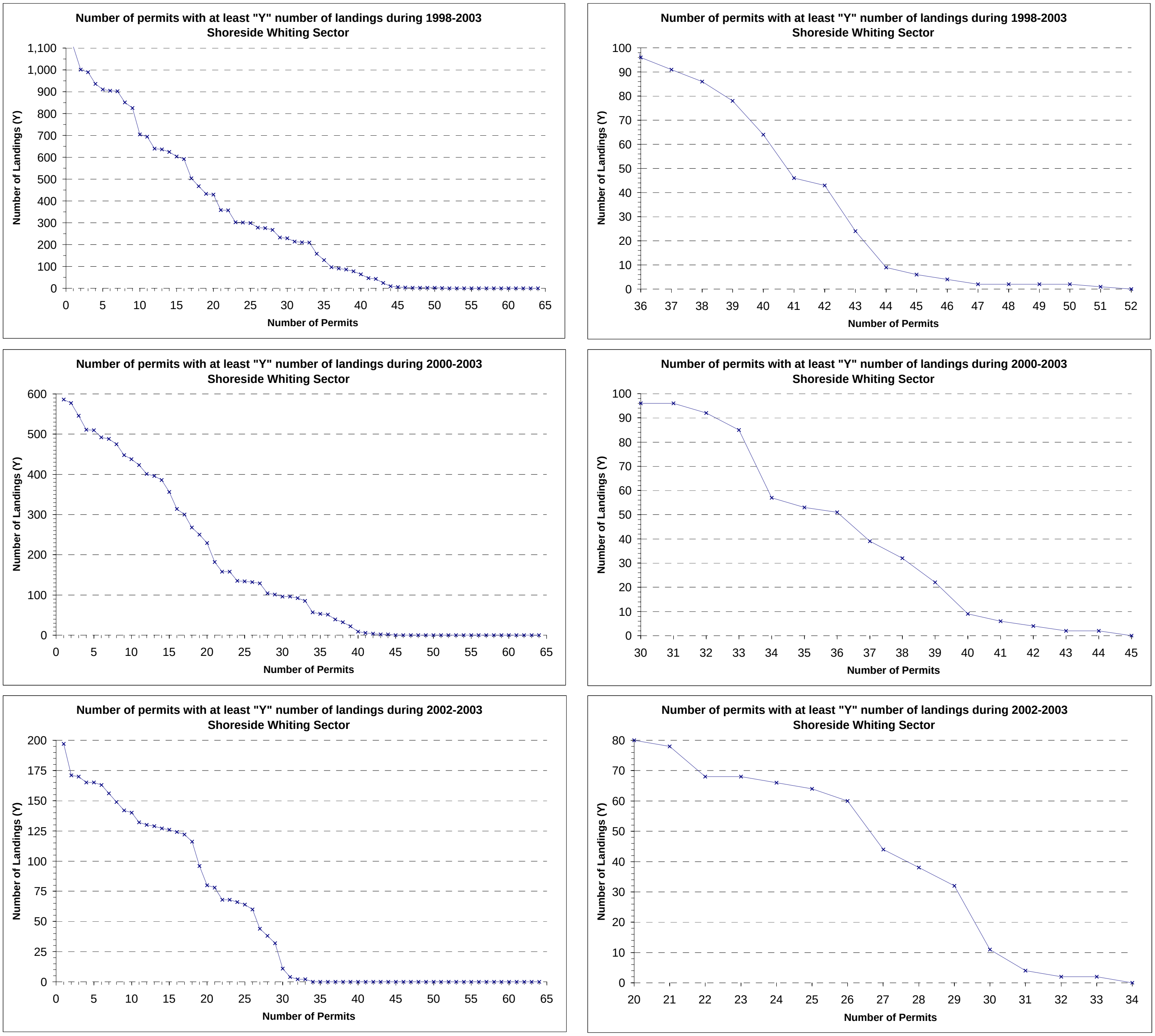
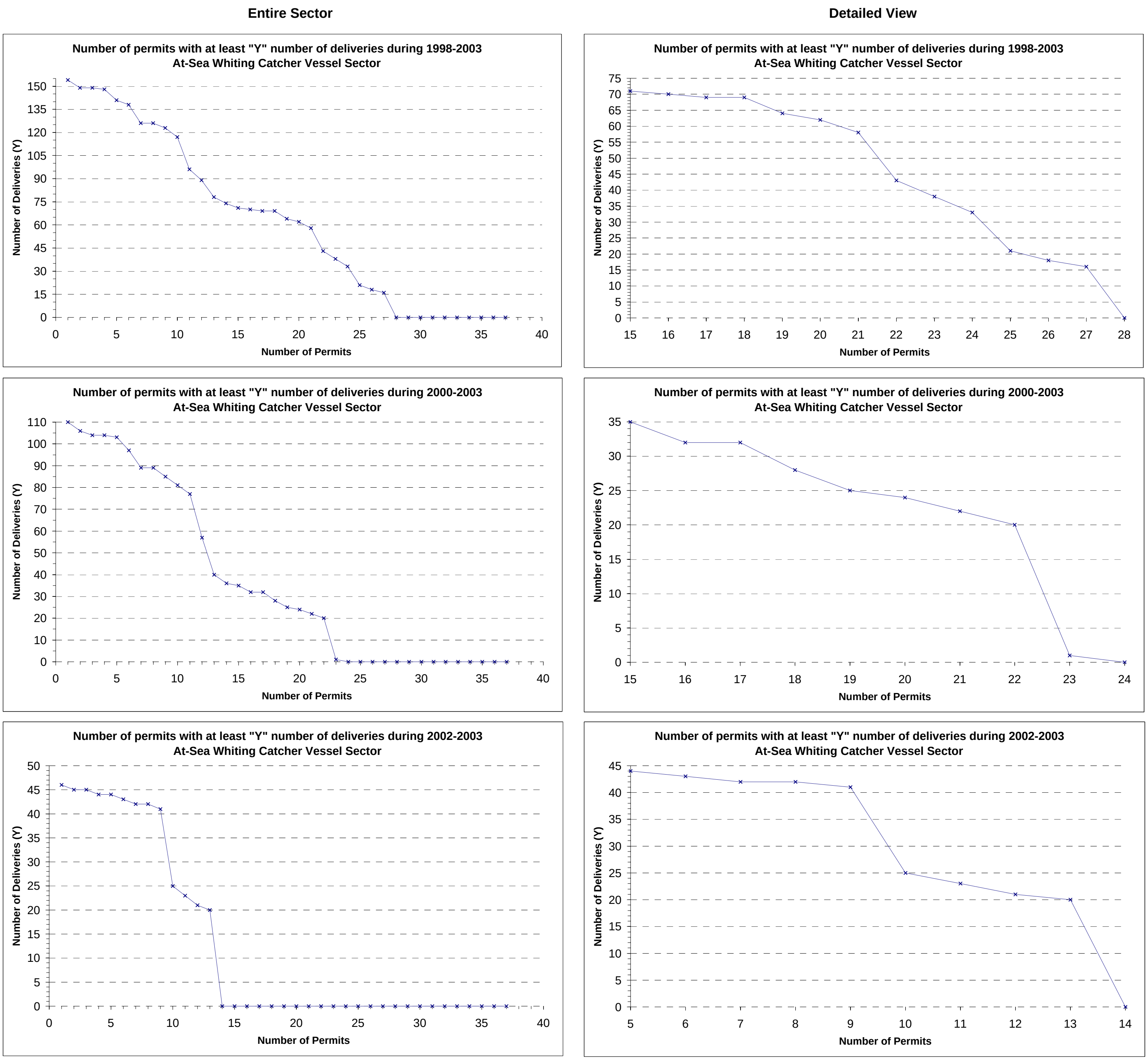


**Figure 3. At-sea Whiting Catcher Vessel Sector: Number of Permits Landing During Alternative Recent Participation Periods**



# H.R. 5946: Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006

## Limited Access Privilege Programs and the Pacific Fishery Management Council

1. Amended text regarding limited access privilege programs (LAPPs) - Magnuson-Stevens Fishery Conservation and Management Act (MSA) Section 303(d) replaced with new Section 303A. (Underlined text of particular interest to Pacific Council. Shaded text does not apply)

**SEC. 106. LIMITED ACCESS PRIVILEGE PROGRAMS.**

**(a) IN GENERAL**.—Title III (16 U.S.C. 1851 et seq.) is amended—
(1) by striking section 303(d); and
(2) by inserting after section 303 the following:

‘‘SEC. 303A. LIMITED ACCESS PRIVILEGE PROGRAMS.
‘‘(a) IN GENERAL.—After the date of enactment of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, a Council may submit, and the Secretary may approve, for a fishery that is managed under a limited access system, a limited access privilege program to harvest fish if the program meets the requirements of this section.

‘‘(b) NO CREATION OF RIGHT, TITLE, OR INTEREST.—Limited access privilege, quota share, or other limited access system authorization established, implemented, or managed under this Act—
‘‘(1) shall be considered a permit for the purposes of sections 307, 308, and 309;
‘‘(2) may be revoked, limited, or modified at any time in accordance with this Act, including revocation if the system is found to have jeopardized the sustainability of the stock or the safety of fishermen;
‘‘(3) shall not confer any right of compensation to the holder of such limited access privilege, quota share, or other such limited access system authorization if it is revoked, limited, or modified;
‘‘(4) shall not create, or be construed to create, any right, title, or interest in or to any fish before the fish is harvested by the holder; and
‘‘(5) shall be considered a grant of permission to the holder of the limited access privilege or quota share to engage in activities permitted by such limited access privilege or quota share.

‘‘(c) REQUIREMENTS FOR LIMITED ACCESS PRIVILEGES.—
‘‘(1) IN GENERAL.—Any limited access privilege program to harvest fish submitted by a Council or approved by the Secretary under this section shall—
‘‘(A) if established in a fishery that is overfished or subject to a rebuilding plan, assist in its rebuilding; and
‘‘(B) if established in a fishery that is determined by the Secretary or the Council to have over-capacity, contribute to reducing capacity;
‘‘(C) promote—
‘‘(i) fishing safety; and

‘‘(ii) fishery conservation and management; and

‘‘(iii) social and economic benefits;

‘‘(D) prohibit any person other than a United States citizen, a corporation, partnership, or other entity established under the laws of the United States or any State, or a permanent resident alien, that meets the eligibility and participation requirements established in the program from acquiring a privilege to harvest fish, including any person that acquires a limited access privilege solely for the purpose of perfecting or realizing on a security interest in such privilege;

‘‘(E) require that all fish harvested under a limited access privilege program be processed on vessels of the United States or on United States soil (including any territory of the United States);

‘‘(F) specify the goals of the program;

‘‘(G) include provisions for the regular monitoring and review by the Council and the Secretary of the operations of the program, including determining progress in meeting the goals of the program and this Act, and any necessary modification of the program to meet those goals, with a formal and detailed review 5 years after the implementation of the program and thereafter to coincide with scheduled Council review of the relevant fishery management plan (but no less frequently than once every 7 years);

‘‘(H) include an effective system for enforcement, monitoring, and management of the program, including the use of observers or electronic monitoring systems;

‘‘(I) include an appeals process for administrative review of the Secretary’s decisions regarding initial allocation of limited access privileges;

‘‘(J) provide for the establishment by the Secretary, in consultation with appropriate Federal agencies, for an information collection and review process to provide any additional information needed to determine whether any illegal acts of anti-competition, anti-trust, price collusion, or price fixing have occurred among regional fishery associations or persons receiving limited access privileges under the program; and

‘‘(K) provide for the revocation by the Secretary of limited access privileges held by any person found to have violated the antitrust laws of the United States.

‘‘(2) WAIVER.—The Secretary may waive the requirement of paragraph (1)(E) if the Secretary determines that—

‘‘(A) the fishery has historically processed the fish outside of the United States; and

‘‘(B) the United States has a seafood safety equivalency agreement with the country where processing will occur.

‘‘(3) FISHING COMMUNITIES.—

‘‘(A) IN GENERAL.—

‘‘(i) ELIGIBILITY.—To be eligible to participate in a limited access privilege program to harvest fish, a fishing community shall—

‘‘(I) be located within the management area of the relevant Council;

‘‘(II) meet criteria developed by the relevant Council, approved by the Secretary, and published in the Federal Register;

‘‘(III) consist of residents who conduct commercial or recreational fishing, processing, or fishery-dependent support businesses within the Council’s management area; and

‘‘(IV) develop and submit a community sustainability plan to the Council and the Secretary that demonstrates how the plan will address the social and economic development needs of coastal communities, including those that have not historically had the resources to participate in the fishery, for approval based on criteria developed by the Council that have been approved by the Secretary and published in the Federal Register.

‘‘(ii) FAILURE TO COMPLY WITH PLAN.—The Secretary shall deny or revoke limited access privileges granted under this section for any person who fails to comply with the requirements of the community sustainability plan. Any limited access privileges denied or revoked under this section may be reallocated to other eligible members of the fishing community.

‘‘(B) PARTICIPATION CRITERIA.—In developing participation criteria for eligible communities under this paragraph, a Council shall consider—

‘‘(i) traditional fishing or processing practices in, and dependence on, the fishery;

‘‘(ii) the cultural and social framework relevant to the fishery;

‘‘(iii) economic barriers to access to fishery;

‘‘(iv) the existence and severity of projected economic and social impacts associated with implementation of limited access privilege programs on harvesters, captains, crew, processors, and other businesses substantially dependent upon the fishery in the region or subregion;

‘‘(v) the expected effectiveness, operational transparency, and equitability of the community sustainability plan; and

‘‘(vi) the potential for improving economic conditions in remote coastal communities lacking resources to participate in harvesting or processing activities in the fishery.

‘‘(4) REGIONAL FISHERY ASSOCIATIONS.—

‘‘(A) IN GENERAL.—To be eligible to participate in a limited access privilege program to harvest fish, a regional fishery association shall—

‘‘(i) be located within the management area of the relevant Council;

‘‘(ii) meet criteria developed by the relevant Council, approved by the Secretary, and published in the Federal Register;

‘‘(iii) be a voluntary association, among willing parties, with established by-laws and operating procedures;

‘‘(iv) consist of participants in the fishery who hold quota share that are designated for use in the specific region or subregion covered by the regional fishery association, including commercial or recreational fishing, processing, fishery-dependent support businesses, or fishing communities;

‘‘(v) not be eligible to receive an initial allocation of a limited access privilege but may acquire such privileges after the initial allocation, and may hold the annual fishing privileges of any limited access privileges it holds or the annual fishing privileges that is members contribute; and

‘‘(vi) develop and submit a regional fishery association plan to the Council and the Secretary for approval based on criteria developed by the Council that have been approved by the Secretary and published in the Federal Register.

‘‘(B) FAILURE TO COMPLY WITH PLAN.—
The Secretary shall deny or revoke limited access privileges granted under this section to any person participating in a regional fishery association who fails to comply with the requirements of the regional fishery association plan.

‘‘(C) PARTICIPATION CRITERIA.—In developing participation criteria for eligible regional fishery associations under this paragraph, a Council shall consider—

‘‘(i) traditional fishing or processing practices in, and dependence on, the fishery;

‘‘(ii) the cultural and social framework relevant to the fishery;

‘‘(iii) economic barriers to access to fishery;

‘‘(iv) the existence and severity of projected economic and social impacts associated with implementation of limited access privilege programs on harvesters, captains, crew, processors, and other businesses substantially dependent upon the fishery in the region or subregion;

‘‘(v) the administrative and fiduciary soundness of the association; and

‘‘(vi) the expected effectiveness, operational transparency, and equitability of the fishery association plan.

‘‘(5) ALLOCATION.—In developing a limited access privilege program to harvest fish a Council or the Secretary shall—

‘‘(A) establish procedures to ensure fair and equitable initial allocations, including consideration of—

‘‘(i) current and historical harvests;

‘‘(ii) employment in the harvesting and processing sectors;

‘‘(iii) investments in, and dependence upon, the fishery; and

‘‘(iv) the current and historical participation of fishing communities;

‘‘(B) consider the basic cultural and social framework of the fishery, especially through—

‘‘(i) the development of policies to promote the sustained participation of small owner-operated fishing vessels and fishing communities that depend on the fisheries, including regional or port-specific landing or delivery requirements; and

‘‘(ii) procedures to address concerns over excessive geographic or other consolidation in the harvesting or processing sectors of the fishery;

‘‘(C) include measures to assist, when necessary and appropriate, entry-level and small vessel owner-operators, captains, crew, and fishing communities through set-asides of harvesting allocations, including providing privileges, which may include set-asides or allocations of harvesting privileges, or economic assistance in the purchase of limited access privileges;

‘‘(D) ensure that limited access privilege holders do not acquire an excessive share of the total limited access privileges in the program by—

‘‘(i) establishing a maximum share, expressed as a percentage of the total limited access privileges, that a limited access privilege holder is permitted to hold, acquire, or use; and

‘‘(ii) establishing any other limitations or measures necessary to prevent an inequitable concentration of limited access privileges; and

‘‘(E) authorize limited access privileges to harvest fish to be held, acquired, used by, or issued under the system to persons who substantially participate in the fishery, including in a specific sector of such fishery, as specified by the Council.

‘‘(6) PROGRAM INITIATION.—

‘‘(A) LIMITATION.—Except as provided in subparagraph (D), a Council may initiate a fishery management plan or amendment to establish a limited access privilege program to harvest fish on its own initiative or if the Secretary has certified an appropriate petition.

‘‘(B) PETITION.—A group of fishermen constituting more than 50 percent of the permit holders, or holding more than 50 percent of the allocation, in the fishery for which a limited access privilege program to harvest fish is sought, may submit a petition to the Secretary requesting that the relevant Council or Councils with authority over the fishery be authorized to initiate the development of the program. Any such petition shall clearly state the fishery to which the limited access privilege program would apply. For multispecies permits in the Gulf of Mexico, only those participants who have substantially fished the species proposed to be included in the limited access program shall be eligible to sign a petition for such a program and shall serve as the basis for determining the percentage described in the first sentence of this subparagraph.

‘‘(C) CERTIFICATION BY SECRETARY.—

Upon the receipt of any such petition, the Secretary shall review all of the signatures on the petition and, if the Secretary determines that the signatures on the petition represent more than 50 percent of the permit holders, or holders of more than 50 percent of the allocation in the fishery, as described by subparagraph (B), the Secretary shall certify the petition to the appropriate Council or Councils.

‘‘(D) NEW ENGLAND AND GULF REFERENDUM.—

‘‘(i) Except as provided in clause (iii) for the Gulf of Mexico commercial red snapper fishery, the New England and Gulf Councils may not submit, and the Secretary may not approve or implement, a fishery management plan or amendment that creates an individual fishing quota program, including a Secretarial plan, unless such a system, as ultimately developed, has been approved by more than 2.3 of those voting in a referendum among eligible permit holders, or other persons described in clause (v), with respect to the New England Council, and by a majority of those voting in the referendum among eligible permit holders with respect to the Gulf Council. For multispecies permits in the Gulf of Mexico, only those participants who have substantially fished the species proposed to be included in the individual fishing quota program shall be eligible to vote in such a referendum. If an individual fishing quota program fails to be approved by the requisite number of those voting, it may be revised and submitted for approval in a subsequent referendum.

‘‘(ii) The Secretary shall conduct a referendum under this subparagraph, including notifying all persons eligible to participate in the referendum and making available to them information concerning the schedule, procedures, and eligibility requirements for the referendum process and the proposed individual fishing quota program. Within 1 year after the date of enactment of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, the Secretary shall publish guidelines and procedures to determine procedures and voting eligibility requirements for referenda and to conduct such referenda in a fair and equitable manner.

‘‘(iii) The provisions of section 407(c) of this Act shall apply in lieu of this subparagraph for an individual fishing quota program for the Gulf of Mexico commercial red snapper fishery.

‘‘(iv) Chapter 35 of title 44, United States Code, (commonly known as the Paperwork Reduction Act) does not apply to the referenda conducted under this subparagraph.

‘‘(v) The Secretary shall promulgate criteria for determining whether additional fishery participants are eligible to vote in the New England referendum described in clause (i) in order to ensure that crew members who derive a significant percentage of their total income from the fishery under the proposed program are eligible to vote in the referendum.

‘‘(vi) In this subparagraph, the term ‘individual fishing quota’ does not include a sector allocation.

‘‘(7) TRANSFERABILITY.—In establishing a limited access privilege program, a Council shall—

‘‘(A) establish a policy and criteria for the transferability of limited access privileges (through sale or lease), that is consistent with the policies adopted by the Council for the fishery under paragraph (5); and

‘‘(B) establish, in coordination with the Secretary, a process for monitoring of transfers (including sales and leases) of limited access privileges.

‘‘(8) PREPARATION AND IMPLEMENTATION OF SECRETARIAL PLANS.—This subsection also applies to a plan prepared and implemented by the Secretary under section 304(c) or 304(g).

‘‘(9) ANTITRUST SAVINGS CLAUSE.—Nothing in this Act shall be construed to modify, impair, or supersede the operation of any of the antitrust laws. For purposes of the preceding sentence, the term ‘antitrust laws’ has the meaning given such term in subsection (a) of the first section of the Clayton Act, except that such term includes section 5 of the Federal Trade Commission Act to the extent that such section 5 applies to unfair methods of competition.

‘‘(d) AUCTION AND OTHER PROGRAMS.—In establishing a limited access privilege program, a Council shall consider, and may provide, if appropriate, an auction system or other program to collect royalties for the initial, or any subsequent, distribution of allocations in a limited access privilege program if—

‘‘(1) the system or program is administered in such a way that the resulting distribution of limited access privilege shares meets the program require-
ments of this section; and

‘‘(2) revenues generated through such a royalty program are deposited in the Limited Access System Administration Fund established by section 305(h)(5)(B) and available subject to annual appropriations.

‘‘(e) COST RECOVERY.—In establishing a limited access privilege program, a Council shall—

‘‘(1) develop a methodology and the means to identify and assess the management, data collection and analysis, and enforcement programs that are directly related to and in support of the program; and

‘‘(2) provide, under section 304(d)(2), for a program of fees paid by limited access privilege holders that will cover the costs of management, data
collection and analysis, and enforcement activities.

‘‘(f) CHARACTERISTICS.—A limited access privilege established after the date of enactment of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 is a permit issued for a period of not more than 10 years that—

‘‘(1) will be renewed before the end of that period, unless it has been revoked, limited, or modified as provided in this subsection;

‘‘(2) will be revoked, limited, or modified if the holder is found by the Secretary, after notice and an opportunity for a hearing under section 554 of title 5, United States Code, to have failed to comply with any term of the plan identified in the plan as cause for revocation, limitation, or modification of a permit, which may include conservation requirements established under the plan;

‘‘(3) may be revoked, limited, or modified if the holder is found by the Secretary, after notice and an opportunity for a hearing under section 554 of title 5, United States Code, to have committed an act prohibited by section 307 of this Act; and ‘‘(4) may be acquired, or reacquired, by participants in the program under a mechanism established by the Council if it has been revoked, limited, or modified under paragraph (2) or (3).

‘‘(g) LIMITED ACCESS PRIVILEGE ASSISTED PURCHASE PROGRAM.—

‘‘(1) IN GENERAL.—A Council may submit, and the Secretary may approve and implement, a program which reserves up to 25 percent of any fees collected from a fishery under section 304(d)(2) to be used, pursuant to section 53706(a)(7) of title 46, United States Code, to issue obligations that aid in financing—

‘‘(A) the purchase of limited access privileges in that fishery by fishermen who fish from small vessels; and

‘‘(B) the first-time purchase of limited access privileges in that fishery by entry level fishermen.

‘‘(2) ELIGIBILITY CRITERIA.—A Council making a submission under paragraph (1) shall recommend criteria, consistent with the provisions of this Act, that a fisherman must meet to qualify for guarantees under subparagraphs (A) and (B) of paragraph (1) and the portion of funds to be allocated for guarantees under each subparagraph.

‘‘(h) EFFECT ON CERTAIN EXISTING SHARES AND PROGRAMS.—Nothing in this Act, or the amendments made by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, shall be construed to require a reallocation or a reevaluation of individual quota shares, processor quota shares, cooperative programs, or other quota programs, including sector allocation <u>in effect</u> before the date of enactment of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006.

‘‘(i) TRANSITION RULES.—<u>The requirements of this section shall not apply to any quota program, including any individual quota program, cooperative program, or sector allocation for which a Council has taken final action or which has been submitted by a Council to the Secretary, or approved by the Secretary, within 6 months after the date of enactment of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006</u>, except that—

‘‘(1) the requirements of section 303(d) of this Act in effect on the day before the date of enactment of that Act shall apply to any such program;

‘‘(2) the program shall be subject to review under subsection (c)(1)(G) of this section not later than 5 years after the program implementation; and

‘‘(3) nothing in this subsection precludes a Council from incorporating criteria contained in this section into any such plans.’’.

**(b) FEES**.—Section 304(d)(2)(A) (16 U.S.C. 1854(d)(2)(A)) is amended by striking ‘‘management and enforcement’’ and inserting ‘‘management, data collection, and enforcement’’.

| Amended MSA Section 304(d) in text box below under Section 106(d) - Conforming Amendment. |
|---|

**(c) INVESTMENT IN UNITED STATES SEAFOOD PROCESSING FACILITIES**.—The Secretary of Commerce shall work with the Small Business Administration and other Federal agencies to develop financial and other mechanisms to encourage United States investment in seafood processing facilities in the United States for fisheries that lack capacity needed to process fish harvested by United States vessels in compliance with the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.).

**(d) CONFORMING AMENDMENT**.—Section 304(d)(2)(C)(i) (16 U.S.C. 1854(d)(2)(C)(i)) is amended by striking ‘‘section 305(h)(5)(B)’’ and all that follows and inserting ‘‘section 305(h)(5)(B).’’

*MSA Section 304(d) as amended:*

304(d) ESTABLISHMENT OF FEES.--

(1) The Secretary shall by regulation establish the level of any fees which are authorized to be charged pursuant to section 303(b)(1). The Secretary may enter into a cooperative agreement with the States concerned under which the States administer the permit system and the agreement may provide that all or part of the fees collected under the system shall accrue to the States. The level of fees charged under this subsection shall not exceed the administrative costs incurred in issuing the permits.

(2)(A) Notwithstanding paragraph (1), the Secretary is authorized and shall collect a fee to recover the actual costs directly related to the ~~management and enforcement~~ **management, data collection, and enforcement** of any--

(i) individual fishing quota program; and

(ii) community development quota program that allocates a percentage of the total allowable catch of a fishery to such program.

(B) Such fee shall not exceed 3 percent of the ex-vessel value of fish harvested under any such program, and shall be collected at either the time of the landing, filing of a landing report, or sale of such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested.

(C) (i) Fees collected under this paragraph shall be in addition to any other fees charged under this Act and shall be deposited in the Limited Access System Administration Fund established under section 305(h)(5)(B), ~~except that the portion of any such fees reserved under section 303(d)(4)(A) shall be deposited in the Treasury and available, subject to annual appropriations, to cover the costs of new direct loan obligations and new loan guarantee commitments as required by section 504(b)(1) of the Federal Credit Reform Act (2 U.S.C. 661c(b)(1)).~~

~~(ii) Upon application by a State, the Secretary shall transfer to such State up to 33 percent of any fee collected pursuant to subparagraph (A) under a community development quota program and deposited in the Limited Access System Administration Fund in order to reimburse such State for actual costs directly incurred in the management and enforcement of such program.~~

**(e) APPLICATION WITH AMERICAN FISHERIES ACT**.—Nothing in section 303A of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.), as added by subsection (a), shall be construed to modify or supersede any provision of the American Fisheries Act (46 U.S.C. 12102 note; 16 U.S.C. 1851 note; et alia).

2. Direction to the Pacific Fishery Management Council regarding development of LAPPs in the West Coast groundfish trawl fisheries.

**SEC. 302. REAUTHORIZATION OF OTHER FISHERIES ACTS.**

**(a) ATLANTIC STRIPED BASS CONSERVATION ACT**
**(b) YUKON RIVER SALMON ACT OF 2000**
**(c) SHARK FINNING PROHIBITION ACT**
**(d) PACIFIC SALMON TREATY ACT.—**
**(e) STATE AUTHORITY FOR DUNGENESS CRAB FISHERY MANAGEMENT**

**(f) PACIFIC FISHERY MANAGEMENT COUNCIL.—**

(1) IN GENERAL.—The Pacific Fishery Management Council shall develop a proposal for the appropriate rationalization program for the Pacific trawl groundfish and whiting fisheries, including the shore-based sector of the Pacific whiting fishery under its jurisdiction. The proposal may include only the Pacific whiting fishery, including the shore-based sector, if the Pacific Council determines that a rationalization plan for the fishery as a whole cannot be achieved before the report is required to be submitted under paragraph (3).

(2) REQUIRED ANALYSIS.—In developing the proposal to rationalize the fishery, the Pacific Council shall fully analyze alternative program designs, including the allocation of limited access privileges to harvest fish to fishermen and processors working together in regional fishery associations or some other cooperative manner to harvest and process the fish, as well as the effects of these program designs and allocations on competition and conservation.

The analysis shall include an assessment of the impact of the proposal on conservation and the economics of communities, fishermen, and processors participating in the trawl groundfish fisheries, including the shore-based sector of the Pacific whiting fishery.

(3) REPORT.—The Pacific Council shall submit the proposal and related analysis to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Resources no later than 24 months after the date of enactment of this Act.

3. Congressional intent regarding the development of the West Coast LAPPs as articulated in Congress by U.S. Senator Inouye and U.S. Congressmen Rahall and DeFazio.

Colloquy Between Congressmen Nick J. Rahall and Peter DeFazio
Pacific Groundfish Fishery

*Mr. DeFAZIO*: *Mr. SPEAKER, I would like to seek clarification from my colleague from West Virginia on the intent of the legislation as it pertains to the Pacific Fishery Management Council's groundfish fisheries management program currently under development. The bill requires the Pacific Council to develop a rationalization program within 24 months from the date of enactment. The Pacific Council has been working on a comprehensive groundfish fisheries management program for more than 3 years and is on target to complete that process by 2008. As I understand the bill, the Pacific Council can continue the development of its groundfish management program without having to restart the process. Is that correct?*

*Mr. RAHALL*: *Yes, the gentleman is correct. It is my understanding that the bill would permit the Pacific Council process to continue. We recognize that the Pacific Council has made substantial progress and do not intend to disrupt their efforts to develop and implement an appropriate groundfish management program, consistent with this Act.*

STATEMENT BY SENATOR DANIEL K. INOUYE
H.R. 5946: Magnuson-Stevens Fishery Conservation and
Management Reauthorization Act of 2006

"*The bill also requires limited access privilege programs, such as individual fishing quota systems, established in the future not only to contribute to a reduction of capacity in overcapitalized fisheries and improve fishermen's safety by ending the race for the fish, but also to consider social and economic benefits to coastal communities. Senator Stevens' and my intent was to sustain thriving fishing communities and promote access to the fisheries by residents of our coastal communities in order to foster the independent, coastal community-based character of our Nation's fisheries. To achieve this aim, the bill sets forth a strong list of standards to ensure that any such program take into account the social and economic implications of the program. In addition, it authorizes the creation of voluntary Regional Fishery Associations for the mutual benefit of fishery participants, including provisions to ensure we maintain free and open markets for fishermen to sell their catch.*

*The bill also requires a periodic review of each program's compliance with the goals of their program. Individual permits will be renewed automatically every 10 years, unless the permit holder fails to meet the requirements specified in the program as meriting modification, limitation or revocation. The bill also contains grandfathering and transition rules to address the application of these new standards to existing and developing programs. I want to make clear that final Senate changes in these provisions were not intended to adversely affect or delay ongoing development of a proposal for a rationalization program for the Pacific trawl groundfish and whiting fisheries by the Pacific Fisheries Management Council. We intend that this process go forward, and that adherence to the new standards not delay development of the plan called for in the bill."*

DRAFT

Agenda Item E.4.b
GAC Report
March, 2007

# Groundfish Allocation Committee (GAC) on Trawl Rationalization
# December 12-14, 2006 Meeting

The GAC met December 12-14, 2006 to discuss the trawl individual quota (TIQ), permit stacking, and vessel co-op alternatives being considered as part of the TIQ process (now termed "trawl rationalization"). This report contains:

1. a summary of recommendations;
2. a listing of the recommendations and rationale;
3. a summary of other tasks volunteered or assigned ;
4. an attachment displaying the trawl rationalization alternatives as they would stand if all GAC recommendations are implemented (Attachment A);
5. an attachment with the Groundfish Management Team (GMT) recommendations on a group to address monitoring issues (Attachment B); and
6. an attachment providing a general outline of the tracking, monitoring and enforcement system (Attachment C).

## *Summary of Recommendations*

The GAC report recommends:

Reducing the Number of Alternatives

1. Combine the individual fishing quota (IFQ) management regime and IFQ program alternatives into a single alternative providing IFQ management for all species, with the possibility of variations to address overfished species.
2. Eliminate the permit stacking alternative.
3. Continue with development of the co-op alternatives as part of a trawl rationalization program.

Simplifying and Refining the Alternatives

4. Eliminate consideration of changing the whiting season opening date as part of this process.
5. Eliminate the "three trawl sector" option (there would be either one or four trawl subsectors).
6. Provide for gear switching (trawl permitted vessels may use IFQ to fish with any directed groundfish gear, except when they have a fixed gear permit and have declared that they are participating as a limited entry fixed gear vessel).
7. Initiate staff work on the monitoring issues identified by the GMT (Attachment B) and additional issues identified by the GAC. National Marine Fisheries Service (NMFS) will take the first steps on this task.
8. Narrow the range of alternatives for initial allocation to processors, such that the most that would be allocated specifically to processors is 25%.
9. Add an option which would attribute shoreside processing history to the entity filling out the fish ticket, without provisions to address situations in which processing was

done by an entity not listed on the fish ticket or in which ownership of the processing facility has changed since the processing occurred.

10. Request managers to develop and present to the GAC in May 2007, information on area distribution. Request Scientific and Statistical Committee (SSC) groundfish subcommittee to identify species susceptible to localized depletion and other factors to consider in establishing biological regions. Formation of a work group on area management may be considered in May.
11. For the initial allocation of IFQ for overfished species, eliminate the equal allocation option and develop an option that would allocate catch history for overfished species based on catch history of proxy (non-overfished) species. Also, maintain the option of allocating overfished species based on overfished species catch history.
12. Defer action on ownership and control limits until additional information is developed.
13. Calculate a permit's history using relative pounds, i.e. in the allocation formula each permit's catch history for a year is expressed as a percent of the fleet total for that year.
14. For entry level opportunities, maintain for consideration on option that would allocate revoked shares to new entrants via a lottery and develop an option for the one time allocation of 5% of the quotas shares to new entrants, possibly by auction. New entrants would be defined as individuals not receiving an initial allocation (partnerships, corporations, etc. would not qualify).
15. Eliminate the community stability program and rely on other measures to address community concerns (e.g. area based management and potential regional fishery management associations).
16. Request that Enforcement Consultants (EC) develop a recommended minimum number of quota pounds required for departure for inclusion as an option. Bonds should be considered as an alternative enforcement mechanism
17. For purpose of subsector allocation based on fleet history, do not include the suboption that would eliminate from the fleet history the history of permits that fail to meet recent participation requirements.
18. Develop an analysis of the potential for spillover of trawl fleet effort into other fisheries.
19. Adopt the cleanup recommendation on page 13.

The result of these recommendations is elimination of the need to distinguish between management regime and IFQ program alternatives and a much simplified set of trawl rationalization alternatives. The combined effect of all GAC recommendations, if adopted by the Council, is reflected in the alternatives displayed in the attachment to this report.

## *Recommendations and Rationale*

### Management Regime and IFQ Program Alternatives

GAC members and advisors, as well as the Independent Experts Panel (IEP) report to the GAC, expressed sentiment on the importance of reducing the number of management regime alternatives.

### *Recommendation 1:*

Eliminate Management Regime Alternative 2 (IFQs for trawl target and allocated species). Combine Management Regime Alternatives 3 and 4 into a single IFQ alternative covering all species, but maintain the possibility of variations to address overfished species. Also combine program alternatives on the IFQ design details into a single alternative.

The GAC concurred with the Trawl Individual Quota Committee (TIQC) recommendation to eliminate Alternative 2. This would eliminate transferable cumulative catch limits and related suboptions from the suite of alternatives under consideration. Alternative 2 was originally created to address the possibility that the Council might not adopt a trawl allocation for some species. A trawl sector allocation is viewed as being integral to the implementation of a trawl IFQ program. In the absence of an allocation it had been suggested that transferable cumulative catch limits be used to manage the unallocated trawl target species. The GAC has now recommended (at its October 2006 meeting on the Intersector Allocation process) that a trawl allocation be established either for all groundfish species or all groundfish species except overfished species. Given the complexity that transferable cumulative catch limits adds to both the description of the program and the analysis, the GAC recommends this alternative be dropped in anticipation that the necessary allocations will be achieved either through the long-term allocation process or the biennial specifications process.

The GAC recognizes that the industry may experience problems operating under the constraints of a system with IFQ for overfished species. As the analysis goes forward and specific problems are identified these should be brought back for consideration. At that time, adjustments might be made to the alternatives, for example, through the creation of a pooling mechanism.

The GAC also suggest further simplification by increasing the species coverage of Alternative 3 to all groundfish species, which allows for Alternatives 3 and 4 to be combined. As the Alternatives 3 and 4 now stand, the only difference in species coverage for IFQs is that Alternative 3 does not cover the "Other Fish" category of groundfish while Alternative 4 covers all groundfish species. As originally conceived, Alternative 3 had provided IFQ management for all species that were currently managed under cumulative limits. However, during the course of considering the IFQ program the species managed by cumulative limits diminished to the point where only the "Other Fish" category now remains, and even the "Other Fish" category has been subject to cumulative limits on a temporary basis. With the small amount of difference in coverage remaining between these two alternatives, there is no longer a clear reason for maintaining the differences, particularly given the complexity it adds to the program.

If Alternative 2 is eliminated and Alternatives 3 and 4 are combined, the single remaining IFQ management regime alternative would manage all species with IFQs. This simplification would reduce the complexity of analysis and would make a clearer document for decision-makers and the public to read and understand. The GAC recommendation also includes flexibility to manage overfished species differently within the IFQ program. In its report, the GMT provided a number of possible mechanisms for managing overfished species differently.

*Recommendation 2:*

Eliminate the permit stacking alternative.

Though the permit stacking alternative has been viewed as the fallback option in case an IFQ program is not achieved, the GAC supported elimination of the alternative. Overall, it was noted that the suite of goals and objectives for the TIQ program would not be achieved under the permit stacking alternative. Furthermore, a permit stacking program could create a different race for fish and, relative to an IFQ program, has a substantially lower level of bycatch reduction and economic benefits.

*Recommendation 3:*

Continue with Alternative 6, co-ops for the whiting fishery. [The proposal for the shoreside fishery is pending development of an industry position.]

By choosing to continue with Alternative 6, the GAC recommends against separating the action of developing a whiting fishery co-op program from the action of developing a non-whiting fishery individual quota program. GAC advisors representing the whiting fishery and processors spoke in favor of creating these two separate but parallel tracks, noting: consensus support among the whiting fishery for the change; the efficiencies that could be gained; and the distinct differences between the whiting and non-whiting fisheries. Concerns expressed by GAC members about creating separate processes included that: there needs to be consideration of mechanisms to transfer fish between the whiting and non-whiting fisheries; using IFQs for whiting management needs to be considered as an alternative to vessel co-ops; process efficiencies would be lost through the division into two tracks; and the separate tracks would become de-linked and compete with one another for Council resources.

Maintaining Alternative 6 as part of the rationalization package will provide a viable non-IFQ alternative for the whiting fishery to be contrasted with the alternative of managing the whiting fishery with IFQs. Another reason for maintaining Alternative 6 is the direction provided in the reauthorized Magnuson-Stevens Act, requiring the Council to consider various rationalization programs that would provide for allocations to vessels and processors working together in a "cooperative manner." GAC members noted that under an IFQ program, IFQ owners could form co-operatives on a voluntary basis. GAC members also identified one aspect of the co-op alternative, the creation of a closed class of processors, as an issue that still needs to be addressed by the Council. The analysis should consider both a closed and open class of processors. A request was made that the Council be brought a discussion paper on the co-op alternatives covering why they are needed, why co-ops cannot be created without Federal regulation, the need for a closed class of processors, how co-ops can be developed that would not leave anyone out.

## Whiting Season Opening Date

One of the benefits from IFQ management is the elimination of other types of management measures, such as season management. The current options include consideration of movement of the whiting season opening date to a time as early as possible, given constraints resulting from the listing of certain salmon stocks under the Endangered Species Act (ESA).

***Recommendation 4:***

The GAC supports the TIQC report on the whiting season opening date. The TIQC recommended that the whiting seasons should not be changed as part of the TIQ action.

The opening dates for the whiting fishery are set to address both socio-economic and endangered species issues. Consideration of movement of the whiting opening date adds to both the complexity of the IFQ alternatives and the analysis. Movement of the opening for the whiting fishery can be addressed after implementation of an IFQ or co-op program through the status quo procedure. That is, if an IFQ program is implemented, change in the season opening dates can continue to occur through the regulatory amendment process.

## Number of Sectors

IFQ programs are often recommended to resolve allocation issues through the market place. The current IFQ alternatives include options that would manage the trawl fishery as three or four subsectors, in addition to the option of managing the trawl fishery as a single trawl sector.

***Recommendation 5:***

Within the remaining TIQ alternative, analyze one and four sectors (eliminate the three sector option).

All GAC members supported maintaining one and four sectors in the alternatives and cited reasons related to simplifying the analysis. One sector may be economically efficient because it allows for full tradability and market place function in the allocation of harvest. With one sector, the market may not fully capture all the important social and economic effects, particularly if some IFQ buyers in the market benefit from both harvesting and processing profits while others only harvest or only process. Four sectors represent the current groundfish fishery and its diversity, and direct allocation between the sectors incorporates some of the socio-economic values that might not be captured by a market driven allocation. It was suggested that under a three sector fishery, the shore based harvesting sector would share one pool of whiting and other groundfish, and that this would allow for a more flexibility to move fish between shoreside whiting and nonwhiting trips to address the fishery's needs. However, the analysis of one and four sectors will bracket the full range and encompass the three sector option.

## Gear Switching

In the current groundfish fishery, when trawl vessels use open access gear their catch is attributed to the trawl sector. If IFQ is not required when these vessels use an open access gear, then some other means will be required to keep the trawl fishery within its allocation. The allocation could be split between trawl vessels fishing with trawl gear (under the IFQ program) and those using other gear, or the catch of trawl vessels with open access gear could be counted against the open access fishery. In the former case, a new very small cap would be created for which the fleet would be monitored and managed. In the latter case, adjustments would be required to accommodate participation of the trawl fleet in the open access fishery with open access gear.

*Recommendation 6:*

Allow gear switching. The IFQ alternative will require that trawl permitted vessels use IFQ when fishing in a directed groundfish fishery with legal groundfish gear, with one exception. When the vessel is also permitted for limited entry fixed gear, and has declared it is participating in the limited entry fixed gear fishery, it will not be required to cover that catch with IFQ and fixed gear limits will apply (including sablefish tier limits). This allows gear switching for any vessel with a limited entry trawl permit. Cumulative limits, which would normally apply to a vessel using legal groundfish open access gear, will not apply when the vessel is fishing under the IFQ system (though the vessel must comply with all other appropriate regulations associated with that gear). Legal open access gear includes fixed gear (pot and longline) for vessels that do not have a limited entry permit endorsed for longline or fishpot gear. IFQ will not be required for trawl vessel use of incidental gear, such as shrimp trawl. The EIS will discuss the flexibility of the system to accommodate permanent gear conversion on a voluntary basis.

The GAC-proposed alternative provides a simpler way to address trawl vessel use of nontrawl gears, as all catch using legal groundfish gear would be counted toward the trawl catch allocation.

GAC highlighted the distinction between gear switching and gear conversion. Permanent gear conversion would allow a vessel or IFQ to switch to another gear but not back to trawl. The concept of gear conversion has not been previously addressed within the TIQ process. Permanent gear conversion could further address the program's conservation goals. However, it might inhibit the gear conversion process if conversion is voluntary, because IFQ holders may be more reluctant to switch gears if they would not have the option of converting back. Or, it could create imbalances in the multi-species mix necessary for prosecution of the trawl fishery, if IFQ for some species were converted to another gear, not leaving enough left in the trawl IFQ markets for vessels to acquire what they need for a multi-species fishery. The proposed provision allows gear switching and would not prevent a vessel from converting to a non-trawl gear; however the vessel could reverse the gear switch or transfer IFQ to a trawl vessel if conditions warranted it. Therefore the conservation benefits are still possible under this recommendation, while flexibility for the harvester is maintained.

## Monitoring Issues

The GMT recommended to the GAC that a monitoring workgroup be formed and composed of management and enforcement staff from the Council, Northwest Region (NWR), Northwest Fisheries Science Center (NWFSC), coastal states and the industry (Attachment B).

*Recommendation 7:*

NMFS (NWR and NWFSC) will take the first step on the task of addressing monitoring issues, in consultation with the states, and report back to the Council no later than the June Council meeting. An initial list of issues for this effort was provided (Attachment B). The list touched on issues such as feasibility of camera monitoring, full retention, design of a compliance observer program (including the use of lower skill level observers/monitors for compliance work), and identifying less burdensome provision for small vessels. Limited landing hours for shoreside monitoring and possible need for Federal trawl landings tracking system, parallel to the state ticket system, will also be addressed by this group. Ultimately other issues will also need to be addressed, such as how to determine the quota pounds used to cover discards if a camera noted a discard event.

The GAC agreed with the need for a group and that it might be possible to initially address the issues without establishing a formal Council body. NMFS agreed to begin work on this task and to coordinate with the NWFSC and states, particularly with respect to the observer program. Consultation with the states is important for providing information from their experience, such as with maximized retention in the whiting fishery. It is intended that once NMFS has initially framed the issues, the dialogue can be expanded to the wider group suggested by the GMT, and that this group may not need to be a formal ad hoc committee of the Council.

The current alternatives call for 100% at-sea monitoring. One significant issue of concern was whether or not 100% at-sea monitoring is required. The GAC recommended that NMFS internally determine the level of monitoring that would be sufficient, and then the Council can shape a monitoring program to achieve that level.

## Permit/Processor Allocations

The current options include the following permit and processor splits of the initial allocation of IFQ: 100/0, 75/25 and 50/50. After initial allocation, the IFQ could be traded, and so the distribution of IFQ between the groups could change over time.

***Recommendation 8:***

Eliminate option of initially allocating 50% of the IFQ to processors from the analysis.

Members of the GAC asked about the objective of an allocation to processors. Part of the original rationale for the 50/50 option, when the TIQC developed it, was that it was the closest legal alternative to a two-pie system. Processors have stated concerns that IFQs would change their relative bargaining position *vis-à-vis* permit holders and result in the potential loss of value of significant capital assets. The majority of GAC members believed that a 50 percent initial allocation to processors would create an imbalance of power. They cited as examples, the lack of power that vessel owners have had in negotiating crab prices and the potential for the number of alternative buyers to be more restricted within smaller geographic regions than it is coastwide. GAC members also noted concern that the initial allocation would only be the starting point with respect to the amount of shares controlled by processors and that they would expect processors to acquire additional shares, subject to accumulation limits. Some processor/permit owners may also receive shares for both their processing activity and permits they own. In general, there was a perception that there is a current imbalance in favor of the processors and that a 100% allocation to harvesters would not create an imbalance in favor of harvesters. On that basis they recommended that the analyzed range be narrowed by reducing the maximum amount that might be allocated to processors while maintaining the option of a 100 percent allocation to permit holders. A minority of GAC members wanted to see the analysis of a 50/50 split before making a decision. It was noted that analysis has not yet been produced to demonstrate that an imbalance would result from a 50/50 initial allocation, though question arose as to the extent that a quantitative analysis could provide insight on this issue.

During discussion, concern was also expressed that vessels fishing IFQ provided by processors might not have the same incentive to minimize bycatch as it would for its own IFQ. Others countered that the processor and vessel would both have incentive to minimize bycatch in order to maximize their ability to harvest and process target species.

## Processor History – Attribution and Accrual Historic Activity

Only the first processing of fish would count toward processing history for the purpose of IFQ allocation. There are two issues to be addressed in assigning processing history.

1. To whom is processing history attributed when it occurs?
2. How does processing history accrue over time for the purpose of initial allocation?

The question of attribution of processing history has to do with the entity to which the processing history is attached at the time it occurs and how that will be established. The question of accrual of processing history has to do with who receives credit for processing history at the time of initial allocation. For the purpose of permits, the permit history is attributed to the permit based on fish ticket information and, for the purpose of initial allocation, accrues to the current owner of the permit, regardless of whether or not he/she was the owner of the permit at the time of the landing. For the purpose of shoreside processing, the GAC has recommended the addition of an option for a single rule to cover both attribution and accrual.

> ***Recommendation 9:***
>
> The GAC recommends that the entity responsible for filling out the state fish ticket (landing receipt) receive the processing history for shoreside landings. For the at-sea fishery observer data and weekly processing reports will be used to document processing history.

Under this recommendation, there is no opportunity for an entity to accrue processing history other than that which is recorded for it on the fish ticket. It is also recognized that in some cases the receiver listed on the fish ticket may not be the first processor. Attribution of processing history to the buyer was supported based on the idea that the business arrangement leading to the transfer of unprocessed fish was one which is outside the knowledge of the state, and outside information in the available landings tracking mechanisms. Not all GAC members agreed that this option responds to the intent to allocate to first processors, if processors are in fact included in the initial allocation. However, the GAC reasoned that the landing receipt is the best official data available, that the approach can be implemented at a reasonable cost, and that the option can be expected to make a reasonably approximate distribution of the initial allocation to processing entities.

The GAC recommendation would also leave in place for consideration as an option the TIQC recommendation. The TIQC approach is based on the idea that processing history should be attributed to whoever does the first processing:

> For shorebased landings, the recipient of the groundfish listed on the fishticket is presumed to be the first processor unless evidence is presented to NMFS that some other entity was the first processor.

This may potentially result in conflicting claims to the history for a particular landing (e.g. claims by the first receiver and a processing company to the history for same fish ticket) and a need for adjudication. For the at-sea fishery, observer data and weekly processing reports will be used to document history.

While shorebased processing history would be initially attributed based on fish ticket information (modified by adjudication), when it comes time for initial allocation, under the TIQC recommendation processing history would accrue to the facility. At the time of initial allocation, for both shorebased and at-sea processors:

> The entity credited for processor history [accruing history] would be the current owner of the processing facility, unless leased, in which case it would be the lease holder.

GAC members noted that the TIQC approach to accrual is supported based on the numerous changes in ownership within the processing industry that has occurred in recent years. The underlying concepts are that if one company acquires another, it acquires both its assets and liabilities and, with respect the leasing provision, it is the lease holder who is really operating the processing business. The TIQC option would attribute the history to the current owner rather than past owners, reducing the dislocation that would occur through the allocation of IFQ to business entities no longer associated with the facility. The TIQC had recommended that other options be dropped but had not reviewed the new GAC recommendation.

## Area Management

The question of whether or not there would be an increased need for area management under an IFQ program, and if so, what adjustments should be made to the alternatives, has been outstanding since the time the Council initially started considering the IFQ program. In June 2005, the Council decided to defer the initiation of consideration of this issue until some of the analysis was more fully developed.

> ***Recommendation 10:***
>
> Ask the managers to look at the data in terms of where catch and landings currently occur, to the extent that data exists. Bring back the information on spatial catch and landings distribution as it exists now. Also, ask that the SSC groundfish subcommittee identify those species that might be of more and less biological concern with respect to localized depletion and identify other factors that should be considered in establishing biological regions. At that point, a decision will be made on a work group and additional members.

The GAC viewed area management as an important consideration within the TIQ program, particularly given their recommendation to remove the community stability program from the alternatives. It was noted that on biological and social bases, area management could be one of the main ways to address community concerns.

The GAC requested that information on catch and landing areas be compiled by managers before the Council takes action to form an area management workgroup. The data request is outlined above in the GAC Recommendation section. There should be no presumptions about the number or boundaries of the areas but managers should provide general recommendations on potential area divisions (maybe a maximum of 10 areas). When making these recommended divisions, the managers should consider existing area divisions, if compatible. Members of the GAC also noted that as the process moves forward there may be a need to provide some guidance on criteria for evaluating area approaches. For example, if areas are established, how would priorities be set among various stocks and stock parameters?

GAC members also expressed interest in receiving analysis that aids in understanding the effect of area management on landings and IFQ tradability; the potential for area management to contribute to community stability; and the potential for area consolidation under a TIQ program and how that would affect conservation and economic concerns.

## Initial Allocation of IFQ (Quota Shares) – Overfished Species

IFQ would be issued as quota shares. Quota shares would entitle the holder to annual issuance of quota pounds. The amount of quota pounds would be determined by application of the person's quota shares to the total trawl catch allocation. Quota shares can be allocated on the basis of a number of factors, including catch history and equal division. The current provisions contain an option that would allocate overfished species equally among all qualified applicants.

> ***Recommendation 11:***
>
> For allocating overfished species, eliminate the equal sharing option and develop the proxy species option, along with the catch history option. The proxy species option would allocate overfished species based on target species history or allocation.

Allocating non-overfished species solely on the basis of equal allocation is not being considered, however, equal allocation of quota shares that would otherwise have gone to bought back permits remains an option. Under this option the quota shares that would have been allocated based on the catch history of bought back permits would be equally divided among all catcher vessel permits.

The following reasons supported the GAC decision to recommend elimination of the overfished species equal sharing option. An equal sharing option would cause a mismatch in a permits IFQ portfolio between the amount of overfished species IFQ and the amount of target species IFQ, which would particularly disadvantage large producers. Likewise, under an equal sharing option some recipients would receive IFQ for species that they do not catch, while others who do catch that species would need to change their IFQ holdings in order to prosecute their fishery. The GAC recommends the analysis of a proxy species option and a catch history option, so that the two methods could be contrasted. The proxy species option would link bycatch species to target species. Therefore, large producers would be rewarded with the allocation of bycatch they need to take their IFQ for target species. The catch history option for overfished species would reward strategies with higher bycatch rates for overfished species. A benefit to keeping the catch history option within the analysis is it would allow the Council to select minimum/maximum sideboards or a mix-and-matching between the proxy species and catch history options. The GMT report also suggests a number of ways to make the initial allocation of overfished species.

NOAA will be reviewing the new Magnuson-Stevens Act (MSA) and then will make a recommendation related to initial allocation and in particular the consideration of auctions.

## Accumulation Limits

Accumulation limit options are being considered for vessels, ownership and control.

> ***Recommendation 12:***
>
> Action on ownership and control limits deferred pending development of additional information on limits used elsewhere.

The TIQC recommended that the holdings of individuals not count toward limits for partnerships, corporations or other entities in which they hold an ownership interest. However, GAC members expressed concern that the TIQC-proposed cap might be circumvented, and asked for further detail and analysis before making a recommendation. Therefore, the GAC requested additional information, and it was suggested that the caps used in the North Pacific be researched as a potential as a source of guidance.

## Initial Allocation of Quota Shares –Relative vs. Absolute Pound

Options are under consideration that would either calculate a permits history based on summing its qualified pounds (absolute pounds) or based on its landings each year expressed as a percent of the fleet's landings for that year (relative pounds). For at-sea vessels catch may be used instead of landings.

> ***Recommendation 13:***
>
> Use relative pounds. A permit's history would be calculated as its percent of the fleet's landings history in each year. All percents are summed for each applicant and the result would be normalized.

The majority of GAC members were in favor of using relative pounds. It was expressed that relative proportions are appropriate in this fishery, given the variability of optimum yields (OY) over time. On the other hand, it was noted that the calculation of absolute pounds is simpler, and that the option to drop years could address a recipient's concerns about the effect of lower opportunity years on their total catch history.

## Entry Level Opportunity

The newly reauthorized MSA requires that entry level opportunities be considered.

> ***Recommendation 14:***
>
> Maintain for analysis an option for creating an entry level opportunity (do not relegate this issue to a trailing amendment). Explicitly consider how 5% of the quota shares (QS) might be set aside for a one time allocation to new entrants, possibly by auction. The allocation would be available to individual persons (as opposed to other types of legal entities, e.g. partnerships, corporations, etc).

Given the MSA requirement, the GAC agreed that using a trailing amendment as the implementation mechanism should not be considered. Within the current alternatives is already an option of redistributing revoked shares via a lottery, but this option needs further development. The one-time 5 percent set-aside for new entrants, which could be auctioned, is a new option that is recommended by the GAC. In addition, GAC members noted that the highly divisible nature of quota shares combined with relatively few restrictions on who could own the shares also allows for an avenue for new entrants. The GAC defined new entrants as those who did not receive initial quota shares.

## Community Stability Program

The community stability program would allocate a certain amount of the trawl allocation each year for distribution to quota pound holders who come forward with proposals to use their quota pounds in a manner that increases the benefits to local fishing communities.

### *Recommendation 15:*

Eliminate this program and rely on other measures to address community concerns (e.g. area based management and potential regional fishery management associations).

GAC members were interested in assuring that community stability is addressed in the TIQ program, but concluded that too many problems were associated with the community stability program. GAC members highlighted issues including: the difficulty of developing completely objective criteria and likely costs and controversy associated with the evaluation of applications; and the potential amount of quota pounds available, once distributed along the coast, might not be enough to benefit the communities.

The GAC viewed the opportunity for communities to buy IFQ, area management, and regional fishery associations as better ways with which to assist communities in achieving stability. Other provisions would need to be added to the alternatives to allow the creation of regional fishery associations. NMFS will be looking at what is required in that regard as part of their assessment of the reauthorized Magnuson-Stevens Act. Still, it was noted that a community stability program could serve as a fallback to address these concerns if area management is not implemented in the TIQ program.

## Minimum Amount of Quota Pounds that Must Be Held on Departure

The program contains a suboption that would require a minimum amount of quota pounds be held prior to a vessels departure. The TIQC has recommended against such a requirement. Attachment C provides a general outline of the IFQ tracking monitoring and enforcement system.

### *Recommendation 16:*

The GAC requested that EC develop a recommended minimum amount for inclusion as an option. Bonds should be considered as an alternative enforcement mechanism.

Given the status of some stocks, some GAC members were uncomfortable with the TIQC recommendation that no minimum amount of quota pounds is necessary for departure. GAC members did not have a suggestion of a minimum amount. Therefore, it was requested that a recommended minimum requirement be developed by EC. One of the advisors suggested the possibility of using a performance bond as an alternative enforcement mechanism.

## Trawl Subsector Allocation Formula

The TIQC recommendations include an option that would allocate the trawl allocation among trawl subsectors based on the catch history of that subsector during the period used for the initial IFQ allocation. One of the suboptions would eliminate from that calculation the catch of any permit which does not meet the recent participation requirement.

> ***Recommendation 17:***
>
> For purpose of subsector allocation based on fleet history, do not include the suboption which would eliminate from the fleet history the history of permits that fail to meet recent participation requirements.

The fleet's fishing opportunity has been constrained due to the landings of all of its members in aggregate. The catch eliminated from the history calculation by application of a recent participation requirement might have been taken by other members of the fleet in the absence of the permit not meeting the requirement. The fleet's catch history and future opportunity should not be modified based on the fishing pattern of an individual permit. The GAC agreed that history should be calculated from the base period adopted by the Council, and that an elimination clause should not be used.

## Spillover

Spillover is the term applied when consolidation/rationalization in one fishery causes an increase in participation in other fisheries.

> ***Recommendation 18:***
>
> Develop an analysis of the potential for spillover.

GAC members agreed that spillover is an issue that needs to be addressed, but it is premature to do so without analysis. Additional guidance for such analysis: It was suggested that the spillover would occur primarily into the crab fishery. Data could demonstrate the current level of participation in the crab fishery by trawlers. The length frequency of latent crab permits may also indicate that these permits would not be a useful size for use on the trawl boats.

## Clean-up Items

The GAC concurred with the following clean-up items.

- If necessary for program implementation, a "catcher-processor" permit designation may be created. However, it appears that IFQ could be implemented simply by identifying those permits with a catch-processor history as being "catcher-processor" permits for the purpose of implementation, without creating an endorsement.

- The treatment of the rare occurrences of stacked trawl permits will be relegated to a footnote until a proposal for resolution is developed and presented (as opposed to being maintained as a major policy choice).
- The TIQC recommended a change from limiting IFQ ownership to those eligible to "own or operate" a United States (US) document vessel to those eligible to "own or control" a US documented vessel. When possible language is brought forth on the requirements for owning IFQ, the GAC requested it be accompanied by a policy paper explaining the distinctions, particularly as compared to the currently proposed language.
- Leasing: Eliminate references to the leasing of quota pounds. When pounds are used there is no longer an asset to return to the lessor, therefore while pounds could be transferred temporarily for contingent use, the concept of leasing pounds is confusing and should be eliminated.
- Prohibit Transfers of Quota Shares in the Last Two Months: The GAC concurred that this can be left as a specification to be determined based on NMFS guidance on what is administratively required. It does not need to be a provision which is varied between options.
- Limited landing hours: Assign this question to the group looking at monitoring issues.
- Program review: Create framework language which will allow the Council to determine the appropriate timing for program review, in line with MSA requirements.

## Other Tasks and Activities:

1. Phil Anderson volunteered to refine TIQ goals and objectives so that they are more in line with the groundfish strategic goals, and will bring a draft to the GAC.
2. The shoreside whiting co-op proposal will be vetted through the industry and then provided to the Council.
3. NMFS (NWR and NWFSC) will begin addressing monitoring issues, in consultation with the states, and report back to the Council at the June Council meeting. The list of monitoring issues (Attachment B), which was circulated at the meeting, should form a starting point for the work.
4. NMFS NWR volunteered that they are developing a "lessons learned" paper based on their experiences with the fixed gear sablefish program. When completed this will be provided for GAC and Council consideration.
5. NOAA will be reviewing the new Magnuson-Stevens Act and then will make a recommendation related to initial allocation and in particular the consideration of auctions. They will also report on what would be necessary to allow for the creation of regional fishery management associations.
6. Prior to making a decision on forming an area management workgroup, the GAC requests the following analysis:
    a. GMT is asked to collect data on where catch and landings currently occur, to the extent that data exists.
    b. Groundfish subcommittee of SSC is asked to identify those species that might be of more and less biological concern with respect to localized depletion.
7. With respect to area management, the GAC would like to see an analysis that aids in understanding the effect of area management on landings and IFQ tradability; the potential for area management to contribute to community stability; and the potential for area consolidation under a TIQ program and how that would affect conservation and economic concerns.

8. A discussion paper was requested on the co-op alternatives covering why they are needed, why co-ops cannot be created without Federal regulation, the need for a closed class of processors, how co-ops can be developed that would not leave anyone out.
9. Analysis of gear switching should include a scenario in which a certain percent (e.g. 10%) of the vessels voluntarily switch to another gear on a permanent basis (convert).

# Trawl Rationalization Alternatives Based on GAC Recommendations (REV 2/8/07)

## *Trawl Rationalization Alternatives*

### Status Quo Management Regime Approach

**Status quo,** cumulative catch limits for nonwhiting and season management for whiting.

### IFQ-Based Management

**IFQs** will be used to manage the catch of groundfish caught by trawl vessels operating under a limited entry trawl permit except catch in fisheries in which Groundfish is harvested incidentally and catch taken under a limited entry fixed gear permit (applies to dual endorsed vessels).

### Whiting Sector Cooperative Based Management

**Co-ops** would be established for one or more of the three whiting sectors. Options are provided for the possible rollover of whiting among sectors and the possible allocation and rollover of bycatch species.

| | |
|---|---|
| Mothership Sector Co-ops | Catcher vessel co-ops for the mothership fishery and limited entry for motherships. |
| Shoreside Sector Co-ops | Catcher vessel co-ops for the whiting shoreside fishery [and possibly limited entry for shoreside processors, (option development pending)]. |
| Catcher-Processor Sector Co-ops | Vessel co-ops for the catcher-processor sector and endorsement to close the class of catcher processor permits. |

ATTACHMENT CONTENTS

PAGE



IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

Attachment A of the GAC Report, March 2007

**Table 1 Overview the elements of the IFQ alternatives.**

| | Element | SubElement | Considerations |
|---|---|---|---|
| A. | ***Trawl Sector Management*** | | |
| A.1 | Scope for IFQ Management | | For what activities are IFQ required (gear switching)? |
| A.2 | IFQ Management Units | | Includes area management. |
| A.3 | General Management and Trawl Sectors" | | Regulations remaining in place and number of trawl sectors. |
| A.4 | Management of NonWhiting Trips | | Some special provisions needed for nonwhiting sector trips. |
| A.5 | Management of Whiting Trips | | Some special provisions needed for whiting sector trips. |
| A.6 | Special Overfished Species Management Provisions | (placeholder) | No special provisions at this time (except with respect to initial allocation and carryovers (see below)). |
| A.7 | Sideboards | (placeholder) | No special provisions at this time. Issue is being evaluated. |
| B | ***IFQ System*** | | |
| B.1 | **Initial Allocation** | | |
| B.1.1 | Eligible Group | Groups and Initial Split of QS | For permits and processors, how much for each? |
| | | Permit History | Rules for assessing permit history. |
| | | Processing Definition | Definition of processing for initial allocation. |
| | | Attributing & Accruing Processing History | Rules for assessing processor history. |
| B.1.2 | Recent Participation | Permits (including catcher-processor permits) | Should permit recent participation be required in order to receive an allocation? If so what amount? |
| | | Processors - mothership | Should processor recent participation be required in order to receive an allocation. If so what amount? |
| | | Processors - shoreside | |
| B.1.3 | Allocation Formula | Permits with catcher vessel history | Formula for quota share allocation for permits. |
| | | Permits with catcher-processor history | Formula for quota share allocation for catcher-processors. |
| | | Processors - motherships | Formula for quota share allocation for motherships. |
| | | Processors - shoreside | Formula for quota share allocation for shoresd processors. |
| B.1.4 | History for Combined Permits and Other Exceptional Situations | | Special rules for exception situations. |
| B.1.5 | Initial Issuance Appeals | | Specifying an appeals process. |
| B.2 | **Permit/Holding Requirements and Acquisition** | | |
| B.2.1 | Permit/IFQ Holding Requirement | | What must be held when? |
| B.2.2 | IFQ Annual Issuance | Start-of-Year QP Issuance | Annual issuance of quota pounds. |
| | | Carryover (Surplus or Deficit) | Carryover of quota pounds from one year to the next. |
| | | Quota Share Use-or-Lose Provisions | Provision to require forfeiture for unused quota |
| | | Entry Level Opportunities | Provisions for new entrants. |
| B.2.3 | IFQ Transfer Rules | Eligible Owners/Holders | Who can own quota shares? |
| | | Transfers and Leasing | Transfers allowed. Consideration of leasing. |
| | | Temporary Transfer Prohibtion | Consider prohibitions needed for program administration. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 1. Overview the elements of the IFQ alternatives (continued ).**

| | Element | SubElement | Considerations |
|---|---|---|---|
| | | Divisibility | Divisibility of quota shares and quota pounds. |
| | | Liens | Liens could be placed on quota shares & quota pounds. |
| | | Accumulation Limits (Vessel, Ownership, Control) | Consideration of accumulation limits. |
| B.3 | **Program Administration** | | |
| B.3.1 | Tracking and Monitoring | | Elements of the tracking and monitoring program. |
| B.3.2 | Economic Data Collection | | Consideration of expanded mandatory data collection. |
| B.3.3 | Program Costs | Cost Transfer and Recovery | What should be recovered and limits on total fees? |
| | | Fee Structure | How should fees be structured? |
| B.3.4 | Program Duration and Modification | | Elements of the review process. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 2. Summary of the IFQ Alternatives**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| A. | ***Trawl Sector Management*** | | **Same for All Alternatives** |
| A.1 | Scope for IFQ Management, Including Gear Switching | | Catch based system: QP (quota pounds) required to cover groundfish catch (including all discards).<br>Gear switching allowed (vessels with limited entry trawl permits can use directed groundfish gears (including open access, longline and fishpot) to harvest their QP). |
| A.2 | IFQ Management Units, Including Latitudinal Area Management | | Quota-Shares/QP will be species, area and sector specific.<br>Species and areas will be as specified in the ABC/OY table, unless it is determined that additional area subdivisions are desirable.<br>**(Process Option**: Initiate a group to address area management)<br>QS may be subdivided after initial allocation. |
| A.3 | General Management and Trawl Sectors<br>" | | Unless otherwise specified, status quo regulations, other than trip limits, will remain in place. Including season closures, as necessary.<br>**Option 1:** One trawl sector.<br>**Option 2**: Four trawl sectors: shoreside nonwhiting, shoreside whiting, mothership, and catcher-processors. |
| A.4 | Management of NonWhiting Trips | | Trip limits will apply to whiting incidental catch in the nonwhiting fishery (in addition to the requirement that catch be covered with for whiting QP). |
| A.5 | Management of Whiting Trips | | At-sea whiting will be closed through a prohibition on at-sea deliveries (including catcher-processor harvest).<br><br>If the trawl sector is divided into subsectors:<br>**Option 1:** Whiting QP rollover provision.<br>**Option 2:** No whiting QP rollover provision. |
| A.6 | Special Overfished Species Management Provisions | (placeholder) | No special provisions (except with respect to initial allocation and carryovers (see below)). |
| A.7 | Sideboards | (placeholder) | No special provisions at this time. Issue is being evaluated. |
| B | ***IFQ System*** | | |
| B.1 | **Initial Allocation** | | |
| B.1.1 | Eligible Groups | Groups and Initial Split of QS | **Option 1:** 100% to permit owners<br>**Option 2:** 75% to permit owners and 25% to processors |
| | | Permit History | Landings/deliveries history goes with the permit. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 2. Summary of IFQ alternatives (continued)**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| | | Processing Definition | Only the first processing counts as processing. A special definition of processors and processing is provided. |
| | | Attributing and Accuring Processing History | Attribute to the first receiver, but for shoreside<br>**Option 1:** Attribute to the receiver reported on the landing receipt.<br>**Option 2:** Same as Option 1, except history may be reassigned to an entity not on the landings receipt, if parties agree or thru an adjudication process. Additionally, history transfers with the facility (unless the facility is leased, in which case it goes to the lease holder). |
| B.1.2 | Recent Participation | Permits (including catcher-processor permits) | **Option 1:** Recent participation is not required.<br>**Option 2:** Recent participation required (one landing/delivery from 1998-2003)<br>**Option 3:** Recent participation required (1998-2003) [level of activity to be determined] |
| | | Processors (motherships) | Recent participation required: (level of activity to be determined] from 1999-2004 |
| | | Processors (shoreside) | Recent participation required: [level of activity to be determined] from 1999-2004 |
| B.1.3 | Allocation Formula | Permits with catcher vessel history | Allocation based on<br>(1) permit history, plus<br>(2) an equal division of QS for buy-back permits<br>For each species/species group to be allocated QS, the history used for allocation will be that for:<br>**Allocation Species Option 1 (Nominal[a] Species):** the species/species group being allocated.<br>**Allocation Species Option 2 (Nominal or Proxy Species):** Use proxy species for nontarget-overfished species and other incidental species (LIST TO BE PROVIDED IN FOOTNOTE)<br>Allocation period: 1994-2003 drop two worst years for whiting trips<br>drop three worst years for nonwhiting trips.[b]<br>Relative pounds. Use a vessels pounds relative to the rest of the fleet to calculate history for each year. |
| | | Permits with catcher-processor history | **Option 1:** Schedule developed by unanimous consent of catch processors.<br>**Option 2:** Permit history: 1994-2003 (no option to drop years) use relative pounds[c]. |
| | | Processors (motherships) | Motherships: 1998-2003 (no option to drop years) use relative pounds.<br>Apply the Allocation Species Options listed above |
| | | Processors (shoreside) | Shoreside Processors: 1994-2004, drop two worst years, use relative pounds.<br>Apply the Allocation Species Options listed above |
| B.1.4 | History for Combined Permits and Other Exceptional Situations | | Permit history for combined permits include the history for all the permits that have been combined.<br>EFPs landings in excess of cumulative limits for the non-EFP fishery will not count.<br>Compensation fish will not count.[de] |
| B.1.5 | Initial Issuance Appeals | | No Council appeals process. NMFS will develop a proposal for an internal appeals process. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 2. Summary of IFQ alternatives (continued)**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| B.2 | **Permit/Holding Requirements and Acquisition** | | |
| B.2.1 | Permit/IFQ Holding Requirement | | 1. Limited entry trawl permit required.<br>2. 30 days to cover catch with QP<br>3. For a vessel to use QP, they must be in the vessel's QP account.<br>4. If a vessel does not have QP to cover its catch, it may not fish until the overage is covered.<br>5. A vessel with a deficit could not transfer its LE permit.<br>**Option:** XXX QP must be held prior to departure from port. |
| B.2.2 | IFQ Annual Issuance | Start-of-Year QP Issuance | Quota pounds would be issued annually to quota share holders. |
| | | Carryover (Surplus or Deficit) | **Non-overfished Species Option 1:** 5% carryover for non-overfished species<br>**Non-overfished Species Option 2:** 10% carryover for non-overfished species<br>**Non-overfished Species Option 3:** 30% carryover for non-overfished species<br><br>**Overfished Species Option 1:** No carryover for overfished species<br>**Overfished Species Option 2:** 5% carryover for non-overfished species<br>**Overfished Species Option 3:** Same carryover as for overfished species |
| | | Quota Share Use-or-Lose Provisions | None. Consider during program review. |
| | | Entry Level Opportunities | **Option 1:** No special provisions.<br>**Option 2**: Lottery for revoked shares. One time distribution of 5% of QS at start of program, possibly through and auction. |
| B.2.3 | IFQ Transfer Rules | Eligible Owners/Holders | Any entity eligible to own or control a US documented fishing vessel with certain AFA and treaty exceptions. |
| | | Transfers and Leasing | **Option 1:** Transferable QP/QS.<br>**Option 2:** Transferable QP/QS but leasing QS prohibited. |
| | | Temporary Transfer Prohibtion | Temporary prohibitions on QS transfers, as necessary for program administration (to be determined by NMFS). |
| | | Divisibility | Unrestricted for quota shares. Whole pound units for quota pounds. |
| | | Liens | Liens could be placed on quota shares and quota pounds. |
| | | Accumulation Limits (Vessel, Ownership, Control) | Limits may vary by species/species group, areas, and sector. Data needed to narrow options. New definition of "control" and other provisions needed. The following options are being considered.<br>**Option 1:** No limits **Option 4:** 10% limits<br>**Option 2:** 50% limits **Option 5:** 5% limits<br>**Option 3:** 25% limits **Option 6:** 1% limits<br>Note: Limits for groundfish or a complex may be applied in addition to the species/species group limits. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 2. Summary of IFQ alternatives (continued)**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| B.3 | **Program Administration** | | |
| B.3.1 | Tracking and Monitoring<br>NMFS will explore the possibility of less than 100% at-sea monitoring and report back on the possibility. | | **Option 1:** 100% at-sea compliance monitors/observers (small vessel exception, if feasible).<br>Discarding would be allowed. Allowing discarding would require that the timeliness of discard reporting be improved to match that for landings reporting. Such timeliness would be necessary to track quota pound usage. VMS would be required.<br>Electronic landings tracking, advance notice of landings, unlimited landing hours. Some shoreside monitoring.<br>Some costs would be controlled through a requirement that delivery sites be licensed. Site licenses would ensure that certain standards would be met that would facilitate monitoring and would aid work force planning. Any landing not made at a licensed site would be illegal.<br>QP account information for vessels would be available in the field. A central lien registry system would include only essential ownership information.<br><br>**Option 2:** Same as Option 1 except as follows. No small vessel exception. There would be full retention and 100% shoreside monitoring, so the discard reporting system would not need to be upgraded. The site licensing program would be replaced by a limitation on the ports to which deliveries could be made. Costs would be further controlled by limiting landing hours. A central lien registry system would contain expanded ownership information.<br><br>**Option 3:** Same as Option 1 except as follows. No small vessel exception. Cameras might be provided as an option for vessels to use in place of compliance observers (feasibility to be determined). Discards would be allowed (except when cameras are used). Instead of creating an electronic state fish ticket system, a Federal system would be created to track trawl landings. A central lien registry system would contain expanded ownership information. |
| B.3.2 | Socio-Economic Data Collection | | **Option 1:** Expanded data collection, voluntary compliance. Include transaction prices in a central QS ownership registry.<br>**Option 2:** Expanded data collection, mandatory compliance. Include transaction prices in a central QS ownership registry. |
| B.3.3 | Program Costs<br>Some cleanup is needed so that the options all cover the same issues. | Cost Transfer and Recovery | **Option 1:** Recover IFQ program costs but not enforcement or science costs<br>A maximum of 3% of ex-vessel value.<br>**Option 2:** Full cost recovery through landing fees plus privatization of certain elements of the management system. |
| | | Fee Structure | To be determined. TIQC recommends a fee structure that reflects usage. |
| B.3.4 | Program Duration and Modification | | Four-year review process.<br>Community advisory committee to review IFQ program performance. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 2. Summary of IFQ alternatives (continued)**

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[a] As used here, "nominal" refers to the species attributed to the vessel after the application of species composition ratios in the PacFIN system. The estimates for nominal species are based on fleet averages and so may vary from actual vessel catch. However, these are the best estimates available of actual vessel catches, specified to the needed levels of species group desegregation.

[b] State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries and observer data will be used for deliveries to motherships.

[c] Based on observer data

[d] **Stacked permits:** On rare occasions two trawl permits have been assigned to the same vessel. During the time more than one permit is assigned to a single vessel . . . Options: A. Divide landing/delivery history equally among both permits. B. Assign all landing/delivery history to the first permit registered for use with the vessel. This issue will not affect the analysis. Therefore, until the issue is decided Option A will be used.

[e] Illegal landings/deliveries do not count toward history for QS allocation.

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 3. Full description of the IFQ Alternatives (footnotes and references to be added)**

| | Element | SubElement | |
|---|---|---|---|
| A. ***Trawl Sector Management*** | | | |
| A.1 | Scope for IFQ Management, Including Gear Switching | | QP will be required to cover actual groundfish catch (no credit for discard survival) of limited entry trawl vessels using any directed groundfish gear, EXCEPT<br>when such vessels also have a limited entry fixed gear permit AND have declared that they are fishing in the limited entry fixed gear fishery.<br><br>*This definition of the scope allows a limited entry trawl vessel to switch to nontrawl groundfish gears, including fixed gear (longline and fishpot), for the purpose of catching their QP.*<br><br>*It also would allow a nontrawl vessel to acquire a trawl permit, and thereby use trawl QP to catch the LE trawl allocation but with nontrawl gear*. |
| A.2 | IFQ Management Units, Including Latitudinal Area Management | | QS/QP will be species and area specific. They may also be trawl subsector specific, if there is a subdivision of the trawl sector. Subsector specific quota pounds may only be used in the sector for which they are issued, unless otherwise provided.<br><br>The species, species groupings and area subdivisions will be those that are specified in ABC/OY table that is part of the groundfish biennial specifications.<br><br>**Option:** The IFQ management units will be further subdivided into latitudinal areas smaller than those reflected in the ABC/OY table (areas and objectives for the subdivision to be specified).<br><br>**(Process Option**: Initiate a group to address area management)<br><br>Future subdivision: If at any time after the initial allocation an IFQ management unit is further subdivided, those holding QS for the unit being subdivided will receive equal amounts of shares for each of the IFQ management units being subdivided.[a] |
| A.3 | General Management and Trawl Sectors<br><br>Terminology note: Where a subsector name is used the term "sector" is used instead of subsector. For example: "The nonwhiting sector is a subsector of the trawl sector." | | Unless otherwise specified, status quo regulations, other than trip limits, will remain in place.[b] If individual vessel overages (catch not covered by quota pounds) make it necessary, season closures will be used to prevent the trawl sector or subsector from going over its allocation. The IFQ fishery may also be closed as a result of overages in other sectors.<br><br>**Option 1:** There will be a single limited entry trawl sector.<br><br>**Option 2**: The trawl sector will be subdivided into four subsectors: shoreside nonwhiting, shoreside whiting, mothership, and catcher-processors. QP may not be transferred between sectors, unless specifically allowed. |
| A.4 | Management of NonWhiting Trips | | If the trawl sector is divided into subsectors, whiting QS will be issued for the nonwhiting sector to cover incidental catch of whiting. Trip limits will also apply to whiting incidental catch in the nonwhiting fishery to ensure that the whiting QP are not used to target whiting. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
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**Table 3. Full description of the IFQ alternatives (continued)**

| | Element | SubElement | |
|---|---|---|---|
| A.5 | Management of Whiting Trips | | Spring openings will be maintained to control impacts on ESA-listed salmon. If there is a single trawl sector, to maintain spring openings for the whiting season, or if necessary close the whiting fishery, targeting on whiting for shoreside delivery will be controlled with vessel trip limits. Thus, a vessel's harvest will be constrained by both its QP and the vessel trip limit. At-sea whiting will be closed through a prohibition on at-sea deliveries (including catcher-processor harvest).<br><br>If the trawl sector is divided into subsectors:<br>**Option 1:** there will be a whiting QP rollover provision. This provision will allow unused quota pounds to be reclassified so that they may be used in any whiting sector.[c]<br>**Option 2:** there will not be a whiting QP rollover provision. |
| A.6 | Special Overfished Species Management Provisions | (placeholder) | No special provisions for overfished species managed with IFQ (except with respect to initial allocation and carryovers (see below)). |
| A.7 | Sideboards | (placeholder) | No special provisions at this time. Issue is being evaluated. |
| B | ***IFQ System*** | | |
| B.1 | **Initial Allocation** | | |
| B.1.1 | Eligible Groups | 1 Groups and Initial Split of Quota Share | ***Eligible Groups*** The initial allocation of quota shares willbe made to permit owners or permit owners[d] and processors. After the initial allocation those eligible to purchase quota shares will not necessarily be limited to these groups (see below: "IFQ/Permit Holding Requirements and IFQ Acquisition").<br><br>The following are the shares of the initial IFQ allocation that are being considered for the eligible groups.<br><br>**Option 1:** 100% to permit owners<br>**Option 2:** 75% to permit owners and 25% to processors<br><br>*After initial allocation, the distribution of shares among groups may change as shares are traded.* |
| | | 2 Permit History | Landing/delivery history will accrue to the permit under which the landing was made. The owner of the permit at the time of initial allocation will receive QS based on the history of the permit. |
| | | 3 Processing Definition | A special definition of "processor" and "processing" will be used for initial quota share allocation. A main intent of the definition is to specify that only the first processor of the fish receives an initial allocation of quota shares. See footnote for definition.[e] |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 3. Full description of the IFQ alternatives (continued)**

| | Element | SubElement | |
|---|---|---|---|
| | | 4 Attributing and Accruing Processing History | **Option 1:** The entity responsible for filling out the state fish ticket (landing receipt) receive the processing history for shoreside landings. For the at-sea fishery observer data and weekly processing reports will be used to document processing history.<br><br>**Option 2:** For shorebased landings, the recipient of the groundfish listed on the fishticket is presumed to be the first processor unless evidence is presented to NMFS that some other entity was the first processor. An adjudication process may be needed to resolve conflicting claims with respect to the question of to whom processing history should be initially attributed. For the at-sea fishery, observer data and weekly processing reports will be used to document history. At the time of initial allocation, for both shorebased and at-sea processors, the entity credited for the processor history [accruing history] would be the current owner of the processing facility, unless leased, in which case it would be the lease holder. |
| B.1.2 | Recent Participation | 1 Permits (including catcher-processor[f] permits) | **Option 1:** Recent participation not required to qualify for QS.<br>**Option 2:** Recent participation required (one landing/delivery from 1998-2003) to qualify for QS<br>**Option 3:** Recent participation required (1998-2003) [level of activity to be determined] to qualify for QS<br>Recent participation in any sector will qualify a permit for QS for all sectors in which it has any history. |
| | | 2 Processors (motherships) | Recent participation is required to qualify for QS: [level of activity to be determined] from 1998-2003. |
| | | 3 Processors (shoreside) | Recent participation is required to qualify for QS: [level of activity to be determined] from 1999-2004. |
| B.1.3 | Allocation Formula[g] | 1 Permits with catcher vessel history | Owners of permits with catcher vessel history will be allocated quota shares based on<br>(1) the landing/delivery history of the permit,[h] plus<br>(2) an equal division of the QS that would have been attributed to buy-back permits based on landing/delivery history alone.<br>For each species/species group to be allocated quota shares, the history to be used for allocation will be that for:<br>**Allocation Species Option 1 (Nominal[i] Species):** the species/species group being allocated.<br>**Allocation Species Option 2 (Nominal or Proxy Species):** the species/species group being allocated or for a closely related target species (proxy species). For nontarget-overfished species and other incidental species listed here, the related proxy species used to allocate QS will be: . . . [List of species for which proxies will be used (and the proxies) to be generated and provided here or in footnote].<br><br>The landing/delivery history for each permit will be calculated for 1994-2003 but the two worst years for each species will be dropped for whiting trips and the three worst years for nonwhiting trips.[j]<br><br>Relative pounds. The permit's history for each year for each year will be calculated as a percent of the fleet total for that year.[k]<br><br>*If there is a single trawl sector, unevenness in data among current trawl sectors may require that the QS be initially allocated on a sector basis but that after initial allocation QS would be freely transferable among sectors. This approach would require establishing a temporary allocation among trawl sectors.[l]* |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
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**Table 3. Full description of the IFQ alternatives (continued)**

| | Element | SubElement | |
|---|---|---|---|
| | | 2 Permits with catcher-processor history | **Option 1:** Owners of permits for catcher-processors (all of whom are members of the Pacific Whiting Conservation Co-op) will develop an allocation schedule by unanimous consent and submit it to the Council for consideration.<br>**Option 2:** Owners of catcher-processor permits will be allocated QS based on permit history for 1994-2003 using relative pounds[m] (no option to drop years). |
| | | 3 Processors (motherships) | Shoreside Processors: the processing history for each qualified entity will be calculated for 1994-2004 but the two worst years will be dropped.<br><br>Apply the Allocation Species Options listed above for permits with catcher vessel history. |
| | | 4 Processors (shoreside) | Shoreside Processors: the processing history for each qualified entity will be calculated for 1994-2004 but the two worst years will be dropped.<br><br>Apply the Allocation Species Options listed above for permits with catcher vessel history. |
| B.1.4 | History for Combined Permits and Other Exceptional Situations | | Permit history for combined permits would include the history for all the permits that have been combined. History for illegal landings/deliveries will not count toward an allocation of quota shares. Landings made under EFPs that are in excess of the cumulative limits in place for the non-EFP fishery will not count toward an allocation of quota shares. Compensation fish will not count toward an allocation of quota shares.[n] |
| B.1.5 | Initial Issuance Appeals | | There would be no Council appeals process on the initial issuance of IFQ. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Any proposed revisions to fishtickets would undergo review by state enforcement personnel prior to finalization of the revisions. |
| B.2 | **Permit/Holding Requirements and Acquisition** **(after initial allocation)** | | |
| B.2.1 | Permit/IFQ Holding Requirement | | 1. Only vessels with limited entry trawl permits would be allowed to participate in the trawl IFQ fishery.<br>2. All catch would have to be covered with QP within 30 days of the landing.<br>3. For a vessel to use QP they would have to be transferred to that vessel's QP account.<br>4. For any vessel with an overage (catch not covered by quota) there would be no more fishing by the vessel until the overage is covered. An overage may be covered by with QP from subsequent years, but not until such QP have been issued by NMFS.<br>5. Additionally, for vessels with an overage, the limited entry permit could not be sold or transferred until the deficit is cleared.<br>**Option:** XXX QP (to be analyzed and amount determined) must be held prior to departure from port. |
| B.2.2 | IFQ Annual Issuance | 1 Start-of-Year Quota Pound Issuance | Quota pounds would be issued annually to quota share holders based on the amount of quota shares they held.<br>*Quota shares would be issued at the time of initial allocation. As specified above, quota share holders would have to transfer their pounds to a vessel's quota pound account in order for the quota pounds to be used.* |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 3. Full description of the IFQ alternatives (continued)**

| | Element | SubElement | |
|---|---|---|---|
| | | 2 Carryover (Surplus or Deficit) Previously called "rollover." The term rollover is now being used for intersector transfers. | A carryover allowance would allow surplus quota pounds in a vessel's quota pound account to be carried over from one year to the next or allow a deficit in a vessel's quota pound account for one year to be carried over and covered with quota pounds from a subsequent year.<br><br>A vessel with a quota pound **surplus** at the end of the current year would be able to use some of those quota pounds in the following year. The amount it could use in the following year would be limited to a specified percent of the vessel's total quota pounds (used and unused) from the current year (see options below).<br><br>A vessel with a quota pound **deficit** in the current year would be able to cover that deficit with quota pounds from the following year without incurring a violation if<br>(1) the amount of quota pounds it needs from the following year is within the carryover allowance, and<br>(2) the quota pounds are acquired within the specified time limit (30 days).<br>*The time limit on acquisition of additional shares to avoid a violation implies that subsequent year quota pounds could only be used to avoid a violation if that deficit (catch overage) occurs toward the end of the year.*[o]<br><br>The following are the quota pound carryover provisions for each IFQ alternative. The percentages are calculated based on the total pounds (used and unused) in a vessel's quota pound account for the current year.<br><br>**Non-overfished Species Option 1:** 5% carryover for non-overfished species<br>**Non-overfished Species Option 2:** 10% carryover for non-overfished species<br>**Non-overfished Species Option 3:** 30% carryover for non-overfished species<br><br>**Overfished Species Option 1:** No carryover for overfished species<br>**Overfished Species Option 2:** 5% carryover for non-overfished species<br>**Overfished Species Option 3:** Same carryover as for overfished species |
| | | 3 Quota Share Use-or-Lose Provisions | A use-or-lose provision is not included, but the need for such a provision will be evaluated as part of future program reviews.<br>*A use-or -lose provision would revoke the quota shares associated with quota pounds that go unused on a repeated basis. Implementing a use-or-lose provision might require that when quota pounds are transferred during the year, information would have to be preserved on the quota shares for which they were originally issued and the quota share usage would have to be tracked across years as quota shares are transferred from one account to another. Given other design elements of the program (e.g. no limit on the number of potential quota share holders) no administratively feasible use-or-lose provisions has yet been identified.* |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 3. Full description of the IFQ alternatives (continued)**

| | Element | SubElement | |
|---|---|---|---|
| | | 4 Entry Level Opportunities | Under the MSFCMA [(303(d)(5)(C)] the Council is required to consider entry level fishermen, small vessel owners, and crew members, and in particular the possible allocation of a portion of the annual harvest to individuals falling in those categories. The following are the related provisions.<br>**Option 1:** No special provisions (*New entry is addressed indirectly by allowing crew, captains and others to acquire quota shares in small increments.)*.<br>**Option 2**: An opportunity will be provided for new entrants to qualify for revoked shares including shares lost due to non-use (if use-or-lose provisions are created). Additionally, a one time distribution of 5% of the quota shares, possibly by auction, will be considered for new entrants at the start of the program. Qualification and distribution criteria to be determined |
| B.2.3 | IFQ Transfer Rules | 1 Eligible Owners/Holders | Any entity eligible to own or control a US documented fishing vessel would be eligible to own or lease QS/QP with certain AFA and treaty exceptions. *The Trawl IQ Committee's intent is to preserve opportunity for existing participants.*[p] |
| | | 2 Transfers and Leasing | **Option 1:** Transferable QP/QS.<br>**Option 2:** Transferable QP/QS but QS leasing prohibited. |
| | | 3 Temporary Transfer Prohibtion | NMFS may establish temporary prohibitions on the transfer of quota shares, as necessary to facilitate program administration. |
| | | 4 Divisibility | The divisibility of quota shares would be unrestricted and the quota pounds would be transferred in whole pound units (i.e. fractions of a pound could not be transferred) |
| | | 5 Liens | Quota shares and quota pounds could be used as collateral but would be subject to modification or revocation without compensation as specified in the MFCMA. Subject to this limit, liens could be placed on quota shares and quota pounds. Liens can and should be facilitated through a central lien registry. Options for the central lien registry are covered in the section on "Program Administration." |
| | | 6 Accumulation Limits (Vessel, Ownership, Control) | Limits are being considered on the amount of quota pounds that could be fished from a single vessel, the amount of quota shares and pounds that could be owned by a single person, and the amount that could be controlled by a single person.[q] Limits may vary by species/species group, areas, and sector. The following are the range options being considered. Additional data work is needed to more fully develop the suite of options, including a new definition of "control" and grandfather clauses (see footnote).[r]<br>**Option 1:** No limits — **Option 4:** 10% limits<br>**Option 2:** 50% limits — **Option 5:** 5% limits<br>**Option 3:** 25% limits — **Option 6:** 1% limits<br>Note: Limits for groundfish or a complex may be applied in addition to the species/species group limits. |
| B.3 | **Program Administration** | | |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
QS = Quota Shares (issued at the start of the program)
QP = Quota Pounds (issued each year based on quota shares held)

**Table 3. Full description of the IFQ alternatives (continued)**

| | Element | SubElement | |
|---|---|---|---|
| B.3.1 | Tracking, Monitoring and Enforcement<br>NMFS will explore the possibility of less than 100% at-sea monitoring and report back on the possibility. | | For all tracking, monitoring and enforcement options: VMS and advance notice of landings would be required; shoreside there would be an electronic landings tracking system, an electronic, quota share/quota pound tracking system; QP account information for vessels would be tracked electronically and available in the field; and there would be a central QS/QP transaction system that would include a QS lien registry.<br><br>**Option 1:**100% at-sea compliance monitors/observers (small vessel exception, if feasible).<br>Discarding would be allowed. Allowing discarding would require that the timeliness of discard reporting be improved to match that for landings reporting. Such timeliness would be necessary to track quota pound usage.<br>Electronic landings tracking (state landings system), advance notice of landings, unlimited landing hours. Some shoreside monitoring.<br>Some costs would be controlled through a requirement that delivery sites be licensed. Site licenses (license criteria to be specified). would ensure that certain standards would be met that would facilitate monitoring and would aid work force planning. Any landing not made at a licensed site would be illegal.<br>The lien registry system would include only essential ownership information.<br><br>**Option 2:**Same as Option 1 except as follows. No small vessel exception. There would be full retention and 100% shoreside monitoring, so the discard reporting system would not need to be upgraded. The site licensing program would be replaced by a limitation on the ports (ports to be specified) to which deliveries could be made. Costs would be further controlled by limiting landing hours (to be specified). A lien registry system would contain expanded ownership information.<br><br>**Option 3:**Same as Option 1 except as follows. No small vessel exception. Cameras might be provided as an option for vessels to use in place of compliance observers (feasibility to be determined). Discards would be allowed (except when cameras are used, in which case full retention would be required). Instead of creating an electronic state fish ticket system, a Federal system would be created to track trawl landings. A lien registry system would contain expanded ownership information. |
| B.3.2 | Socio-Economic Data Collection[s] | | **Option 1:** The data collection program would be expanded, but submission of economic data would be voluntary.[t] Information on QS transaction prices would be included in a central QS ownership registry.<br>**Option 2:** The data collection program would be expanded and submission of economic data would be mandatory.[u] Information on QS transaction prices, including leases, would be included in a central QS ownership registry. |

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
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QP = Quota Pounds (issued each year based on quota shares held)

**Table 3. Full description of the IFQ alternatives (continued)**

| | Element | SubElement | |
|---|---|---|---|
| B.3.3 | Program Costs Some cleanup is needed so that the options all cover the same issues. | 1 Cost Recovery | **Option 1:** Fees would be used to recover costs associated with management of the IFQ program but not for enforcement or science. The limit on fees would be 3% of ex-vessel value, as specified in the MSFCMA.<br>**Option 2:** There would be full cost recovery. Cost recovery would be achieved through landing fees plus privatization of elements of the management system. In particular, privatization for monitoring of IFQ catch (e.g., industry pays for their own compliance monitors). Stock assessments would not be privatized and the electronic fish ticket system would not be privatized. |
| | | 2 Fee Structure | To be determined. TIQC recommends a fee structure that reflects usage (e.g. per day fees to cover at-sea observer costs). |
| B.3.4 | Program Duration and Modification | | There would be a four-year review process along with review criteria based on program goals and objectives, schedule to be determined by the Council. Among other factors, the review would include evaluation of whether or not there are localized depletion problems and whether or not quota shares are being utilized. Standard fishery management plan and regulatory amendment procedures would be used to modify the program. A community advisory committee would also advise the Council on performance of the IFQ program. |

[a] **Error! Main Document Only.**If a new management unit is established that is not a subset of an existing management unit, the Council will need to take action at that time to develop criteria for quota share reapportionment.

[b] The current process for changing the opening dates involves a regulatory amendment developed under the FMP through a framework process. Implementation of an IFQ program should not change this process

[c] Whiting IFQ may not be transferred from one sector for use in another. However, there may be midseason rollovers, adjustments that would modify the restriction on transfer between trawl sectors or directly reallocate quota pounds from one sector to another. The TIQC has recommended the following:

"Assuming that the Council decides to move forward with alternatives that include subdivision of the trawl sector, the **TIQC recommends** that the following rollover option be analyzed.

- In advance of the season, any processors potentially interested in processing off/on the West Coast must declare that intent.
- For each sector with unused whiting IFQ, the National Marine Fishery Service will survey potential processors on Sept 15 (or another date which may be specified preseason by the Council).
- If for any sector there is no interest/commitment to processing any of the remaining unused whiting IFQ for that sector then the whiting IFQ for that sector will be released from the sector constraint and may be used in any trawl sector."

[d] Depending on the allocation formula, potentially including permits used for catcher-processors.

IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
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[e] **"Processors"**

**At-sea processors** are those vessels that operate as motherships in the at sea whiting fishery and those permitted vessels operating as catcher-processors in the whiting fishery.

**A shoreside processor** is an operation, working on US soil, that takes delivery of trawl-caught groundfish that has not been "processed at-sea" and that has not been "processed shoreside"; and that thereafter engages that particular fish in "shoreside processing." Entities that received fish that have not undergone "at-sea processing" or "shoreside processing" (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a "processor" for purposes of QS/QP allocations.

**"Shoreside Processing"** is defined as either of the following:

1. Any activity that takes place shoreside; and that involves:
   - cutting groundfish into smaller portions; OR
   - freezing, cooking, smoking, drying groundfish; OR
   - packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.
2. The purchase and redistribution into a wholesale or retail market of live groundfish from a harvesting vessel.

[f] If an catcher-processor consensus formula is used, recent participation would not be applied.

[g] Because there is unevenness among trawl subsectors with respect to the data available for allocation, whether there is one sector or four sectors, it is likely that separate initial QS allocations will need to be made for each sector but, if there is one sector, after the initial allocation QS would be freely transferable among sectors. Given that motherships and catch processors have had 100 percent observer coverage for most of the period, the data are likely to indicate catches of incidental species. The available data for the shoreside fisheries is landings based. Depending on the level of compliance with full retention rules in the shoreside whiting fishery, shoreside whiting data may be relatively comparable to data for at-sea deliveries. In the shoreside nonwhiting fishery there have been discards which are not accounted for in the landings receipts (for the purpose of controlling total mortality discards are estimated for the fleet but not on a vessel basis).

[h] For past years in which the landings/deliveries for particular species or species group to be allocated were aggregated with other species or species groups, catch composition data will be applied to estimate the annual landings/deliveries associated with each permit/processor.

[i] As used here, "nominal" refers to the species attributed to the vessel after the application of species composition ratios in the PacFIN system. The estimates for nominal species are based on fleet averages and so may vary from actual vessel catch. However, these are the best estimates available of actual vessel catches, specified to the needed levels of species group desegregation.

[j] State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries and observer data will be used for deliveries to motherships.

[k] The following is a general description. For each species, the permit's share for a year would be determined by dividing by the sector's total history of the species for that year. The permit's shares for all years would then be summed to derive a history value for that permit (worst year(s) will be dropped if it is so specified in the allocation formula). The same calculation would be carried out for all other permits and the results would be summed to determine a history value for the fleet. The permit's history value would be divided by the fleet's history value to determine the permit's share of the quota issued on the basis of history.

[l] The TIQC has recommended to the GAC that allocation among trawl sectors be established using the same history periods that the Council decides to use for allocating quota shares.

[m] Based on observer data

[n] **Stacked permits:** On rare occasions two trawl permits have been assigned to the same vessel. During the time more than one permit is assigned to a single vessel . . . Options: A. Divide landing/delivery history equally among both permits. B. Assign all landing/delivery history to the first

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permit registered for use with the vessel. This issue will not affect the analysis. Therefore, until the issue is decided Option A will be used for the analysis.

o Carryover of deficits provides some flexibility to use pounds from a year to cover a deficit from a previous year. Without a carryover provision, a vessel would still need to use pounds in a subsequent year to cover an overage but would incur a violation.

p **TIQC Recommendation (November 2006):** Any individual or entity eligible to own or control a US fishing vessel pursuant to USC 102(C) and provisions of AFA (202(g) and 213(g)) is eligible to own or lease quota shares or quota pounds. The TIQC recommends that exact wording, in line with the TIQC's intent, be developed by NOAA regional Counsel.

q **Vessel Use:** An accumulation limit on the QP that may be used on a single vessel during the year. This element would mean that no vessel could use more than a predetermined percentage of the quota pound pool. Grandfather provisions?

**Ownership:** An accumulation limit on the ownership of QS/QP. No registered owner of QS/QP could own more than a predetermined percentage of the Quota Share pool or Quota Pound pool. Grandfather provisions would allow those receiving an initial allocation greater than the cap to maintain ownership of those quota shares.

**Control** (NEEDS REDEFINITION)**:** An accumulation limit on the control of QS/QP. This element would mean that no person could control more than a predetermined percentage of the quota share pool or quota pound pool, regardless of whether that control was established through ownership, leasing or other means. Control would go beyond ownership and leasing and include any situation where an entity had the ability to independently direct how QS/QP would be used. Enforcement of the provision would be through investigations initiated based on reasonably substantiated complaints of those who believe they are encountering adverse effects from excess control by an individual entity. Grandfather provisions?

r **Evaluation of Amounts Owned or Controlled:** The TIQC has recommended the following (November 2006). The ownership or control of QS/QP by a particular legal entity will be construed as the combination of (1) all the QS/QP directly owned or controlled by that particular legal entity, and (2) all or a portion of the QS/QP owned by other legal entities that are at least partially owned by that particular legal entity. The QS/QP owned or controlled by the persons who own that particular legal entity will not count toward the cap of that entity. The portion of the QS/QP owned by a particular legal entity through ownership of another entity will be calculated through proration. (Note a "particular legal entity" may also be an individual). Other methods considered but rejected included, **Count all:** Every person with an ownership interest in an entity will be considered to fully own or control all QS or QP owned or controlled by that entity (for the purpose of applying accumulation caps). **Count all with at least 10%:** Every person with at least a 10% ownership interest in an entity will be considered to fully own or control all QS or QP owned or controlled by that entity (for the purpose of applying accumulation caps).

s **Data collection, status quo.**

- Voluntary submission of economic data for LE trawl industry (status quo efforts)
- Voluntary submission of economic data for other sectors of the fishing industry.
- Ad hoc assessment of government costs.

**Voluntary Provisions:** NMFS will continue to support the PSMFC EFIN project attempts to collect economic and social data useful in evaluating the impacts of fishing and fishing regulations.

**Central Registry:** The program will include no new central registries for quota share owners/lessees or limited entry permit owners/lessees other than that necessary to directly support the IFQ tracking and monitoring system, as maintained by the NMFS Permit Office.

**Government Costs:** Data on the monitoring, administration, and enforcement costs related to governance of the IFQ program will be collected and summarized on an ad hoc basis.

t **Data collection, Option 1:** Expanded **voluntary** submission of economic data:

- Voluntary submission of economic data for LE trawl industry (expanded survey efforts)

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- Voluntary submission of economic data for other sectors of the fishing industry.
- Include transaction value information in a centralized registry of ownership and leases. [Shaded is added text.].
- Formal monitoring or government costs.

**Voluntary Provisions:** Attempts will be made to collect, on a voluntary basis, the same types of data identified for collection through a mandatory program. Additional funding (as compared to status quo) will be needed to support the collection of these data.

**Central Registry:** Information on transaction prices will be included in a central registry of quota share owners/lessees. Such information would also be included for LE permit owners/lessees.

**Government Costs:** Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the IFQ program.

u **Data collection, Option 2:** Expanded **mandatory** submission of economic data:

- Mandatory submission of economic data for LE trawl industry.
- Voluntary submission of economic data for other sectors of the fishing industry.
- Include transaction value information in a centralized registry of ownership and leases[shaded is added text].
- Formal monitoring or government costs.

**Mandatory Provisions:** The Pacific Fishery Management Council and the National Marine Fisheries Service shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data, compliance with which would be mandatory for members of the West Coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be maintained in a confidential manner and may not be released to any party other than staffs of Federal and state agencies directly involved in the management of the fisheries under the Council's authority and their contractors.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl IFQ program and continued through the life of the program. Cost, revenue, ownership, and employment data will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the IFQ program. This data could also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. This data collection effort is also required to evaluate achievement of goals and objectives associated with the IFQ program. Both statutory and regulatory language shall be developed to ensure the confidentiality of these data. Additional funding (as compared to status quo) will be needed to support the collection of these data.

Any mandatory data collection program shall include: A comprehensive discussion of the enforcement of such a program, including enforcement actions that would be taken if inaccuracies are found in mandatory data submissions. The intent of this action would be to ensure that accurate data are collected without being overly burdensome on industry in the event of unintended errors.

**Voluntary Provisions:** A voluntary data collection program will be used to collect information needed to assess spillover impacts on non-trawl fisheries.

**Central Registry:** Information on transaction prices will be included in a central registry of quota share owners/lessees. Such information would also be included for LE permit owners/lessees.

**Government Costs:** Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the IFQ program.

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**Table 3. Full description of the IFQ alternatives (continued)**

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IFQ = Individual Fishing Quota, in general (encompasses both QS and QP)
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## *Whiting Sector Cooperative Alternative*

Under this alternative, there would be no changes in management of the nonwhiting fishery. (Other alternatives considered here might be adopted for the nonwhiting fishery.) There will be three whiting sectors: shoreside whiting, mothership and catcher-processors. Depending on the options selected, one or more of the sectors will be managed with co-ops.

## Whiting Sector Management Under Co-ops

Under the co-op alternatives all catcher vessels would have a choice of whether to participate in a co-op or nonco-op portion of the fishery. For catch-processors, no formal co-op fishery would be established but rather a close class would be established and a vessel could, at its option, decide not to participate in a co-op with other members of that fishery.

### Whiting Management

Under the co-op options for the mothership and shoreside sectors, catcher vessel permits would be endorsed for deliveries to these sectors and amounts of history assigned.
The whiting catch history calculation for each mothership endorsed catcher vessel permit [CV(MS)] and shoreside endorsed catcher vessel permit [CV(MS)] will be assigned to a pool for the co-op in which the permit will participate or a pool for the mothership or shoreside non-co-op fishery. Co-ops are responsible for monitoring and enforcing the catch limits of co-op members. NMFS will monitor the catch in the non-co-op fishery, the co-op fisheries and the overall catch of all three sectors. NMFS will close these fisheries when their catch limits have been achieved.

#### Annual Whiting Rollovers

**Whiting Rollover Option 1.** There **will not** be a **rollover** of unused whiting from one whiting sector to another.
**Whiting Rollover Option 2.** Each year rollovers to other sectors may occur if sector participants are surveyed by NMFS and no participants intend to harvest remaining sector allocations in that year. Current provisions for NMFS to re-allocate unused sector allocations of whiting (from sectors no longer active in the fishery) to other sectors still active in the fishery would be maintained (see 50CFR660.323(c) – Reapportionments).

### Bycatch Species Management

For the foreseeable future the whiting fishery will be managed under bycatch limits (hard caps) for widow, canary, and darkblotched rockfish. The ESA-listed salmon bycatch management measures, that is, the 11,000 Chinook threshold, 0.05 rate threshold, and triggered 100 fathom closure, will also continue to be in place. The goal of bycatch management is to control the rate and amounts of rockfish and salmon bycatch to ensure each sector is provided an opportunity to harvest its whiting allocation.

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**Bycatch Allocation Subdivision**

**Subdivision Option A:** Subdivide bycatch species allocation among each of the whiting sectors (see Component 6 for basis for allocation).
**Subdivision Option B:** Do not subdivide bycatch species.

**No Bycatch Subdivision** If bycatch species are not allocated among the sectors, then

- **Bycatch Management Option 1:** all sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species; a controlled pace may be established if the sectors choose to work together cooperatively, potentially forming an intersector/interco-op cooperative.
- **Bycatch Management Option 2:** Same as Option 1, including the potential for forming co-ops, except there will be seasonal releases of bycatch allocation.

At the outset, it is envisioned that the seasonal approach would be used to manage widow rockfish bycatch; for canary rockfish and darkblotched rockfish, status quo management would be maintained (i.e., no sector allocation and no seasonal apportionment).

A seasonal release bycatch management program would be implemented through regulation. For reference, a similar program is used to manage halibut bycatch in NPFMC-managed flatfish and Pacific cod fisheries, see 50CFR679.21(d).

In practice, seasonal releases protect the next sector entering the fishery. For example, a May 15-June 15 release would be used by the catcher-processors and motherships, but it protects the shoreside fishery; the June15-September release would be used by shoreside and whatever catcher-processors and motherships are still fishing whiting, and to protect a fall at-sea season after September 15; the final release in September would again be shared by the catcher-processors and motherships, assuming shoreside is done.

For example:

1. No sector bycatch allocations.
2. Status quo for canary and darkblotched rockfish; i.e., no seasonal or sector allocation.
3. May 15 - June 15; 40% of widow hard cap released.
4. June 15 - August 31; an additional 45% of widow hard cap released.
5. Sept. 1 - Dec. 31; final 15% of widow hard cap released.
6. Once a seasonal release of widow rockfish is reached, the whiting fishery is closed to all three sectors for that period. The fishery re-opens to all three sectors upon release of the next seasonal release of widow rockfish.

7. Unused amounts from one seasonal release rollover into subsequent release periods.

(note–percentages are for illustration purposes only, actual release percentages would be developed through the PFMC process)

### Bycatch Subdivision

Rollovers. If each sector has its own allocation of bycatch, unused bycatch may be rolled over from one sector to another if the sector's full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.

## At-sea Observers/ Monitoring

- **Shoreside Whiting Fishery:** Increase to 100% to enforce catch accounting requirements.
- **At-sea Whiting Fishery:** 100% coverage aboard mothership and catcher-processors would continue.

For some coverage, cameras may be used in place of observers (feasibility to be determined).

## Sector Allocation

- Existing whiting trawl allocations to remain intact between shoreside whiting sector (42%), mothership delivery sector (24%) and catcher-processor sector (34%).
- If incidental catch species are allocated between the whiting sectors (see options in Component 3), the allocations will be made on a *pro-rata* basis relative to whiting allocated to each sector.

## Co-ops for Catcher Vessels Delivering to Motherships

The following is a description of the co-op alternative for catcher vessels delivering to motherships.

The mothership whiting fishery would be managed in two modes:

1. Catcher vessels delivering to motherships (CV(MS)) co-op(s)
2. Seasonal management for those not participating in co-ops

Catcher vessels with a CV(MS) co-op endorsement would choose the mode in which they will fish during a fishing year and commit to that mode for the entire fishing year.

**CV(MS) Endorsement**

Permits with a qualifying history would be designated as CV(MS) permits through the addition of an endorsement to their limited entry groundfish permit.

**Qualifying for a CV(MS) Endorsement.** A limited entry permit will qualify for a CV(MS) endorsement if it has a total of more than 500 mt of whiting deliveries to motherships from

**Qualification Option A:** 1998 through 2004

**Qualification Option B**: 1994 through 2003

**Initial calculation to be used by NMFS to determine the distribution to co-op and non-co-op fishery pools.** A CV(MS) permit calculated catch history will be based on

**Allocation Option A:** its best 6 out of 7 years from 1998 through 2004

**Allocation Option B**: its best 9 out of 11 years from 1994 through 2004

**Allocation Option C:** its best 6 out of 7 years from 1998 through 2003

**Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

**Mothership (MS) Permits.** The vessel owners of qualifying motherships will be issued MS permits. In the case of bareboat charters, the charterer of the bareboat will be issued the permit. Only vessels for which such permits are held may receive at-sea deliveries from catcher vessels. A qualifying mothership is one which processed

at least 1,000 mt of whiting in each of any two years from 1998 through 2004

MS permits will be transferable and there will be no size endorsements associated with the permit. A vessel may not harvest whiting and operate as a mothership in the same year. MS permits may only be used for processing by one vessel per year. Exclusionary language will be added to indicate that a vessel that has left US fisheries may not return.

**Annual Registration.** Each year MS and CV(MS) permit holders planning to participate in the mothership sector must register with NMFS. At that time they must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery so that NMFS can make appropriate distributions to the co-op and non-co-op fisheries.

**Co-op Formation.** Co-ops will be formed among CV(MS) permit owners.

Multiple Co-ops **<u>must</u>** be formed based on the mothership where the CV permit holders delivered the majority of their most recent years' catch. Co-op agreements will be submitted to NMFS. Co-op agreements must distribute catch allocations to members based on their catch history calculation distributed to the co-op by NMFS

**Co-op Allocation:** Each year NMFS will determine the distribution to be given to each co-op based on the catch history calculation of CV(MS) permits registered to participate in the co-op that year.

**Non-co-op Allocation:** Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

**Movement between Motherships.**

**Option A:** Each year, CV(MS) permit owners will choose between fishing in the non-co-op fishery or delivering to the same mothership that they most recently delivered the majority of their whiting catch in the last calendar year in which they participated. However, if a CV(MS) permit participated in the non-co-op fishery in the previous year, or did not participate in the mothership whiting fishery, it is released from its obligation and may deliver to any mothership in a subsequent year. In the first year of the program, the CV(MS) permit owner's choice will be between delivering in the non-co-op fishery and making co-op deliveries to the licensed mothership to which the permit made a majority of its whiting deliveries in the last calendar year in which they participated.

**Option B:** CV(MS) permit owners may move between motherships at any time. (If this option is selected, conforming changes will be made to all other sections of the mothership co-op alternative.)

**Mutual Agreement Exception:** By mutual agreement of the CV(MS) permit owner and mothership to which the permit is obligated, and on a year-to-year basis, a permit may deliver to a licensed mothership other than that to which it is obligated. Such an agreement will not change the permit's future year obligation to the mothership (i.e., the vessel would still need to participate in the non-co-op fishery for one year in order to move from one mothership to another).

**Temporary Transfer of Allocation to CV(MS) and nonCV(MS) Endorsed Permits.** Owners of valid limited entry permits that are members of co-ops are permitted to transfer co-op allocations amongst other coop members. Such inter- or intra- co-op transfers must deliver co-op shares to the mothership to which allocation is obligated unless released by mutual agreement. Also, a co-op allocation may be harvested by any catcher vessel holding a valid limited entry trawl permit (including one that does not have a CV(MS) endorsement). Whiting allocations are not permanently separable from a limited entry permit. Allocations may not be transferred from the mothership sector to another sector.

**CV(MS) Permit Combination to Achieve a Larger Size Endorsement**

A CV(MS) endorsed permit that is combined with a limited entry trawl permit that is not CV(MS) endorsed or one that is CV(Shorside) [CV(SS)] endorsed will be reissued with the CV(MS) endorsement. If the other permit is CV(SS) endorsed, the CV(SS) endorsement will also be maintained on the resulting permit. However, CV(MS) and CV(SS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(MS) permit is combined with a CP permit, the CV(MS) endorsement and history would not be reissued on the combined permit. The size endorsement resulting from permit combinations would be determined based on the existing permit combination formula.

**Accumulation Limits.**

**MS Permit Ownership:** No individual or entity owning a MS permit(s) may process more than XX% of the total mothership sector whiting allocation.

**CV(MS) Permit Ownership:** No individual or entity may own CV(MS) permits for which the allocation totals greater than XX% of the total whiting mothership allocation.

**Mothership Permit Transfer.**

If a mothership transfers its MS permit to a different mothership or different owner, the CV(MS) permit obligation remains in place unless changed by mutual agreement or participation in the non-co-op fishery.

**Mothership Withdrawal.**

If a mothership does not participate in the fishery and does not transfer its permit to another mothership or mutually agree to transfer delivery to another mothership, the CV(MS) permit holders obligated to that mothership may participate in the non-co-op fishery.

If a mothership does not qualify for an MS permit in the first year of the program, the vessels which delivered to that mothership in the previous year may deliver to the qualified mothership to which it last delivered its majority of catch or participate in the non-co-op fishery.

## Co-ops for Catcher Vessels Delivering to Shoreside Processors — Strawman Placeholder Based on Mothership Proposal

**THIS ALTERNATIVE PROVIDES A GENERAL STRUCTURE FOR CONSIDERATION, MODELLED AFTER THE PROPOSALFOR THE MOTHERSHIP SECTOR. INDUSTRY REPRESENTATIVES ARE DEVELOPING A PROPOSAL IN CONSULTATION WITH THEIR CONSTITUENTS.**

The shoreside whiting fishery would be managed in two modes:

1. CV(SS) co-op(s)
2. Non-co-op Fishery: Seasonal management for those not participating in co-ops .

Catcher vessels with a CV(SS) co-op endorsement would choose the mode in which they will fish during a fishing year and commit to that mode for the entire fishing year.

**CV(SS) Endorsement**
Permits with a qualifying history would be designated as CV(SS) permits through the addition of an endorsement to their limited entry groundfish permit.

**Qualifying for a CV(SS) Endorsement.** A limited entry permit will qualify for a CV(SS) endorsement if it has a total of more than 500 mt of whiting deliveries to shoreside processors from

**Qualification Option A:** 1998 through 2004
**Qualification Option B**: 1998 through 2003
**Qualification Option C**: 1994 through 2004
**Qualification Option D**: 1994 through 2003

**Initial calculation to be used in determining NMFS distribution to co-op and non-co-op fishery pools.** A CV(SS) permit calculated catch history will be based on

**Allocation Option A:** its best 6 out of 7 years from 1998 through 2004
**Allocation Option B**: its best 9 out of 11 years from 1994 through 2004
**Allocation Option C:** its best 6 out of 7 years from 1998 through 2003
**Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

**Shorseside Processor (SSP) Permits.** Owners of qualifying shoreside processors will be issued SSP permits. Only processors for which SSP permits are held may receive shoreside deliveries from catcher vessels. A qualifying shoreside processor is one which processed at least 1,000 mt of whiting in each of any two years from 1998 through 2004. SSP permits will be transferable. SSP permits may only be used by one owner during the year.

**Annual Registration.** Each year SSP and CV(SS) permit holders planning to participate in the shoreside sector must register with NMFS. At that time they must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery so that NMFS can make appropriate distributions to co-op(s) and the non-co-op fishery.

**Co-op Formation.** Co-ops will be formed among CV(SS) permit owners.
**Number of Co-ops** Multiple co-ops **must** be formed.

Co-op formation will be based on the shoreside processor where the CV(SS) permit holders
**History Tie Option A:** delivered the majority of their most recent years' catch.

**History Tie Option B:** delivered the majority of the catch for the entire time period from 1994 thought 2003.
**History Tie Option C:** delivered the majority of the catch for the entire time period from 1994 thought 2004.

Co-op agreements will be submitted to NMFS. Co-op agreements must distribute catch allocations to members based on the permit specific catch history calculation that NMFS used to distribute allocation to the co-op.

**Co-op Allocation:** Each year NMFS will determine the distribution to be given to each co-op based on the catch history calculation of CV(SS) permits registered to participate in the co-op that year.
**Non-co-op Allocation:** Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

**Movement between Shoreside Processors.**
**Option A.** Each year, CV(SS) permit owners will choose between fishing in the non-co-op fishery or, if the vessel has met its two year commitment to a processor [need more interpretation of this] , delivering to the same shoreside processor to which they most recently delivered the majority of their whiting catch in the last calendar year in which they participated. However, if a CV(SS) permit participated in the non-co-op fishery in the previous **two years** it is released from its obligation and may deliver to any shoreside processor in a subsequent year. In the first year of the program, the CV(SS) permit owner's choice will be between delivering in the non-co-op fishery and making co-op deliveries to the licensed shoreside processor to which the permit made a majority of its whiting landings in the last calendar year in which they participated.
**Option B:** CV(SS) permit owners may move between processors at any time (if this option is selected, conforming changes will be made to all other sections of the shoreside co-op alternative).

**Mutual Agreement Exception:** By mutual agreement of the CV(SS) permit owner and shoreside processor to which the permit is obligated, and on a year-to-year basis, a permit may deliver to a licensed shoreside processor other than that to which it is obligated. Such an agreement will not change the permit's future year obligation to the shoreside processor (i.e. the vessel would still need to participate in the non-co-op fishery for one year in order to move from one shoreside processor to another).

**Temporary Transfer of Allocation to CV(SS) and non-CV(SS) Endorsed Permits.** Owners of valid limited entry permits that are members of co-ops are permitted to transfer co-op allocations amongst other co-op members. Such inter- or intra co-op transfers must deliver co-op shares to the shoreside processor to which allocation is obligated unless released by mutual agreement. Also, a co-op allocation may be harvested by any catcher vessel holding a valid trawl limited entry permit (including one that does not have a CV(SS) endorsement). Whiting allocations are not permanently separable from a trawl limited entry permit Allocations may not be transferred from the shoreside sector to another sector.

**CV(SS) Permit Combination to Achieve a Larger Size Endorsement**

A CV(SS) endorsed permit that is combined with a limited entry trawl permit that is not CV(SS) endorsed or one that is CV(MS) endorsed will be reissued with the CV(SS) endorsement. If the other permit is CV(MS) endorsed, the CV(MS) endorsement will also be maintained on the resulting permit. However, CV(SS) and CV(MS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(SS) permit is combined with a CP permit, the CV(SS) endorsement and history would not be reissued on the combined permit. The size endorsement resulting from permit combinations would be determined based on the existing permit combination formula.

**Accumulation Limits.**

**Shoreisde Processing Permit Ownership:** No individual or entity of a SSP permit(s) may process more than XX% of the total shoreside sector's whiting allocation.

**CV(SS) Permit Ownership:** No individual or entity may own CV(SS) permits for which the allocation totals greater than XX% of the total whiting shoreside allocation.

**SSP Permit Transfer.**

If a shoreside processor transfers its SSP permit to a different shoreside processor or different owner, the CV(SS) permit's obligation remains in place unless changed by mutual agreement or participation in the non-co-op fishery.

**Shoreside Processor Withdrawal.**

If a shoreside processor does not participate in the fishery and does not transfer its SSP permit to another shoreside processor or mutually agree to transfer delivery to another shoreside processor, the CV(SS) permit holders obligated to that shoreside processor may participate in the non-co-op fishery.

If a shoreside processor does not qualify for a SSP permit in the first year of the program, the vessels which delivered to that shoreside catcher processor in the previous year may deliver to the qualified shoreside processor that it last delivered its majority of catch or participate in the non-co-op fishery.

## Co-ops for Catcher-Processors

Catch by the catcher-processor sector would be controlled primarily by closing the fishery when a constraining allocation is reached. As under status quo, vessels may form co-ops to achieve benefits that result from a slower paced more controlled harvest. The main change from status quo is the creation of a catcher-processor endorsement that would close the catcher-processor fishery to new entrants.

**Catcher-Processor (CP) Endorsement.** The class of CP endorsed permits (CP permits) would be limited by an endorsement placed on a limited entry permit. Limited entry permits registered to qualified catcher-processor vessels would be endorsed as CP permits. A qualified vessel is one that harvested and processed in the catcher-processor sector of the Pacific whiting fishery sometime from 1997 through 2006. Only vessels with a CP limited entry permit would be allowed to process whiting at-sea. Limited entry permits with CP endorsements would continue to be transferable.

**Annual Registration.** No annual registrations or declarations are required.

**Co-op Formation.** As under status quo, co-op(s) will be formed among holders of permits for catcher-processors. Participation in the co-op will be at the discretion of those permit holders. If eligible participants choose to form a co-op, the catcher-processor sector will be managed as a private voluntary cooperative and governed by a private contract that specifies, *inter alia*, allocation of whiting among CP permits, catch/bycatch management, and enforcement and compliance provisions. Since NMFS would not establish an allocation of catch or catch history among permits, if any permit holder decides not to participate, the potential co-op benefits will diminish and a race for fish is likely to ensue. Similarly, if more than one co-op forms, a race for fish would likely ensue, absent an inter co-op agreement.

**Co-op Allocation.** There would be no government directed subdivision of the catcher-processor sector quota among participants. The catcher-processor sector allocation would be divided among eligible catcher-processor vessels (i.e., those catcher-processor vessels for which a CP permit is held) according to an agreed catcher-processor cooperative harvest schedule as specified by private contract.

#### CP Permit Combination to Achieve a Larger Size Endorsement

A CP permit that is combined with a limited entry trawl permit that is not CP endorsed would result in a single CP permit with a larger size endorsement (a CV(MS) or CV(SS) endorsement on one of the permits being combined would not be reissued on the resulting permit). The resulting size endorsement would be determined based on the existing permit combination formula.

Attachment B to GAC Report, March 2007.

# Considerations for the TIQ Monitoring Program Workgroup Tasks (Summary of GMT Recommendations)

Staff Summary of GMT statement to the GAC:

1. assess the level and type of monitoring required to document total catch, if discards are allowed
2. assess the feasibility of full retention (including consideration of impacts on fishing and market practices as part of feasibility evaluation)
3. assess the feasibility of cameras to document full retention and identify fish species
4. assess feasibility of using cameras to document a partial retention requirement (discard some species but not others)
5. assess the effects of full retention on total mortality
6. analysis of the costs and effects of observers

There are a number of other issues that have surfaced during various GMT discussions that may also be appropriate considerations for this group. These include:

1. What is the feasibility and what are the infrastructure requirements for "time-of-landing" reporting of trip discard data, if they are to have a quality and reliability that can be used for enforcement purposes (i.e. equivalent in utility to a fish ticket)?
2. What data is feasible for observers to collect at sea, and what skill levels would be required?
3. Is it feasible to develop an at-sea monitoring requirement that would be less burdensome for small vessels?
4. How would the existing WCGOP be integrated with an IFQ monitoring program (would vessels have to carry two observers, could WCGOP fill the role for the IFQ program)?
5. What are the trade-offs that should be considered in evaluating private contract observes vs. government employees?
6. How might the observer program be structured to minimize costs (consider both from the perspective of government cost and private cost)?
7. What levels of supervisory and administrative support would be required for different approaches to organizing the observer program and how would costs be distributed between the government and private sector)?
8. What levels of service are to be provided (should a vessel be able to get an observer anywhere on the coast at any time?)

# From Quota Share Issuance to

# Use, Tracking, Monitoring and Enforcement

1. Quota shares are issued to permit holder and possibly processors.

2. Quota shares may then be transferred to fishery participants and nonparticipants but transfers are not valid until registered with NMFS..

3. Each year, quota pounds are issued to the holders of quota shares.

4. Quota pounds must be transferred to a vessel account in order to be used. Quota pounds may also be transferred among individuals and not registered to a vessel, but cannot be used until registered. Quota pound transfers are not valid until registered with NMFS.

5. A vessel using IFQs must carry a compliance observer/monitor while fishing its quota pounds.

6. At the time of landing, discards and actual landings are reported to an electronic catch tracking system.

7. Pounds caught are electronically cross checked against quota pounds held in the vessel's account.

8. If the vessel does not have enough quota pounds to cover its catch, (1) it has 30 days to acquire the needed quota pounds without incurring a violation, and (2) until the catch is covered it may not go fishing and the permit may not be transferred from the vessel.

9. If the vessel does not acquire the needed quota pounds it will be found in violation, forfeit its landing, and still be required to cover the catch with quota pounds before fishing again.

10. If necessary, a vessel may use pounds from a subsequent year to cover its catch, however, (1) it must wait until that year to acquire the pounds, and (2) it still may not fish or transfer its permit until that catch is covered.

Agenda Item E.4.b
Goals and Objectives
March 2007

# PROPOSED REVISED GOALS AND OBJECTIVES

By Phil Anderson

At the request of the Groundfish Allocation Committee in December 2006, I volunteered to revise the draft goals and objectives of the proposed trawl rationalization program, as prepared by the Trawl Individual Quota Committee (TIQC). As described, these goals and objectives are to outline the purpose of the propose action; therefore, I focused on what could be achieved through a trawl rationalization program over the long-term, and excluded proposed objectives that would rely on mechanisms other than a trawl rationalization program to be accomplished.

In developing these proposed revisions, I reviewed the current goals and objectives in the Pacific Fishery Management Council's Groundfish Fishery Management Plan, the goals and objectives of the different elements in the Council's Strategic Plan, the national standards, and the provisions in the Magnuson-Stevens Fishery Conservation and Management Act.

## Proposed Revisions to Trawl Rationalization Goals and Objectives

Replace current goals:

1. Increase regional and national net benefits including improvements in economic, social, environmental and fishery management objectives.
2. Achieve capacity rationalization through market forces and create an environment for decision-making that can rapidly and efficiently adjust to changing conditions.

With the following:

> Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of healthy stocks, and achieves individual accountability of catch and bycatch.

Revise Objectives as follows:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
~~3. Minimize negative ecological impacts while taking the available harvest.~~
3. ~~Reduce~~ Promote practices that reduce bycatch ~~and discard mortality~~.
~~5. Promote individual accountability — responsibility for catch (landed catch and discards).~~
~~6. Increase stability for business planning~~.
4. Increase operational flexibility.
5. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.

7. Provide quality product for the consumer.
8. Increase safety in the fishery.

In addition to the changes to the goals and objectives, there is a list of constraints and guiding principles that are to be taken into account in designing the IFQ program. An additional item would be added to this list.

## Constraints and Guiding Principles

1. Taking into account the biological structure of the stocks including such factors as populations and genetics.
2. Taking into account the need to ensure that the total OYs and Allowable Biological Catch (ABC) for the trawl and all other sectors are not exceeded.
3. <u>Minimize negative impacts resulting from localized concentrations of fishing effort.</u>
4. Accounting for total groundfish mortality.
5. Avoiding provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.
6. Avoiding excessive quota concentration.
7. Providing efficient and effective monitoring and enforcement.
8. Designing a responsive review evaluation and modification mechanism.
9. Take into account the management and administrative costs of implementing and overseeing the IFQ program and complementary catch monitoring programs and the limited state and federal resources available.

# TRAWL INDIVIDUAL QUOTA COMMITTEE (TIQC) REPORT TO THE GROUNDFISH ALLOCATION COMMITTEE DECEMBER, 2006

The TIQC met November 6-8, 2006, reviewed provisions needing refinement, considered areas where the alternatives might be narrowed, received a report on Groundfish Management Team (GMT) concerns and developed recommendations on a vessel co-op alternative. This reports also incorporates elements of the TIQC's September 2006 report to the Council. The following are the sections of this report.

# Refining and Narrowing Alternatives

## *IFQs (Alternatives 2, 3 and 4 and IFQ Program Design Details)*

### Alternative 2, IFQs for Trawl Target and Allocated Species and Alternative 3, IFQs for All Except the "Other Fish" Category of Groundfish

> **TIQC Recommendation:** Eliminate management regime Alternatives 2 and extend Alternative 3 to cover all species.

Based on the Groundfish Allocation Committee (GAC) decision to develop allocation options that would create a trawl allocation for either all groundfish species or all groundfish species except overfished species, the TIQC recommends that alternatives based on IFQs for some species and cumulative limit or other management measures for other species be eliminated. These actions would eliminate transferable cumulative catch limits from the suite of alternatives under consideration. Therefore, there is no longer a need to address whether or not there would be a limit on the number of cumulative limits that might be stacked on a single vessel. If the Council does not accept the TIQC recommendation, then the need for such a limit should be reconsidered.

### Element 1.7 Whiting Season Opening Dates

> **TIQC Recommendation:** The opening dates for the whiting seasons should not be changed as part of the action that creates an IFQ program. The current process for changing the opening dates involves a regulatory amendment developed under the FMP through a framework process.

Implementation of an IFQ program should not change this process, i.e. .if an IFQ program is implemented, change in the season opening dates should continue to occur through the regulatory amendment process.

### Element 2.1 Number of Trawl Sectors

**From the Sept 2006 TIQC Meeting:**

> Management Regime Alternatives 2 and 3 would maintain subdivision of the trawl sector divisions while Management Regime Alternative 4 would create a single trawl sector. While the decision on whether to have a single or subdivided trawl sector is a Council policy call, the TIQC discussed the tradeoffs underlying the decision on whether to maintain trawl sectors. These are summarized as follows.

**Reasons for Maintaining Trawl Sector Subdivision**

If the IFQ program does not include sector subdivisions, it is believed that the vast majority of the whiting would be sold to and taken by the catcher-processor sector. This would have adverse effects on communities and those invested in shoreside and mothership operations. Independent vessels, jobs on the vessels, and current ways of doing business could disappear. Losses to communities with investments in the fisheries, docks, and fish industry services could also be very significant.

There are values other than efficiency that are addressed in the objectives. Rationalization should not be allowed to increase efficiency without constraint. Preservation of the existing sectors would limit the potential for rapid, radical and unanticipated transformations under IFQs.

**Reasons for Creating a Single Trawl Sector**

The distribution of harvest among different trawl harvest modes should be market based. Artificial divisions should not be created to protect weak members of industry. While protection for markets and diversity may be desirable, costs associated with lost efficiency and program administration are

too high. This tradeoff between the costs and benefits of maintaining sectors needs to be evaluated by maintaining an option that would have no sector divisions.

Flexibility in the distribution of IFQ among sectors is needed to deal with unforeseen circumstances. The option proposed below for IFQ rollover between sectors is basically voluntary (based on declarations of intent). Given the voluntary nature of the rollover option, the only alternative which provides the needed flexibility is the alternative with one sector (Alternative 4).

## Element 2.3 Management of the Whiting Fishery

**From the Sept 2006 TIQC Meeting:**

The TIQC worked on development of an option to allow the rollover of whiting IFQ from one whiting sector to another. The TIQC notes that the need to consider rollover mechanisms assumes that trawl sectors are maintained.

**Whiting Rollover Option**

Assuming that the Council decides to move forward with alternatives that include subdivision of the trawl sector, the **TIQC recommends** that the following rollover option be analyzed.

- In advance of the season, any processors potentially interested in processing off/on the West Coast must declare that intent.
- For each sector with unused whiting IFQ, the National Marine Fishery Service will survey potential processors on Sept 15 (or another date which may be specified preseason by the Council).
- If for any sector there is no interest/commitment to processing any of the remaining unused whiting IFQ for that sector then the whiting IFQ for that sector will be released from the sector constraint and may be used in any trawl sector.

**Pros and Cons of a Whiting IFQ Rollover**

The TIQC did not reach a consensus on whether or not a rollover option would be needed if sectors are maintained. The discussion on this issue is summarized as follows.

**Reasons for No Whiting IFQ Rollover**

Elimination of the rollover option would simplify the program and reduce program costs. If the program is implemented and there is a problem with fish being left on the table, a rollover option could be developed through a trailing amendment. Not including a rollover option would encourage innovation among those having difficulty using their IFQ. It is difficult to design a rollover system that would not be subject to manipulations that might have adverse conservation effects or effectively eliminate the sector divisions.

**Reasons for a Whiting IFQ Rollover**

A rollover would reduce the chance that fishermen, communities and consumers will forgo benefits by leaving fish in the water. For example, catcher vessel IFQ for mothership deliveries could be stranded and left unused if mothership processors decide not to participate at a level sufficient to take the available allocation.

## Bycatch Species Management In the Whiting Fishery

Alternative 2 provides that there would be a separate pool of bycatch species for each sector. **The TIQC recommends** that an option be added to provide a single pool of bycatch species for all whiting sector deliveries. This option may provide the sectors with more flexibility to utilize the available bycatch while accessing their whiting IFQ. Options have yet to be developed for the possible rollover of bycatch species between sectors, if separate sectors are established.

### B.1.1. The Entity Qualifying for Processor Catch History

> **TIQC Recommendation:** The entity credited for processor catch history would be the current owner of the processing facility, unless leased, in which case it would be the lease holder. Options that would give landings history to the current owner even if the facility is leased out or to the past owner should be dropped from consideration.

The past owners should not receive the quota share for an asset they have sold. These owners are either no longer processing or using other assets that may have their own landings history.

In many situations, it will be the current owner of the facility that has invested in the asset, has invested in developing the processing business, and is carrying the risk This person should receive credit for the landings history associated with the facility. However, if the current owner is leasing the facility to another entity that runs the processing operation, the entity running the processing operation should receive credit for the landings history of the facility. It is the operator of the facility that is active in the markets, as a buyer of raw product and seller of processed product. The daily processing and market operations of these entities will be more directly affected than the entity leasing the facility to the operator. If processors are to receive the allocation as part of an effort to strike a certain balance between processing and harvesting interests then it should be the business operating the facility that receives the allocation rather than the lessor. The lessor should receive the history for the plant even if the plant is currently inoperative.

### B.1.3 Distinguishing Catcher-Processor and Catcher Vessel Permits

> **TIQC Recommendation:** If a distinction is needed between catcher-processor and non-catcher-processor limited entry permits, a catcher-processor endorsement should be developed based on history activities for the vessel using the permit.

Some provisions in the TIQ program may apply to catcher-processor permits but there is no distinction between catcher-processor permits. If needed, such a distinction should be created. For example, if there is a specification for "owners of catcher-processor vessel permits" the effect of which cannot implemented by reinterpreting the provision as "owners of limited entry permits with history as a catcher-processor" then a catcher-processor endorsement should be developed.

### B.1.5 Weighting Between Years

To calculate a permit's catch history:

- under a relative share approach, the permit's share of total catch would be determined each year then summed across all years.[1]
- under an absolute pounds approach, the permit's pounds would be summed across all years and then divided by the fleets history summed across all years..

**TIQC Recommendation:** At this time, the TIQC does not have a recommendation as to whether to go with absolute or relative pounds, but does not that the choice is primarily a philosophical one. However, a majority of the TIQC has expressed a preference for relative pounds.

This issue likely affects individual vessels more than it affects the configuration of the fleet. For example, the curve showing the concentration of quota shares among permits for an allocation based on weighting will not vary much for the fleet, as compared to a similar curve for an allocation that is not based on weighting. At the same time, for individual vessels the differences may be more substantial (i.e. while the curve will not change much, permits will change positions on the curve).

Thus, the issue to be decided has more to do with the philosophies or principles to be embodied in the allocation than it does with the performance of the system.

An absolute pound approach gives each permit the same credit for a given amount of catch regardless of overall opportunity or performance of the fleet in a particular year. Such a system may also be viewed as being somewhat simpler.

A system based on relative pounds will give more credit for a given amount of catch in years with lower levels of total fleet catch. Because of the general downward trend in harvest of the trawl groundfish fishery, a relative pound approach will tend to provide more credit to vessel with a metric ton of catch in recent years than it would in earlier years.

As compared to an absolute pounds system, under relative pounds permits would tend to do better if they

- do better relative to other vessels in low total harvest years
- are less constrained by catch reduction regulations
- have caught more in recent years than earlier years

While it may or may not be decided that use of relative pounds might be a reasonable approach for allocating target species quota shares, for species constraining harvest, such as overfished species, relative pounds would reward vessels that take a greater percentage of the catch of constraining species in recent years. Therefore relative pounds should not be used for overfished species.

[1] This is a general description, the actual steps would be more detailed and depend, for example, on whether permits were allowed to drop their worst two years and adjustments needed to make the results sum to 100%.

### B.1.6 Catch History for Stacked Permits

In some cases, there has been more than one trawl permit at a time registered to a single vessel. This is not a major issue affecting the analysis and should be taken out of the option list and inserted as a footnote. The TIQC would like information on the history of the situations in question and will develop a recommendation on this issue at a later time.

> **TIQC Recommendation:** For the analysis, allocate catch history equally among all permits with which the vessel is associated at the time of the landing and resolve the policy issue at a later time.

### B.2.1 Minimum Quota Pound Holding Requirement

At issue is whether or not a limited entry trawl permitted vessel should be required to hold some minimum amount of quota pounds before leaving port on a fishing trip. The Enforcement Consultants reported to the TIQC that they were considering a recommendation that 1,000 pounds be held (with no requirement as to the species composition of the quota pound holdings).

> **TIQC Recommendation:** There should be no minimum holding requirement. To require a minimum would add to monitoring costs. The monitoring, enforcement, and penalty system will be more than sufficient to ensure that vessels acquire the IFQ needed to cover their catch.

### B.2.2.4. Entry Level Opportunities

The MS Act requires that the Council consider providing entry level opportunities.

> **TIQC Recommendation:** Provide no additional special opportunities for entry level participants.

The TIQC considered this issue and notes that entry level opportunity are provided to crew members and others through highly divisible shares that facilitate incremental acquisition of capital assets (quota shares). Entry level opportunities is provided by specifying high divisibility of quota shares and allowing anyone eligible to own or control a US documented fishing vessel. This should be noted as the Council response to the MS Act required consideration and any additional special provisions eliminated from consideration.

### B.2.3.1 Eligible Owners/Holders

This provision currently indicates that anyone eligible to own or operate a US documented fishing vessel would be allowed to own or lease quota shares. The purpose of this provision is to ensure that current participants in the fishery would be allowed to continue after an IFQ program is implemented. The provision should be as restrictive as possible while achieving that end. The TIQC recommends modifying the definition by changing "operate" to "control" and specifying that those provided exceptions under the AFA be included among the eligible.

> **TIQC Recommendation:** Any individual or entity eligible to own **<u>or control</u>** a US fishing vessel pursuant to USC 102(C) and provisions of AFA (202(g) and 213(g)) is eligible to own or lease quota shares or quota pounds. The TIQC recommends that exact wording, in line with the TIQC's intent, be developed by NOAA regional Counsel.

### B.2.3.2 Permit Transfers and Leases of QS/QP

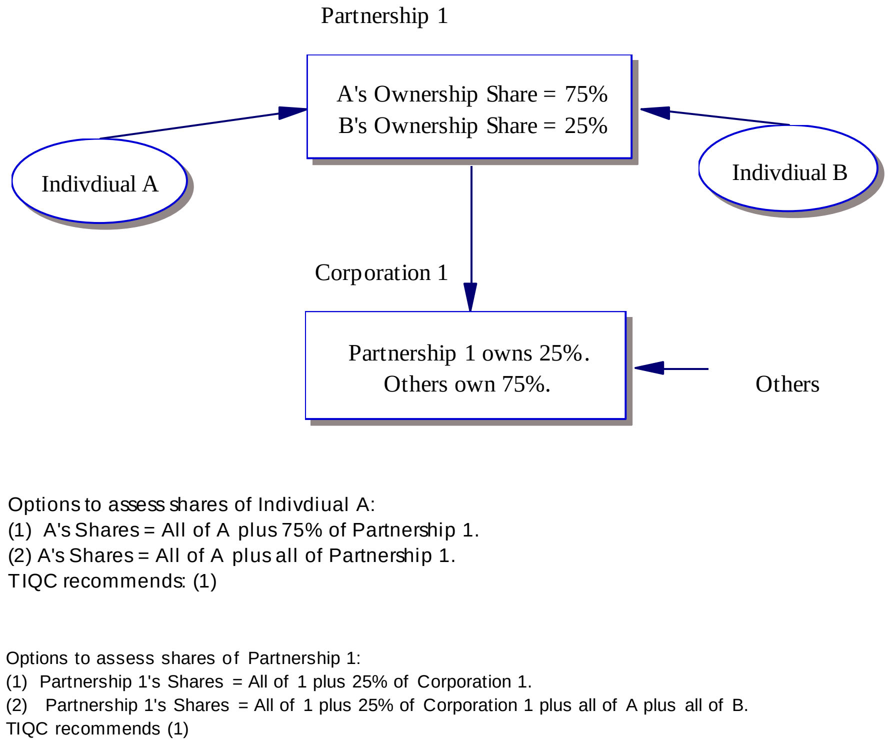
> **TIQC Recommendation:** To avoid confusion, the TIQC recommends the elimination of language indicating that quota pounds may be leased.

Since quota pounds are annual and, once used, confer no additional harvesting opportunity, referencing the lease of quota pounds may lead to confusion. Any desire to provide quota pounds to an individual through a short term option to use can be achieved through private contract and need not be referenced as a "lease."

### B.2.3.6 Accumulation Limits

The current alternatives provide that a person's ownership of quota shares be determined prorata, based on the person's ownership share of any entity owning quota shares. For example, in the following figure, Individual A would be considered to own 100% of the shares held under his/her own name but only 75% of the shares held by Partnership 1 in which Individual A holds a 75% interest.

The question posed to the TIQC was “Should any of Individual A’s shares be counted against Partnership 1’s ownership cap?”




**The TIQC recommendation:** Quota shares a person owns would not count toward the caps of any partnership, corporate or other entity in which the person has an ownership interest. Further, for whatever ownership caps are established, persons should be allowed to retain whatever QS they qualify for, even if in excess of the caps that are eventually established (grandfather clause). The TIQC requested that staff work with NOAA Regional Counsel and Joe Plesha to develop some definitions of control for its consideration.

Counting a person’s personal holdings toward those of other entities in which that person holds an interest could result in unanticipated constraints on consolidation. For example, counting Individual A’s ownership against Partnership 1 could lead to counting quota shares in long chain of interlinked ownerships. If Partnership 1 also shared ownership in Corporation 1, Individual A’s shares would count against Partnership 1 and Corporation 1. Further, Corporation 1’s ownership would include all the quota shares held by any member of Corporation 1 and a portion of these shares would count against Partnership 1. A partnership or other entity does not generally direct all of the activities of those with an ownership interest in the entity. Therefore, the activities of those with an ownership interest in the entity should not count against the limit of the entity.

## B.3.1 Limited Landing Hours

**TIQC Recommendation:** There should be no limit on landing hours.

Limited landing hours are being proposed as a cost savings measure. The TIQC notes numerous problems with limiting landing hours and recommends against such provisions. While many vessels generally offload between 5 am to 10 am others, on a situational or routine basis, need to off load at different times. The whiting fishery needs to operate 24 hours a day. There are times of year during which if the weather breaks there may be many vessels fishing at the same time. Problems with specifying an offloading period include competition with other vessels for unloading time (including nontrawl vessels), the potential diminishment of product value and quality with delays in unloading, and equity issues around priorities the processors may set in deciding which vessels to offload first. Degradation of product quality becomes more critical if a vessel has already had to wait a period of time for other vessels to unload, such that the vessel would be in port a day or more before offloading could commence. If the idea of rationalization is to provide more flexibility, this provision is moving in the opposite direction. If the limited landing hours are intended to help reduce enforcement costs, this may be unnecessary if there is 100% compliance monitoring of the offloading activities.

## B.3.2 Cost Recovery

Program performance and equity may vary based on the structure of fees used to recover program costs.

> **TIQC Recommendation:** The TIQC recommends that fee structures be aggregated across the fleet but tied to measures which represent actual costs. If actual costs vary by pounds landed, then fee structures should be based on pounds landed. If actual costs vary by days-at-sea then fee structures should be based on days-at-sea. The TIQC requests that proposed fee structures be developed and presented for TIQC consideration.

## B.4.0 Community Stability Program

**From the Sept 2006 TIQC Meeting:**

> **The TIQC recommends** that the Council incorporate all of the attached changes to the community stability program into the current version of the program (IFQ Program C) but at the same time notes there may be substantial administrative costs associated with a community stability program.
>
> The intent of the community stability program is to economically benefit coastal communities. Market development and enhancement, flexibility/coordination with market forces, facilitation of new operations, and industry stabilization at the local level are all desired outcomes. While the program allows any partnership that includes an IFQ holder to apply for community stability quota, ideally the partnerships coming forward will involve fishermen, processors, and others associated with the community.
>
> The community stability program is proposed to further the following IFQ objectives.

5. Increase stability for business planning.
7. Minimize adverse effects from an IFQ program on fishing communities to the extent practicable.
8. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.

The TIQC notes that substantial additional work needs to be done in developing objective quantifiable criteria. Criteria should address objectives including stabilization, innovation, and employment opportunities. Development of objective quantitative criteria that are applicable across diverse communities and would appropriately rank proposals is a challenging task.

Further development of these alternatives requires additional technical expertise as well as general policy guidance of the type provided by the TIQC. If the Council is to move ahead with a community stability program, **the TIQC requests** that the Council provide the needed technical support.

## *Permit Stacking (Alternative 5)*

### Element 1.2. Credit for stacked permits.

The TIQC considered whether or not credit for stacked permits should be tied to the catch history of those permits.

> **The TIQC recommendation:** The credit for stacked permits should be set to a fixed percentage of full cumulative limits (not varying across time).

As compared to an approach under which the percentage would float in order to maintain a relatively stable set of limits for the base permit, this would provide permit buyers more certain knowledge about what it was they are buying.

As compared to an approach under which the stacking credit for each permit would vary depending on the catch history of the permit, this would be simpler and less expensive to administer and enforce.

The TIQC requests some analysis to help determine the amount of credit that might be appropriate for a stacked permit, given that the objective is to control adverse impact on vessels that do not stack permits. This information should include an assessment of the amount of overhead under recent cumulative limits and the amount that might be expected if the stacking process reduced the number of vessels to one-third the current number.

### Element 1.4  Nonwhiting Endorsements

> **TIQC Recommendation:** The TIQC recommends that nonwhiting endorsements be removed as an element of the permit stacking alternative.

The suite of opportunities provided by the groundfish fishery should be viewed as a whole and vessels should be able to move between various segments in the fishery. A vessel with a groundfish permit should not be excluded from participating in one segment solely on the basis of its decision to focus on some other segment for a period of time. Not including a nonwhiting endorsement would also simplify the program and reduce costs.

## Groundfish Management Team Report and TIQC Response

The GMT reviewed a number of issues with the TIQC.

### *Overfished Species (B.1.0, buffers and RCAs)*

**The GMT presented the following preliminary proposals to the TIQC.**

1. Consider a more recent period for allocation of QS (2003-2005)

   If overfished species are allocated based on older catch history (when there were target fisheries on some of the overfished species) some vessels may end up with a lot of quota shares for overfished species and others very little. Additionally, those with higher catches of species that became overfished would be rewarded.

2. Use tiers assigned based on aggregate groundfish landings history. The tiers could be used in one of two ways.
   A. Quota shares would be assigned based on the tier and after assignment would be transferable.
   B. A permit has a tier assignment and is given an amount of pounds each year.

TIQC members noted that a tier system would flatten out differences in the fleet to the advantage of lower producers and disadvantage of larger producers. It also appears to add an additional level of complexity as compared to allocating overfished species based on target species and bycatch rates. A tier system would have to take into account geographic distribution of a vessel's activities. In general, the TIQC believes that many of concerns about difficulties related to the very small amounts of quota pounds that may be available for some species will be addressed by fishermen working together based on an understanding of the serious consequences to the individual vessel that would result from catch in excess of the quota pounds that were available. For example, fishermen may enter private agreements under which vessels pool available quota shares for constraining incidental catch species. Also, fishermen that only receive a very small amount of an overfished species are likely to either augment their holdings with additional purchases or sell what they receive. It is unlikely that they would try to fish with only a few pounds of some species available to them. Accumulation caps should address the GMT's concern that individuals might corner the quota shares for constraining overfished species. Whatever system is developed to address concerns about the challenges of operating an IFQ program for overfished species, it needs to take into account changing conditions as stocks recover.

3. Establish more conservative RCA boundaries or buffers to prevent IFQ fishery from shutting down due to overages.

The TIQC recommends that modification of the RCA boundaries not be built into the program but rather be flagged as a concern and adjustments made during implementation, if it is deemed necessary. The TIQC viewed the buffer issue as something that should be addressed by the GAC. Concern was expressed about the idea of midseason releases of a buffer in the context of an IFQ program. Adjustment to quota pound holdings could be difficult and have high administrative costs, relative to the benefits.

## *Gear Switching (Component 3.0)*

The GMT reported that it supports gear switching opportunity and presented the idea that in addition to allowing gear switching an incentive to switch gears might be provided. The GMT also noted that bycatch rates may change when a vessel is allowed to switch gears.

The TIQC noted that the only trawl target species that might be caught more cleanly with a species other than trawl gear might be sablefish. It was also noted that even with gear switching the monitoring provisions would still be in place, at-sea compliance observers would be required even if a vessel switched gears. Thus there would be better coverage on trawl vessels that switch gear than on nontrawl vessels using the same gear. The TIQC also noted that habitat benefits may not result from gear switching. For example, switching to longline gear could increase damage to corrals.

## *Central Lien Registry (B.2.3.5)*

The GMT recommends reliance on a UCC system through the states rather than a central lien registry. The TIQC's concern is that the public have an opportunity to examine ownership and lien records. Some members of the TIQC felt this could be handled privately.

## *Sideboards (New)*

While the GMT has recommended consideration of sideboards to prevent the spillover of effort into other fisheries, the TIQC did not believe it necessary to create a system of sideboards. Most of the other nongroundfish fisheries are already under limited entry programs. Shrimp is an exception. Participation in this cyclical fishery is more dependent on biomass and the strength of the market. As compared to the situation under cumulative landing limits, an IFQ program is not likely to have substantial effect on participation in the shrimp fishery.

### *Area Management (Component 5)*

The GMT will provide the TIQC with a paper on area management. TIQC members discussed the possibility that accumulation caps, port logistical limits and market forces may take care of these concerns by dispersing landings.

## Vessel Co-operatives (Alternative 6)

The vessel co-operative alternative recommended by the TIQC is provided as an attachment to this report. The TIQC developed an alternative for the shoreside whiting, mothership whiting, and catcher-processor sectors. For much of the shoreside whiting co-op proposal, the template provided by the mothership proposal was followed. Two of the areas that varied were the period of time used to determine the processors to which a vessel would be committed at the outset of the program, and the number of years a vessel must participate in the non-co-op fishery in order to switch from one processor to another. Representatives of the shoreside sector will be consulting with their constituents regarding the alternative that was developed, and in particular the qualifying requirements, with the intent of identifying an industry preferred program from the suite of options currently contained within the shoreside alternative.

While the design of the co-op portion of the alternative for each sector is independent of the other sectors, provisions for each sector pertaining to rollovers, bycatch management and allocation are interlinked. Therefore, while there is a separate section for each sector under the first component, which describes the function of the co-op for that sector, for the other components there is only a single section covering all three sectors.

The TIQC reviewed a preliminary recommendations by the GMT that consideration be given to providing a co-op option for the nonwhiting fishery. The GMT noted the potential use of co-ops to pool catch opportunities in order to stay within impact constraints for overfished species and that co-ops might have a lower administrative cost than IFQs. The TIQC discussed cost differences with the GMT. GMT members indicated the need for further analysis in order to determine whether or not the cost differences would be substantial.

The TIQC also received a briefing on co-ops in the north Pacific from John Gruver of United Catcher Boats.

# Attachments

## *Revised Decision Points (From Section 2.4 of Chapter 2)*

This section provides the list of remaining decision points and revised table of IFQ management regime alternatives that would remain if all the TIQC's recommendations are accepted, The number of decision points remaining before and after the TIQC recommendations would be as follows.

| | Management Regime Alternatives | | | IFQ Program Design Details |
|---|---|---|---|---|
| | IFQs | Permit Stacking | Vessel Co-ops | |
| Before Current Recommendations | 9 | 3 | N/A | 21 |
| After Current Recommendations | 6 | 2 | 16 | 13 |

Some of the remaining decision points are amenable to further narrowing by the TIQC or Groundfish Allocation Committee, prior to the development of full EIS.

### 2.4.1 Decision Points List

**Main Management Regime Decision**

1. Select the main tool that will be used to manage the groundfish limited entry trawl fishery.

- Status Quo (Cumulative Landing Limits and Seasons for Whiting)
- IFQs for Any or All Trawl Sectors (Catch Based)
- Permit Stacking for Nonwhiting Sectors (Catch Based)
- Vessel Co-operatives for Whiting Sectors (Catch Based)

**IFQ Management Regime Alternative Decision**

**IFQ Component 1**

No decisions.

**IFQ Component 2**

1. Number of trawl sectors (one, three or four). (Alt 2, 3 &4) (Element 2.1)
2. Bycatch caps (a single bycatch cap for all three whiting sectors or one for each whiting sector and rollovers) (Alt 2) (Element 2.2 and 2.4)
3. Whiting rollover (allowed or not), if so, specify whiting rollover mechanism (Alt 2) (Element 2.3)

**IFQ Component 3**

4. Groundfish catch of limited entry trawl vessels using gears other than groundfish trawl (whether to allow gear switching). (Alt 2, 3 &4) (Element 3.1 thru 3.4)

**IFQ Component 4**

No decisions.

**IFQ Component 5**

5. Area management process option (decision to create a committee to study has been deferred).

**IFQ Component 6**

6. Trawl sector allocation formula. Whether or not to eliminate catch history for vessels without recent participation. (Alt 2 & 3) (Element 6.1)

## Permit Stacking Management Regime Alternative

### Permit Stacking Component 1

1. Method for specifying the amount of credit to be provided for stacked permits (Element 1.2)

### Permit Stacking Component 3

2. Allow gear switching (allow trawl limits to be taken with directed open access gear and limited entry longline and fishpot) (Elements 3.1 thru 3.4)

## Vessel Co-op Management Regime Alternative

### Co-op Component 1

***Catcher Vessels Delivering to Motherships (CV(MS))***

1. Catcher vessels delivering to motherships [CV(MS)] endorsement qualifying requirement (time period options)
2. CV(MS) catch history calculation options (periods and numbers of a permits worst years to drop)
3. Mothership permit qualifying requirement (time period options)
4. Movement between motherships (require 1 year in the non-co-op fishery or allow free movement).
5. Accumulation limit for the share of total fish a mothership may process (decide percent)
6. Accumulation limit for the share of total allocation a person may control through CV(MS) permits (decide percent)

***Catcher Vessels Delivering to Shoreside Processors***

7. Catcher vessels delivering to shoreside processors [CV(SS)] endorsement qualifying requirement (time period options)
8. CV(SS) catch history calculation options (periods and numbers of a permits worst years to drop)
9. Shoreside processor permit qualifying requirement (time period options)
10. The basis for determining the processor to which the permit is initially committed (most recent year or majority of landings for the entire allocation time period)
11. Movement between shoreside processors (require 2 years in the non-co-op fishery or allow free movement).
12. Accumulation limit for the share of total fish a mothership may process (decide percent)

13. Accumulation limit for the share of total allocation a person may control through CV(SS) permits (decide percent)

***Catcher-Processors***

There are no Component 1 decisions needed for catcher processors.

**Co-op Component 2 (All Whiting Sectors)**

14. Whether or not to have a whiting rollover between whiting sectors and, if so, the mechanism.
15. Whether or not to subdivide bycatch species among whiting sectors and provide rollovers.
16. If there is no subdivision of bycatch species, would there be seasonal releases.

**Co-op Components 3, 4, 5 and 6 (All Whiting Sectors)**

For Components 3, 4 5, and 6 there are no options on which decisions are needed.

## IFQ Program Design Detail Alternatives

### Initial Allocation

1. Proportion of initial allocation to go to permit owners and proportion to processors (all alternatives). (B.1`.1)
2. Recent participation requirements (yes or no) (Alt B). (B.1.2)
3. Recent participation requirements (define options in Alt A and C) (B.1.2)
4. Elements of allocation formula. (catch history or equal allocation for overfished species?) (all alternatives) (B.1.3)
5. Species/spp groups for which QS will be issued and issuance of QS species without an intersector allocation (options) (all alternatives). (B.1.4)
6. Species/spp groups on which the allocation will be based (Use the species being allocated or only target species?). (all alternatives) (B.1.4)
7. Weighting of catch history between years (weight or don't weight) (B.1.5)

### Permit/IFQ Holding Requirements and IFQ Acquisition (After Initial Allocation)

8. Carryover allowance options. (Amount) (B.2.2.2)
9. Prohibit or limit QS transfers in the last two months. (Yes/No) (B.2.3.3)
10. Accumulation limits (levels for use on a vessel, ownership and control). (B.2.3.6)

### Program Administration

11. Cost recovery proposals needed (Type of recovery mechanisms and principles to follow). Proposals for privatization needed. (B.3.2)
12. Timing of review vis a vis biennial management cycle. (B.3.3)

### Community Stability

13. Criteria for evaluating community stability program (B.4.0)

Table 2-3. Decision points for IFQ management regime alternatives (with Alternative 2 eliminated).

| | | Alternative 3<br>IFQs for All Groundfish<br>(Except in the Whiting Fishery) | Alternative 4<br>IFQs for<br>All Groundfish |
|---|---|---|---|
| ***Element 1.1 IFQ Program to Be Applied*** | | Alternative 3A – Program A<br>Alternative 3B - Program B<br>Alternative 3C - Program C | Program C |
| | | ***Other Catch Control Tools*** | |
| ***Element 1.2 Permit Stacking*** | | N/A | N/A |
| ***Element 1.6 General Season Closures --*** | | Yes | Yes |
| **COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied** | | | |
| ***Element 2.1 Sectors*** | | Sectors Option 3A: Four sectors (SS=Shoreside; MS=Mothership; CP=Catcher-processor)<br>Sectors Option 3B: Three sectors | One sector |
| ***Element 2.2 ~~Primary Trawl Target and Allocated~~ Species***<br><br>***(Except Whiting)*** | | SS non-whiting deliveries: IFQs<br>SS, MS, & CP whiting deliveries: bycatch caps for significant bycatch species and cumulative limits.<br>Bycatch cap Option 1: A single bycatch cap for all whiting sectors combined.<br>Bycatch cap Option 2: Each whiting sector has its own bycatch cap and there will be a bycatch rollover provision. | IFQs |
| ***Element 2.3 Whiting*** | . | SS non-whiting deliveries: IFQs and year-round whiting cumulative catch limits.<br>SS, MS, & CP whiting: IFQs<br><br>Whiting Rollover Option 1: Not Allowed;<br>Whiting Rollover Option 2: Allowed | IFQs |

| | | Alternative 3<br>IFQs for All Groundfish<br>(Except in the Whiting Fishery) | Alternative 4<br>IFQs for<br>All Groundfish |
|---|---|---|---|
| **Component 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl** | | | |
| ***Element 3.1***<br>***Directed Open Access (except fishpot and longline)*** | . | Switching Option 3A: IFQ not required<br>Switching Option 3B: IFQ required.<br>.<br>Open access limits **apply**.<br><br>Switching Option 3A: Catch counts against open access allocation<br>Switching Option 3B: Catch counts against trawl allocation. | IFQ required.<br>Open access limits **do not apply**.<br><br>Catch counts against trawl allocation. |
| ***Element 3.2***<br>***Longline and Fish Pot Without an LE Fixed Gear Endorsement*** | | IFQ required.<br><br>Switching Option 3A: LE fixed gear limits apply<br>Switching Option 3B: LE fixed gear limits do not apply<br><br>Catch counts against trawl allocation. | Same as Alt 3. |
| ***Element 3.3***<br>***Longline and Fish Pot With an LE Fixed Gear Endorsement*** | | Switching Option 3A: IFQ not required and no opportunity to land groundfish in excess of fixed gear limits. Fixed gear catch counts against fixed gear.<br>Switching Option 3B: IFQ **not** required **but may be used** to catch in excess of fixed gear limits.<br><br>Catch against fixed gear limits counts against fixed gear.<br>IFQ catch counts against trawl allocation. | Same as Alt 3. |
| ***Element 3.4***<br>***Incidental Open Access*** | | IFQ **not** required | Same as Alt 3. |
| **Component 4. At-sea Observers/ Monitoring** | | | |
| | | 100% at-sea compliance observers. | 100% at-sea compliance observers or cameras (if feasible) |

| | | Alternative 3<br>IFQs for All Groundfish<br>(Except in the Whiting Fishery) | Alternative 4<br>IFQs for<br>All Groundfish |
|---|---|---|---|
| **Component 5. Area Management** | | | |
| | **Program Option for All Action Alternatives:** Plan to establish additional regional management areas as needed at a later time. IFQ program alternatives include provisions to allow later subdivision of IFQs by area.<br>**Process Option:** Task a group to begin considering the need for additional regional management areas (biological or socio-economic) and potential boundaries along with a process for identifying and responding to regional management area issues that may develop or become more apparent in the future. **[Decision deferred until additional information is available, e.g. preliminary DEIS is ready.]** | | |
| **Component 6. Sector Allocation** | | | |
| ***Element 6.1 Within Trawl*** | | Establish sector specific allocation within trawl allocation based on each sector's relative historic shares. **Option** to eliminate history for permits not meeting recent participation requirements | No allocation required within the trawl sector. |
| ***Element 6.2 Trawl/All-Other-Gear*** | Establish needed intersector allocations through the intersector allocation process. | | |
| ***Element 6.3 Trawl/ Open Access*** | | Augment the open access allocation.<br>**Linked to Gear Switching Option A of Element 3.1 of Alt 3.** | N/A |

## *Vessel Co-operative Alternatives (6a, 6b and 6c)*

Under this alternative, there would be no changes in management of the nonwhiting fishery. The following is the alternative that is being forwarded to the Groundfish Allocation Committee for its consideration.

**COMPONENT 1: Catch Control Tools**

***Catcher Vessels Delivering to Motherships (Alternative 6a)***

The mothership whiting fishery would be managed in two modes:

1. Catcher vessels delivering to motherships (CV(MS)) co-op(s)
2. Seasonal management for those not participating in co-ops

Catcher vessels with a CV(MS) co-op endorsement would choose the mode in which they will fish during a fishing year and commit to that mode for the entire fishing year.

**CV(MS) Endorsement**
Permits with a qualifying history would be designated as CV(MS) permits through the addition of an endorsement to their limited entry groundfish permit.

**Qualifying for a CV(MS) Endorsement.** A limited entry permit will qualify for a CV(MS) endorsement if it has a total of more than 500 mt of whiting deliveries to motherships from

**Qualification Option A:** 1998 through 2004
**Qualification Option B**: 1994 through 2003

**Initial calculation to be used in determining NMFS distribution to co-op and non-co-op fishery pools.** A CV(MS) permit calculated catch history will be based on

**Allocation Option A:** its best 6 out of 7 years from 1998 through 2004
**Allocation Option B**: its best 9 out of 11 years from 1994 through 2004
**Allocation Option C:** its best 6 out of 7 years from 1998 through 2003
**Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

**Mothership (MS) Permits.** The vessel owners of qualifying motherships will be issued MS permits. In the case of bareboat charters, the charterer of the bareboat will be issued the permit. Only vessels for which such permits are held may receive at-sea deliveries from catcher vessels. A qualifying mothership is one which processed

at least 1,000 mt of whiting in each of any two years from 1998 through 2004

MS permits will be transferable and there will be no size endorsements associated with the permit. A vessel may not harvest whiting and operate as a mothership in the same year. MS permits may only be used for processing by one vessel per year. Exclusionary language will be added to indicate that a vessel that has left US fisheries may not return.

**Annual Registration.** Each year MS and CV(MS) permit holders planning to participate in the mothership sector must register with NMFS. At that time they must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery so that NMFS can make appropriate distributions to the co-op and non-co-op fisheries.

**Co-op Formation.** Co-ops will be formed among CV(MS) permit owners.

Multiple Co-ops **must** be formed based on the mothership where the CV permit holders delivered the majority of their most recent years' catch. Co-op agreements will be submitted to NMFS. Co-op agreements must distribute catch allocations to members based on their catch history calculation distributed to the co-op by NMFS

**Co-op Allocation:** Each year NMFS will determine the distribution to be given to each co-op based on the catch history calculation of CV(MS) permits registered to participate in the co-op that year.

**Non-co-op Allocation:** Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

**Movement between Motherships.**

**Option A:** Each year, CV(MS) permit owners will choose between fishing in the non-co-op fishery or delivering to the same mothership that they most recently delivered the majority of their whiting catch in the last calendar year in which they participated. However, if a CV(MS) permit participated in the non-co-op fishery in the previous year, or did not participate in the mothership whiting fishery, it is released from its obligation and may deliver to any mothership in a subsequent year. In the first year of the program, the CV(MS) permit owner's choice will be between delivering in the non-co-op fishery and making co-op deliveries to the licensed mothership to which the permit made a majority of its whiting deliveries in the last calendar year in which they participated.

**Option B:** CV(MS) permit owners may move between motherships at any time (if this option is selected, conforming changes will be made to all other sections of the mothership co-op alternative).

**Mutual Agreement Exception:** By mutual agreement of the CV(MS) permit owner and mothership to which the permit is obligated, and on a year-to-year basis, a permit may deliver to a licensed mothership other than that to which it is obligated. Such an agreement will not change the permit's future year obligation to the mothership (i.e. the vessel would still need to participate in the non-co-op fishery for one year in order to move from one mothership to another).

**Temporary Transfer of Allocation to CV(MS) and nonCV(MS) Endorsed Permits.** Owners of valid limited entry permits that are members of co-ops are permitted to transfer co-op allocations amongst other coop members. Such inter- or intra- co-op transfers must deliver co-op shares to the mothership to which allocation is obligated unless released by mutual agreement. Also, a co-op allocation may be harvested by any catcher vessel holding a valid limited entry trawl permit (including one that does not have a CV(MS) endorsement). Whiting allocations are not permanently separable from a limited entry permit Allocations may not be transferred from the mothership sector to another sector.

**CV(MS) Permit Combination to Achieve a Larger Size Endorsement**

A CV(MS) endorsed permit that is combined with a limited entry trawl permit that is not CV(MS) endorsed or one that is CV(SS) endorsed will be reissued with the CV(MS) endorsement. If the other permit is CV(SS) endorsed, the CV(SS) endorsement will also be maintained on the resulting permit. However, CV(MS) and CV(SS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(MS) permit is combined with a CP permit, the CV(MS) endorsement and history would not be reissued on the combined permit. The size endorsement resulting from permit combinations would be determined based on the existing permit combination formula.

**Accumulation Limits.**

**MS Permit Ownership:** No individual or entity owning a MS permit(s) may process more than XX% of the total mothership sector whiting allocation.

**CV(MS) Permit Ownership:** No individual or entity may own CV(MS) permits for which the allocation totals greater than XX% of the total whiting mothership allocation.

**Mothership Permit Transfer.**

If a mothership transfers its MS permit to a different mothership or different owner, the CV(MS) permit obligation remains in place unless changed by mutual agreement or participation in the non-co-op fishery.

**Mothership Withdrawal.**

If a mothership does not participate in the fishery and does not transfer its permit to another mothership or mutually agree to transfer delivery to another mothership, the CV(MS) permit holders obligated to that mothership may participate in the non-co-op fishery.

If a mothership does not qualify for a MS permit in the first year of the program, the vessels which delivered to that mothership in the previous year may deliver to the qualified mothership that it last delivered its majority of catch or participate in the non-co-op fishery.

***Catcher Vessels Delivering to Shoreside Processors (Alternative 6b)***

The shoreside whiting fishery would be managed in two modes:

1. CV(SS) co-op(s)
2. Non-co-op Fishery: Seasonal management for those not participating in co-ops .

Catcher vessels with a CV(SS) co-op endorsement would choose the mode in which they will fish during a fishing year and commit to that mode for the entire fishing year.

**CV(SS) Endorsement**

Permits with a qualifying history would be designated as CV(SS) permits through the addition of an endorsement to their limited entry groundfish permit.

**Qualifying for a CV(SS) Endorsement.** A limited entry permit will qualify for a CV(SS) endorsement if it has a total of more than 500 mt of whiting deliveries to shoreside processors from
- **Qualification Option A:** 1998 through 2004
- **Qualification Option B**: 1998 through 2003
- **Qualification Option C**: 1994 through 2004
- **Qualification Option D**: 1994 through 2003

**Initial calculation to be used in determining NMFS distribution to co-op and non-co-op fishery pools.** A CV(SS) permit calculated catch history will be based on
- **Allocation Option A:** its best 6 out of 7 years from 1998 through 2004
- **Allocation Option B**: its best 9 out of 11 years from 1994 through 2004
- **Allocation Option C:** its best 6 out of 7 years from 1998 through 2003
- **Allocation Option D**: its best 9 out of 11 years from 1994 through 2003

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

**Shorseside Processor (SSP) Permits.** Owners of qualifying shoreside processors will be issued SSP permits. Only processors for which SSP permits are held may receive shoreside deliveries from catcher vessels. A qualifying shoreside processor is one which processed at least 1,000 mt of whiting in each of any two years from 1998 through 2004. SSP permits will be transferable. SSP permits may only be used by one owner during the year.

**Annual Registration.** Each year SSP and CV(SS) permit holders planning to participate in the shoreside sector must register with NMFS. At that time they must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery so that NMFS can make appropriate distributions to co-op(s) and the non-co-op fishery.

**Co-op Formation.** Co-ops will be formed among CV(SS) permit owners.

**Number of Co-ops:** Multiple co-ops **must** be formed.

Co-op formation will be based on the shoreside processor where the CV(SS) permit holders

**History Tie Option A:** delivered the majority of their most recent years' catch.

**History Tie Option B:** delivered the majority of the catch for the entire time period from 1994 thought 2003.

**History Tie Option C:** delivered the majority of the catch for the entire time period from 1994 thought 2004.

Co-op agreements will be submitted to NMFS. Co-op agreements must distribute catch allocations to members based on their catch history calculation distributed to the co-op by NMFS

**Co-op Allocation:** Each year NMFS will determine the distribution to be given to each co-op based on the catch history calculation of CV(SS) permits registered to participate in the co-op that year.

**Non-co-op Allocation:** Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

**Movement between Shoreside Processors.**

**Option A.** Each year, CV(SS) permit owners will choose between fishing in the non-co-op fishery or, if the vessel has met its two year commitment to a processor [need more interpretation of this] , delivering to the same shoreside processor to which they most recently delivered the majority of their whiting catch in the last calendar year in which they participated. However, if a CV(SS) permit participated in the non-co-op fishery in the previous **two years** it is released from its obligation and may deliver to any shoreside processor in a subsequent year. In the first year of the program, the CV(SS) permit owner's choice will be between delivering in the non-co-op fishery and making co-op deliveries to the licensed shoreside processor to which the permit made a majority of its whiting landings in the last calendar year in which they participated.

**Option B:** CV(SS) permit owners may move between processors at any time (if this option is selected, conforming changes will be made to all other sections of the shoreside co-op alternative).

**Mutual Agreement Exception:** By mutual agreement of the CV(SS) permit owner and shoreside processor to which the permit is obligated, and on a year-to-year basis, a permit may deliver to a licensed shoreside processor other than that to which it is obligated. Such an agreement will not change the permit's future year obligation to the shoreside processor (i.e. the vessel would still need to participate in the non-co-op fishery for one year in order to move from one shoreside processor to another).

**Temporary Transfer of Allocation to CV(SS) and nonCV(SS) Endorsed Permits.** Owners of valid limited entry permits that are members of co-ops are permitted to transfer co-op allocations amongst other co-op members. Such inter- or intra co-op transfers must deliver co-op shares to the shoreside processor to which allocation is obligated unless released by mutual agreement. Also, a co-op allocation may be harvested by any catcher vessel holding a valid trawl limited entry permit (including one that does not have a CV(SS) endorsement). Whiting allocations are not permanently separable from a trawl limited entry permit Allocations may not be transferred from the shoreside sector to another sector.

**CV(SS) Permit Combination to Achieve a Larger Size Endorsement**

A CV(SS) endorsed permit that is combined with a limited entry trawl permit that is not CV(SS) endorsed or one that is CV(MS) endorsed will be reissued with the CV(SS) endorsement. If the other permit is CV(MS) endorsed, the CV(MS) endorsement will also be maintained on the resulting permit. However, CV(SS) and CV(MS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(SS) permit is combined with a CP permit, the CV(SS) endorsement and history would not be reissued on the combined permit. The size endorsement resulting from permit combinations would be determined based on the existing permit combination formula.

**Accumulation Limits.**

**Shoreisde Processing Permit Ownership:** No individual or entity of a SSP permit(s) may process more than XX% of the total shoreside sector's whiting allocation.

**CV(SS) Permit Ownership:** No individual or entity may own CV(SS) permits for which the allocation totals greater than XX% of the total whiting shoreside allocation.

**SSP Permit Transfer.**

If a shoreside processor transfers its SSP permit to a different shoreside processor or different owner, the CV(SS) permit's obligation remains in place unless changed by mutual agreement or participation in the non-co-op fishery.

**Shoreside Processor Withdrawal.**

If a shoreside processor does not participate in the fishery and does not transfer its SSP permit to another shoreside processor or mutually agree to transfer delivery to another shoreside processor, the CV(SS) permit holders obligated to that shoreside processor may participate in the non-co-op fishery.

If a shoreside processor does not qualify for a SSP permit in the first year of the program, the vessels which delivered to that shoreside catcher processor in the previous year may deliver to the qualified shoreside processor that it last delivered its majority of catch or participate in the non-co-op fishery.

***Catcher-Processors (Alternative 6c)***

Catch by the catcher-processor sector would be controlled primarily by closing the fishery when a constraining allocation is reached. As under status quo, vessels may form co-ops to achieve benefits that result from a slower paced more controlled harvest. The main change from status quo is the creation of a catcher-processor endorsement that would close the catcher-processor fishery to new entrants.

**Catcher-Processor (CP) Endorsement.** The class of CP endorsed permits (CP permits) would be limited by an endorsement placed on a limited entry permit. Limited entry permits registered to qualified catcher-processor vessels would be endorsed as CP permits. A qualified vessel is one that harvested and processed in the catcher-processor sector of the Pacific whiting fishery from sometime from 1997 through 2006. Only vessels with a CP limited entry permit would be allowed to process whiting at-sea. Limited entry permits with CP endorsements would continue to be transferable.

**Annual Registration.** No annual registrations or declarations are required.

**Co-op Formation.** As under status quo co-op(s) will be formed among holders of permits for catcher-processors. Participation in the co-op will be at the discretion of those permit holders. If eligible participants choose to form a co-op, the catcher-processor sector will be managed as a private voluntary cooperative and governed by a private contract that specifies, *inter alia*, allocation of whiting among CP permits, catch/bycatch management, and enforcement and compliance provisions. Since NMFS would not establish an allocation of catch or catch history among permits, if any permit holder decides not to participate, the potential co-op benefits will diminish and a race for fish is likely to ensue. Similarly, if more than one co-op forms, a race for fish would likely ensue, absent an inter co-op agreement.

**Co-op Allocation.** There would be no government directed subdivision of the catcher-processor sector quota among participants. The catcher-processor sector allocation would be divided among eligible catcher-processor vessels (i.e., those catcher-processor vessels for which a CP permit is held) according to an agreed catcher-processor cooperative harvest schedule as specified by private contract.

**CP Permit Combination to Achieve a Larger Size Endorsement**

A CP permit that is combined with a limited entry trawl permit that is not CP endorsed would result in a single CP permit with a larger size endorsement (an CV(MS) or CV(SS) endorsement on one of the permits being combined would not be reissued on the resulting permit). The resulting size endorsement would be determined based on the existing permit combination formula.

**COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied (Alternatives 6a, 6b and 6c)**

There will be four trawl sectors: Shoreside nonwhiting, shoreside whiting, mothership and catcher-processors.

**Whiting**

Whiting will continue to be divided among the sectors.

The whiting catch history calculation for each CV(MS) and CV(SS) permit will be assigned to a pool for the co-op in which the permit will participate or a pool for the mothership or shoreside non-co-op fishery. Co-ops are responsible for monitoring and enforcing the catch limits of co-op members. NMFS will monitor the catch in the non-co-op fishery, the co-op fisheries and the overall catch of the shoreside and mothership sectors. NMFS will close these fisheries when their catch limits have been achieved.

**Whiting Rollovers**

**Whiting Rollover Option 1.** There **will not** be a **rollover** of unused whiting from one whiting sector to another.

**Whiting Rollover Option 2.** Rollovers to other sectors may occur if sector participants are surveyed by NMFS and no participants intend to harvest remaining sector allocations. Current provisions for NMFS to re-allocate unused sector allocations of whiting (from sectors no longer active in the fishery) to other sectors still active in the fishery would be maintained (see 50CFR660.323(c) – Reapportionments).

**Bycatch Species**

For the foreseeable future the whiting fishery will be managed under bycatch limits (hard caps) for widow, canary, and darkblotched rockfish. The ESA salmon bycatch management measures, that is, the 11,000 Chinook threshold, 0.05 rate threshold, and triggered 100 fathom closure will also continue to be in place. The goal of bycatch management is to control the rate and amounts of rockfish and salmon bycatch to ensure each sector is provided an opportunity to harvest it's whiting allocation.

**Bycatch Allocation Subdivision**

**Subdivision Option A:** Subdivide bycatch species allocation among each of the whiting sectors (see Component 6 for basis for allocation).

**Subdivision Option B:** Do not subdivide bycatch species.

**No Bycatch Subdivision** If bycatch species are not allocated among the sectors, then

- **Bycatch Management Option 1:** all sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species, a controlled pace may be established if the sectors choose to work together co-operatively, potentially forming an intersector/interco-op co-operative.
- **Bycatch Management Option 2:** Same as Option 1, including the potential for forming co-ops, there will be seasonal releases of bycatch allocation.

At the outset, it is envisioned that the seasonal approach would be used to manage widow rockfish bycatch; for canary rockfish and darkblotched rockfish, status quo management would be maintained (i.e., no sector allocation and no seasonal apportionment).

A seasonal release bycatch management program would be implemented through regulation. For reference a similar program is used to manage halibut bycatch in NPFMC-managed flatfish and Pacific cod fisheries, see 50CFR679.21(d).

In practice seasonal releases protect the next sector entering the fishery. For example a May 15 - June 15 release would be used by the catcher-processors and motherships, but protects the shoreside fishery; the June 15 - September release would be used by shoreside and whatever catcher-processors and motherships are still fishing hake, and protect a fall at-sea season after September 15; the final release in September would again be shared by the catcher-processors and motherships, assuming shoreside is done.

For example (note – percentages are for illustration purposes only, actual release percentages would be developed through the PFMC process):

1. No sector bycatch allocations.
2. Status quo for canary and darkblotched rockfish; i.e., no seasonal or sector allocation.
3. May 15 - June 15; 40% of widow hard cap released.
4. June 15 - August 31; an additional 45% of widow hard cap released.
5. Sept. 1 - Dec. 31; final 15% of widow hard cap released.
6. Once a seasonal release of widow rockfish is reached, the whiting fishery is closed to all three sectors for that period. The fishery re-opens to all three sectors upon release of the next seasonal release of widow rockfish.
7. Unused amounts from one seasonal release roll-over into subsequent release periods.

**Bycatch Subdivision**

Rollovers. If each sector has its own allocation of bycatch, unused bycatch may be rolled over from one sector to another if the sector’s full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.

**COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Gear Switching) (Alternatives 6a, 6b and 6c)**

Nonwhiting groundfish management measures are not addressed in this alternative.

**COMPONENT 4. At-sea Observers/ Monitoring (Alternatives 6a, 6b and 6c)**

- **Shoreside Whiting Fishery:** Increase to 100% to enforce catch accounting requirements.
- **At-sea Whiting Fishery:** 100% coverage aboard mothership and catcher-processors would continue.

For some coverage, cameras may be used in place of observers (feasibility to be determined).

**COMPONENT 5. Regional Area Management (Alternatives 6a, 6b and 6c)**

No heightened need for area management identified (as compared to status quo).

**COMPONENT 6. Sector Allocation (Alternatives 6a, 6b and 6c)**

- Existing whiting trawl allocations to remain intact between shoreside whiting sector (42%), mothership delivery (MS) sector (24%) and catcher-processor sector (34%).
- If incidental catch species are allocated between the whiting sectors (see options in Component 3) the allocations will be made on a pro-rata basis relative to whiting allocated to each sector.

## *Proposed changes to the Community Stability Program*

The following are the changes to the community stability program provisions that were proposed at the September 2006 Council meeting.

| **Alternatives** | Alt 2 | Alt 3a | Alt 3b | Alt 3c | Alt 4 |
|---|---|---|---|---|---|
| **Component B.4** **Community Provisions** | | | | | |
| **Element B.4.1 Adopt a community stability ~~holdback~~ program with the following provisions.** A portion of annual quota pounds would be ~~held back~~ set aside and allocated for proposals submitted by partnerships of quota share owners/lessees and non- quota share holders (e.g. community partnerships). The proposals would be evaluated based on quantitative criteria that prioritizes community benefits. The quota pounds held back for this purpose will continue to be "trawl quota pounds" and must be used in a manner consistent with the scope of the trawl individual quota program. | ☑ | ☐ | ☐ | ☑ | ☑ |
| **Element B.4.2 Program Objectives. The Community Stability Program objectives reflect a subset of TIQ program objectives. Specific objectives include**<br>**1) Increase stability for business planning,**<br>**2) Minimize adverse effects from an IFQ program on fishing communities to the extent practical, and**<br>**3) Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| **SubElement B.4.2.1** Set Aside. Some amount of the shoreside trawl QP would be set aside to be allocated to partnerships of QS owners/lessees and non-quota holders who submit proposals for using the community stability holdback program allocation in a manner that benefits communities. The total amount set aside for all such proposals would be as determined in Element 2.2.5<br>*** It may be determined that the optimal period for these allocations is greater than one year.** | ☑ | ☐ | ☐ | ☑ | ☑ |

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| **SubElement B.4.2.2** Management Body: A Council Appointed Committee<br>Committee Authority and Appointment: Magnuson-Stevens Act authority. Appointed by the Council. Recommendations would require approval by the Council before being forwarded to NMFS.<br>Committee Role: Use specific measurable criteria to make recommendations to the Council on the amount of quota pounds to be allocated for proposals presented by QS owners/lessees for the purpose of achieving specific community development, enhancement, or stabilization goals.<br>Composition: The committee would be composed of representatives of West Coast regions, port districts, processors, and fishermen as determined under a Council operating procedure. | ☑ | ☐ | ☐ | ☑ | ☑ |
| ***Option A (B.4.2.2)*** Joint Staffing and Administration: **Committee reports would be developed for the committee by the staff of the NMFS Limited Entry Office and related expenses would be included as part of program costs to be covered by fees. Other staffing functions would be carried out by the Council.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| ***Option B (B.4.2.2)*** Council Staffing and Administration: **All staffing functions would be carried out by the Council.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| **SubElement B.4.2.3** Eligibility for Participation. Proposals may be submitted by **partnerships of QS holders, including partnerships with QS holders and non-QS holders (e.g. community groups) or** individual QS **holders. QS holders may only participate in one proposal for any given time period.** | ☑ | ☐ | ☐ | ☑ | ☑ |

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| **SubElement B.4.2.4** Criteria allocating among proposals. **A set of quantitative criteria will be used to objectively determine the amount of QP to be allocated to a proposal. The Council may determine that for stability and planning reasons the allocations for some or all proposals should be for periods longer than 1 or 2 years.**<br><br>**Future modifications of criteria. As the program progresses over time, the need to modify the criteria may arise. The criteria may be modified,, deleted, or augmented as part of the biennial specifications process, or a three meeting process, so long as the modifications are consistent with the objectives identified for the Community Stability Program.**<br><br>**Calculation of Allocation. Each criterion will be scaled such that they are evenly weighted and values fall between 0 and 1 (or between 0 and 100). Scores for all criteria would be added together to derive a single score for each proposal. The scores for all proposals would be summed. The amount to be allocated to each collaborative proposal would be the score for that proposal divided by the sum of all scores times the total holdback for each species covered by the application.**<br><br>**Seven potential criteria are listed in the following options. The Council may select one or all of the criteria options.**<br><br>The following are not necessarily mutually exclusive. | ☑ | ☐ | ☐ | ☑ | ☑ |
| *The first three criteria are reasonably well developed; the other criteria probably need more development before they would be ready for use.*<br><br>***Option A (B.4.2.4)*** Past Performance: **The degree to which the quota committed to previous projects was utilized in accordance with the commitments made (does not apply to overfished species). This criterion comes into effect in the second year of the program. Past performance will not be available in the initial year.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| ***Option B (B.4.2.4)*** Quota pounds committed **to the project by the applicants: The ex-vessel fair market value of all pounds committed (based on previous year's prices) will be summed and divided by the fair ex-vessel value of all pounds committed by all proposals. For this criterion, scores of all proposals will be scaled** | ☑ | ☐ | ☐ | ☑ | ☑ |

| | | | | | |
|---|---|---|---|---|---|
| **proportionally such that a score of 1 will be assigned to the proposal with the greatest amount of pounds committed to the proposal.** | | | | | |
| ***Option C (B.4.2.4)*** Port Dependence: **Proportion of port governing body revenue from activities of vessels, buyers, and processors divided by total port revenues. Proportion of revenues in all proposals will be adjusted proportionally such that the largest proportion of revenues receives a score of one.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| *The remaining criteria probably need further review and development.*<br>***Option D (B.4.2.4)*** Utilization: **Proportion of raw product to be converted to consumptive and non-consumptive human use (including meal and fertilizer). ~~times past performance on utilization commitments~~. Indicator of wastage and potential pollution externalities.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| ***Option E (B.4.2.4)*** Local Added Value: **Fair market value of proposed exports from community divided by fair market value of ex-vessel landings. The committee will determine a fair market value for the proposed product and apply the same per pound market values to all proposals. (Apply as a past performance measure if advance commitment to product forms is not tenable). For this criterion, scores of all proposals will be scaled proportionally such that a score of 1 will be assigned to the proposal with the greatest added value ratio.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| ~~***Option F (B.4.2.4)*** **Local Labor 1: Local employees divided by total individuals employed (FTE) by the firms that are parties to the proposal.**~~ | ☑ | ☐ | ☐ | ☑ | ☑ |
| ***Option G (B.4.2.4)*** Local Labor 2: **Total local wages to be paid per dollar fair market value of proposed exports or final products. The committee will determine a fair market value for the proposed product and apply the same per pound market values to all proposals. Proportionally scale the scores of all proposals such that the proposal with the largest ratio is scaled to one.** | ☑ | ☐ | ☐ | ☑ | ☑ |

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|---|---|---|---|---|---|
| ~~*Option H (B.4.2.4)*~~ ~~**Public Debt Related to Fisheries Development: For the port in which the landings will be made, the amount of public debt directly related to investments supporting the fishing industry and relying on fishing activity for debt recovery divided by the total amount of debt identified in all such proposals and scaled proportionally such that a score of 1 is assigned to the proposals benefiting ports with the greatest fishing infrastructure related debts.**~~ | ☑ | ☐ | ☐ | ☑ | ☑ |
| ***Option I (B.4.2.4)*** Public Investment Dedicated to Fisheries**: For the port in which the landings will be made, the amount of public investments directly supporting the fishing industry divided by the total amount of other investments in the port (not related to fishing). Identify investments in all such proposals and scale proportionally such that a score of 1 is assigned to the proposals benefiting ports with the greatest fishing industry related debts.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| **SubElement B.4.2.5** Accumulation Limits. **All additional quota acquired by a person through participation in a proposal will count toward accumulation caps.** | ☑ | ☐ | ☐ | ☑ | ☑ |
| **SubElement B.4.2.6** Transferability. **Quota pounds issued for proposals may be transferred as long as their use is consistent with the <u>original</u> proposal and fish are caught, handled and landed in all manners originally specified in the <u>original</u> proposal.** | ☑ | ☐ | ☐ | ☑ | ☑ |

Agenda Item E.4.d
GMT Report
March 2007

GROUNDFISH MANAGEMENT TEAM REPORT ON TRAWL RATIONALIZATION
(TRAWL INDIVIDUAL QUOTA (TIQ) PROGRAM)

The Groundfish Management Team (GMT) met on February 1 in Seattle and discussed a series of topics related to the TIQ program. This report summarizes that discussion on the following six topics: (1) Sideboards; (2) Area Management; (3) Overfished Species Allocation based on Proxy Species; (4) Overfished Species Management; (5) Use-or-Lose Provision; and (6) Discard Survival Credit. The GMT's comments on Sideboards and Overfished Species Allocation/Management are also summarized in tables at the end of this report.

Excerpts from the GMT's report to the Groundfish Allocation Committee (GAC) (December 2006) are included as an attachment to this report. Issues addressed in that report are: (1) Community Stability Holdback Provision; (2) Cooperatives; (3) Gear Switching; (4) Number of Trawl Sectors; (5) Area Management; and (6) Monitoring Issues.

## 1. Sideboards

A rationalized trawl fishery may have an effect on other West Coast fisheries. For example, bycatch of Pacific halibut is likely to increase and so negatively impact Pacific halibut fisheries; disaster tows can lead to exceeding the trawl allocation, which could lead to a closure of all sectors to avoid exceeding the acceptable biological catch (ABC). Therefore, the GMT suggests the following protection measures. The GMT does not recommend, however, that the Council adopt sideboards to address the possibility of effort spill-over into other fisheries.

**Sideboards to protect fisheries that target Pacific halibut**
GMT recommends that transferable prohibited species caps (TPSC) be developed for Pacific halibut bycatch in the limited entry (LE) trawl fishery. Fishing opportunities are likely to increase under rationalization which would likely lead to increased incidental catch of Pacific halibut. Unless there are controls on the incidental catch of Pacific halibut, other sectors will have fishing opportunities taken away by the likely increase in Pacific halibut catch in the trawl fishery. Pacific halibut TPSC could be developed based on a proxy, or bycatch rate.

**Sideboards to ensure the LE trawl fishery does not exceed its allocation**
Inseason Area Closures
The GMT recommends that the Council and NMFS maintain routine management authority to close areas (i.e. adjust rockfish conservation area (RCA) boundaries) if the LE trawl sector reaches or exceeds its allocation of a particular species before the end of the year. Disaster tows are likely to occur in the fishery and therefore there is a risk that the entire sector allocation may be exceeded. To prevent impacts to other sectors due to the exceeded trawl allocation – and to allow the LE trawl fishery the opportunity to continue fishing – areas should be closed to stop the catch of a species in the LE trawl sector without closing the entire LE trawl fishery.

Area Closures under Gear Switching
The GMT recommends that setting more restrictive RCA boundaries be an option for trawl individual fishing quota (IFQ) holders that use non-trawl gear. If a trawler wishes to prosecute IFQ with longline gear, the risk of a disaster catch of yelloweye increases. Instead of allowing those fishers to access the LE fixed gear RCA, the GMT recommends that those vessels be subjected to RCA boundaries that are more restrictive (which may mean fishing seaward of the trawl RCA).

**Sideboards to control increased effort in non-trawl fisheries**
The GMT does not recommend any effort controls as a sideboard measure. There are generally three additional fisheries that LE trawl fishers participate in: the Dungeness crab fishery, the pink shrimp and prawn trawl fisheries, and the sablefish tier fishery. The GMT does not believe that non-trawl participants in these other fisheries will be impacted to any noticeable degree if LE trawl fishers have the opportunity to participate in these other fisheries to a greater extent than they do under status quo. Furthermore, given that these fisheries are state-managed, issues such as latent permits are best addressed outside of the Council process.

## 2. Area Management

In December, the GAC requested that managers bring back to the GAC information on spatial catch and landings distribution as it exists now, so as to support decision-making on area management in the TIQ program. In discussing the information that should be provided, the GMT identified the following:

1. Retained catch data by area from trawl logbooks
2. Spatial distribution of West Coast Groundfish Observer Program data
3. Spatial distribution of NMFS trawl survey data
4. Landings data by port from PacFIN

The GMT has requested from the Northwest Fisheries Science Center (NWFSC) the catch data, West Coast Groundfish Observer Program (WCGOP) data, and NMFS trawl survey. The NWFSC has stated that this information may be available after the April Council meeting. Landings data by port (1994-2005) is already available from information assembled for the Groundfish Allocation Committee. Assembling available information to determine how fish stocks are distributed, where they are caught, and where they are landed is a logical first step in evaluating potential biological and socio-economic area management needs. The GMT plans to review this information, once available, and then identify possible next steps to present at the May GAC meeting.

Currently identified biological differences such as genetic separation, or even average size would also be informative to spatial management considerations. Existing stock assessments contain some information in this regard, however, the GMT also plans to emphasize during this stock assessment process the importance of including area management analysis/discussion in the stock assessments. Area management will be one of the elements on the GMT checklist of items to address at Stock Assessment Review (STAR) Panels. Even if a life history difference is not discernable by area, a stock assessment author could, for example, note differences in exploitation rates or other factors and so add to the information available for better spatial management.

## 3. Overfished Species Allocation based on Proxy Species

In December, the GAC requested that an option be developed that allocates overfished species using proxy species.

The GMT proposes that both of the following options be analyzed:

**Option 1:** Apply the weighted average bycatch rate from 2003-2006 to target species catch from **2003-2006**. Estimates would be normalized to a percentage and converted to a quota share.

**Option 2:** Apply the weighted average bycatch rate from 2003-2006 to target species catch from **1994-2003**. Estimates would be normalized to a percentage and converted to a quota share.

The difference between the two proposed options is the time series of target species catch information that is applied in the calculation. By using 2003-2006, Option 1 is designed for quota share allocation to best approximate, to the degree possible, the structure of the status quo fishery. Doing so should allow for a more smooth adjustment of catch portfolios during the first years of the program. However, using these more recent years conflicts with the 2003 control date. Option 2 applies the same time series (1994-2003) that is planned to be used for allocation of all other species. Given that WCGOP data is not available for the years prior to 2001, there is a mismatch between the bycatch rates (from 2003-2006) and this longer time series of target species data.

As stocks are declared rebuilt, it is expected that their allocation will have to be revisited. This would need to occur first at the intersector level and then at the permit level. For example, the catch distribution of widow rockfish currently does not reflect what would be possible once the stock is rebuilt, however this would likely require changes to its intersector allocation.

## 4. Overfished Species Management

In order for the TIQ program to operate under the constraints of overfished species, the GMT believes that flexibility needs to be provided within the system to address the potential for events such as disaster tows and sector overages. Therefore, the GMT supports the following policy options as mechanisms to aid in the management of overfished species under a TIQ program:

1. <u>IFQ Carryover Allowances</u>

The current TIQ alternatives include a carryover provision. While a carryover allows for flexibility to deal with overages at the individual level, this could add up to a species' optimum yield (OY) or ABC being exceeded. Likewise, underages carried over to the following year could lead to exceeding the OY or ABC in that subsequent year. Therefore, a carryover allowance would need to be tied to another mechanism, such as allocation buffers or multi-year OYs, discussed below.

2. <u>Allocation Buffers</u>

There is recognition that if the trawl sector exceeds its allocation of an overfished species, this could cause the closure of other sectors in order to avoid exceeding the OY. To avoid this situation the GMT again suggests that a creating a buffer be considered, either for the groundfish fishery as a whole through the intersector allocation process or for the trawl sectors through the TIQ allocation process.

A buffer within the trawl allocation would provide flexibility for allowing carryovers between years without exceeding an OY or ABC, as long as the buffer was sufficiently large to cover the carryovers.

3. <u>Co-ops</u>

A pooling mechanism is another way to protect against overages from disaster tows. Within an IFQ program, pooling could occur through a number of ways, including: for overfished species, a mandatory system of co-ops and open access (while IFQ would still be used for all other species); or a voluntary establishment of co-ops.

4. <u>Inseason Area Closures</u>

As discussed under the *Sideboards* section of this report, inseason adjustment of the RCA could allow for the LE trawl fishery to continue fishing after it has reached or exceeded its allocation of a particular overfished species before the end of the year. The area closures could also prevent the trawl fishery's catches from shutting down non-trawl fisheries.

In addition, the GMT considered a Council staff suggestion that "multi-year OYs" may be another approach for dealing with overfished species management. It may be possible to construct OYs so that they must be achieved over the sum of a number of years, rather than achieved on a yearly basis. The flexibility gained would support use of the carryover allowances. Multi-year OYs seem to make sense for stocks such as overfished species, given the large gap between the OY and the ABC that would protect against the yearly ABC being exceeded. It still needs to be determined whether or not this option is legally viable. However, NMFS is rewriting its National Standard 1 Guidelines, which may provide a good opportunity for the Council to voice its support for making allowances in the guidelines for multi-year OYs. Another consideration will be the effect of multi-year OYs on rebuilding trajectories.

While the policy options outlined above attempt to provide additional flexibility, the GMT is still concerned about unavoidable circumstances within the severe constraints of this fishery. With the carryover provision, it could take an individual multiple years to cover a single disaster tow; in the meantime, the vessel cannot leave the dock. The Council may want to consider ways to address this kind of situation, such as limiting the amount of the overage that must be covered as a percent of the total shareowner's holdings. The GMT notes that information from WCGOP on the frequency and magnitude of disaster tows would assist in developing criteria for determining when different penalties would be applied.

## 5. Use-Or-Lose Provision

A use or lose provision is intended to prevent two different situations: 1) when an individual hordes quota shares of a particular species so that they are not fished or to influence market situations and 2) when multiple members in an organization purchase quota shares, retire those shares, and effectively reduce or eliminate portions of the West Coast trawl fishery. The first concern could be addressed through a quota share accumulation limit. There appear to be no tools available in the current suite of trawl IQ alternatives that would prevent the second scenario.

The GMT has identified two ways to implement a use-or-lose provision. The first requires that quota pounds and shares be registered to a permit, and the second requires that they are registered to a vessel. Either would require that changes be made to the current set-up of the TIQ program in order to allow for the tracking necessary for a use-or-lose provision.

**Option 1:** A use-or-lose provision could be constructed by requiring that quota pounds (QP) and quota shares (QS) be registered to a **LE trawl permit** and that only IFQ share owners be allowed to hold QP. Individuals that own a permit could still freely purchase and trade divisible QS and QP. At the end of each season, a review of registered QP would be matched against IFQ catch for each permit. Permits that have not caught X percent of a species' QP (including that purchased from another IFQ owner) over X years will be notified that X% of their QS will be revoked and re-distributed across other IFQ share holders. For example, the Council and NMFS could specify that a permit must fish at least 51% of their QP of a given species in one out of three years. If that does not occur, the Council/NMFS would revoke some portion of what they had not caught in the largest year. Persons that are notified that their QS may be revoked will be given one year to transfer (sell) that amount of quota share. To summarize:

**Option 1a: For each species, lose X% of QS if less than X% of a permit's QP are not fished over an X-year average**

This discussion assumes that the use-or-lose provision is applied on a per species basis. It would also be possible, however, to apply it in aggregate. An aggregate calculation would address situations in which, for example, there is not enough overfished species quota available to access certain target species. The latter case is particularly acute for species such as yellowtail or chilipepper rockfish, which do not currently have directed fisheries. To summarize this option:

**Option 1b: For the aggregate of all QP in a permit's account, lose X% of QS if less than X% of a permit's QP are not fished over a X-year average**

In order for the mechanism to be constructed, the following must be true:

- QS must be registered to a permit
- QP can only be registered to permits that have QS
- Catch must be registered to a permit

The following table shows a hypothetical example of matching IFQ accounts against catch performance for the purposes of implementing a use-or-lose provision. The specific elements of this example are that permits must catch at least 51% of their QP for at least one year out of every 3 years, and if they do not, they lose 60% of what they did not catch in the largest year.

**Hypothetical Account Used to Track Fishing Performance for Purposes of a Use-or-Lose Provision (permit XX4LE has quota shares revoked, permit XX5LE does not have quota shares revoked)**

| Year | Permit No. | Species | Registered Pounds at Dec 31 | Cumulative Harvested Pounds as of Dec 31 | Percent of QP caught | Lose Notification? (Y or N) | % of Share Revoked |
|---|---|---|---|---|---|---|---|
| 2010 | XX4LE | Dover | 300,000 | 150,000 | 50% | N | 0% |
| 2011 | XX4LE | Dover | 300,000 | 120,000 | 40% | N | 0% |
| 2012 | XX4LE | Dover | 300,000 | 100,000 | 33% | Y | 30% |
| 2010 | XX5LE | Sable | 280,000 | 200,000 | 71% | N | 0% |
| 2011 | XX5LE | Sable | 280,000 | 220,000 | 79% | N | 0% |
| 2012 | XX5LE | Sable | 280,000 | 250,000 | 89% | N | 0% |

Permit XX4LE loses shares

Permit XX5LE does not lose shares

**Option 2:** A use or lose provision could be constructed by requiring that IFQ be registered to a qualified **vessel**. A qualified vessel list would be created based on prior active engagement; new vessels could enter the fishery and be placed on the qualified vessel list. Individuals could still freely purchase and trade quota, but before purchasing quota, a vessel must agree to have that quota registered to a qualified vessel and the quota transfer must have that vessel specified as part of the transfer. Quota owners, quota purchasers, and vessel owner would sign the transfer agreement. This would not guarantee any harvest rights to the vessel. The quota owner would have the rights to transfer that quota, not the vessel owner. However if the vessel does not fish a given percentage of its registered quota pounds, then that vessel loses its endorsement as a qualified IFQ vessel.

Lastly, while Options 1b and 2b address situations in which a species cannot be accessed, the GMT also suggests consideration of another route. A exemption could be included in the use-or-lose provision so that if X% of the trawl allocation of a species is not caught by the fleet as a whole, then the use-or-lose provision is not applied to that species in that year.

## 6. Discard Survival Credit

In the current bottom trawl management system, a certain percentage mortality for discarded lingcod, sablefish, and Pacific halibut is assumed. This percentage is applied to discard estimates from observer data, expanded, and added to catch data to produce an estimate of total mortality. Along these lines, the GMT considered the benefits of introducing a discard survival credit to the TIQ program.

As a non-retention species, halibut survival could be credited by increasing the overall quantity of the quota that is allocated. For example, if 50% survivability is continued to be assumed, then this would allow for double the halibut quota pounds to be allocated.

For retained species, discards could be recorded by an observer. When the catch is matched against quota pounds, the account would be deducted by landings of the species and discards of the species, minus the discard amount that is assumed to have survived. Use of a discard survival credit mechanism must be constructed so that it does not encourage discarding. The mechanism also adds complexity and cost to the monitoring program and suggests that only an observer, rather than a monitor, could be used.

The GMT recommends forwarding for analysis the use of discard survival credits for sablefish, lingcod, and halibut.

**Table 1. Summary of GMT proposals on sideboards.**

| | | |
|---|---|---|
| **Sideboards** | **Sideboards to protect fisheries that target Pacific halibut** | Pacific Halibut Bycatch: GMT recommends that transferable prohibited species caps (TPSC) be developed for Pacific halibut bycatch in the LE trawl fishery. Fishing opportunities are likely to increase under rationalization which would likely lead to increased incidental catch of Pacific halibut. Unless there are controls on the incidental catch of Pacific halibut, other sectors will have fishing opportunities taken away by the likely increase in Pacific halibut catch in the trawl fishery. Pacific halibut TPSC could be developed based on a proxy, or bycatch rate. |
| | **Sideboards to ensure the LE trawl fishery does not exceed its allocation** | Maintaining Sector Allocations with Disaster Tows: The GMT recommends that the Council and NMFS maintain routine management authority to close areas if the LE trawl sector reaches or exceeds its allocation of a particular species before the end of the year. Disaster tows are likely to occur in the fishery and therefore there is a risk that the entire sector allocation may be exceeded. To prevent impacts to other sectors from this exceedence -- and to allow the LE trawl fishery the opportunity to continue fishing -- areas should be closed to stop the catch of a species in the LE trawl sector without closing the entire LE trawl fishery. |
| | | Maintaining Sector Allocations with Gear Switching: The GMT recommends that setting more restrictive RCA boundaries be an option for trawl IFQ holders that use non-trawl gear. If a trawler wishes to prosecute IFQ with longline gear, the risk of a disaster catch of yelloweye increases. Instead of allowing those fishers to access the LE fixed gear RCA, the GMT recommends that those vessels be subjected to RCA boundaries that are more restrictive (which may mean fishing seaward of the trawl RCA). |
| | **Sideboards to control increased effort in non-trawl fisheries** | Increased Effort in Non-Trawl Fisheries: The GMT does not recommend any effort controls as a sideboard measure. There are generally 3 additional fisheries that LE trawl fishers participate in-- the Dungeness crab fishery, the pink shrimp and prawn trawl fisheries, and the sablefish tier fishery. The GMT does not believe that non-trawl participants in these other fisheries will be impacted to any noticeable degree if LE trawl fishers have the opportunity to participate in these other fisheries to a greater extent than they do under status quo. |
| Summary: Develop Pacific halibut prohibited species caps for the trawl fishery to protect sectors that target Pacific halibut; maintain routine management authority to close areas where species are found if the trawl sector reaches or exceeds its allocation of that species; retain the ability to require those vessels that participate in gear switching to fish subject to restrictive RCA boundaries; do not implement measures that restrict effort spill-over in non-trawl fisheries | | |

**Table 2. Summary of GMT proposals for addressing initial allocation of overfished species and management of overfished species.**

| | | |
|---|---|---|
| **Overfished Species** | **Initial Allocation** | Allocate Overfished Species to LE Permits Based on a Bycatch Rate: GMT recommends that overfished species be allocated to permits based on a bycatch rate. That bycatch rate would apply to the permits catch history of target species. In the non-whiting fishery that bycatch rate would be stratified by area and depth. Two proposals were identified for allocating overfished rockfish:<br>Proposal 1: Allocate overfished rockfish by applying the weighted average bycatch rate from 2003- 2006 to target species catch from the same period. Estimates would be normalized to a percentage and converted to a quota share<br>Proposal 2: Allocate overfished rockfish by applying the weighted average bycatch rate from 2003 - 2006 to target species catch from one of the currently specified allocation periods (a time period between 1994 and 2003). Estimates would be normalized to a percentage and converted to a quota share |
| | **Management** | Maintain Authority to close Areas: The GMT recommends that the Council and NMFS maintain routine management authority to close areas if the LE trawl sector reaches or exceeds its allocation of a particular species before the end of the year. Disaster tows are likely to occur in the fishery and therefore there is a risk that the entire sector allocation may be exceeded. To prevent impacts to other sectors from this exceedence -- and to allow the LE trawl fishery the opportunity to continue fishing -- areas should be closed to stop the catch of a species in the LE trawl sector without closing the entire LE trawl fishery. |
| | | Allow for Carryovers: There is a high probability that vessels may accidentally exceed their quota of overfished species. Allowing for some limited exceedance of overfished species quota - subject to a penalty - would allow for prosecution of the fishery while acknowledging the constraints of overfished species |
| | | Establish Overall Buffers: There is a probability that sectors may accidentally exceed their allocation of overfished species. Establishing an overall buffer would provide a mechanism to limit negative impacts to various fishery sectors if one sector exceeds their allocation. |
| | | Allow for the formation of catch pools or coops: The GMT recommends that fishers be allowed to form catch pools or cooperatives to help balance overfished species catch amounts. Catch pools/cooperatives have the ability to act as an insurance mechanism against unexpected catch rates. |
| | | Council staff proposal: Multi-year OYs. |

**Attachment 1: Excerpts from GMT Report to the Groundfish Allocation Committee on TIQ Program Development**

The GMT prepared a report for the Groundfish Allocation Committee's December 12-14, 2006 meeting on the TIQ program. The GAC considered the GMT report in making their recommendations, which have now been forwarded to the Council. Since that time, the GMT has clarified its recommendations on overfished species allocation and management. This attachment, therefore, is the GMT's report to the GAC, without the discussion on overfished species allocation and management.

## Thematic Issues to Refine the Alternatives

*1.* **Community Stability Holdback Provision** (B.4) *(see page 3 of this report)*
The GMT suggests that the overall objective of providing community stability should be further defined. Accomplishing community stability could be accomplished in other ways in addition to the proposed provision, such as through: (1) an area management approach; or (2) a buyback-type program using taxes/transfer fees on quota shares. Finally, the GMT recommends consideration of using a holdback provision for reasons other than providing community stability, such as to achieve conservation or other socio-economic objectives.

*2.* **Cooperatives** (Alternative 6) *(see pages 4-5 of this report)*
Cooperative-based management can result in many of the same conservation and economic benefits as IFQ programs if the right incentives are built in. Assuming that such construction of the program is achieved, cooperatives have the potential to be successful in any of the existing groundfish trawl sectors, including the bottom trawl sector. Alternative 6 currently includes only whiting sectors.

The GMT notes several advantages of a cooperative program over an IFQ program, including a reduced level of agency infrastructure and personnel needed for management, and the reduced risk of overfished species overages thanks to pooling of quota across several permits.

## Thematic Issues to Narrow the Alternatives

*3.* **Gear Switching** (Element 3.0) *(see pages6-7 of this report)*
The GMT notes the differing regulations between trawl and non-trawl gear types and across IFQ and non-IFQ fisheries, and so suggests that certain restrictions would be necessary in order to allow for gear switching under the TIQ program. As it is expected that gear specific RCA boundaries would still be in place, it would be necessary for a vessel to declare the gear type when leaving on an IFQ fishing trip, unless it is determined that compliance observers can effectively monitor compliance with RCAs for a trip using both trawl and nontrawl gear. For vessels that hold both a sablefish endorsed fixed gear permit and an LE trawl permit, that IFQ holder could only fish in the IFQ or sablefish tier fishery on a single trip.

Further discussion is needed about the potential for increased interactions with overfished species, and yelloweye rockfish in particular, under gear switching. The GMT notes two potential ways to address this: (1) institute a more conservative non-trawl RCA; or (2) allow gear switching in the north only if the yelloweye rockfish OY is at or above a specified amount.

*4.* **Number of Trawl Sectors** *(see page 8 of this report)*
Considering the potentially adverse economic outcome for the overall West Coast groundfish trawl industry, the GMT is not in favor of establishing an IFQ system with only one sector (Alternative 2 in 2.1). The GMT believes that managing all trawl sectors as a single sector under an IFQ program could result in a shift in the concentration of quota shares toward the catcher-processor sector, and that such an outcome may not be the best scenario.

## Issues for Further Development

The GMT considers the following two topics to be of high priority and plans to further develop recommendations on them in the spring. However, as noted below, the GMT recommends that the Council take action earlier in order to initiate dialogue needed for such development.

*5.* **Area Management** *(see page 8 of this report)*

The GMT supports the process option (5.1.3) that tasks a group to consider the need for additional regional management areas and potential boundaries and to propose a process for identifying and responding to future regional management area issues, and encourages the Council to take next steps toward creating this group. The GMT intends to collaborate with the group to provide the Council with further analysis and recommendations.

*6.* **Monitoring Issues** *(see page 9 of this report)*

The GMT is considering its perspective on whether full retention can be used in the non-whiting trawl fishery to achieve total catch accounting, with particular attention to the feasibility and impacts of full retention and the ability of cameras to document retention of catch. The GMT is also discussing what level and type of monitoring is required to document total catch in a fishery that allows discards.

Analysis and recommendations on these issues require input and expertise from a wider group than just GMT members. The GMT recommends that the Council initiate discussions with industry on feasibility and impacts of full retention as well as evaluate the findings on using cameras to document full retention in the whiting fishery. The GMT also recommends that the Council initiate a work group consisting of staff from the Council, NMFS Northwest Region, NWFSC, coastal states, and industry regarding monitoring infrastructure necessary to support the TIQ program.

## Specific Recommendations

While most of the comments provided here are not at this point recommendations for actions to take, the GMT does make the following three specific recommendations:

1. Consider eliminating the consideration of one trawl sector – and maintain distinctions between multiple trawl sectors – for the purposes of setting up and implementing an IFQ program.
2. Initiate a work group on area management, as outlined in the process option in component 5 of the Management Regime Alternatives.
3. Initiate a work group consisting of management and enforcement staff from the Council, NMFS Northwest Region, NWFSC, coastal states, and industry regarding: (1) the use of observers, cameras and other necessary infrastructure to monitor the TIQ fishery; and (2) the feasibility of assessing penalties and/or fines for non-compliance.

## GMT THOUGHTS REGARDING THE COMMUNITY STABILITY HOLDBACK PROVISION UNDER THE TIQ PROGRAM

IFQ Program Alternative C (B.2.2.5) provides for a set aside of up to 20% of the non-whiting shoreside trawl sector allocation each year; this set aside would allocate to quota share/pound holders who have submitted proposals, ranked on the basis of objective criteria that evaluate benefits to local communities. The GMT noted in their September 2006 report that protecting communities from the unintended consequences of an IFQ program should continue to be explored.

To that end, the overall objective—that is, to provide community stability—needs to be further defined, so the results can be evaluated. What exactly do we want to accomplish? What is the time period that will be used to establish a "baseline?" How will this program be monitored to ensure that the objective is being accomplished? How can the source of community stability be determined (i.e., is it the direct result of providing this fishing opportunity, or are there other factors)?

Second, once the objective is clearly defined, there should be different options identified and analyzed to accomplish the objective. A community stability holdback provision could be one option. Other options could include: (a) an area management approach—creating geographic IFQ regions and limiting quota transfers to within those regions (note: something similar to this approach will likely be needed to address species that do not have coastwide OYs anyway); or (b) a buyback-type program—including a tax (or transfer fee?) on quota shares to provide direct economic relief to those communities and/or displaced crewmembers or processors that were adversely affected by the implementation of the trawl IFQ program.

The GMT also stated that holdback provisions for reasons other than providing community stability (e.g., to achieve socioeconomic or conservation objectives) should also be considered. To achieve this, a general holdback provision could be implemented with the purpose of being used to provide community stability, socioeconomic, or conservation objectives, as needs arise.

GMT RECOMMENDATIONS

1) Decide whether to keep the current alternative as specified—that is, focused on providing a set aside for community stability purposes (the details of the program would be developed later), or whether to broaden the alternative to allow for set asides (or reserves) for other uses.

2) If the Council wants to keep providing community stability as an objective, then decide whether to broaden the alternatives to explore other ways to achieve community stability.

3) Decide whether these community stability alternatives should be considered:
   a. An area management approach—i.e., creating geographic IFQ regions and limiting transfers to within those regions
   b. Include a tax or transfer fee on quota shares to provide direct economic relief to communities and/or displaced crewmembers or processors adversely affected by the TIQ program

## GMT THOUGHTS REGARDING ALLOWING COOPERATIVE-STYLE MANAGEMENT UNDER A TRAWL INDIVIDUAL QUOTA SYSTEM

The concept of allowing fishing cooperatives has been used in several fisheries including the Alaska pollock fishery and the catcher-processor sector of the Pacific whiting fishery. Cooperative-based management can result in many of the same conservation and economic benefits as Individual Fishing Quota programs if the right incentives are built into that program.

Cooperatives that are designed to track total catch, have limits on the take of target and non-target species, and allocate portions of those species to that cooperative will give the members an incentive to fish in a way that reduces bycatch in a manner similar to IFQs. They may also reduce discard, increase the economic value of the fishery, increase the utilization of resources harvested in the fishery, and increase safety in the fishery. Assuming that a cooperative-type program is constructed in a manner that creates the right incentives, it has the potential to be successful in any of the existing groundfish trawl sectors.

In the catcher-processor portion of the whiting fishery, cooperative fisheries management has proven to be a successful management tool. Bycatch of overfished species has decreased, the season length has increased, and the amount of effort (and hence cost) in the fishery has decreased. These same benefits could apply to other portions of the whiting fishery, but the adequacy of existing and future catch monitoring systems should be fully explored to determine their feasibility for such a program.

Cooperative-type fisheries management also has the potential to work in the traditional bottom trawl sector of the groundfish trawl industry. While this sector has more participants, more target species, more fishing area, and more ports, those same issues would be in play under an IFQ program. The difficulty in implementing a cooperative-type program is that a cooperative only works as well as members of that cooperative agree to work together and communicate. Several issues can influence the effectiveness of a cooperative including: the number of participants in that cooperative, the number of species managed under that cooperative, the relevance of information shared between cooperative members, and the geographic extent of that cooperative amongst other things. The number of participants in a cooperative can decrease the effectiveness of that cooperative if members can't agree, if information sharing is slow to reach all members of the cooperative, or if the number of participants makes the management of that system too top-heavy for effective decision making. The number of species managed under that cooperative can influence the effectiveness of the cooperative because as the number of species is increased, more care must be taken to balance the cooperatives catch to stay within allocated catch limits. The geographic extent of a cooperative can influence the effectiveness of that cooperative because communication and information sharing may be difficult over a wide area, information may be irrelevant from one area to another, and the sense of community necessary for a fishing cooperative to succeed may not be adequate if members don't reside in close enough proximity to one another.

These types of concerns suggest that fishing cooperatives must be voluntary formations, and that these voluntary formations could be developed on a regional and sector basis. Since success is based upon members getting along, cooperatives need to be formed among willing participants. Cooperatives would need to have a fishery that is prosecuted in a common enough fashion that fishery-type information is relevant to all members of the cooperative (bycatch occurring off a California port may not be relevant to fishers engaged off of a coastal Washington port for example), and cooperatives would need to be small enough that they can be successfully managed.

From an agency implementation standpoint, fishing cooperatives have some benefits over an IFQ program. Where an IFQ program may require the development of infrastructure that tracks catch on a per vessel basis, tracks catch on a per species basis, tracks changes in quota ownership during the season, and tracks changes in quota holders during the season, a fishing cooperative system is not likely to require the same level of infrastructure and personnel. Assuming a cooperative system is developed where allocations of target and bycatch species are made on an annual or biennial basis, trading of those allocations is not permitted across cooperatives, and a real-time reporting system that tracks retained and discarded species is in place, implementation from an agency standpoint could be far simpler than an IFQ program.

Cooperative-type management systems are likely to have benefits to sectors outside the whiting sector. If sector based allocations of overfished species are similar to the projected amounts currently in the GMT's bycatch scorecard, those amounts will mean that, under an IFQ program, each bottom trawl permit would receive a very small amount of quota for some species (the average permit would receive 100 lbs of canary for example). A fishing cooperative would have the benefit of pooling that amount of quota across several different permits. This effectively spreads the risk of exceeding a catch amount over a wider number of vessels, thereby reducing the risk to each individual vessel and increasing the probability of accessing more target species. So while an individual may have difficulty staying within 100 lbs of quota for a year, the cooperative may be able to manage itself on a whole to stay within a collective pool more effectively.

GMT RECOMMENDATIONS

1. Analyze fishing cooperatives in the catcher processor, mothership, shorebased whiting, and non-whiting sectors of the limited entry trawl fishery.

## GMT THOUGHTS REGARDING ALLOWING GEAR SWITCHING UNDER A TRAWL INDIVIDUAL QUOTA SYSTEM

IFQ supporters have argued that one of the benefits of an IFQ program is that it allows fishermen to adapt to changing conditions. Changing conditions can encompass many different things such as changes in regulatory constraints or changes in the market. Allowing holders of trawl IFQ to use any legal groundfish gear would contribute toward giving fishermen the tools necessary to adapt. The use of gears other than trawl gear could be used to better manage bycatch of non-target species and balance IFQ accounts since different gears have varying degrees of selectivity and productivity when it comes to catching various groundfish species.

There might be two processes needed to address gear switching: (a) inseason by trawlers who decide to switch gears in the middle of a two-year cycle; and (b) through the two-year biennial management cycle for those who want to switch gears on a more permanent basis. If gear switching were allowed under an IFQ program, it is likely that RCAs would still exist, and it is likely that these RCAs would still be gear specific. Assuming this is the case, allowing gear switching to occur under an IFQ program would require that IFQ fishers declare the gear type (using the current declaration system) they are using prior to prosecuting their IFQ in order to verify they are staying within the appropriate fishing area. This is similar to status quo regulations where vessels must declare the fishery they are engaging in prior to leaving port. There could be a different suite of regulations that pertain to those trawlers who switch gears (e.g., there may be some areas that we only want to allow switching to pot gear, and not longline). However, if information from compliance observers is able to verify the location and depth at which a gear is being used, it may be possible to allow for the use of trawl and non-trawl gear on the same trip while still assuring compliance with the gear-specific RCAs.

Allowing for gear switching to occur would also require that vessels with both a sablefish endorsed fixed gear permit and an LE trawl permit only engage in one of these two fisheries per trip, and that the vessel declare which fishery they were engaging in prior to leaving port. That is, the IFQ holder could only fish either in the IFQ fishery or the sablefish tier fishery, but not both, regardless of the gear used when fishing with the IFQ. This would be necessary since each permit would be subject to different regulations (the sablefish tier fishery allows discarding to occur whereas an IFQ program would count total catch) and enforcing those regulations may require different levels of at sea monitoring for example.

Unless prohibited in order to enforce RCA compliance, gear switching could be considered during a trip if the vessel is only engaged in the IFQ fishery (and the not sablefish tier fishery, as an example). Under this situation, a vessel could use a combination of trawl gear and fixed gear to catch its IFQ. This trip would be observed and all catches would count against the vessel’s IFQ.

For process (b) mentioned above, there might be some trawlers who completely switch over their gear (and sell their trawl gear, as an example). If that's done, the GMT should probably consider those people as part of the non-trawl sector when developing biennial management measures, or considering implications with regard to sector-specific allocations

Further discussion is also needed about the potential for increased interactions with overfished species, particularly yelloweye rockfish. Conceivably, if a large number of trawlers wanted to switch to longline gear, there is likely not enough yelloweye to accommodate their bycatch with the current non-trawl RCA boundaries in place. One thought to address this is to have more conservative non-trawl RCA boundaries in place (e.g., 125 fms in the north). However, if that is done, then it would: (a) penalize the non-trawl fleet for these trawlers switching gears; and (b) provide a disincentive to trawlers to switch gears. These are two things that we should try to avoid if possible, so it may be the case that the OY for yelloweye is so low that restrictions on the degree of gear switching may need to be put in place, particularly in the north. With regard to the south, there may be data on bocaccio and cowcod catches with non-trawl gear that could help determine whether the bycatch of bocaccio and cowcod in trawl vs. non-trawl is comparable. If so, then gear switching may be a viable option for the south. Another thought is to only allow gear switching in the north if the yelloweye rockfish OY is at or above a specified amount.

Switching from trawl to fixed gear is generally considered to be a habitat-friendly measure, and has been promoted by some specifically for this reason. While this might be the case if fishing before and after the gear switch takes place in the same area, transfer of fishing effort to new areas as a result of this action might not be so straightforward. For example, trawlers that are currently constrained from fishing in high-relief areas, either through regulation or through exclusion by footrope configuration, could potentially transfer their fishing effort to just such areas. While habitat impacts within former trawl areas might be reduced, impacts on sessile organisms by line gear in high relief areas might be increased.

Finally, given the complexity of the gear switching issue, one recommendation would be to explore the development of a gear switching program on a broader scale for the groundfish fishery as a whole, which could be in place with or without a TIQ program. This would help ensure that gear switching is thoroughly considered and would allow for its implementation independent of a TIQ program.

GMT RECOMMENDATIONS

1) Decide whether to explore a gear switching program within the TIQ program and on a broader scale, or whether to only consider gear switching as part of a TIQ program.

2) Decide whether the following provisions should be considered in the suite of alternatives:
    a. Require vessels to use the VMS declaration system to indicate in advance whether it was going to switch gears
    b. Only allow vessels to participate in one fishery per trip (i.e., either TIQ, if one is in place, or the sablefish tier fishery, as an example, but not both)
    c. Allow vessels to use a combination of gears during a trip if fishing under a TIQ program (and all catch would count against the vessel's TIQ), if compliance with RCAs can be assured through compliance monitors.
    d. Applying more conservative non-trawl RCA boundaries to those vessels that decide to switch gears (to avoid further constraining the current non-trawl fishery)
    e. Only allow gear switching in the northern area if the yelloweye rockfish OY is at or above a specified amount.

## GMT THOUGHTS REGARDING THE NUMBER OF TRAWL SECTORS IDENTIFIED IN THE TIQ PROGRAM

The GMT is not in favor of establishing an IFQ system with only one sector - there is merit in establishing limits on how much each sector can own/hold. The GMT believes that managing all trawl sectors as a single sector under an IFQ program could result in a shift in the concentration of quota shares toward the catcher-processor sector, and that such an outcome may not be the best scenario. The GMT believes that this scenario is likely because the catcher processor sector obtains revenues from the catching and processing of fish, whereas shorebased catcher vessels only obtain revenue from the harvesting of fish. If shorebased catcher vessels and at sea catcher processors were forced to compete in the same market place to purchase fishing quota, a catcher processor would view that quota as more valuable and would, therefore, be likely to acquire increasing holdings of fishing quota. In such a scenario, the impact to shorebased processors and fishing communities may not be considered in the value of that quota, yet those entities would be impacted nonetheless. In other words, an owner of a shorebased catcher vessel that is interested in purchasing or selling fishing quota may not take into account the value that shorebased processors and fishing communities place on IFQ, and therefore, that vessel owner would tend to under-value IFQ. The result may be increasingly large concentrations of fishing quota in the catcher processor sector, and this result may not be the best economic outcome from the perspective of other members of society engaged in the fishing industry.

GMT RECOMMENDATION

1. Consider eliminating the consideration of one trawl sector – and maintain distinctions between multiple trawl sectors – for the purposes of setting up and implementing an IFQ program.

## INITIAL GMT THOUGHTS REGARDING AREA MANAGEMENT IN THE TIQ PROGRAM

Given that the current broad-scale management approach falls short of fully addressing the spatial structure of some fish populations, a system that makes fishing effort even more fluid has the potential to exacerbate this situation. Concentration of quota shares in a region might make sense economically, but might have unforeseen biological and social consequences.

A process is outlined in the alternatives for how quota would be re-allocated if a stock is divided geographically into separate acceptable biological catches/OYs, after the IFQ program has been implemented. More detail is needed on how quota may be re-allocated following geographic subdivision of a stock's ABC/OY. Therefore the GMT supports the process option (5.1.3) that tasks a group to consider the need for additional regional management areas and other related management issues. The GMT intends to collaborate with that group to provide the Council with further analysis and recommendations.

GMT RECOMMENDATION

1. Initiate a work group on area management, as outlined in the process option in component 5 of the Management Regime Alternatives.

## INITIAL GMT THOUGHTS REGARDING MONITORING ISSUES IN THE TIQ PROGRAM

The GMT is considering its perspective on monitoring issues with respect to two scenarios: a TIQ program that requires full retention and a TIQ program that allows discards.

In evaluating whether or not full retention can be used in the non-whiting trawl fishery to achieve total catch accounting, the GMT notes in particular the following issues that should be considered:

- The ability of cameras to accurately document whether all catch is retained;
- The manner in which retained catch is validated shoreside;
- Mortality costs of retaining discarded fish with high trawl survival (e.g., lingcod, sablefish, halibut); and
- Impacts on traditional fishing and market practices resulting from landing catch that is currently discarded.

With respect to monitoring of catch in an IFQ fishery that allows discards, the GMT underscores the need to assess what level and type of monitoring is required to document total catch. The following issues are especially relevant to this assessment:

- Analysis of cost and logistics of observers;
- Whether or not cameras can accurately identify fish species; and
- Whether or note some species could be required to be retained (but not necessarily sold).

Analysis and recommendations on these issues require input and expertise from a wider group than just GMT members. The GMT recommends that the Council initiate discussions with industry on feasibility and impacts of full retention as well as evaluate the findings on using cameras to document full retention in the whiting fishery. The GMT also recommends that the Council initiate a work group consisting of management and enforcement staff from the Council, NMFS Northwest Region, NWFSC, coastal states, and industry regarding monitoring infrastructure necessary to support the TIQ program. Finally, the GMT requests to meet with Canadian counterparts to learn about the Canadian observer program.

**Recommendations**

1. Initiate a work group consisting of management and enforcement staff from the Council, Northwest Region, NWFSC, coastal states and the industry regarding the use of observers, cameras and other necessary infrastructure to monitor the TIQ fishery, and the feasibility of assessing penalties and/or fines for non-compliance.
2. Initiate discussions with industry on feasibility and impacts of full retention. Evaluate the findings on using cameras to document full retention in the whiting fishery. Work with Northwest Fisheries Science Center (NWFSC) and West Coast Groundfish Observer Program (WCGOP) regarding the use of cameras.
3. Additionally, the GMT should meet with the Canadian observer program to learn about their observer program.

Agenda Item E.4.d
December 2006 IEP Report
March, 2007

11 December 2006

TO: PFMC Groundfish Allocation Committee

FROM: Independent experts Panel
Christopher Dewees
Bob Francis
Susan Hanna, Chair
Dan Huppert
Gil Sylvia

SUBJECT: Review of Range of TIQ Alternatives

The IEP was asked to review documents presenting the range of alternatives to be analyzed and to make recommendations regarding the reduction and simplification of options. The Groundfish Allocation Committee is interested in determining "a range of feasible, supported alternatives that can be presented in a clear, concise manner for Council consideration."

The IEP reviewed Chapters 1 and 2 of the EIS, TIQC minutes (Nov. 2006), and statements of the GAP, SSC, and GMT (Sept. 2006).

**General Comments**

The list of alternatives is too long and is difficult to follow. The framework for analysis is poorly organized, alternatives are poorly written, and tables are redundant. The multitude of alternatives and sub-options within alternatives is very difficult to comprehend, summarize or evaluate. We sympathize with the frustration expressed by the GAP in its Sept. 06 statement with the complexity of the information and the confusion of its presentation. We also agree with the SSC (Sept. 06) statement that the links between the performance measures, the management regime alternatives, and program goals are unclear.

We reiterate several general themes of our earlier recommendations to the TIQC:

- The importance of keeping alternatives as simple as feasible
- The need to explicitly consider tradeoffs between efficiency of purely market-determined outcomes vs. compromises to meet social or biological goals
- The need to expect creative business arrangements among groups of like-minded quota share owners and the importance of program flexibility to be able to accommodate them
- The importance of considering having a period of limited transferability to let people experience and learn the system

- The need to assess the enforcement tradeoff between trying to catch many cheaters though full observation with modest penalties versus catching a few and inflicting draconian penalties and seizures of assets

**Comments on Specific Document Sections**

**1. Program Goals and Objectives**

The framework is inconsistent with the goals and objectives of the TIQ Program. The goals and objectives statement provides two fundamental principles for developing and constraining alternatives and options for analysis: 1) maximize net national/regional benefits which are composed of economic, social, ecological components (and therefore potential tradeoffs among these three classes of benefits); and 2) use market tools to efficiently rationalize the fishery and adapt to change. A third issue, although not explicit in the goals and objectives but obvious in the selected alternative/options are equity tradeoffs among user groups (harvester 1 vs harvester 2; harvesters vs processors, community 1 vs community 2, etc.)

**2. Program Alternatives**

The alternatives as stated are incoherent and illogical—one approach is to move from more to fewer constraining options. Another approach is to cluster alternatives in categories such as harvester, processor, community and ecology. The list of alternatives is confusing and generates a hodgepodge of options. Many of the options may not necessarily confer significant tradeoffs in the direction predicted.

Given the inconsistency described above, we recommend reorganizing the alternatives and options, and eliminating the existing alternatives and sub-alternatives. There are two possible ways to do this. The first is to reorganize the alternatives consistent with the strategic goals and objectives:

- Status quo
- Options that may have significant potential to maximize economic benefits
- Options that may have significant potential to improve social benefits (but at a significant cost to economic or ecological benefits)
- Options that may have significant potential to improve ecological benefits (but at potential cost to the other two subgoals).

The key operational word is "significant:" if the options aren't *apriori* expected to create "significant" benefits or tradeoffs then they don't need to be included.

The second approach is to compare status quo with all other significant TIQ options in one alternative (after we eliminate all non-significant options). That is, list all the significant options under each component heading for one TIQ heading. The analysts would then be expected to conduct the analysis in a way that demonstrates the economic, social, ecological effects and tradeoffs of each option consistent with the strategic goals and objectives. The results would be organized to show option clusters that have major economic benefits versus groups of options that generate significant social or ecological/conservation benefits or potential equity tradeoffs.

**3. Number of Options**

Even if the present structure of alternatives is retained, the number of options within each alternative needs to be reduced. The following is one approach to reducing the number of options:

- For each of the Alternative Management Regimes (besides status quo) list all possible options now included in the TIQ Alternatives Report (do not organize by sub-alternatives; it's too confusing).
- For each option ask three questions:
    - Is this option consistent with the two primary TIQ Plan goals and does it have the potential to generate significant net benefits?
    - Does this option generate potentially significant tradeoffs between social, economic, and ecologically related objectives?
    - Does this option represent significant unknowns regarding impacts on objectives?

  If the answer to any of the three questions is yes, retain the option for analysis—otherwise eliminate it. Again, the key word is "significant". Other types of criteria could be used (strong, moderate, weak-- or relative ranking, etc), but they all lead in the same direction of dropping insignificant options.

A number of options or classes of options can also be dropped because they are not appropriate for analysis. These fall into four types:

- Options that are basically the same for all alternatives (e.g. all alternatives require 100% observer coverage.)
- Options that are dependent on the other options selected or exogenous factors (e.g. optimal season length for whiting has been selected by consensus of the existing rights holders to meet their collective needs including adapting to seasonal conditions, and can change over time.)
- Administrative options (many of these are relatively minor, a consistent requirement, and can be analyzed in a secondary "fine-tuning" analysis.)
- Options that depend on observing the operation of system once implemented.

The allocation options are categorically different than the other types of options since they are a one-time decision. They should be separated from other decisions that effect year-to-year operations, catches, administration, etc. and reviewed first.

**4. Overfished Species**

The issue of overfished species is a difficult one. Initial allocations are complex because those who had relatively large historical catches of now overfished species will be given a real windfall and a lot of leverage. Some type of proportional allocation might work better.

Individual responsibility appears to be a key element of the TIQ approach and could naturally include individual incentives and consequences that lead to avoidance of species of concern. Having to obtain quota, pay deemed values (increasingly higher as you exceed quota), or stop fishing seem like ample incentives to avoid certain species. It is important not to underestimate the ability of fishermen to improve targeting skills when given draconian negative incentives.

The abundance of species of concern needs to be monitored on a timely basis and TACs adjusted accordingly. Some of these species may become significantly more or less abundant, but the quota share holdings may not match the proportional mix in trawl catches in a timely fashion.

Once the trawl fleet has IFQs, they are likely to become quite sensitive to, and vocal about the behavior of the other groundfish sectors (non-trawl, recreational) concerning overfished species.

**5. Community Stability**

Area quotas may be a more cost effective way to address the issue of community stability and are worthy of analysis. Many other dedicated access programs around the world use area quotas (TACs) to recognize regional differences in stock structure and species mix, to reduce serial depletion, and to spread out effort. Area quotas would create some enforcement concern to prevent moving of fish between areas by vessel or truck.

**6. Gear Switching**

Allowing gear switching may reduce the catch of overfished species and is liable to lead to potential gains in economic benefits for some species. With incentives provided by IFQs, quota owners are likely to come up with creative value-added schemes to maximize returns. Some of these changes may not even be imagined yet, and point to the need to allow program flexibility to different types of arrangements.

With or without gear switching, other sectors may want to move towards IFQs. This movement might be accelerated by gear switching in the trawl sector.

**7. Distributional Impacts**

The California trawl fleet is more diverse than the more northern fleet, with numerous vessels landing low volumes, but with relatively high values resulting from specialty markets and value-added processing. Will the allocation and monitoring rules put these vessels at a competitive disadvantage or relative advantage? This should be explicitly analyzed. The SSC pointed out the need to consider the change in landing prices (increases) that one might expect under IFQs (as experienced elsewhere).

**8. Cooperatives**

Cooperative behavior in quota share management may happen naturally as a business strategy with little need for government intervention. Harvesters can voluntarily form cooperatives and are likely to do so under IFQs without PFMC guidance on when and how.

Cooperatives are difficult to organize unless the group is of a manageable size, geographically close together and homogeneous in motivation and operating strategy. However, quota shareholder organizations are quite common in other ITQ programs, existing for the purpose of sharing costs of research, data collection, marketing, and government relations. There is no reason to not expect attempts to establish similar organizations under the TIQ.

Accordingly, the co-op options (Alternatives 6a, 6b and bc as described on pp 45-46) seem pointless. Under these alternatives the catcher vessels are required to form a co-op and then the co-ops are required to "distribute catch allocations to members based on their catch history calculation distributed to the co-op by NMFS."

What would be the point in creating the extra layer of management represented by the co-op, since this rule, combined with the NMFS calculation of catch history, in effect mimics and vessel level IFQ based upon catch history? Is the intent that such a co-op wouldn't permit any shifting of catch shares among vessels? That prohibition would be equivalent in effect to non-tradable IFQs. It would also tie the harvests of each co-op vessel to a particular processor.

A co-op by definition is a voluntary association of like-minded people (or a least people who expect benefits from collective, coordinated action). A required organization whose sole objective is to implement some IFQ allocations tied to a processor doesn't fit this definition of a "co-operative". On what actions are they co-operating?

One could make a strong case that both the vessel stacking and vessel co-op alternatives are inconsistent with the strategic goals and objectives. There is no evidence to suggest that either approach offers significant net regional or national benefits relative to the TIQ approach (in fact they are likely to decrease benefits). For the stacking regime, the lumpiness of the rights limits flexibility, efficiency, and adjustment. For the co-ops, the allocations and TIQs address these benefits. We reiterate that co-ops would be expected to form voluntarily if there was a common interest in doing so.

**9. Cost Recovery**

Having attributable costs may help with transparency and acceptance by quota owners. Consider charging on quota share owned rather than landings. This would be a slight incentive to fish the shares rather than locking them up and might make "use it or lose it" provisions less of a consideration.

**10. Limited Processing Permits**

Does the Council actually have the authority under the Magnuson-Stevens Act to issue limited entry permits for shoreside processors as indicated under Analytical Alternative 6b (Chap 2, p. 29)?

**11. Harvest Share Allocation to Processors**

No detail is presented regarding the objectives of allocating harvest quota to processors. The presumption is that such an allocation is intended either to compensate established processors for potential losses associated with "stranded assets" or to prevent the location of landings from shifting radically from the current communities.

To address the first objective of compensating established processors for potential losses associated with "stranded assets," the potentially stranded costs must be carefully documented to justify allocating 25% or 50% of the value of IFQs in the fishery. To meet the second objective of preventing the location of landings from shifting radically from the current communities, an analysis would have to demonstrate why the processing sector would be any less likely to shift locations than fishing vessels, once issued IFQs.

Currently, siting of processing plants responds at least partly to the location of fishing fleets. With control of IFQs, processors could exploit economies of scale in processing by consolidating into fewer plants and requiring that the fishing vessels who lease their IFQs land at those sites. Thus, there are potential community instabilities exacerbated under the processor quota options. These are issues requiring analytical attention.

Issuing IFQs to processors introduces some additional possible complications that are not discussed in the presentation of alternatives. Suppose that one or a few processors have a dominant position in the processing industry and that they also deliver a large enough fraction of the fresh groundfish in local markets to affect price. Does the Processor Quota alternative then give them additional market power (monopoly power to restrict supply to achieve a higher market price for groundfish in product markets, or monopsony power to restrict purchases of fish from the fishing fleet to reduce price of landed fish, or both)? There may need to be a review of this option by the anti-trust division of the Department of Justice, as there was for the Pacific Whiting Conservation Cooperative.

Finally, how would an IFQ based on catch be allocated to an entity that does not catch groundfish? Alternatives 2, 3, and 4 each state that the IFQs would be allocated “based on catch.” Since any of these Alternatives could be combined with IFQ Program A, B, or C, there should be a clear statement about how the IFQs going to processors would be allocated. Would it be history of landings at plants (rather than catch) by species? Or would a processor get 50% of any IFQs that would otherwise be allocated (based upon catch) to vessels normally landing at that company's plant? Would this be a plant-by-plant allocation for multi-plant companies, or would it be a company-wide allocation?

Port
Orford
Ocean
Resource
Team

Agenda Item E.4.e
Public Comment
March 2007

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**P.O.O.R.T. • PO BOX 679 • PORT ORFORD, OR 97465 • (541) 332-0627 • poort@carrollsweb.com**

December 11, 2006

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Chairman Hansen:

I am writing on behalf of the Port Orford Ocean Resource Team (P.O.O.R.T.) in regards to the Trawl IQ alternatives being discussed by the Groundfish Allocation Committee. The community of Port Orford has been actively involved in developing a new model for fisheries management in Port Orford. Our long term goal is to implement a community based stewardship model which supports sustainable and diverse fisheries, good science, and reasonable access to fisheries resources in a local stewardship area. Like other ports, we have been severely impacted by the increasingly restrictive regulatory environment needed to conserve and rebuild salmon and groundfish stocks. Port Orford is very dependent on access to fisheries resources – about 25% of our workforce (over 100 individuals) are involved in fishing or fisheries related businesses. Our communities hope is for long term sustainability and stability of the resources we depend on.

P.O.O.R.T. has the following specific comments with regard to the alternatives currently being considered by the Groundfish Allocation Committee, other groundfish committees and Council membership.

1) We support continued analysis of those options which take into account community stability (Program C) and ask that analysis be specific enough for all alternatives to describe potential impacts to non-trawl communities in addition to those with a trawl fleet (Port Orford currently has a non-trawl fleet).
2) When considering the impacts to open access fishers, we ask that the analysis of options also consider the dependency that some ports (like Port Orford) have on open access fisheries. Gear switching by Trawl IQ permit holders may have an adverse impact on Port Orford's fleet of open access vessels if their catch with non-trawl gear counts against an open access allocation or increases effort on local fish stocks.
3) We support the development of options which consider area based allocation of groundfish under any IQ program and measures to prevent localized depletion.

P.O.O.R.T commends the Trawl IQ committee and Council staff for including measures for community stability and area management of groundfish resources. I thank you for the opportunity to comment on the trawl individual quota program alternatives being considered for management of our groundfish resources.

Sincerely,
Leesa Cobb
Leesa Cobb, Program Director

PACIFIC MARINE
CONSERVATION COUNCIL



February 13, 2007

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

Dear Chairman Hansen,

The Pacific Marine Conservation Council (PMCC) respectfully submits the attached consensus statement regarding area-based management of Pacific groundfish, for the Council's review. PMCC is a nonprofit, public benefit corporation, with offices in Astoria, OR and Port Townsend, WA. The organization has a diverse Board of Directors representing commercial and sport fishermen, marine scientists and community advocates who are dedicated to sustaining healthy and diverse marine ecosystems. PMCC operates under a strategic directive to promote ecosystem based management that fosters sustainable fishing communities.

We believe that the development of a finer-scale management system for Pacific groundfish has implications for several management activities currently being addressed by the Council, including the development of the groundfish trawl individual quota plan. PMCC's intent is to provide this information on area-based management for public comment at the March 2007 Council meeting, and organize an expanded presentation by some of the signatories of the statement.

We look forward to providing the Council with more detailed information and participating in further discussions on this issue in the near future. Thank you for your consideration of this letter and consensus statement.

Sincerely,

Jennifer Bloeser

Jennifer Bloeser
Science Director

PACIFIC MARINE
CONSERVATION COUNCIL

# Consensus Statement on Spatial Management of West Coast Fisheries

In August 2006, a group of scientists, fishermen, and fisheries-policy experts were convened by Pacific Marine Conservation Council (PMCC) for the 'Cape to Cape Meeting', to explore the issue of spatial (area-based) management of west coast groundfish. This group was first tasked with reviewing existing information on three scales of spatial structure: population (genetic, metapopulation, population dynamic/stock assessment, life history), ecological community (assemblage and ecosystem scales), and human community. They were then tasked with evaluating the merits of some form of spatial management of west coast groundfish, and generating specific recommendations for its implementation.

As a starting point for this process, PMCC made the following straw proposal: a practical first step might be to increase the spatial resolution of current management measures by using the three major capes in the region: Blanco, Mendocino and Conception. The capes are well-known biogeographic boundaries of fish communities [1, 2, 3] and form the basis for existing International North Pacific Fisheries Commission (INPFC) statistical areas.

**The following statement is a consensus of the Cape to Cape working group:**

*The Cape to Cape group feels that successful management of west coast fisheries depends in great measure on matching the spatial scales of interest for coastal communities with those scales naturally found within marine ecosystems. As such, the group supports management of west coast groundfish fisheries at regional scales that recognize the unique relationships between local stocks and the fishing communities that depend on them.*

## Review of existing concepts and information

As is the case with all fisheries, those for west coast groundfish are social-ecological systems [4], integrated concepts of humans in nature. They are seldom linear and predictive, and the issue of scale – in particular the match between spatial and temporal scales at which institutional, ecosystem, and associated human community processes occur - becomes central to effective policy [5].

There is clear evidence of spatial structure in marine ecosystems along the West Coast of North America [6, 7, 8]. This is manifested in regional differences in the structural and functional aspects of both physical and biological components of marine ecosystems. Consequently, nearshore ecosystems exhibit marked regional differences in species composition, dynamics and productivity [9]. Offshore ecosystems, in particular over the continental slope, exhibit abrupt changes in the vicinity of the aforementioned capes (Blanco, Mendocino and Conception) [10].

However, this spatial structure is not fixed in time [2, 3, 11]. Much is defined by geomorphologic (e.g., bottom type, depth and topography) and oceanic (e.g., currents, upwelling) aspects of the physical environment, whereas the temporal variability is largely driven by climate-ocean processes (e.g., interannual variability, El Niño-Southern Oscillation (ENSO), Pacific Decadal Oscillation (PDO), climate change.) And these dynamic structuring processes are continually changing. In the face of increasing uncertainty and variability in the marine environment (e.g., climate change, dead zones), managing stocks on a finer scale should provide flexibility and increase the resilience of stocks and ecosystems. For example, Berkeley et al. (2004) [11] suggest that the geographic source of successful recruits to west coast groundfish populations may differ from year to year. As a result, "management should strive to preserve a minimal spawning biomass throughout the geographic range of the stock." Spatial management thus becomes proactive.

As elsewhere in the world, human communities along the West Coast of North America also exhibit marked spatial structure in size, composition and the socioeconomic processes that affect them. Like their ecological counterparts in the marine environment, this spatial structure reflects geographic variation in the physical (e.g., geomorphologic, hydrologic, climatic) and biological (vegetation and associated agricultural and forestry practices) attributes of the environment. This regional variation determines the relative role of fisheries in the socioeconomic and cultural composition of local communities. Highly populated regions around major ports facilitate large-scale, industrialized offshore fisheries, whereas small, remote communities support coastal family-based fisheries. In turn, the relative importance of subsistence, recreational and commercial fisheries varies regionally. Moreover, human impacts on the marine environment vary regionally in relation to the distribution and size of human populations and the magnitude and kinds of human activities (e.g., waste discharges, nutrient influx, cooling water intakes of power plants, likelihood of oil spills, altered riverine and estuarine structure and functions.)

The scientific community and fishing industry have long recognized that spatial management congruent with the spatial and temporal scales of marine ecosystems and human communities is necessary for healthy marine ecosystems and sustainable fisheries [6, 12, 13]. Unfortunately, the existing coast-wide scale of institutional structures for the management of west coast groundfish does not correspond to the spatial and temporal structure of ecological and socioeconomic systems. As a consequence, this scale of management does not adequately protect against local area depletion of stocks, provides disincentives for stewardship, and fails to safeguard the biological structure of fish populations and the ecosystems that support them.

For example, as a result of this coast-wide management approach, over-harvest in one area has shut down fishing over large areas of the coast, resulting in prohibited access to historic resources by coastal fishing communities. The inability to account for spatial structure can lead to uncertainty in the status of stocks and the effects of local ecosystems on stock productivity and resilience. Generalizations of the status of a stock from one portion of a species range across its entire range can give misleading inferences regarding stock status over vast portions of a stock. Coast-wide fisheries management lacks the flexibility to accommodate and does not account for regional variation of multiple stressors (i.e. non-fishing impacts described above in combination with fishing impacts) to marine ecosystems and fished populations. Thus, one fundamental solution to the current management dilemma is a regionally-based management structure which recognizes that fish populations and community uses are not evenly distributed along the coast.

## Conclusions

- A major factor of variability in the species composition of west coast marine fishes, invertebrates and algae assemblages occurs in an inshore/offshore direction [1, 2, 3, 7].

- There is a distinct similarity between the spatial homogeneity of the biological and human communities as one moves from the nearshore to the offshore groundfish fisheries. As one moves offshore, both the ecosystems and their associated fishing economies become more spatially homogeneous.

- It seems reasonable that offshore groundfish management might focus on the fish and associated harvest levels designed to sustain biological structure (i.e. an ecosystem-based approach.) This would likely be a scaled down version of management per status quo to one that is area-based and perhaps delineated by major capes. Providing incentives to reduce bycatch of overfished species could be a priority for spatial management offshore.

- In contrast, nearshore management might focus on human communities and access to nearshore resources. Nearshore management would likely be structured at a finer spatial scale than offshore, and more oriented toward coastal community or nearshore allocations based on gear-type.

## Recommendations

- The spatial pattern of groundfish management should be different between offshore and nearshore fisheries.

    - Offshore management would have larger geographic areas (e.g., regions with boundaries defined by capes), be top-down (Federal fishery councils), and be more traditionally species-based and model-driven, applied within an ecosystem-based management context. In essence this would be a scaling down of current assessment and management protocol to the Cape to Cape areas. The focus of offshore management would be on maintaining healthy offshore ecosystems utilizing an ecosystem-based management approach, with a spatial scale larger than that applied for nearshore fisheries management.

    - Nearshore management would have smaller areas defined by the interfacing of coastal communities with nearshore reefs and fishing grounds, be more bottom-up (States, local communities), and require more innovative approaches linking fishing communities with ecosystems. The focus of nearshore management would be on maintaining healthy interactions between coastal communities and nearshore ecosystems, with coast-wide coordination and information transfer across a network of local management entities.

- No new information or assessments are needed to initiate Cape to Cape management right now.

- Spatial management can be justified on both a biological basis (e.g., discrete population structure, spatially distinct species assemblages) and a social one (e.g., conservation incentives to keep fishing.)

- This concept could be applied within the current structure of west coast groundfish management authority, stock assessment and survey methodologies.

- Even if new stock assessments cannot be done at a newly (smaller) defined spatial scale right now, quotas can still be rationally and scientifically determined on a spatial grid (i.e. Cape to Cape). Most of the major species are quantitatively surveyed each year on a much smaller spatial grid than that which is currently used for management.

- As a possible approach, coast-wide quotas could be pro-rated based on relative survey abundance by area.

- In order to initiate the spatial management process, and provide conservation incentives that will reduce the bycatch of overfished species while still maintaining harvest opportunities, we recommend that spatial quotas first be implemented for all overfished species.

Finally, the Cape to Cape working group supports the following three recommendations for spatial west coast groundfish research and management made by Golden (2006) [14] to the Pacific Fishery Management Council's (Council) Trawl Individual Quota Committee:

- The Council should continue to support research into spatial sampling and modeling approaches for stock assessments. The degree of localized overfishing is unknown; fishery and survey data and habitat information should be analyzed on a finer spatial scale to develop a better understanding of fishing effort and fish distribution patterns.

- Recent studies of population and age structure and recruitment dynamics raise serious biological concerns with current and proposed management. Current management measures (Rockfish Conservation Areas (RCAs), selective gears, etc.) alongside new tools (finer area allocation, Marine Protected Areas (MPAs), etc.) should be considered to enhance proper spatial management, safeguard against localized overfishing as a precautionary measure, and to conserve population and age structure needed to increase the likelihood of successful recruitment events.

- Area allocation of Optimum Yield (OY) for west coast groundfish should be employed as a hedge against unpredictable spawning success. Available information on species characteristics (genetic structure, age structure, reproduction, and larval dispersal) should be used as a guide to establish boundaries and OYs for sub-areas within the West Coast.

**Summary**

The Cape to Cape working group strongly supports spatial management of west coast groundfish fisheries. This system will benefit both the resource and the fishing industry. Information is currently available to allow its immediate implementation. A white paper now in preparation will document and elaborate on the points made in this statement. Subsequently, PMCC will host meetings with members of the fishery science, fishery management and fishing communities to further outline an implementation strategy. The Cape to Cape working group recognizes that spatial management will take time to implement and looks forward to continued collaboration on this issue.

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**Members of the Cape to Cape working group who endorsed this statement:**

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* *Support for this document represents personal scientific view, and does not imply endorsement by NOAA Fisheries Service.*

*West Coast Seafood Processors Association*
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February 14, 2007

Chairman Donald Hansen
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

**RE: Agenda item E.4, Trawl Rationalization**

Dear Chairman Hansen and Members of the Council:

On behalf of the members of the West Coast Seafood Processors Association (WCSPA), we offer the following comments relative to the Council's effort to rationalize the traditional groundfish and whiting fisheries.

Council staff has done a good job clarifying the Environmental Impact Statement outline for this program, and we are encouraged by the Groundfish Allocation Committee's work to narrow the range of proposed alternatives.

**Summary of comments**

There are three items we feel could be furthered improved, and one recommendation on the process of moving forward with analysis:

1. The three original allocation options between permit holders and processors should remain (100/0, 50/50, and 75/25), as was recommended by the Trawl IQ Committee.
2. Deletion of the GAC-recommended allocation option which allocates quota to fish ticket issuing agents, as opposed to groundfish processors.
3. Revision of the processor history assignment option that attributes groundfish processing history to "facilities," as opposed to companies which meet the Council's definition of "processor."
4. Given the Council's limited resources, WCSPA recommends a phased analysis of whiting and groundfish rationalization, with whiting to proceed first.

## 1. Retention of 50/50 processor allocation option

WCSPA requests the Council retain the 50/50 IQ allocation option in the EIS analysis. Again, this is still at the analytical stage, and we feel removing this option and leaving 25% as the de facto ceiling on processor allocation is both prejudicial to the analysis, and arbitrary.
While 50% may be perceived as high, it is an appropriate bookend to zero. Picking only a point in the middle (25%) is seemingly convenient, but lacks any academic basis, and runs contrary to the spirit of the National Environmental Policy Act (NEPA), which requires that all reasonable options be analyzed. A 50/50 allocation option was previously pursued by the shore-side whiting sector, it has

been used in a parallel quota (two-pie) program in Alaska, it was requested for analysis by constituents during the scoping phase of this EIS, and it was recommended for analysis by the Trawl IQ Committee. A 50/50 option has been well established and should be retained for analysis.

**2. Deletion of quota allocation option to fish ticket issuing agents**

At its meeting in December, the Groundfish Allocation Committee recommended adding another allocation option to the EIS analysis. The intent was to simplify the analysis, but we feel it simply made it more complex and departs from the objective of the program. This third allocation option, allocation of IQ to fish ticket issuing agents, should be removed from the EIS.

In the majority of cases, primary groundfish processors buy fish directly from their vessel partners, issue their own fish tickets, take custody of the fish and then process it into another form. But in several cases the act of "receiving" the fish is contracted to a third party, largely due to the geographic isolation of the receiving station which has proximity to the fishing grounds. Neah Bay is a good example of a receiving station with proximity to the grounds, but no primary groundfish processing capacity. Therefore, processors often contract with people in Neah Bay to receive fish and issue a fish ticket, even though in some cases that fish is actually purchased directly by the processor under contract with the fishermen.

In such a case, the fish ticket issuing agent is merely a third-party go-between. They have little investment in the fishery other than a dock and totes. To distinguish the difference between a fish ticket issuer and a fish processor, the Council has maintained a definition of "processing." This definition was recently updated by the Council specifically to apply to a groundfish rationalization program. This was done in formal session and in consultation with NOAA General Counsel. That definition holds that simply issuing a fish ticket does not qualify, deny or have any material bearing on whether an entity is a "processor." "Processors" are defined by what they do to a fish (cook, cut, freeze, etc.), not how they procure it.

The West Coast Seafood Processors Association requests that the Council reject any option of allocating harvest quota to fish ticket issuing agents, and instead stick with an option of allocating to processors that comport with the Council's own definition of processing.

**3. Attribution of processing history**

As was just outlined, the Pacific Fishery Management Council has adopted a definition of "processing," specifically to apply to groundfish rationalization. The question has then been, how does the Council assign processing history to match up with landing records? Unfortunately, no common data set exists across the three states that records processing activity. The fish ticket data is the only common data set which provides a basis for attribution of processing history, and therefore a basis for quota allocation.

The problem is that as was mentioned previously, fish receivers are not always processors, and do not necessarily meet the Council's definition of "processing."

**Proposed solution**

After discussions with Council staff and NOAA General Counsel, WCSPA has devised a workable solution to ensure that processing history is appropriately attributed and allocated to "processors" as the Council has intended base on its own definition.

We propose the Council use a simple two-part process to attribute processing history—assume the fish ticket issuer is the processor of that same fish, but in order to have that processing history attributed to them, the recipient must meet the Council's definition of primary "processing." Under this scenario, fish ticket issuers are assumed to be the processor and rightful owner of that processing history. They will then be allocated a commensurate amount of quota, unless a processor makes application to NMFS for those pounds and can provide documentation proving that for the pounds of fish in question they were the entity that met the definition of "processing," and not the entity that issued the fish ticket.

A set of criteria for appeals or claims will have to be established, and we are happy to work with Council staff and NOAA General Counsel to develop that. It is our belief that simply having this process in place will prevent misallocation of processing history by dissuading fish ticket issuers from contesting processor claims to pounds they were issued based on fish ticket data alone. Further, since there are very few processors who do not issue their own fish tickets, this shouldn't be a significant issue in the first place. But it is important of course for those who are in this situation.

**4. Phased analysis of whiting and groundfish**

While the trawl groundfish rationalization process moves forward, its ultimate success is still dependent on a clear sector allocation of groundfish, both between recreational and commercial and between gear sectors within the commercial fishery. While an analysis of sector allocation is underway for traditional groundfish, it is still a long way off. Therefore, the Council's analysis of a trawl rationalization program is in many ways betting on the come.

In contrast, for the whiting fishery, sector allocation is resolved. For this reason, in addition to the industry consensus forming in the whiting fishery, we recommend the Council phase the EIS analysis, and proceed first with an analysis of whiting Coops. If funds were available to do everything at once, then by all means it should be done. But, given limited resources, it makes most sense to proceed with the simpler analysis first.

**Conclusion**

The West Coast Seafood Processors Association continues to support rationalization of the groundfish and whiting fisheries. We feel that a complete and thorough analysis is needed to ensure the Council can make informed policy decisions on what kind of system to adopt and how that system should be implemented.

While we are encouraged by the recent streamlining of the process, we want to make sure the Council retains enough contrast in the remaining options so as to provide a true range of alternatives.

Sincerely,

Kent Craford
WCSPA Consultant

# CONSIDERATION OF INSEASON ADJUSTMENTS

The Council set optimum yield (OY) levels and various management measures for the 2007 groundfish management season with the understanding these management measures will likely need to be adjusted periodically through the biennial management period with the goal of attaining, but not exceeding, the OYs.

The Northwest Fisheries Science Center (NWFSC) released the 2005 groundfish observer data report (Agenda Item E.2.b, Attachment 1) in late January, which was reviewed by the Groundfish Management Team (GMT) at their January 30-February 1 meeting. These data indicated that bycatch rates for canary rockfish using selective flatfish trawls north of 40°10' N latitude were much higher than anticipated, causing the 2005 canary rockfish OY to be exceeded by 2 mt. It is important to also note that, while the estimated 2006 total catch of canary rockfish has yet to be determined, higher bycatch rates in the north by selective flatfish trawls can be reasonably assumed.

The NWFSC also provided a spatial analysis of 2005 canary rockfish bycatch rates (Agenda Item E.2.b, Attachment 2), which allowed the GMT to consider alternative area closures and rockfish conservation area (RCA) adjustments at a finer spatial scale than north and south of 40°10' N latitude. The GMT developed a range of inseason adjustment options for this year's trawl fishery designed to reduce the canary rockfish impact to levels approximating that originally decided for 2007 using the new bycatch rates (Agenda Item E.5.b, GMT Report). Additionally, the GMT updated all the commercial bycatch models to project species' impacts using these new data at their last meeting and also updated the bycatch scorecard (Agenda Item E.5.b, GMT Report 2).

On February 9, 2007, National Marine Fisheries Service (NMFS) issued a public notice requesting industry cooperation in reducing this year's trawl catch of petrale sole (Agenda Item E.5.c, NMFS Public Notice). Trawl landings of petrale sole have been proceeding at a higher than anticipated rate due to good weather conditions and low crab fishing effort. NMFS is projecting nearly half of the petrale sole OY may be caught by the end of February at the current catch rate. The Council may want to consider adjustments to the petrale sole limited entry trawl cumulative trip limits and the trawl RCA to prevent early OY attainment.

The Washington Department of Fish and Wildlife is also proposing adjustments to Washington recreational fishery RCAs for Council consideration at this meeting (Agenda Item E.5.c, WDFW Report).

The GMT and the Groundfish Advisory Subpanel (GAP) will begin meeting on Monday, March 5, 2007 (see Ancillary A and Ancillary B agendas) to discuss and recommend inseason adjustments to ongoing 2007 groundfish fisheries. Under this agenda item, the Council is to consider advisory body advice and public comment on the status of ongoing fisheries and recommended inseason adjustments prior to adopting final changes.

**<u>Council Action</u>:**

1. **Consider information on the status of ongoing fisheries.**
2. **Consider and adopt inseason adjustments as necessary.**

<u>Reference Materials</u>:

1. Agenda Item E.5.b, GMT Report: Alternatives for Reducing Canary Rockfish Bycatch in the Limited Entry Non-Whiting Trawl Fishery.
2. Agenda Item E.5.b, GMT Report 2: 2007 Projected Mortality Impacts (mt) Under Current Regulations.
3. Agenda Item E.5.c, NMFS Public Notice: Request for Industry Cooperation in Reducing 2007 Trawl Petrale Sole Catch.
4. Agenda Item E.5.c, WDFW Report: Washington Department of Fish and Wildlife Report on Groundfish Inseason Management Measures.
5. Agenda Item E.5.e, Public Comment.

<u>Agenda Order</u>:

a. Agenda Item Overview — John DeVore
b. Report of the Groundfish Management Team (GMT) — Kelly Ames
c. Agency and Tribal Comments
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action:** Adopt Recommendations for Adjustments to 2007 Fisheries

PFMC
02/20/07

Agenda Item E.5.b
GMT Report
March 2007

# Alternatives for Reducing Canary Rockfish Bycatch in the Limited Entry Non-Whiting Trawl Fishery

Predictions for the 2007 catch of canary rockfish by the non-whiting limited entry (NWLE) trawl fleet have been updated based on the most recent observer data (2005) . These updated predictions show that the predictions made last fall were too low. In the fall of 2006 the Groundfish Management Team (GMT) predicted a canary rockfish catch level of less than 8 metric tons in this fishery. Based on recently available data from the West Coast Groundfish Observer Program the prediction has been revised upward to approximately 20 metric tons with status quo management measures. Without adjustments to fishery management measures it is projected that canary rockfish catch will exceed the 2007 OY of 44 metric tons.

This document discusses available tools and short term alternatives for restricting the NWLE trawl fleet in order to reduce canary impacts. This document also discusses the need for additional tools for long term management of this fishery. In developing the alternatives, several different approaches and variables were considered to reduce canary rockfish catch in the NWLE trawl fishery. As a result, three sets of alternatives are presented. The initial set of alternatives show the basic actions needed to meet different levels of impacts within the 20 to 8 ton range (Table 1). For purposes of analysis, two sets of sub alternatives have been developed on the assumption that the objective is to limit the NWLE trawl fleet to something on the order of 8 metric tons (the amount assumed to be available to this sector during the development of 2007 management measures) rather than reduce the impacts associated with other fishery sectors. Achievement of this objective is going to affect the ability to trawl in two key areas: the shoreward area between Columbia River and Leadbetter Point and the shoreward area North of Cape Alava. For each of these areas a set of sub alternatives have been developed each of which can move the NWLE trawl fleet, in total, to 8 metric tons with the ability, to some extent, to blend these sub options (Tables 2 and 5).

## Available Tools

To achieve canary rockfish catch reductions in the NWLE trawl fishery in the near term, several tools are available that can be implemented as routine measures through an inseason action and these include:

1. Modification of trawl cumulative limits north of 40°10' N. lat., between 40°10' and 38° N. lat., and south of 38° N. lat.
2. Modification of Rockfish Conservation Area (RCA) boundaries
3. The use of management area boundaries to provide more restrictive management measures in portions of the coast, including
    a. the US/Canada boundary
    b. the Vancouver/Columbia management area boundary--47°30' N. lat.

   c. the Columbia/Eureka management area boundary--47° N. lat.
   d. the Eureka/Monterey management area boundary--40°30' N. lat.
   e. the Monterey/Conception management area boundary--36° N. lat.
   f. the US/Mexico boundary
4. The use of commonly used geographic coordinates to provide more restrictive management measures in portions of the coast, including
   a. Cape Alava, WA--48°10.00' N. lat.
   b. Queets River, WA--47°31.70' N. lat.
   c. Pt. Chehalis, WA--46°53.30' N. lat.
   d. Leadbetter Point, WA--46°38.17' N. lat.
   e. Washington/Oregon border--46°16.00' N. lat.
   f. Cape Falcon, OR--45°46.00' N. lat.
   g. Cape Lookout, OR--45°20.25' N. lat.
   h. Cascade Head, OR--45°03.83' N. lat.
   i. Heceta Head, OR--44°08.30' N. lat.
   j. Cape Arago, OR--43°20.83' N. lat.
   k. Cape Blanco, OR--42°50.00' N. lat.
   l. Humbug Mountain--42°40.50' N. lat.
   m. Marck Arch, OR--42°13.67' N. lat.
   n. Oregon/California border--42°00.00' N. lat.
   o. Cape Mendocino, CA--40°30.00' N. lat.
   p. North/South management line--40°10.00' N. lat.
   q. Point Arena, CA--38°57.50' N. lat.
   r. Point San Pedro, CA--37°35.67' N. lat.
   s. Pigeon Point, CA--37°11.00' N. lat.
   t. Ano Nuevo, CA--37°07.00' N. lat.
   u. Point Lopez, CA--36°00.00' N. lat.

In the longer term, other tools could be developed such as more refined area closures (canary rockfish conservation areas), but implementing such tools would require a more refined analysis of data sources, would need to be developed through the Council's two-meeting process and accompanied by a NEPA analysis, and would be implemented via notice-and-comment rulemaking (See FMP at 6.2.).

## Short Term Approaches

The analyses presented here utilize the management tools available for routine measures to show predicted canary rockfish catch levels in the NWLE trawl fishery during the 2007 fishing year. The approach taken in these preliminary analyses was to restrict geographic areas that have the highest bycatch rate of canary rockfish first. The alternatives analyzed had more restrictive shoreward RCA boundaries in areas where the bycatch rate of canary rockfish was highest, identified by the available areas listed in bullets 3 and 4 above, and the analysis of the most recently available observer data. These analyses are provided for informational purposes and that further deliberation on canary rockfish bycatch reduction measures will occur at the March meeting of the Pacific Fishery Management Council.

Based on analysis of the most recently available observer data, the areas with the highest bycatch rate of canary rockfish are: 1) that area shoreward of the trawl RCA north of Cape Alava to the US/Canada boundary, 2) that area shoreward of the trawl RCA between Leadbetter Point and the

Columbia River and, 3) that area shoreward of the trawl RCA between Cape Arago and Humbug Mountain. The following map shows those 3 areas next to the state of Oregon, Washington, and the 75 fathom RCA boundary. The reader is referred to the Northwest Fisheries Science Center reports for further information on canary rockfish catch levels and area-specific bycatch (see Agenda Items E.2.b, Attachments 1 and 2).

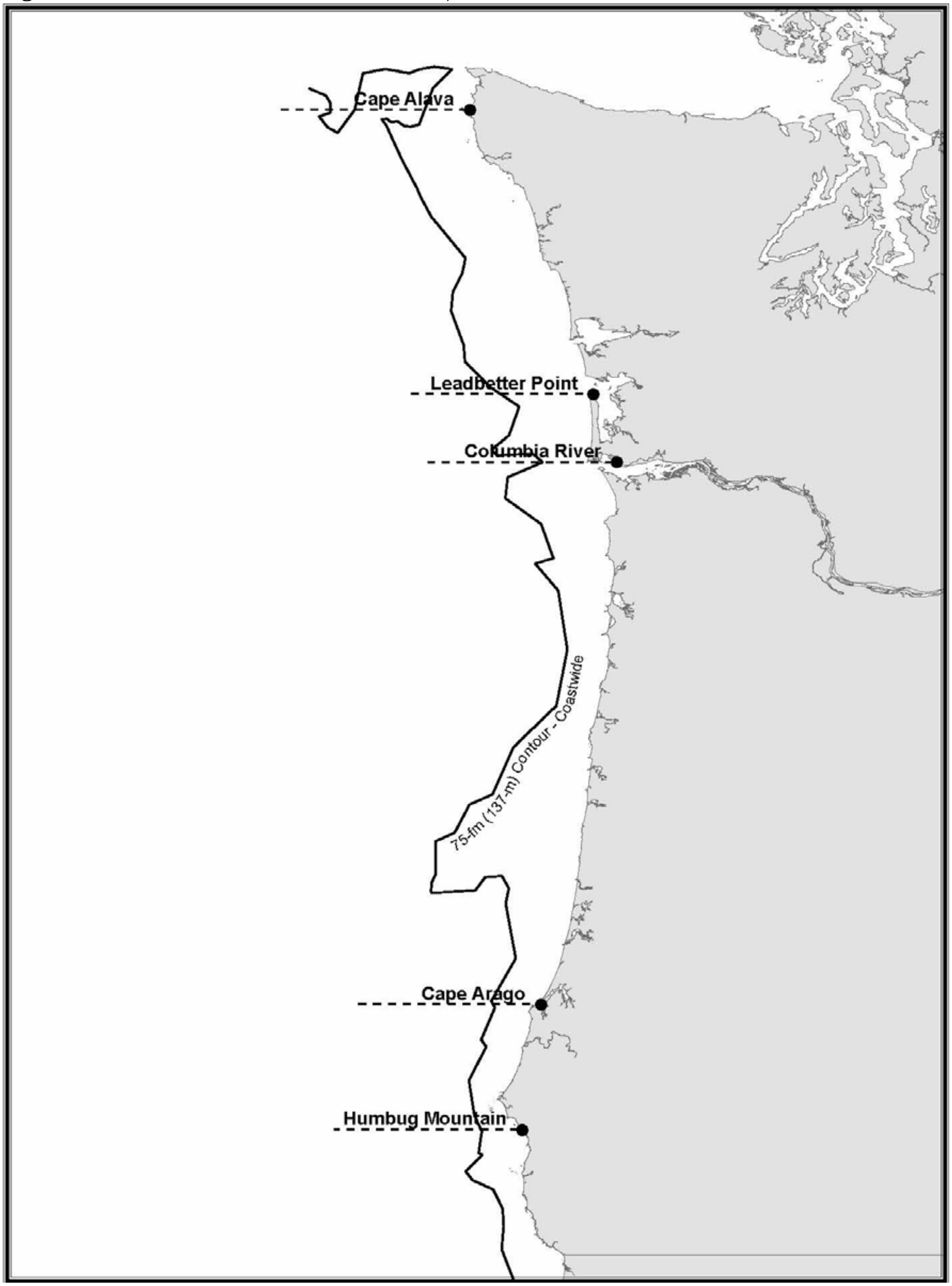


**Figure 1 Geographic Areas Used in Analyses**

## Alternatives that Show Differing Levels of Canary Impacts

Using currently specified trawl cumulative limits, several scenarios were generated showing the impact of restricting areas with the highest canary bycatch. The following table displays the result of those scenarios by showing the predicted catch of canary rockfish as 1) the shoreward RCA boundary is moved to 75 fathom all year in the north, and, 2) the above three specified areas are closed to trawling shoreward of the trawl RCA. Each alternative is cumulative in that the second alternative closes shoreward of the RCA north of Cape Alava, the third alternative closes shoreward of the RCA north of Cape Alava and between Cape Arago and Humbug Mountain, and the fourth alternative closes shoreward of the RCA north of Cape Alava, between Cape Arago and Humbug Mountain, and between Leadbetter Point and the Columbia river.

**Table 1 Predicted Canary Catch in the Non-Whiting Trawl Fishery by Alternative**
**(Alternatives restrict areas shoreward of the trawl RCA)**

| Alternative | Description | Canary Impacts (mt) |
|---|---|---|
| SQ | • No Change- 75 fm shoreward RCA boundary all year in north except 100 fm shoreward RCA boundary in period 4 | 20.0 |
| ALT 1 | • 75 fm shoreward RCA boundary all year in north | 18.0 |
| ALT 2 | • 75 fm in north<br>• Close shoreward of RCA north of Cape Alava | 13.4 |
| ALT 3 | • 75 fm in north<br>• Close shoreward of RCA north of Cape Alava<br>• Close shoreward of RCA between Mt. Humbug and Cape Arago | 10.9 |
| ALT 4 | • 75 fm in north<br>• Close shoreward of RCA north of Cape Alava<br>• Close shoreward of RCA between Mt. Humbug and Cape Arago<br>• Close shoreward of RCA between Leadbetter Pt. and Col. R. | 8.0 |

## Alternatives that Allow Trawling Shoreward of the RCA between Leadbetter Point and Columbia River

Further analysis of available observer data shows that by keeping that area between Leadbetter Point and the Columbia River open during the winter months, the aggregate bycatch rate of canary rockfish in the north actually declines. This is because observer data shows the ratio of canary to target species catch in the winter months decreases in that area. Further information from LE trawl logbooks shows that the Columbia-Leadbetter area is an economically important area to the Astoria port group. Based on this information, three additional alternatives were constructed that modify the shoreward RCA boundary between Leadbetter Point and the

Columbia River during certain times of the year. Alternative LC.1 closes that area shoreward of the RCA between Leadbetter Point and the Columbia River in the summer (May through August). Alternative LC.2 restricts the shoreward RCA boundary to 60 fathoms between Leadbetter Point and the Columbia River in the summer. Alternative LC.3 keeps the Leadbetter Point to Columbia River area open to 60 fathoms during the summer but modifies cumulative limits in the north to keep canary rockfish impacts to 8 metric tons.

### Table 2 Predicted Canary Catch in the Non-Whiting Trawl Fishery for Alternatives that Allow Some Fishing between Columbia River and Leadbetter Point

**(Alternatives restrict areas shoreward of the trawl RCA)**

| Alternative | Description | Canary Impacts (mt) |
|---|---|---|
| ALT LC.1 | • Shoreward RCA boundary at 75 fm in the north (1)<br>• Close Shoreward of the RCA north of Cape Alava<br>• Close Shoreward of the RCA between Humbug and Arago<br>• Close Shoreward of the RCA between Leadbetter and Col R in summer | 7.9 |
| ALT LC.2 | • Shoreward RCA boundary at 75 fm in the north<br>• Close Shoreward of the RCA north of Cape Alava<br>• Close Shoreward of the RCA between Humbug and Arago<br>• Restrict the Shoreward RCA boundary to 60 fm between Leadbetter and Col R in summer | 8.4 |
| ALT LC.3 | • Shoreward RCA boundary at 75 fm in the north<br>• Close Shoreward of the RCA north of Cape Alava<br>• Close Shoreward of the RCA between Humbug and Arago<br>• Restrict Shoreward RCA boundary to 60 fm between Leadbetter and Col R in summer<br>• Modify Cumulative Limits | 8.0 |

The following tables show the trawl cumulative limits that would be in place in the north with alternatives LC.1, LC.2, and LC.3.

## Table 3  Cumulative Limits for Alternatives LC.1 and LC.2

| | | Cumulative Limits | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Area/Gear | Period | Sablefish | Longspn | Shortspn | Dover | Other Flat | Petrale | Arrowt'th | Slope Rock |
| North 40 10 | 1 | 13,000 | 22,000 | 7,500 | 80,000 | 110,000 | 50,000 | 100,000 | 4,000 |
| Large | 2 | 13,000 | 22,000 | 7,500 | 80,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| Footrope | 3 | 15,000 | 22,000 | 7,500 | 60,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| | 4 | 15,000 | 22,000 | 7,500 | 60,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| | 5 | 15,000 | 22,000 | 7,500 | 60,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| | 6 | 13,000 | 22,000 | 7,500 | 80,000 | 110,000 | 50,000 | 100,000 | 4,000 |
| North 40 10 | 1 | 5,000 | 3,000 | 3,000 | 40,000 | 90,000 | 16,000 | 90,000 | 4,000 |
| SFFT | 2 | 8,000 | 3,000 | 3,000 | 40,000 | 90,000 | 25,000 | 90,000 | 4,000 |
| | 3 | 8,000 | 3,000 | 3,000 | 40,000 | 90,000 | 25,000 | 90,000 | 4,000 |
| | 4 | 8,000 | 3,000 | 3,000 | 40,000 | 90,000 | 25,000 | 90,000 | 4,000 |
| | 5 | 8,000 | 3,000 | 3,000 | 40,000 | 90,000 | 25,000 | 90,000 | 4,000 |
| | 6 | 5,000 | 3,000 | 3,000 | 40,000 | 90,000 | 16,000 | 90,000 | 4,000 |

## Table 4  Cumulative Limits for Alternative LC.3

| | | CUMULATIVE LIMITS BY PERIOD | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SUBAREA | PERIOD | Sablefish | Longspn | Shortspn | Dover | Other Flat | Petrale | Arrowt'th | Slope Rock |
| North 40 10 | 1 | 13,000 | 22,000 | 7,500 | 80,000 | 110,000 | 50,000 | 100,000 | 4,000 |
| Large | 2 | 13,000 | 22,000 | 7,500 | 80,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| | 3 | 15,000 | 22,000 | 7,500 | 60,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| | 4 | 15,000 | 22,000 | 7,500 | 60,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| | 5 | 15,000 | 22,000 | 7,500 | 60,000 | 110,000 | 30,000 | 100,000 | 4,000 |
| | 6 | 13,000 | 22,000 | 7,500 | 80,000 | 110,000 | 50,000 | 100,000 | 4,000 |
| North 40 10 | 1 | 5,000 | 3,000 | 3,000 | 40,000 | 90,000 | 16,000 | 90,000 | 4,000 |
| SFFT | 2 | 8,000 | 3,000 | 3,000 | 40,000 | 90,000 | 25,000 | 90,000 | 4,000 |
| | 3 | 8,000 | 3,000 | 3,000 | 40,000 | 60,000 | 20,000 | 40,000 | 4,000 |
| | 4 | 8,000 | 3,000 | 3,000 | 40,000 | 60,000 | 20,000 | 40,000 | 4,000 |
| | 5 | 8,000 | 3,000 | 3,000 | 30,000 | 60,000 | 20,000 | 40,000 | 4,000 |
| | 6 | 5,000 | 3,000 | 3,000 | 30,000 | 60,000 | 16,000 | 40,000 | 4,000 |

## Alternatives that Allow Trawling Shoreward of the RCA North of Cape Alava

The Groundfish Management Team discussed the above analyses and paid particular attention to economic impacts that would occur to vessels operating in the area north of Cape Alava. Trawl logbook data shows that substantial trawl effort and catch occurs in this area and this area is important to both the Oregon and Washington trawl fleet. Based on GMT discussion, input from industry representatives, and available data sources, it was largely determined that closing the shoreward area north of Cape Alava would have a disproportionate impact on the northern Washington trawl fleet based out of Bellingham, Blaine, and Neah Bay (2006 fish ticket data indicate 10 vessels made NWLE trawl deliveries to ports in this area). Logbook data shows that this area is the most intensely fished area of vessels that homeport in those locations. Because of these impacts, additional analyses were requested with the intention of exploring possibilities that would allow for some fishing opportunity in the shoreward area north of Cape Alava. The approach taken to explore fishing opportunity in this area was to craft management measures that would consciously push large trawl vessels in the north to areas seaward of the RCA and thus reduce canary impacts because of less effort and catch occurring in the shoreward areas. Shoreward fishing opportunity would be modified to allow trawling in the area north of Cape Alava without leading to excessive canary rockfish bycatch.

The first alternative (A.1) explored a wholesale change to the seaward RCA boundary for periods 3, 4, and 5 to allow more fishing opportunity in the deep areas and to get effort to move out of the shoreward area. Alternative A.1 restricted that shoreward area between Columbia River and Leadbetter Point, and that shoreward area between Cape Arago and Mt. Humbug. The shoreward area north of Cape Alava was closed in the summer months, but open to 75 fathoms in the winter. This alternative was constructed with the idea that northern Washington trawlers could travel to areas south of Cape Alava during the summer when weather was more favorable, but would be allowed to fish closer to port in the winter during harsher weather conditions.

Alternative A.2 mirrors alternative A.1, but cumulative limits are adjusted in the north to bring the canary rockfish impacts down from 9.5 to 8.2 metric tons.

Other options were explored, including the possibility of establishing a 60 fathom shoreward RCA line and a 50 fathom shoreward RCA line north of Cape Alava. Available information showed that while canary catch decreases in the shallower areas, target catch decreases more rapidly, meaning the bycatch rate is higher at shallower depths in this area compared to the bycatch rate at 75 fathoms. Additionally, trawling is prohibited in Washington within 3 miles from shore, substantially limiting the available fishing area shoreward of a 60 or 50 fathom line. Based on this information, alternatives that considered RCA boundaries shallower than 75 fathoms in the area north of Cape Alava were not further considered.

**Table 5 Predicted Canary Catch in the Non-Whiting Trawl Fishery for Alternatives that Allow Some Fishing North of Cape Alava**
**(alternatives restrict areas shoreward of the trawl RCA)**

| Alternative | Description | Canary Impact (mt) |
|---|---|---|
| Alt A.1 | • move shoreward boundary to 75 fm in north all year<br>• move seaward boundary to 180 fm in the north in period 3, 4, and 5<br>• close shoreward of RCA between Cape Arago and Mt. Humbug<br>• close shoreward of RCA between Col R and Leadbetter in summer (open in winter)<br>• close shoreward of RCA north of Cape Alava in summer (open in winter) | 9.5 |
| Alt A.2 | • move shoreward boundary to 75 fm in north all year<br>• move seaward boundary to 180 in the north during period 3, 4, and 5<br>• close shoreward of RCA between Cape Arago and Mt. Humbug<br>• close shoreward of RCA between Col R and Leadbetter in summer (open in winter)<br>• close shoreward of RCA north of Cape Alava in summer (open in winter)<br>• adjust shoreward cumulative limits in the north | 8.2 |

**Table 6 SFFT Cumulative Limits for Alternative A.2**

| | | CUMULATIVE LIMITS BY PERIOD | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Area/Gear | Period | Sablefish | Longspn | Shortspn | Dover | Other flat | Petrale | Arrowtth | Slope Rock |
| North of 40 10 SFFT Limits | 1 | 5,000 | 3,000 | 3,000 | 40,000 | 90,000 | 16,000 | 90,000 | 4,000 |
| | 2 | 8,000 | 3,000 | 3,000 | 40,000 | 90,000 | 25,000 | 90,000 | 4,000 |
| | 3 | 6,000 | 3,000 | 3,000 | 25,000 | 30,000 | 15,000 | 30,000 | 4,000 |
| | 4 | 6,000 | 3,000 | 3,000 | 25,000 | 30,000 | 15,000 | 30,000 | 4,000 |
| | 5 | 6,000 | 3,000 | 3,000 | 25,000 | 30,000 | 15,000 | 30,000 | 4,000 |
| | 6 | 5,000 | 3,000 | 3,000 | 25,000 | 30,000 | 15,000 | 30,000 | 4,000 |

## Long Term Canary Rockfish Bycatch Approaches

The GMT discussed several tools for managing canary rockfish bycatch in the longer term. These tools would be used to achieve the necessary reductions in canary rockfish bycatch, but would presumably alleviate some of the constraints placed on the industry from any of the above alternatives. It is important to point out that more refined tools for dealing with canary rockfish bycatch are likely to require an Exempted Fishing Permit (EFP), require a more refined analysis of data sources, would need to be developed through the Council's two-meeting process and accompanied by a NEPA analysis, and implemented via notice-and-comment rulemaking (see FMP at §6.2). Some of these ideas include but are not limited to:

1. Development of more refined area closures (canary rockfish conservation areas).
2. Conducting an EFP to test trawl gears off northern Washington that differ from the selective flatfish trawl.
3. Conducting an EFP to test the effectiveness and impacts of allowing adversely impacted trawlers to use pot/trap gear while fishing in areas closed to trawling.

The GMT also recognizes that higher bycatch rates in some areas could reflect historical patterns of fishery exploitation, and that focusing effort on select areas could potentially have population impacts over smaller spatial scales as well as potentially bias the ability to assess canary rockfish fishing mortality by reflecting age or length compositions from the more heavily exploited segment of the population. Similar concerns have already been raised with respect to existing area closures, and such concerns speak to the increasing need to consider both population structure and management measures over finer spatial scales.

**2007 Projected mortality impacts (mt) under current regulations. January 2007 update. a/**

**1/31/2007**

| Fishery | Bocaccio b/ | Canary | Cowcod | Dkbl | POP | Widow | Yelloweye |
|---|---|---|---|---|---|---|---|
| **Limited Entry Trawl- Non-whiting** | **47.9** | **20.0** | **2.1** | **194.3** | **71.6** | **0.7** | **0.1** |
| **Limited Entry Trawl- Whiting** | | | | | | | |
| At-sea whiting motherships | | 4.0 | | 25.0 | 1.0 | 220.0 | 0.0 |
| At-sea whiting cat-proc | | | | | 2.9 | | 0.0 |
| Shoreside whiting | | | | | 1.8 | | 0.0 |
| Tribal whiting | | **0.7** | | 0.0 | 0.6 | 6.1 | 0.0 |
| **Tribal** | | | | | | | |
| Midwater Trawl | | 1.8 | | 0.0 | 0.0 | 40.0 | 0.0 |
| Bottom Trawl | | 0.8 | | 0.0 | 3.7 | 0.0 | 0.0 |
| Troll | | 0.5 | | 0.0 | 0.0 | | 0.0 |
| Fixed gear | | 0.3 | | 0.0 | 0.0 | 0.0 | 2.3 |
| **Limited Entry Fixed Gear** | | 1.2 | | 1.3 | 0.4 | | 2.9 |
| Sablefish | 13.4 | | 0.0 | | | 0.0 | |
| Non-Sablefish | | | 0.1 | | | 0.5 | |
| **Open Access: Directed Groundfish** | | **1.0** | | | | | |
| Sablefish DTL | 0.0 | | 0.1 | 0.2 | 0.1 | 0.0 | **0.5** |
| Nearshore (North of 40°10' N. lat.) | 0.0 | **1.8** | | 0.0 | 0.0 | **0.1** | **2.0** |
| Nearshore (South of 40°10' N. lat.) | 0.0 | | | 0.0 | 0.0 | | |
| Other | 10.6 | | | 0.0 | 0.0 | 0.0 | **0.1** |
| **Open Access: Incidental Groundfish** | | | | | | | |
| CA Halibut | 0.1 | **0.0** | | 0.0 | 0.0 | | |
| CA Gillnet c/ | 0.5 | | | 0.0 | 0.0 | 0.0 | |
| CA Sheephead c/ | | | | 0.0 | 0.0 | 0.0 | 0.0 |
| CPS- wetfish c/ | 0.3 | | | | | | |
| CPS- squid d/ | | | | | | | |
| Dungeness crab c/ | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| HMS b/ | | 0.0 | 0.0 | 0.0 | | | |
| Pacific Halibut c/ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pink shrimp | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |
| Ridgeback prawn | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Salmon troll | 0.2 | **0.8** | 0.0 | 0.0 | 0.0 | 0.3 | 0.2 |
| Sea Cucumber | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Spot Prawn (trap) | | | | | | | |
| **Recreational Groundfish e/** | | | | | | | |
| WA | | 5.7 | | | | | 6.2 |
| OR | | | | | | 1.4 | |
| CA | 98.0 | 8.3 | 0.4 | | | 8.0 | 1.7 |
| **Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs. f/** | | | | | | | |
| | 2.0 | **7.5** | 0.1 | 3.8 | 3.6 | 0.9 | 2.0 |
| **TOTAL** | 173.2 | 54.5 | 2.8 | 224.7 | 85.7 | 278.1 | 18.2 |
| **2007 OY** | **218** | **44.0** | **4.0** | **290** | **150** | **368** | **23** |
| **Difference** | 44.8 | -10.5 | 1.2 | 65.4 | 64.3 | 90.0 | 4.8 |
| **Percent of OY** | 79.4% | 123.9% | 70.0% | 77.5% | 57.1% | 75.6% | 79.0% |
| Key | | = either not applicable; trace amount (<0.01 mt); or not reported in available | | | | | |

a/ All numbers reflect projected annual total catches except that the non-tribal "Limited Entry Trawl- Whiting" numbers are the total bycatch caps for canary, darkblotched, and widow rockfish. Only cells in bold font borders have been updated.

b/ South of 40°10' N. lat.

c/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

d/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

e/ Values in scorecard represent projected impacts. However, harvest guidelines for 2007 are as follows: canary in WA and OR combined = 8.2 mt and in CA = 9.0 mt; yelloweye in WA and OR combined = 6.8 mt and in CA = 2.1 mt.

f/ Research projections only updated for canary rockfish in November 2006. The other species' updates will be updated in March 2007.

***National Marine Fisheries Service, Northwest Region***
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# PUBLIC NOTICE

For Information Contact:
The Groundfish Branch (206) 526-6140

NMFS-SEA-07-01
FOR IMMEDIATE RELEASE
February 9, 2007

## PACIFIC COAST GROUNDFISH FISHERY
## REQUEST FOR INDUSTRY COOPERATION IN REDUCING 2007 TRAWL PETRALE SOLE CATCH

The National Marine Fisheries Service (NMFS) estimates that 2007 petrale sole catch is proceeding at a higher than anticipated rate. As of February 2, 2007, the estimated 2007 petrale sole catch is 600 metric tons (mt.) Favorable weather, a reduced Dungeness crab season, and aggregation of the petrale sole stock has contributed to higher than anticipated catch levels, and available information shows that it is likely the catch of petrale sole in February 2007 will be equivalent to that of January 2007. By the end of February, the catch of petrale sole could be 1,200 mt out of a coastwide optimum yield (OY) of 2,499. If that level of petrale catch occurs, it will likely lead to reductions for the summer petrale fishery and a possible elimination of petrale sole fishing opportunities in November-December 2007.

A summer and November-December petrale fishery may still be able to be held if the catch of petrale sole in the bottom trawl fishery is voluntarily reduced in February. Analysis of available information shows that a February 2007 catch level of 200-300 mt of petrale sole may still allow for enough management flexibility to prosecute a summer petrale fishery and would leave some opportunity for November-December petrale fishery.

The Pacific Fishery Management Council has expressed its desire to have petrale sole fishing opportunities throughout the 2007 calendar year. Therefore the National Marine Fisheries Service is requesting that the industry voluntarily reduce its catches of petrale sole during the month of February.

Visit the NMFS Northwest Region website for current groundfish management regulations, VMS information, and RCA boundary coordinates.
http://www.nwr.noaa.gov/Groundfish-Halibut/index.cfm

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# WASHINGTON DEPARTMENT OF FISH AND WILDLIFE REPORT ON GROUNDFISH INSEASON MANAGEMENT MEASURES

Based on the 2006 harvest estimates for the Washington recreational fishery, the Washington Department of Fish and Wildlife (WDFW) is proposing inseason adjustments to the Washington recreational rockfish conservation areas (RCAs) in 2007 and 2008. Specifically, WDFW is proposing that the recreational RCAs (i.e., depth restrictions) that were in effect in 2006 remain in effect in 2007 and 2008.

Washington and Oregon share recreational harvest guidelines for canary and yelloweye rockfish. In 2006, the Washington portion of the shared canary rockfish harvest guideline was 1.7 mt and its portion of the shared yelloweye harvest guideline was 3.5 mt. These total catch amounts or harvest targets, if projected to be attained inseason by the Washington recreational fishery, were the triggers to consult with the Oregon Department of Fish and Wildlife and consider an inseason action to slow or eliminate further canary or yelloweye rockfish mortality in this fishery. In 2005, WDFW projected that the yelloweye harvest target would be attained prematurely prompting such a consultation. That consultation indicated the shared yelloweye harvest guideline would be attained early, resulting in a WDFW action implemented on August 5 to close the recreational groundfish fishery outside of 30 fm in waters off Washington north of Leadbetter Pt. at 46º38’10” N latitude. The Council and NMFS adopted conforming federal regulations that were implemented on October 1, 2005.

New Washington recreational management measures were adopted for 2006 to avoid early canary and yelloweye rockfish harvest guideline attainment. To reduce the catch of yelloweye rockfish to stay within the Washington recreational harvest target, WDFW proposed, and the Council adopted, the following modifications to the 2006 Washington recreational fishery:

- Prohibit retention of rockfish and lingcod seaward of a line approximating the 20 fm depth contour from May 22, 2006, through September 30, 2006, in Marine Areas 3 and 4 (waters off Washington north of the Queets River at 47º31’42” N latitude where canary and yelloweye catches are highest), except on days that halibut fishing is open (which is approximately 5 days in May, and 2 days in June).

- Prohibit retention of rockfish and lingcod seaward of a line approximating the 30 fm depth contour from March 18, 2006, through June 15, 2006, in Marine Area 2 (waters off Washington between Leadbetter Pt. and the Queets River).

Through the biennial specifications process, using harvest data through 2005, WDFW staff projected the amount of canary and yelloweye rockfish that would be harvested in the Washington recreational fishery under the regulations listed above, and identified additional restrictions that could be in place (i.e., extending the time period for these depth restrictions), if needed. However, with the depth restrictions described above, the Washington recreational fishery stayed under its harvest targets, harvesting 1.28 mt of canary and 1.70 mt of yelloweye rockfish. As noted in the 2007-08 Groundfish Specifications Environmental Impact Statement, these additional restrictions would adversely impact Washington’s coastal communities that are heavily reliant upon recreational groundfish fishing opportunity. Therefore, WDFW is requesting that the Washington recreational RCAs be modified as described in Attachment 1.

***Washington Recreational Regulations***

***Recreational Groundfish Conservation Areas off Washington***

*Recreational RCA*

Between the U.S. border with Canada and the Queets River, recreational fishing for groundfish is prohibited seaward of a boundary line approximating the 20-fm (37-m) depth contour from May ~~1~~ **21** through September 30, except on days when the Pacific halibut fishery is open in this area….

Between the Queets River and Leadbetter Point, recreational fishing for groundfish is prohibited seaward of a boundary line approximating the 30-fm (55-m) depth contour from March 17, 2007, through ~~July 31~~ **June 15**, 2007, except that recreational fishing for sablefish and Pacific cod is permitted within the recreational RCA from May 1 through June 15. In 2008, recreational fishing for groundfish is prohibited seaward of a boundary line approximating the 30-fm (55-m) depth contour from March 15, 2008, through ~~July 31~~ **June 15**, 2008, except that recreational fishing for sablefish and Pacific cod is permitted within the recreational RCA from May 1 through June 15….

Josh Churchman
Box 5 Ocean Parkway
Bolinas, CA 94924

February 14, 2007

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

Dear Council Members,

I am writing in regards to the 2007 regulations for shelf rockfish in the fixed gear fishery. After reviewing the allocations, I have noticed once again that Central California's allocation is drastically less than that of Northern and Southern California. I would like to request an in-season adjustment to fix what appears to be an arbitrary penalty to one district in favor of another.

As you can see from the current regulations, Southern California is allowed three thousand pounds of minor shelf rockfish for each two month period while Central California is allowed primarily two thousand pounds of only chilipepper. The fish stocks are rebuilding rapidly in both these regions and widows, bocaccio, and chilipepper all swim together. When I fish for chilipepper, both widows and bocaccio are hooked and come to the surface dead. The result of the Central region being restricted to primarily chilipepper has been increased and un-acceptable discard of both widows and bocaccio. If Central California had a minor shelf allocation similar to the Southern region, my discard rates would drop to near zero. I have fished hook and line in the region for over thirty years and never had to discard fish prior to these regulations. Over the past seven years, my discard rates have approached fifty percent. I often stop fishing before I meet my quota because I am disgusted by the amount of discard. The current regulations maximize discard for all shelf rockfish in the Central district while minimizing discard in the Southern district.

I also noticed that the 2007 regulations for Central California increased the trawl sector's allocation to 44,000 pounds of chilipepper annually while fixed gear remained stagnant at 12,000 pounds. What is the science justifying this discrepancy? My understanding is that there are only two active fixed gear permits in the central California District landing shelf rockfish. Therefore, the regulations I have been discussing in this letter really only effect two vessels. I understand the need to regulate the fishery during the rebuild; however given the increased allocation for the trawl sector, along with the increased discard of widows and bocaccio, I am left wondering why the regulations are so restrictive for the two remaining fixed gear permits in Central California. Even a small increase and broadening of the fixed gear allocation would not result in a significant change in the rebuilding plan. The result would be reduced discard and creating a more sustainable fishery for the remaining permit holders.

As I mentioned at the start of this letter, I would like an in-season adjustment for minor shelf rockfish for fixed gear in Central California. I would like the Central region to have an allocation that combines widows, chilipeppers, and bocaccio at levels reflecting equity between sectors and regions. A change in the regulations would minimize discard in the fixed gear fishery and create a more sustainable future for the few of us who remain here in central California.

I look forward to your response.

Sincerely,
Josh Churchman

Tel: 415.868.0982
Email: josh.churchman@gmail.com

Agenda Item E.5.e
Supplemental Public Comment 2
March 2007

Council members,

I am writing to you today to ask you to consider an opening of the commercial shelf rockfish fishery in the extreme southern district of California for the remainder of the March - April management period.

Reasons for request; Consistant availability of product is hurt by the closure.

Over the Easter holiday there is a strong demand for fresh local fish. Holiday visitors expect to find fresh seafood. In addition to the closure of waters to U.S. fishermen, importation from Mexico shuts down as fishermen take long periods of time off for the religious period. Poor weather during this period often makes for few days at sea.

My catch is marketed directly to restaurants in the San Diego area. The March - April closure hurts my business because I have to start all over again in May. Many Chinese restaurant owners are unfamiliar with the laws and communication can be difficult. When I do not show up for two months it is difficult to re-establish a working agreement and often the price has to be re-negotiated.

Fishing for shelf rockfish is open for sportfishing during the March -April period and this leads to increased sales of sport-caught fish. Enforcement agents have little chance of catching the weekend fisherman who sells his catch. When restaurants have a supply of commercially caught fish they are not tempted to purchase sport-caught fish. Sportfishermen have argued that a commercial closure is "fair" because the sportfishing for shelf rockfish is closed during Jan-Feb. Sportfishermen have many advantages including access to fish that are not commercially legal and the opportunity to travel to Mexican waters to avoid the closure.

January-February catch totals for Seaforth Landing, Mission Bay, San Diego:

3800 Anglers
152 trips
45 days

2081 Bass (sand/kelp)
2392 Rockfish
722 Vermilion rockfish
125 Sculpin (scorpionfish)
311 Ling Cod
305 Ocean Whitefish
10 Halibut
4 Sheephead
216 Yellowtail
254 Bonito

3 Barracuda
882 Mackerel
6321 Giant Squid
These numbers show that the sport fleet is able to carry passengers and produce sport fish without being hurt by a rockfish closure.

The March - April period was opened at the last minute during 2006 and it helped the commercial fishermen while having created no problems for the sportfishermen. Please consider my request.
Thank You.

John Law - Wild West Commercial Fishing

# EMERGENCY RULE LIMITING 2007 WHITING VESSEL PARTICIPATION

At its September 2006 meeting, the Council recommended work to complete Amendment 15 to the Pacific Coast Groundfish Fishery Management Plan (FMP) proceed expeditiously to protect traditional West Coast fisheries from potential harm from American Fisheries Act (AFA) qualified vessels with no history in the fishery prior to the passage of the AFA. Recognizing this amendment process could not be concluded before the 2007 Pacific whiting season, the Council also recommended a request to National Marine Fisheries Service (NMFS) for an emergency rule (Agenda Item E.6.a, Attachment 1). The proposed emergency rule would prohibit participation in the shore-based, mothership, and catcher/processor sectors of 2007 Pacific whiting season by AFA-qualified vessels without historic participation in any of those specific sectors prior to 2006.

The Council received a letter dated January 11, 2007, from NMFS Regional Administrator Robert Lohn to Council Chairman Donald Hansen (Agenda Item E.6.a, Attachment 2), denying the Council's request for an emergency rule. In a follow-up letter dated February 13, 2007 (Agenda Item E.6.a, Attachment 3), Mr. Lohn stated, "If the Council chooses to forward a new proposal and supporting record for emergency action during the 2007 season based on continued concern about the general effect of new entrants on the fishery, we would review that request on its merits." With regard to new entrants into the fishery, the letter expresses concern about a new request for limitation solely for AFA advantaged vessels, as opposed to a request to a limit on all new entrants under Magnuson-Stevens Fishery Conservation and Management Act authority.

Reference materials include a September 29, 2006 letter submitted by the Washington Department of Fish and Wildlife recommending NMFS not approve the Council recommendation for an emergency rule (Agenda Item E.6.a, Attachment 4), a February 6, 2007 letter from the Oregon Department of Fish and Wildlife expressing disappointment with the NMFS denial of the Council request for an emergency rule (Agenda Item E.6.a, Attachment 5) and NMFS policy guidelines for the use of emergency rules (Agenda Item E.6.a, Attachment 6).

The Council is tasked with reviewing the Council's original emergency rule request, hearing reports from NMFS, and considering a new request to NMFS for an emergency rule to limit participation in the 2007 Pacific whiting fishery.

## Council Action:

**Consider Requesting an Emergency Rule to Limit Vessels in the 2007 Whiting Fishery to Address Conservation Concerns**

Reference Materials:

1. Agenda Item E.6.a, Attachment 1: November 9, 2006 letter from Dr. McIsaac to Mr. Lohn conveying Council request for an emergency rule for the 2007 Pacific whiting fishery.
2. Agenda Item E.6.a, Attachment 2: January 11, 2007 letter from Mr. Lohn to Chairman Hansen regarding NMFS disapproval of the Council emergency rule request.
3. Agenda Item E.6.a, Attachment 3: February 13, 2007 letter from Mr. Lohn to Chairman Hansen regarding clarification on the disapproval of the emergency rule request.
4. Agenda Item E.6.a, Attachment 4: September 29, 2006 letter from Mr. Koenings to Mr. Lohn expressing WDFW opposition to the emergency rule request.
5. Agenda Item E.6.a, Attachment 5: February 6, 2007 letter from Mr. Moore to Mr. Lohn expressing ODFW opposition to the NMFS disapproval of the emergency rule request.
6. Agenda Item E.6.a, Attachment 6: August 27, 1997 Federal Register notice, Policy Guidelines for the Use of Emergency Rules, (62*FR*44421).

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. NMFS Report — Frank Lockhart
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Consider Requesting an Emergency Rule to Limit Vessels in the 2007 Whiting Fishery to Address Conservation Concerns

PFMC
02/15/07

**Pacific Fishery Management Council**

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November 9, 2006

Mr. Robert Lohn, Regional Administrator
National Marine Fisheries Service, Northwest Region
7600 Sand Point Way NE, BIN C15700
Seattle, WA 98115-0070

Re: Pacific Fishery Management Council rationale and justification for an emergency rule for the 2007 Pacific whiting fishery.

Dear Mr. Lohn: Bob

On October 17, 2006, you received a letter conveying the September 2006 recommendation of the Pacific Fishery Management Council (Council) for an emergency rule for the 2007 Pacific whiting fishery to protect the fishery from harm caused by vessels qualified under the American Fisheries Act (AFA). The Council motion passed on September 13, 2006 was to (1) move forward expeditiously to complete Council action on a simplified Amendment 15 to the *Pacific Coast Groundfish Fishery Management Plan* for implementation in 2008 and (2) recommend National Marine Fisheries Service (NMFS) approve an emergency rule to be implemented for the 2007 season to prohibit participation of AFA-qualified vessels with no sector specific catch history in the fishery prior to 2006 (effectively December 31, 2005) in the shore-based, mothership, or catcher-processor sectors of the 2007 Pacific whiting fishery. In taking this action, the Council recognized that completion of Amendment 15 represents the best mechanism for achieving long-term protective measures for West Coast fisheries. Because completing Amendment 15 cannot occur prior to 2008, the Council also recognizes the need for an interim rulemaking process to prevent imminent harm to fisheries in 2007. The purpose of this letter is to provide additional background, justification, and rationale in support of this recommendation.

## BACKGROUND

When Congress passed the AFA in 1998, Congress designated the Council to develop conservation and management measures to protect West Coast groundfish fisheries from potential harm caused by the AFA. In September 1999, the Council initiated Amendment 15 to address this concern and requested NMFS publish notice of the rules under consideration and a control date of September 16, 1999. This control date applies to participation by catcher vessels in mothership and shore-based Pacific whiting fisheries, and in the inshore groundfish fishery for non-whiting species. The Council also set a control date of June 29, 2000 as notice to the public and potential purchasers of limited entry permits held by AFA entities. This control date provides advance notice that, based on future Council action, groundfish limited entry permits held by an AFA entity may be revoked or restricted to a specific fishery sector.

The Council addressed Amendment 15 again at its September 2001 meeting when the Council reviewed a range of alternatives and initial analyses and adopted a preferred alternative. The preferred alternative covered many issues and included provisions to limit catcher vessel participation in West Coast groundfish fisheries (at-sea whiting, shore-based whiting, non-whiting) by sector to those vessels with qualifying landings during the period of January 1, 1994 to September 16, 1999. The Council directed Council staff to complete public review drafts of the analysis and proposed management measures but, because of competing workload, an urgent need to rebuild overfished groundfish stocks, and the appearance of no imminent harm, the Council tabled action on Amendment 15 in 2002.

At the March 2006 Council meeting, the Council's Legislative Committee discussed a request by staff of the U.S. Senate Committee on Commerce, Science, and Transportation for Council input on draft AFA amendatory language. The Council sent a letter dated March 17, 2006 to the U.S. Senate Committee recommending that "all AFA qualified vessels (original or replacement) - not just catcher/processor vessels - without West Coast landing history prior to June 29, 2000 be prohibited from participating in the Pacific whiting fishery."

At the June 2006 meeting, the Legislative Committee and the Council heard testimony regarding participation by AFA qualified vessels in the shore-based sector of the Pacific whiting fishery. Additional public comments stated that Council recommended restrictions on AFA qualified vessels would not go far enough to protect all sectors of the West Coast Pacific whiting fishery and that sector specific "side board" landing requirements should be requested and that current efforts to address the issue through Federal legislation were unlikely to address all of the Council's concerns. In response, the Council recommended revisiting Amendment 15 to the Groundfish Fishery Management Plan (FMP) as a potential mechanism for protecting West Coast fisheries from adverse impacts caused by the AFA. At its June 12-16, 2006 meeting in Foster City, California, the Council heard testimony regarding concerns of harm to the Pacific whiting fishery from an influx of vessels qualified under the AFA and scheduled a review of various mechanisms for achieving the protective provisions called for in the original act.

At its September 10-15, 2006 meeting in Foster City, California, the Council discussed the previously tabled Amendment 15 and the current status and future prospects for the Pacific whiting fishery and heard considerable testimony that AFA-qualified vessels have entered the Pacific Whiting fishery since the Council tabled Amendment 15 in 2002. The Council concluded additional fishing effort by AFA-qualified vessels in 2006 likely contributed to a shortened season resulting in decreased revenue for traditional fishery participants and their communities. Additionally, the Council has expressed concern that additional fishing effort and shortened fishing seasons can create a 'race for fish' in the fishery which could lead to higher bycatch of the depleted rockfish and salmon stocks. The Council is concerned about detrimental effects that have occurred since AFA-qualified vessels with no history in the fishery have entered the West Coast Pacific whiting fishery, and the risk that detrimental effects could intensify in future seasons if no action is taken.

Consequently, the Council passed its September 2006 motion to expeditiously complete Council action on Amendment 15 and to recommend NMFS approve an emergency rule to be implemented for the 2007 season to prohibit participation of AFA-qualified vessels with no sector specific catch history in the fishery prior to 2006 (effectively December 31, 2005) in the shore-based, mothership, or catcher-processor sectors of the 2007 Pacific whiting fishery.

## JUSTIFICATION AND RATIONALE FOR AN EMERGENCY RULE

During its September 2006 deliberations concerning a temporary or emergency rulemaking activity for the 2007 Pacific whiting fishery, the Council reviewed the criteria for an emergency rule as detailed in Federal Register on August 21, 1997 (62*FR*44421). This notice states that "For the purpose of Section 305(c) of the Magnuson-Steven Fishery Conservation and Management Act 'an emergency exists in any fishery' is defined as a situation that:

1) Results from recent, unforeseen events or recently discovered circumstances; and
2) Presents serious conservation or management problems in the fishery; and
3) Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process."

The following section of this letter will address each of these criteria listed above individually to provide sufficient justification and rationale for determining an emergency in the Pacific whiting fishery exists and that temporary or emergency rulemaking efforts are warranted until such time the Council can complete work on Amendment 15.

1) The Current Situation "Results from recent, unforeseen events or recently discovered circumstances."

As mentioned above, the Council did not foresee any imminent threat from AFA-qualified vessels when it tabled activity on Amendment 15 in 2002 and no substantial threat was perceived by the Council until 2006 when the potential harm to West Coast groundfish fisheries, specifically to the shore-based Pacific whiting fishery, by AFA-qualified vessels was realized. Table 1, at the end of this letter, details Pacific whiting harvest, duration of the shore-based Pacific whiting fishery, and participation levels from 1992 through 2006. Landings of the AFA-qualified, non-AFA-qualified, and traditional vessels in the 2006 shore-based whiting fishery are detailed in Table 2.

Compared to prior years, the 2006 shore-based Pacific whiting season demonstrated differentially high risks from AFA-qualified vessel entrants due to bycatch, economic instability, and changes in fishery behavior inherent in a derby fishery. In the 2006 shore-based Pacific whiting fishery, 37 vessels landed 97,314 metric tons (mt) of Pacific whiting. Of the 37 vessels participating in 2006, 15 are AFA-qualified vessels 11 of which participated in the shore-based Pacific whiting fishery prior to the enactment of the AFA in 2000. Of the remaining four AFA-qualified vessels, one vessel has participated in the shore-based Pacific whiting exempted fishing permit (EFP) fishery since 2001. The remaining three vessels first participated in the shore-based Pacific whiting EFP fishery in 2006. The recent entry of these vessels in 2006 was not anticipated when management measures for the 2006 fishery were adopted by the Council and were only recently brought to the Council's attention as reviewed in the previous background material. The four AFA-qualified vessels that participated in 2006 that had not participated prior to the enactment of the AFA and the establishment of the control date landed a total of 15,742 mt. This amount was 16% of the 97,314 mt of whiting landed in the shoreside fishery coastwide, and 17% of the 91,840 mt of whiting landed in Washington and Oregon (Table 2).

Five additional vessels that were non-AFA-qualified participated in the 2006 shore-based fishery and not in the 2005 fishery. Four of those vessels had not landed whiting in the shore-based fishery since the inception of EFP fishing in 1992, while one of those non-AFA-qualified vessels does have prior participation in this fishery. Two of those non-AFA-qualified vessels elected to sort-at-sea, and not participate in the EFP fishery. These five non-AFA-qualified participants made 101 deliveries (9%), landing 3,239 mt of whiting, or 3% of the coastwide landings, and 4% of the landings in Washington and Oregon (Table 2). These vessels averaged 32 mt of whiting per landing (Table 2).

There were 28 "traditional" vessels (i.e. those vessels with shore-based Pacific whiting participation history prior to 2006) that participated in the 2006 shore-based Pacific whiting fishery. All of those vessels participated in the EFP fishery. These vessels had significant shore-based Pacific whiting participation history prior to 2006.

AFA-qualified vessels have the necessary infrastructure, the management flexibility, and, under current market conditions there are increasing incentives for AFA-qualified vessels to begin participating in the West Coast groundfish fishery. The price of whiting was unusually high in 2006 at $0.065 per pound (1992-2005 average price of $0.04 per pound), and, combined with the expanding markets for white fish have increased the attractiveness of this fishery for those vessels already equipped to participate in this fishery. Existing processors are increasing whiting processing capabilities to supply both domestic and international markets. These new and changing market conditions were not anticipated by the Council prior to recent Pacific whiting fisheries.

In summary, new market incentives and participation in the fishery from AFA-qualified vessels, unforeseen by the Council in 2002 when Amendment 15 was tabled, combined with existing fishing capacity of AFA-qualified vessels likely contributed to increased effort and a shortened season in the 2006 Pacific whiting fishery.

<u>2) The Current Situation "Presents serious conservation or management problems in the fishery"</u>

An intensive management regime is in place for West Coast fisheries to avoid or minimize impacts to species of concern and adding capacity to existing traditional fleets creates both management and conservation problems. Council managed groundfish fisheries are constrained by rebuilding requirements for seven groundfish species declared overfished. The entry of new participants to West Coast fisheries could be very disruptive with regard to the incidental catch of overfished rockfish species because additional effort from such vessels creates a derby-style "race for fish" leading to higher bycatch of depleted rockfish. The shore-based whiting fishery is one of low overall bycatch achieved through fleet feedback mechanisms and informed, cautious fishing patterns. As the "race for fish," and thus the "race for bycatch" escalate, the incentives for maintaining fishery practices that result in low bycatch are sacrificed. The likely result of an influx of new vessel participation is promotion of a derby-style fishery, lasting a few weeks or less, and the associated increased bycatch that typically results from this type of fishery.

Spillover of vessels from the shore-based whiting fishery into the bottom trawl fishery after the completion of an amplified derby-style fishery for whiting has the potential to negatively impact the West Coast groundfish fishery management due to unanticipated increases in effort, and increased uncertainty in the inseason regulation assessment model.

Avoiding bycatch of overfished groundfish species is of critical importance to groundfish fisheries including the Pacific whiting fishery and efforts to minimize bycatch benefit from knowledge of local fishing patterns and conditions. The very low levels of allowable bycatch in these fisheries create a situation where a single tow that is high in bycatch can have significant impacts on overfished species and the management regime. Even with the bycatch efforts listed above, tows with high bycatch have occurred. For example, in June 2004, a catcher vessel for a mothership caught 3.9 mt of canary rockfish in a single tow representing 53% of the annual fleet-wide bycatch allowance for this species. Additionally, in 2005 and 2006 research trawl surveys designed to assess stock health experienced single tow events with a much larger catch of canary rockfish than anticipated. Although the latter example is a potentially desirable outcome, each of these examples created the potential for fishery closures and unacceptable impacts to overfished species. The likelihood of future high bycatch tows increases with an influx of vessels less familiar with the West Coast whiting fishery, particularly when increased fishing effort creates a derby-style fishery where both traditional vessels and new entrants are forced to land Pacific whiting as quickly as possible. This situation represents a serious conservation problem for several overfished species which are potentially vulnerable to the Pacific whiting fishery.

The intensive and well developed management program currently in place to manage the shore-based whiting fishery on a daily basis is unable to accommodate a fast paced derby-style fishery. As the duration of the fishery decreases, so does the ability of fishery management agencies to react to and adjust for problem situations. The current shore-based whiting fishery is intensively managed, using a daily processor reporting system. The current tracking system is over-burdened at the current pace of the fishery. It is expensive and difficult to try to attempt daily tracking of this fishery. Acceleration of the fishery will likely cause a breakdown in the ability to monitor the harvest of whiting as well as the impacts to species of concern and hinder the ability of fishery managers to respond to either slow the fishery or close it completely in a timely manner. The tacking of both landed whiting catch and bycatch is critical to the management of the groundfish fishery and deterioration of the existing monitoring program represents a serious management problem for West Coast States, the Council, and NMFS.

There exists serious concerns regarding increased pressure associated with a derby-style fishery which is perpetuated by the unique characteristics of AFA-qualified vessels. These vessels pose a unique and substantial risk to the bycatch reduction measures that have already been established by the traditional participants in this fishery. The infrastructure needed to effectively fish in the Pacific whiting fishery is expensive and unattainable for most of the existing bottom trawl fleet. For those vessels that lack the equipment and specifications needed, the cost of outfitting a vessel is prohibitively expensive and outweighs the potential profits in the fishery. For these reasons, the existing traditional whiting fleet has been relatively stable since the inception of the EFP fishery in 1992. However, the needed infrastructure currently exists for AFA-qualified vessels, as the same equipment is used in the Bering Straight/Aleutian Islands (BSAI) pollock fishery. Moreover, the latent capacity of AFA-qualified vessels has greater potential to adversely impact the West Coast groundfish fishery than that of the bottom trawl fleet due to their larger capacity (the average landing by the four AFA-qualified vessels was 171.11 mt while the average landing by the remaining 33 vessels was 79.93 mt, an average of more than double). AFA-qualified vessels, with their existing equipment and large capacities, create considerable potential for future derby-style whiting fisheries and their associated management and conservation problems.

An existing trawl vessel no smaller than roughly 70 feet in length is required to effectively haul and operate the equipment needed to fish whiting in a safe manner. Older trawl vessels are not wide enough to maintain stability under the heavy equipment load needed for this fishery. The equipment needed to effectively target whiting includes: sonar, head rope sounder, mid-water trawl net, and a separate engine for the hydraulics needed to operate the mid-water net. To preserve the product once it is brought on board, tanking capabilities and refrigerated sea water systems are required. A conservative estimate of the overall costs associated with configuring a current non-whiting trawl vessel of small size to effectively fish in the shore-based whiting fishery is approximately $195,000. That cost increases with capacity and size of vessel, with a potential to exceed $800,000. This cost outweighs the potential profits made in the shore-based whiting fishery by existing bottom trawl vessels. AFA-benefited vessels escape the equipment and vessel re-fitting costs, as the equipment needed to efficiently harvest pollock in the BSAI management area is the same equipment described above, needed to efficiently harvest whiting in the shore-based whiting fishery.

In addition to the needed infrastructure to enter the fishery, the current structure of the BSAI pollock fishery grants AFA-qualified vessels the flexibility needed to adjust fishing strategies to participate in West Coast groundfish fisheries. After enactment of AFA, vessels were granted BSAI pollock dedicated access privileges (DAP) under which fishing cooperatives are assigned a portion of the overall sector allocation based on the historical participation levels of each of the member vessels. Those vessels are then assigned an amount of pollock by the cooperative. The vessel has the flexibility to either harvest their DAP within the set season, lease or trade their DAP to another vessel, or not use the DAP at all. The lengthened season allows AFA-qualified vessels to participate in other fisheries and still achieve their pollock harvest limits.

<u>3) The situation can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process.</u>

The Council has revitalized the Amendment 15 process but there is insufficient time to complete the amendment process for implementation prior to the 2007 Pacific whiting fishery. As demonstrated above, there is reason to believe AFA-qualified vessels with no qualified history in the traditional West Coast whiting fishery will continue to participate in, or newly enter, the fishery in 2007. The immediate benefits of preventing a derby-style race for fish, both in terms of conservation of rebuilding rockfish species and preserving a stable traditional fishery with its well developed management program, provide adequate justification to forego the normal rulemaking process for the 2007 fishery. The Council's public process and deliberative consideration and analysis of potential harm to West Coast fisheries resulting from the AFA, has and will result in informed decision-making in this matter. Therefore, the Council is requesting an expedited rulemaking process to complete and implement the necessary protective measures for 2007 while the normal rulemaking process is underway.

There is both West Coast and North Pacific precedent for this proposed emergency action. The risks to West Coast groundfish fisheries and stocks from a derby-style fishing effort, expanding over-capitalization, and potential overages in bycatch limits exceed the risks and uncertainty present in 2005 when NMFS took action by emergency rule (1) in May 2005 to implement bycatch caps in the open access groundfish fishery when a large longline freezer vessel threatened to enter the fishery targeting on dogfish shark and (2) in August 2005 to implement salmon conservation zones in Pacific whiting fishery. Additionally, initial implementation of AFA sideboards in the BSAI and Gulf of Alaska (GOA) groundfish fisheries, the BSAI crab fishery, and the Alaska scallop fishery were done through emergency rule while the North Pacific Fishery Management Council was executing the amendment process.

As stated in the Council's September 2006 motion, the Council intends to move forward on Amendment 15 as expeditiously as possible. The Council's goal is to complete Amendment 15 and associated rulemaking process in time for the 2008 whiting fishery. To achieve this goal, the Council is scheduled to revise and simplify the existing Amendment 15 alternatives for protecting West Coast fisheries between now and the April 2007 Council meeting in Seattle, Washington. At the April 2007 meeting, the Council is scheduled to hear testimony from its advisory bodies and the public before approving a range of alternatives for additional public review and detailed analysis of the impact of such actions on the fishery participants and the resource. To allow time for advance notice and the normal rulemaking process, the Council will strive to fully analyze the alternatives and choose a preferred alternative at its June 2007 meeting.

It is important to note that under the last deliberative process and normal rulemaking effort by the Council in 1999-2002, the Council implemented control dates of 1999 and 2001 and identified a preliminary preferred alternative to requiring vessel participation by 1999, well before December 31, 2005 as requested in the Council's September motion. It is likely that these existing control dates and qualifying landing periods will again be considered by the Council in 2007 during deliberative analysis and review of a new suite of Amendment 15 alternatives. The requested emergency rulemaking action is intended as an interim and intermediate step towards protecting West Coast fisheries.

## CONCLUSION

The Council is quite concerned about detrimental effects occurring to the Pacific whiting fishery caused by vessels advantaged by the AFA. The Council is committed to considering the proper action to addressing the current influx of AFA-qualified vessels with no landing history from entering or switching sectors in the traditional West Coast whiting fisheries. To achieve the necessary protective measures the Council made a motion in September 2006 to move forward expeditiously to complete Council action on a simplified Amendment 15. The Council is currently scheduled to develop and analyze a range of alternatives under its usual public process and identify a preferred alternative by June of 2007 to allow adequate time for the requisite rulemaking and public comment periods before the start of the 2008 fishery.

While the deliberative process to complete Amendment 15 is underway, and to protect the 2007 West Coast whiting fishery from the potential harm from AFA-qualified vessels as demonstrated in this letter and the Council's administrative record, the Council is requesting that NMFS approve an emergency rule to be implemented for the 2007 Pacific whiting season. This rule should prohibit participation of AFA-qualified vessels with no sector specific catch history in the fishery prior to 2006 (effectively December 31, 2005) in the shore-based, mothership, or catcher-processor sectors of the 2007 Pacific whiting fishery. The emergency rule can be justified by both the criteria required and the precedence of recent similar emergency action taken by NMFS on West Coast groundfish and North Pacific fisheries.

Additionally, for your information, we have enclosed the written public comment received at the Council office to date regarding this matter. Although the Council is not scheduled to address Amendment 15 or the emergency rule request directly at the November 2006 Council meeting, these written comments will be presented to the Council and the public as an informational report.

If you or your staff has any questions regarding this letter, please contact me or Mr. Mike Burner, the lead Staff Officer on this matter at 503-820-2280.

Sincerely,

Donald McIsaac, Ph.D.
Executive Director

MDB:ckc

c: Council Members
Mr. Rod McGinnis, NMFS, Southwest Regional Administrator
Ms. Eileen Cooney
Dr. John Coon
Mr. Jim Seger
Mr. John DeVore
Ms. Laura Bozzi
Mr. Kit Dahl
Mr. Chuck Tracy

Table 1. Summary of the whiting harvest, season start and end dates, season duration, and vessel and processor participants in the shore-based whiting fishery from 1992-2006.

| Year | Whiting Harvest (mt) | Whiting Allocation (mt) | Start Date | End Date | Duration (Days) | # Vessels | # Processors |
|---|---|---|---|---|---|---|---|
| 1992 | 49,092 | 80,000 | 4/15/1992 | 10/30/1992 | 198 | 23 | 7 |
| 1993 | 41,926 | 42,000 | 4/15/1993 | 8/24/1993 | 131 | 24 | 13 |
| 1994 | 72,367 | 97,000 | 4/15/1994 | 11/23/1994 | 222 | 33 | 8 |
| 1995 | 73,397 | 75,776 | 4/15/1995 | 7/25/1995 | 101 | 35 | 15 |
| 1996 | 84,680 | 87,001 | 5/15/1996 | 9/10/1996 | 118 | 37 | 11 |
| 1997 | 87,499 | 86,900 | 6/15/1997 | 8/22/1997 | 68 | 38 | 12 |
| 1998 | 87,627 | 86,900 | 6/15/1998 | 10/13/1998 | 120 | 35 | 13 |
| 1999 | 83,388 | 83,800 | 6/15/1999 | 9/13/1999 | 90 | 36 | 14 |
| 2000 | 85,653 | 83,790 | 6/15/2000 | 9/15/2000 | 92 | 36 | 14 |
| 2001 | 73,326 | 72,618 | 6/15/2001 | 9/26/2001 | 103 | 29 | 13 |
| 2002 | 45,276 | 44,906 | 6/15/2002 | 7/17/2002 | 32 | 29 | 8 |
| 2003 | 51,061 | 50,904 | 6/15/2003 | 7/14/2003 | 29 | 35 | 9 |
| 2004 | 89,251 | 90,510 | 6/15/2004 | 8/14/2004 | 60 | 26 | 9 |
| 2005 | 97,378 | 97,469 | 6/15/2005 | 8/18/2005 | 64 | 29 | 10 |
| 2006 | 97,322 | 97,314 | 6/15/2006 | 8/2/2006 | 48 | 37 | 14 |
| **Average** | **74,616** | **78,459** | | | **98** | **32** | **11** |

Table 2. Comparison of whiting landings made by AFA-qualified, non-AFA-qualified, and traditional vessel in the 2006 shore-based whiting fishery. (W = Washington, O = Oregon, and C = California)

| | AFA-Qualified Vessels (4) | | | Non-AFA-Qualified Vessels (5) | | | Traditional Vessels (28) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Max.Vessel | Ave. Vessel | Total | Max. Vessel | Ave. Vessel | Total | Max. Vessel | Ave. Vessel |
| # of Landings | 92 | 29 | 23 | 101 | 28 | 20 | 978 | 81 | 35 |
| % of W-O | 9% | 3% | 2% | 9% | 3% | 2% | 91% | 8% | 3% |
| % of W-O-C | 8% | 2% | 2% | 9% | 2% | 2% | 84% | 7% | 3% |
| Volume (mt) | 15,742 | 4,576 | 3,935 | 3,239 | 933 | 648 | 78,333 | 6,566 | 2,798 |
| % of W-O | 17% | 5% | 4% | 4% | 1% | 1% | 85% | 7% | 3% |
| % of W-O-C | 16% | 5% | 4% | 3% | 1% | 1% | 80% | 7% | 3% |
| mt/landing | 171 | 158 | 171 | 32 | 33 | 32 | 80 | 81 | 80 |

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

JAN 11 2007

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, OR 97220

Dear Mr. Hansen: Don

The purpose of this letter is to advise the Pacific Fishery Management Council (Council) that the National Marine Fisheries Service (NMFS) has determined that the Council's request regarding an emergency rule limiting participation in the Pacific whiting fishery should not be approved. The Council had requested that NMFS "approve an emergency rule to be implemented for the 2007 [whiting] season to prohibit participation of AFA-qualified vessels with no sector specific catch history in the fishery prior to 2006 (effectively December 31, 2005) in the shore-based, mothership, or catcher-processor sectors of the 2007 Pacific whiting fishery." (quoted from your letter of November 9, 2006.)

The Council had made the above request in order to "prevent imminent harm to fisheries in 2007," based on its anticipation that it could not complete Amendment 15 to the fishery management plan (FMP) prior to the 2008 primary whiting season. Amendment 15, which the Council tabled in 2001, was intended to respond to Section 211(c)(3) of the American Fisheries Act (AFA), which required that "By not later than July 1, 2000, the Pacific Fishery Management Council...shall recommend for approval by the Secretary [of Commerce] conservation and management measures to protect fisheries under its jurisdiction and the participants in those fisheries from adverse impacts caused by this Act or by any fishery cooperatives in the directed pollock fishery."

The decision on whether to grant the emergency rule request depended on whether the perceived harm to the Pacific whiting fishery was caused by the AFA itself, and if there were harm from the AFA, whether the potential harm to the fishery during the 2007 season outweighs the benefits of Council's full rulemaking process. Even if NMFS had found harm from AFA vessels it would not be enough; the harm would need to be traced to the AFA.

Although the 2006 shoreside whiting season was shorter than in past years, the fishery's duration was shortened by new participation from both AFA and non-AFA vessels. Higher whiting prices and new markets for whiting filets attracted new interest from shoreside fish processors that had not previously participated in the primary shoreside season. These processors sought out vessels to deliver whiting, contracting with both AFA and non-AFA vessels. Higher whiting prices also affected the mothership sector which, for the first time in several years, took its complete allocation before the end of the calendar year.

NMFS issued 39 shoreside whiting exempted fishing permits (EFPs) for the 2006 primary whiting season; 15 of those EFPs were held by AFA vessels. Of the 15 AFA vessels with 2006 EFPs, four were new participants in the 2006 shoreside whiting sector. Of the four new AFA vessel participants in the shoreside whiting sector, only one was newly associated with a groundfish limited entry permit in 2006. The remaining three AFA vessels new to the shoreside whiting sector have been registered for use with their same limited entry permits since the early to mid-1990s, and have participated in either the groundfish bottom trawl fishery, the mothership whiting sector, or both.

Even if NMFS were to approve the Council's request for an emergency rule prohibiting AFA vessel participation in the shoreside whiting fishery, participation in the 2007 whiting primary season would remain open to any non-AFA vessel that currently has or is able to purchase or lease a limited entry trawl permit. For this reason, the Northwest Region does not believe that the AFA itself is the cause of increased participation in the shoreside whiting fishery, nor does the Region believe that prohibiting AFA vessels from participating in the whiting fishery would solve the concern expressed by the Council and members of the public about the shorter season duration in 2006 and the potential for a shorter duration season in 2007. The Northwest Region believes that the number of vessels participating in the 2007 whiting season will depend largely on whiting availability and price per pound.

Although NMFS's consideration of this emergency rule request is governed by the AFA and the effect of that law, we also believe that it is appropriate to look to agency guidelines on implementing emergency rules under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). On August 21, 1997, NMFS issued policy guidelines for the use of emergency rules under Section 305(c) of the Magnuson-Stevens Act (62 FR 44421). Those guidelines state, in part, that "Controversial actions with serious economic effects, except under extraordinary circumstances, should be done through normal notice-and-comment rulemaking." The Northwest Region of NMFS believes that this Council request may be considered a controversial action with serious economic effects for those vessels that would be excluded from the fishery.

For the reasons discussed above, and because the Northwest Region of NMFS believes that groundfish allocation decisions are more appropriately handled through the Council's full rulemaking process (as described in Section 6.2(D) of the FMP) than through an emergency rule process, I have denied the Council's request for an emergency rule. I note that the recently passed congressional amendments to the Magnuson-Stevens Act contain several provisions specific to the West Coast Pacific whiting fishery. NMFS looks forward to working with you in the coming year as you develop new management measures for the whiting fishery, whether in furtherance of Amendment 15 or in response to a new Magnuson-Stevens Act.

Sincerely,

Bob Lohn

D. Robert Lohn
Regional Administrator

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

February 13, 2007

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador PL
Portland, OR 97220

Dear ~~Mr. Hansen~~ Don:

The National Marine Fisheries Service is committed to working with the PFMC to continue your strong tradition of sustainably managing west coast fisheries.

As you know, we did not move forward with your request for emergency action to prohibit certain American Fisheries Act (AFA) boats from participating in the 2007 Pacific Whiting season. The reasons are spelled out in our January 11 response to you and I won't elaborate on them here.

We recognize that the council remains concerned about potential adverse conservation and/or safety effects to the fishery from unconstrained entry in 2007. If the Council chooses to forward a new proposal and supporting record for emergency action during the 2007 season based on continued concern about the general effect of new entrants on the fishery, we would review that request on its merits. We would, however, continue to be concerned if the request based the proposed action on the AFA, which applies only to a subset of potential new entrants, rather than the Magnuson-Stevens Act.

In at least one previous instance, NOAA has approved an emergency rule request to limit participation in a fishery. In that instance, the restrictions (a) applied to all new entrants in the fishery, and (b) were adopted because of conservation concerns. Significantly, there was substantial information in the record documenting the basis of the conservation concerns.

Any request for emergency action that has the primary effect of allocating the whiting resources among different users will need very strong supporting documentation, since fishery, allocation by itself, is not an appropriate reason for an emergency rule. Finally, NMFS will review any request for consistency with the MSA and associated emergency rule guidelines, as well as the APA.

NMFS looks forward to continuing our relationship to sustainably manage west coast fisheries into the future.

Sincerely,

Bob Lohn

D. Robert Lohn
Regional Administrator

State of Washington
**DEPARTMENT OF FISH AND WILDLIFE**

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

September 29, 2006

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PFMC

Mr. Robert Lohn, Regional Administrator
NOAA – Fisheries
7600 Sand Point Way NE
Seattle, Washington 98115

Dear ~~Mr. Lohn~~: Bob -

During the week of September 11, 2006, the Pacific Fishery Management Council (Council) passed a motion to recommend that the National Marine Fisheries Service (NMFS) adopt an emergency rule to prohibit participation in the shoreside whiting fishery by American Fisheries Act (AFA)-qualified vessels that did not participate in the shoreside fishery prior to 2006. The purpose of this letter is to express the Washington Department of Fish and Wildlife's opposition to this action and our recommendation that NMFS deny the Council's request.

The rationale that was articulated for the motion, which was made by the Oregon Department of Fish and Wildlife (ODFW) representative, is: 1) four AFA-qualified vessels participated in the shoreside whiting fishery in 2006 - one vessel had participated since 2001 in the mothership sector and three new vessels that reportedly had not participated prior to the enactment of the AFA; 2) these four new vessels "contributed to the shoreside fishery closing 7-10 days earlier than the previous year;" 3) two "traditional" shoreside participants in Oregon reported declines of 25-30% in deliveries and revenue from previous seasons; and 4) because of the relatively larger size (harvest capacity) and lack of experience of the four vessels in the shoreside fishery, these new AFA vessels have a higher potential to take rockfish, thereby, increasing the risk of exceeding the hard rockfish bycatch caps that are applicable to the entire whiting fishery (all sectors).

As the discussion ensued on the Council floor, it became clear that in addition to the four new AFA-qualified vessels there were also six additional new vessels that were non-AFA-qualified participating in the 2006 shoreside fishery. We agree that the new harvest capacity represented by the ten new vessels that entered the fishery in 2006 was a primary factor in the season being reduced in time; it is unclear from the data presented whether the shortened season was a direct result of the participation by the AFA vessels. We would also point out that the information in the ODFW report is not an accurate post-season estimate of the impact of the proposed emergency rule on the 2006 season. The information regarding the landings by these targeted AFA-qualified vessels referenced 15,928 metric tons (mt) (17.3%) of the 91,995 mt landed into Oregon and Washington. This harvest total includes the harvest by all four vessels when, in fact,

the emergency rule would only impact three of the vessels. The harvest total of the three AFA vessels affected by the rule is 11,352 mt, which is 12.3% of the Oregon/Washington total.

Washington has two processors that participate in the shoreside fishery, one in Westport and the other in Ilwaco. In 2005, 33.2% of the shoreside non-tribal whiting harvest was landed into Washington; 63.6% was landed into Oregon. In 2006, two of the three new AFA vessels landed into Westport, Washington. However, the proportion of the whiting harvest landed into Washington decreased by 3%, while Oregon's landings increased by 2%. The third new AFA vessel and five of the six non-AFA vessels all landed into Oregon. It is likely that these vessels had a more direct effect on the number of deliveries and market availability for those "traditional" participants in Oregon than the boats landing in Washington.

With regard to the potential of the new AFA vessels to have higher bycatch of overfished rockfish, the overall amount of bycatch in the shoreside sector in 2006 decreased by about 50% from 2005 for canary, darkblotched, and widow rockfish, which are the primary species of concern for this fishery. Furthermore, these particular vessels had very low individual bycatch rates of these species.

This emergency rule has the potential to significantly impact Washington's shoreside whiting fishery participants – the two AFA vessels that landed into Washington in 2006 represent about 15% of Washington's total shoreside whiting landings and over 20% of the amount delivered into Westport. The emergency rule singles out three AFA-qualified vessels, while it is well known that a large portion of the vessels participating in the shoreside fishery are AFA-qualified, some of which have maintained their AFA benefits while becoming full time participants in the West Coast whiting fishery. The emergency rule will not fix the problem associated with new entrants into the fishery and the corresponding negative impacts on the historic participants.

This emergency rule creates a limited access program in the absence of an assessment of the impacts to these participants and due process. The Council adopted two control rules relative to this fishery more than six years ago. These vessel owners made substantial investments to participate in the fishery without any knowledge that their participation would be limited to only one season. In fact, at least one vessel owner purchased a permit from an existing shoreside participant (his vessel did not add a vessel to the fleet, it replaced one). Situations such as this would likely be analyzed through a more deliberative process. From our perspective, to take this action via emergency rule rather than through a full rule making process is indefensible.

Finally, as you know, the Council has begun developing alternatives for a dedicated access program for the West Coast groundfish trawl fishery, including the whiting fishery. If additional effort limitation measures are needed in the shoreside fishery, developing and implementing such measures is more appropriately addressed through that process so that the impacts on those affected can be analyzed and considered by the Council prior to making a final decision.

If you have any questions regarding this matter, please contact Phil Anderson, Assistant Director for Intergovernmental Resource Management, at 360.902.2720.

Sincerely,

Jeff P. Koenings, Ph.D.
Director

cc: Phil Anderson
Michele Culver

Oregon
Theodore R. Kulongoski, Governor

**Department of Fish and Wildlife**
Office of the Director
3406 Cherry Avenue, NE
Salem, OR 97303
503.947.6044
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February 6, 2007

Mr. Robert Lohn, Regional Administrator
NOAA – Fisheries
7600 Sand Point Way NE
Seattle, WA 98115

Dear Mr. Lohn:

I have recently received a copy of your letter to Pacific Fishery Management Council Chairman Don Hansen dated January 11, 2007. We are extremely disappointed with your decision to deny the Council's request for an emergency rule to prohibit participation in the 2007 whiting fishery by American Fisheries Act (AFA) qualified vessels that did not participate in the fishery prior to 2006.

I cannot over-emphasize the urgent nature of our concerns and the potential impact to coastal fishing communities. I understand there are AFA qualified vessels with no history in the whiting fishery preparing to enter each of the three sectors (shoreside, catcher-processor, and mothership). It is clear that the lack of action on an emergency rule will result in significant de-stabilization of this fishery in 2007. I urge you to reconsider your decision and implement the Council's recommended emergency rule. I have attached a copy of materials that ODFW staff prepared to brief me on this issue and hope you find it useful.

Please contact me at your earliest convenience if you have questions or concerns.

Sincerely,

Virgil Moore

Virgil Moore, Director
Oregon Department of Fish and Wildlife

cc: Dr. William Hogarth, Director, NMFS
Dr. Donald McIsaac, Executive Director, PFMC
Mr. Donald Hanson, Chair, PFMC
Mr. Frank Lockhart, NW Region, NMFS
Ms. Eileen Cooney, NOAA Office of General Counsel
Dr. Jeff Koenings, Director, WDFW

# OREGON DEPARTMENT OF FISH AND WILDLIFE'S JUSTIFICATION FOR APPROVAL OF AN EMERGENCY RULE RESTRICTING PARTICIPATION IN THE 2007 PACIFIC WHITING FISHERY

October 24, 2006

The Oregon Department of Fish and Wildlife (ODFW) received a copy of a letter (Attachment 1) submitted by the Washington Department of Fish and Wildlife (WDFW) to Mr. Robert Lohn of the National Marine Fisheries Service (NMFS). The letter addresses the motion passed by the Pacific Fishery Management Council (Council) at its September 2006 meeting, recommending that NMFS adopt an emergency rule to prohibit participation in the shoreside whiting fishery by American Fisheries Act (AFA)-qualified vessels that did not participate in the shoreside, catcher/processor, or mothership whiting fisheries prior to 2006. The purpose of this document is to provide clarifying comments and additional information on several topics addressed in the WDFW letter, and to urge NMFS to implement this important Council recommendation.

ODFW reasserts, as stated in the Agenda Item C.5.b., Supplemental ODFW Report (Attachment 2): "*The AFA provides that the Council shall take action to protect the West Coast groundfish fisheries from potential impacts. It did not require that these impacts be documented or even realized prior to the Council taking protective actions, but required that the Council take action to prevent likely or potential impacts. It is clearly a mandate that is preventative in nature. Therefore, ODFW contends that action to protect the West Coast shoreside whiting fishery at this time is appropriate. Action is clearly justified and prudent due to the effort shift from AFA vessels during the 2006 season, and would exceed the requirements in the AFA for action by the Council or NMFS to take protective measures.*"

This report will:

*A)* Clarify the motion that was made by Mr. Curt Melcher, ODFW, including the friendly amendment made by Mr. Dale Meyers, Washington At-Large Council representative.

*B)* Demonstrate that this situation meets or exceeds the criteria for an emergency rule as detailed in 62 CFR 44421, August 21, 1997.

   *1)* *"Results from recent, unforeseen events or recently discovered circumstances."*

      a) The 2006 shoreside whiting season demonstrated differentially high risks from AFA-qualified vessel entrants due to bycatch, economic instability and changes in fishery behavior inherent in a derby fishery.

2) *"Presents serious conservation or management problems in the fishery."*

   a) A serious overfished species bycatch/conservation exists as a result of the increased pressure associated with a derby or "Olympic" fishery which is perpetuated by the unique characteristics of AFA-benefited vessels.

   b) The infrastructure needed to effectively fish in the shoreside whiting fishery is expensive and unattainable for most of the existing bottom trawl fleet. However, the needed infrastructure currently exists for AFA-benefited vessels, as the same equipment is used in the Bering Sea/Aleutian Islands (BSAI) pollock fishery.

   c) The current structure of the BSAI pollock fishery grants AFA-benefited vessels the flexibility needed to adjust fishing strategies to participate in West Coast groundfish fisheries with little or no additional expenses.

   d) The latent capacity of AFA-benefited vessels has greater potential to adversely impact the West Coast groundfish fishery, than that of the bottom trawl fleet due to the unique characterists of the AFA-benefited fleet.

   e) There are increasing incentives for AFA-benefited vessels to begin participating in the West Coast groundfish fishery, and specifically in the shoreside whiting fishery.

   f) The intensive and well developed management program currently in place to manage the shoreside whiting fishery is unable to accommodate a fast paced "derby" fishery.

   g) Spillover from the shoreside whiting fishery has the potential to negatively impact the bottom trawl fishery due to unanticipated increases in effort, and increased uncertainty in the inseason regulation assessment model.

3) *"Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process."*

   a) The Council has revitalized the Amendment 15 (protection from adverse impacts caused by the AFA) process, but there is not sufficient time to complete the amendment process for implementation prior to the 2007 shoreside whiting fishery when protection from the adverse impacts further described in this report is needed.

   b) The risks of a derby fishery, expanding over-capitalization, and potential overages in bycatch limits exceed the risks and uncertainty present in 2005 when NMFS did take action by emergency rule in West Coast groundfish fisheries (open access, and Pacific whiting).

   c) Demonstrate the precedent set in the North Pacific where initial implementation of AFA sideboards in the BSAI and Gulf of Alaska (GOA) groundfish fisheries, the BSAI crab fishery, and the Alaska scallop fishery were done through emergency rule while the North Pacific Fishery Management Council was executing the AFA amendment process.

The data used in the analysis shown in this letter is specific to the shoreside sector, and is the best information available to-date. Landings data were compiled on October 5, 2006. Similar information for the catcher/processor and mothership sectors is not readily available to ODFW, nor is there an agreement between the state and participants in those sectors that would allow publication of data that would otherwise fall within the confidentiality restriction governing all landing data (such an agreement exists for participants in the shoreside whiting exempted fishing permit (EFP) fishery).

In an effort to prevent disclosure of the whiting landings made by any one particular vessel, catches are reported in the following aggregations: four AFA-qualified vessels without participation in the shoreside whiting fishery prior to the implementation of AFA ("AFA-qualified" vessels), five non-AFA-qualified vessels that participated in 2006, but not in 2005 ("non-AFA-qualified" vessels), and the remaining 28 vessels that participated in both the 2005 and 2006 shoreside whiting fisheries ("traditional" vessels). All of the traditional vessels have participation history in the shoreside whiting fishery prior to the enactment of AFA. When referencing "AFA-benefited vessels", all vessels that receive benefits from the AFA, regardless of their participation in West Coast groundfish fisheries are included.

**Supporting Information:**

A) **Clarification of Motion:** At the 2006 September Council meeting held in Foster City, California, the motion that was made by Mr. Curt Melcher, ODFW, and amended by Mr. Dale Meyers, WA At-Large, is as follows:

*1) The Council shall continue working expeditiously on Amendment 15. 2) The Council recommends to NMFS that there be an adoption of emergency rule prior to the 2007 Pacific whiting fishery that would prohibit participation in the shoreside, catcher/processor, and mothership sectors of the Pacific whiting fishery by AFA-qualified vessels that do not have a historic participation record in those sectors prior to 2006 (i.e., participation in the shoreside, catcher-processor, or mothership sector by December 31, 2005 required for participation in the 2007 fishery).*

There was no provision for cross-over between sectors. Historical participation in the mothership sector would not qualify a vessel to participate in the shoreside sector in 2007. In making this motion, Mr. Melcher referred to agenda item C.5.b., Supplemental ODFW Report, which contains information supporting the motion. That report is Attachment 2 to this report.

B) **Criteria for an Emergency Rule:** ODFW asserts that this situation meets or exceeds the criteria for an emergency rule.

1) ***Results from recent, unforeseen events or recently discovered circumstances:*** The 2006 shoreside whiting season demonstrated differentially high risks from AFA-qualified vessel entrants due to bycatch, economic instability, and changes in fishery behavior inherent in a derby fishery. In 2006, the potential harm to West Coast groundfish fisheries, specifically to the shoreside whiting fishery, by AFA vessels was realized. Table 1 details the amount of whiting harvest, duration of the shoreside whiting fishery, and participation levels from 1992 through 2006.

**2006 Shoreside Whiting Fishery Participation:**

Thirty-seven vessels landed 97,314 mt of Pacific whiting shoreside in the 2006 directed shoreside fishery. Of the 37 vessels participating in 2006 (35 participated in the EFP fishery, two sorted at-sea), 15 are AFA-qualified vessels. Eleven of those vessels participated in the shoreside whiting EFP fishery prior to the implementation of AFA in 1999. Of the remaining four AFA-qualified vessels, one vessel has participated in the shoreside whiting EFP fishery since 2001. The remaining three vessels first participated in the shoreside whiting EFP fishery in 2006.

Five additional vessels that were non-AFA-qualified participated in the 2006 shoreside fishery and not in the 2005 fishery. Four of those vessels had not landed whiting in the shoreside fishery since the inception of the EFP fishery in 1992, while one of those non-AFA-qualified vessels does have prior participation in this fishery. Two of those non-AFA-qualified vessels elected to sort-at-sea, and not participate in the EFP fishery.

There were 28 traditional vessels that participated in the 2006 shoreside whiting fishery. All of those vessels participated in the EFP fishery. These vessels had significant shoreside whiting participation history prior to 2006. The landings of the AFA-qualified, non-AFA-qualified, and traditional vessels in the 2006 shoreside whiting fishery are detailed in Table 2.

**AFA-qualified Landings in the 2006 Shoreside Whiting Fishery:**

The four AFA-qualified vessels that participated in 2006 that had not participated prior to the enactment of the AFA and the establishment of the control date landed a total of 15,742 mt. This amount was 16% of the 97,314 mt of whiting landed in the shoreside fishery coastwide, and 17% of the 91,840 mt of whiting landed in Washington and Oregon (Table 2). Three of the AFA-qualified vessels (including the one AFA-qualified vessel which has participated in this fishery since 2001) landed whiting in Westport, Washington (one vessel made deliveries in both Westport (2) and Astoria (15)).

A total of 52 deliveries (18% of the Washington landings) were made by AFA-qualified vessels into Washington (Table 3), landing a total of 9,093 mt of whiting (30% of the whiting landed into Washington). Two of these four AFA-qualified vessels made 40 deliveries (5% of the Oregon landings) into Oregon, landing 6,649 mt of whiting, or 11% of the whiting landed into Oregon.

The proposed emergency rule would affect two of the three AFA-qualified vessels that delivered whiting into Washington, as one of those AFA-qualified vessels has participated in the shoreside whiting fishery since 2001, and therefore that vessel would be eligible to participate in the 2007 shoreside whiting fishery. This vessel contributed substantially to the Washington deliveries, as WDFW pointed out in their letter to NMFS.

It is stated in the WDFW letter to NMFS that "*The emergency rule singles out three AFA-qualified vessels, while it is well known that a large portion of the vessels participating in the shoreside fishery are AFA-qualified, some of which have maintained their AFA benefits while becoming full time participants in the West Coast whiting fishery.*" There have been a total of 28 AFA-qualified vessels that have delivered whiting shoreside since the inception of the EFP fishery in 1992. Four of those vessels entered the shoreside whiting fishery post-AFA; one vessel began participating in 2001 and three vessels made their first landings in 2006. Each of the remaining 24 AFA-benefited vessels was a full time participant in the shoreside whiting fishery prior to the implementation of the AFA in 1999.

**Non-AFA-qualified Landings in the 2006 Shoreside Whiting Fishery:**

Five non-AFA-qualified vessels participated in 2006 that did not participate in 2005 (four of which made their first landings in this fishery; one had made landings prior to 2005). Two of those vessels did not participate in the EFP fishery in 2006, instead electing to sort-at-sea. These five non-AFA-qualified participants made 101 deliveries (9%), landing 3,239 mt of whiting, or 3% of the coastwide landings, and 4% of the landings in Washington and Oregon (Table 2). These vessels averaged 32 mt of whiting per landing. These landing numbers are substantially smaller than those described in the previous section for the four AFA-qualified vessels. Therefore, WDFW's assertion in their letter to NMFS, that "*It is likely that these vessels* (non-AFA vessels) *had a more direct effect on the number of deliveries and market availability for those "traditional" participants in Oregon than the boats landing in Washington.*" is clearly not justified.

Table 1. Summary of the whiting harvest, season start and end dates, season duration, and vessel and processor participants in the shoreside whiting fishery from 1992-2006.

| Year | Whiting Harvest (mt) | Whiting Allocation (mt) | Start Date | End Date | Duration (Days) | # Vessels | # Processors |
|---|---|---|---|---|---|---|---|
| 1992 | 49,092 | 80,000 | 4/15/1992 | 10/30/1992 | 198 | 23 | 7 |
| 1993 | 41,926 | 42,000 | 4/15/1993 | 8/24/1993 | 131 | 24 | 13 |
| 1994 | 72,367 | 97,000 | 4/15/1994 | 11/23/1994 | 222 | 33 | 8 |
| 1995 | 73,397 | 75,776 | 4/15/1995 | 7/25/1995 | 101 | 35 | 15 |
| 1996 | 84,680 | 87,001 | 5/15/1996 | 9/10/1996 | 118 | 37 | 11 |
| 1997 | 87,499 | 86,900 | 6/15/1997 | 8/22/1997 | 68 | 38 | 12 |
| 1998 | 87,627 | 86,900 | 6/15/1998 | 10/13/1998 | 120 | 35 | 13 |
| 1999 | 83,388 | 83,800 | 6/15/1999 | 9/13/1999 | 90 | 36 | 14 |
| 2000 | 85,653 | 83,790 | 6/15/2000 | 9/15/2000 | 92 | 36 | 14 |
| 2001 | 73,326 | 72,618 | 6/15/2001 | 9/26/2001 | 103 | 29 | 13 |
| 2002 | 45,276 | 44,906 | 6/15/2002 | 7/17/2002 | 32 | 29 | 8 |
| 2003 | 51,061 | 50,904 | 6/15/2003 | 7/14/2003 | 29 | 35 | 9 |
| 2004 | 89,251 | 90,510 | 6/15/2004 | 8/14/2004 | 60 | 26 | 9 |
| 2005 | 97,378 | 97,469 | 6/15/2005 | 8/18/2005 | 64 | 29 | 10 |
| 2006 | 97,322 | 97,314 | 6/15/2006 | 8/2/2006 | 48 | 37 | 14 |
| **Average** | **74,616** | **78,459** | | | **98** | **32** | **11** |

Table 2. A comparison of whiting landings made by AFA-qualified, non-AFA-qualified, and traditional vessels in the 2006 shoreside whiting fishery. (W = Washington, O = Oregon, and C = California)

| | AFA-Qualified Vessels (4) | | | Non-AFA-Qualified Vessels (5) | | | Traditional Vessels (28) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Max.Vessel* | Ave. Vessel** | Total | Max. Vessel* | Ave. Vessel** | Total | Max. Vessel* | Ave. Vessel** |
| # of Landings | 92 | 29 | 23 | 101 | 28 | 20 | 978 | 81 | 35 |
| % of W-O | 9% | 3% | 2% | 9% | 3% | 2% | 91% | 8% | 3% |
| % of W-O-C | 8% | 2% | 2% | 9% | 2% | 2% | 84% | 7% | 3% |
| Volume (mt) | 15,742 | 4,576 | 3,935 | 3,239 | 933 | 648 | 78,333 | 6,566 | 2,798 |
| % of W-O | 17% | 5% | 4% | 4% | 1% | 1% | 85% | 7% | 3% |
| % of W-O-C | 16% | 5% | 4% | 3% | 1% | 1% | 80% | 7% | 3% |
| mt/landing | 171 | 158 | 171 | 32 | 33 | 32 | 80 | 81 | 80 |

* Max. Vessel = The vessel that landed the most whiting (mt) within their vessel category.
** Ave. Vessel = The average landings/volume of all of the vessels within their vessel category.

Table 3. A comparison of whiting landings made by AFA-qualified vessels in the 2006 shoreside whiting fishery.

| | Washington | Oregon |
|---|---|---|
| # of Vessels* | 3 | 2 |
| # of Processors | 1 | 2 |
| # of Landings | 52 | 40 |
| % of State | 18% | 5% |
| % of AFA | 57% | 43% |
| % of W-O | 5% | 4% |
| % of W-O-C | 4% | 3% |
| Volume (mt) | 9,093 | 6,649 |
| % of State | 30% | 11% |
| % of AFA | 58% | 42% |
| % of W-O | 10% | 7% |
| % of W-O-C | 9% | 7% |

* One vessel made deliveries into both Washington and Oregon

WDFW states in their letter to NMFS that "*We agree that the new harvest capacity represented by the ten new vessels that entered the fishery in 2006 was a primary factor in the season being reduced in time; it is unclear from the data presented whether the shortened season was a direct result of the participation by the AFA vessels*." There were actually eight vessels that participated in the 2006 shoreside whiting fishery that did not participate in 2005. Table 2 details the gross difference between whiting landings made by the AFA-qualified vs. non-AFA-qualified participants, and Figure 1 shows the relative amount of harvest by AFA-qualified, non-AFA-qualified, and traditional participants. By dividing the total whiting volume landed by AFA-qualified vessels by the average daily whiting volume landed by the remaining fishery participants, it is demonstrated that the season would have likely lasted thirteen days longer, had the AFA-qualified vessels not have participated.

$$\mathbf{15{,}742\ mt\ )\ 1{,}212\ mt/day = 13\ days}$$

**2006 Shoreside Whiting Fishery Processor Participation:**

Fourteen processors participated in the shoreside whiting fishery coastwide. Eight of those processors ("traditional") had participated in the 2005 shoreside whiting fishery; six processors ("new") had not participated in the 2005 shoreside whiting fishery. The eight "traditional" processors processed 91% of the whiting landed in the 2006 shoreside whiting fishery (Figure 2).

2) ***Presents serious conservation or management problems in the fishery:***

**Bycatch:**

There is a serious overfished species bycatch/conservation concern due to increased pressure associated with a derby or "Olympic" fishery which is perpetuated by the unique characteristics of AFA-benefited vessels. These vessels pose a unique and substantial risk to the bycatch reduction measures that have already been taken in this fishery.

The issue of bycatch in this fishery is two fold. First and foremost, there is considerable concern about the impacts that may be realized as more vessels enter the fishery than about the bycatch levels observed in 2006. The shoreside whiting fishery is one of low overall bycatch. As the "race for fish", and thus the "race for bycatch" are exacerbated, the incentives for maintaining fishery practices that result in low bycatch are sacrificed. The likely result of AFA-benefited vessel participation is promotion of a derby style fishery, lasting a couple of weeks or less, and the associated increased bycatch (which includes

Figure 1. Percentage of 2006 shoreside whiting catch by vessel category.

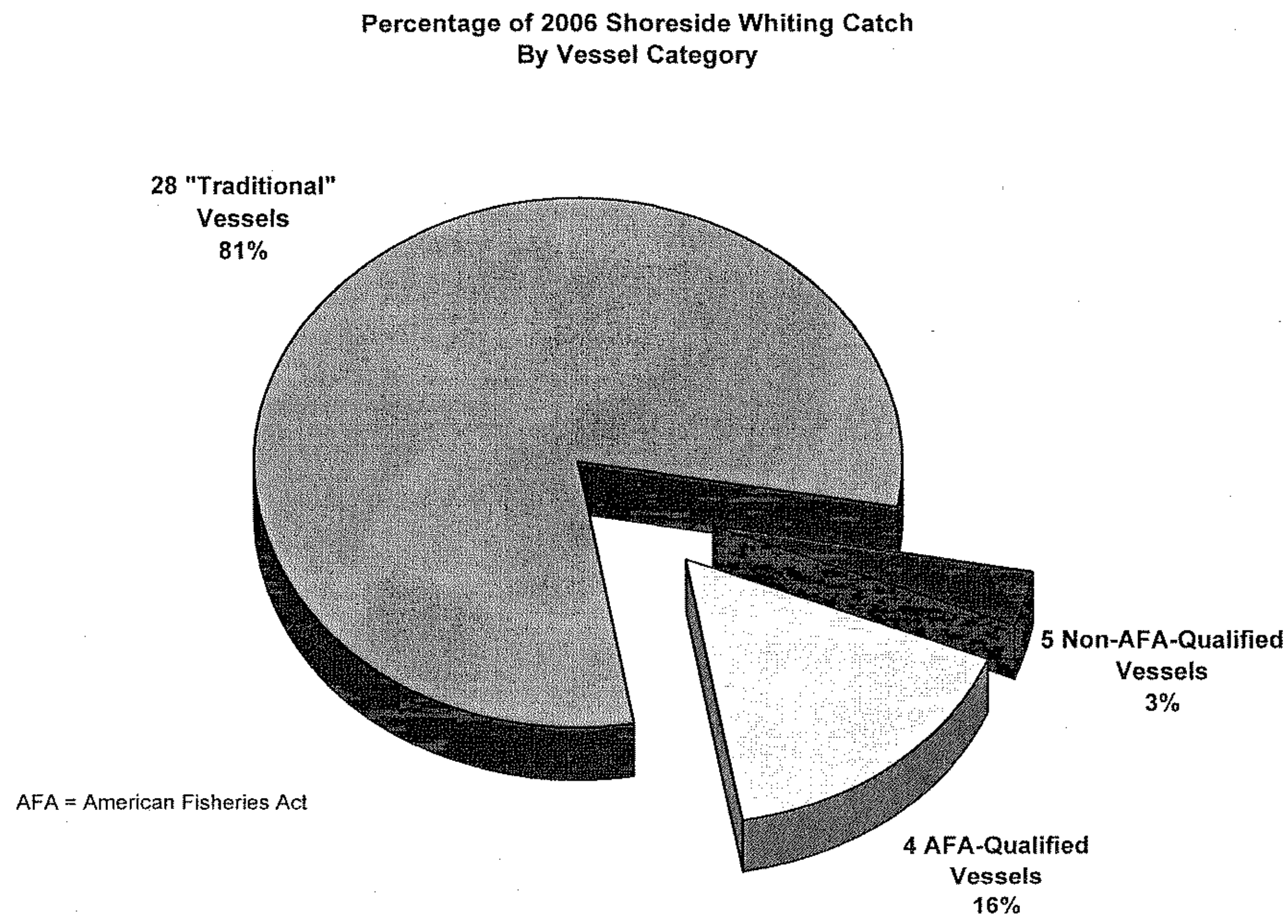
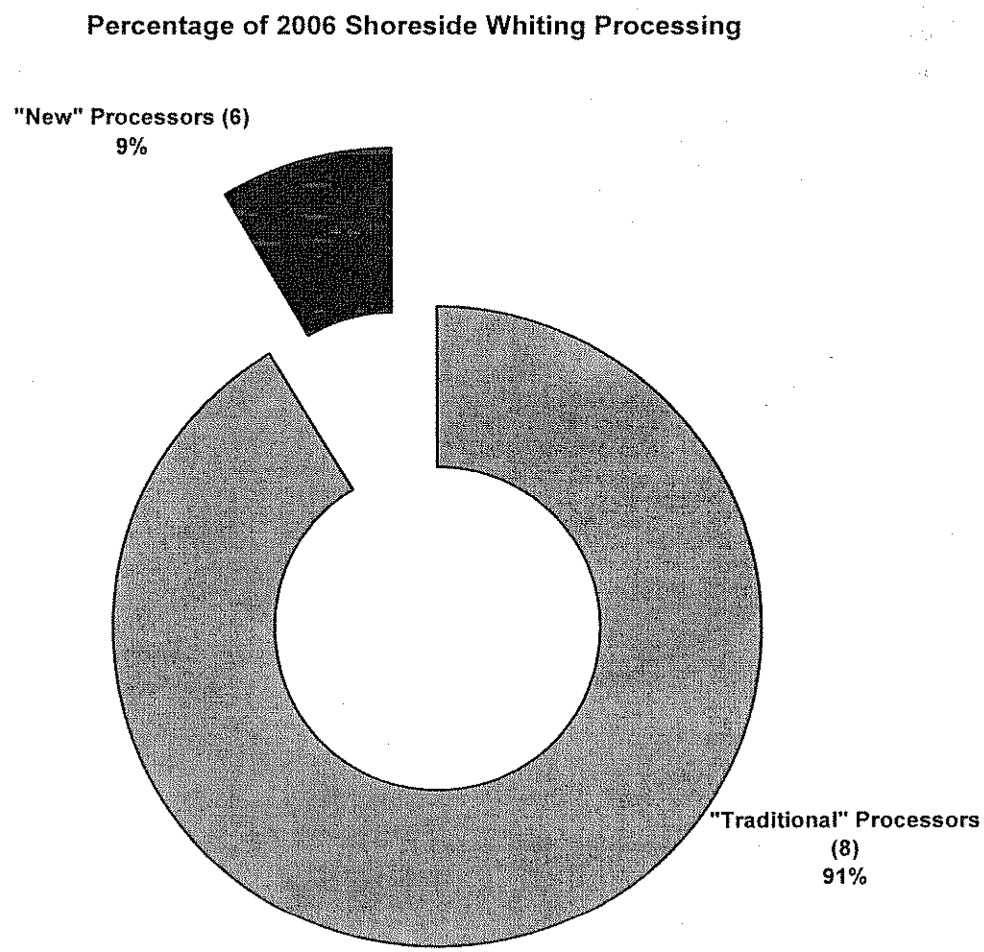


Figure 2. Percentage of 2006 shoreside whiting catch processed by "new" processors (did not participate in 2005) and "traditional" processors (also participated in 2005).



species of concern such as Chinook salmon, widow rockfish, darkblotched rockfish, and canary rockfish) that typically results from this type of fishery.

The second fold of the bycatch issue is the actual bycatch rates obtained by large capacity vessels without experience in the shoreside whiting fishery. Additionally, Alaska vessels without experience in West Coast groundfish fisheries do not have experience operating in fisheries that have great constraints from stocks that have been declared "overfished". WDFW states in their letter to NMFS that "*...these particular vessels* (AFA-qualified) *had very low individual bycatch rates...*" Three of the four vessels had bycatch rates that **were higher** than the average rate of 0.0024 mt of bycatch (excluding Chinook salmon and Pacific halibut) per 1 mt of whiting landed. The same three AFA-qualified vessels had bycatch rates for Chinook salmon and Pacific halibut that were just below the average of 0.011 fish per 1 mt of whiting landed. While any vessel can have a disaster tow, the risk to this fishery and all West Coast groundfish fisheries is increased with larger capacity vessels due to the shear volume of fish that can be impacted during a tow.

**Infrastructure:**

The infrastructure needed to effectively participate in the shoreside whiting fishery includes: vessel size and horse power, appropriate electronics and fishing gear, and refrigeration and tanking capabilities. For those vessels that lack the equipment and specifications needed, the cost of outfitting a vessel outweighs the potential profit and is prohibitively expensive and unattainable for most of the existing bottom trawl fleet. However, the needed infrastructure currently exists on AFA-benefited vessels, as exactly the same equipment is used in the BSAI pollock fishery.

An existing trawl vessel no smaller than ~70 ft in length is required to effectively haul and operate the equipment needed to fish whiting in a safe manner. Older trawl vessels are not wide enough to maintain stability under the heavy equipment load needed for this fishery. A horsepower (HP) class of 450-500 HP is marginal. Vessels fishing at this level would be substantially less efficient than the current shoreside whiting vessels. Re-powering a vessel into the next HP class would cost approximately $100,000 - $125,000.

Before a trawl vessel, especially one that has been modified, can participate in the shoreside whiting fishery it would need to pass a stability test. This test consists of a full inclining experiment, and is administered by a naval architect and witnessed by an inspector with the United States Coast Guard. The test is completed at an estimated cost of $10,000 - $20,000. If the vessel was unable to pass the stability test, it would need to be "sponsoned" or widened. This consists of adding material to the existing bulkheads to make it wider (increasing the width by 6 to 8 feet, and thus increasing its stability). This process is extremely expensive (estimated to cost $250,000 - $350,000) and requires consultation with a naval architect.

The equipment needed to effectively target whiting includes: sonar, head rope sounder, mid-water trawl net, and a separate engine for the hydraulics needed to operate the mid-water net. The sonar and head rope sounder have an estimated cost of $15,000 – $20,000 each. Also, due to advances in net configuration and materials, a new mid-water net would be needed at an approximate cost of $25,000 – $40,000 for the net and codend. A separate engine for the additional hydraulics needed to fish the mid-water net (making vertical adjustments to the net) would have to be installed and plumbed at a minimum cost of $15,000 – $20,000.

To preserve the product, once it is brought on board, tanking capabilities and Refrigerated Sea Water (RSW) systems are required. Installing tanking capabilities consist of reconfiguring the hold and bulkhead to hold water and product. The tank needs to be lined with a watertight material such as fiberglass. The cost for tanking a vessel ranges from $70,000 – $100,000 depending on the tank capacity. For a vessel with a smaller hold, the cost for the RSW system is estimated at $80,000 – $100,000. A current participant in the shoreside whiting fishery recently replaced the RSW on his vessel at a cost of $160,000. The cost of the both the tank and the RSW system increase with the capacity of the vessel.

The overall low-end cost of configuring a current non-whiting trawl vessel of small size to effectively fish in the shoreside whiting fishery is approximately $195,000. That cost increases with capacity and size of vessel, with a potential to exceed $800,000. This cost outweighs the potential profits made in the shoreside whiting fishery by existing bottom trawl vessels. AFA-benefited vessels escape the equipment and vessel re-fitting costs, as the equipment needed to efficiently harvest pollock in the BSAI management area is the same equipment described above, needed to efficiently harvest whiting in the shoreside whiting fishery.

The existing whiting fleet has been relatively stable since the inception of the EFP fishery in 1992. This is mainly due to the cost of outfitting an existing bottom trawl vessel to effectively fish in the shoreside whiting fishery. Brad Pettinger, Executive Director of the Oregon Trawl Commission, reviewed the non-AFA-benefited vessels that currently hold a West Coast groundfish limited entry trawl permit (142 catcher vessels). He concluded that approximately 21 vessels could potentially fish for whiting in the future. The hold capacity of the 21 vessels, if they were all tanked would average 100,000 lbs. (ranging from 80,000 – 120,000 lbs). Only five of those vessels are currently tanked as they participate in the Dungeness crab fishery. Not one of the 21 trawl vessels is currently configured to fish for whiting without additional equipment; and the expense of doing so far outweighs the potential profits to be gained in the shoreside whiting fishery, as those vessels would also need to alter their current business plans.

**Fishery Participation Incentives:**

There are increasing incentives for AFA-benefited vessels to begin participating in the West Coast groundfish fishery, and specifically in the shoreside whiting fishery including increased price and market demand for whiting, low start-up costs as AFA-benefited vessels already posses the needed infrastructure (as described in the previous section), and the need to establish landing history and qualifications for an Individual Fishing Quota program.

The price of whiting was unusually high in 2006 at $0.065 per pound (compared to the 992-2005 average price of $0.04 per pound), and, combined with the expanding markets for white fish have increased the attractiveness of this fishery for those vessels already equipped to participate in this fishery. There were six processors that processed shoreside whiting in 2006 that did not participate in 2005, as pointed out in the WDFW letter to NMFS. As shown in Figure 2 (page 10), the "new" processors processed very little (9%) of the shoreside whiting landed coastwide in 2006. Existing processors are increasing whiting processing capabilities. The majority of the shoreside whiting is being processed and sold as either "headed and gutted" product or surimi product, with some fillet processing being conducted. These products are being marketed internationally.

The Council is currently in the midst of developing an individual quota (IQ) program for the West Coast groundfish trawl fishery. Although NMFS established a control date of November 6, 2003 (69 CFR 1563, January 9, 2004) specific to the trawl IQ program, vessels are attempting to accrue landings history to fulfill potential participation requirements to secure individual quotas of groundfish.

**Current BSAI Pollock Fishery:**

The current structure of the BSAI pollock fishery grants AFA-benefited vessels the flexibility needed to adjust fishing strategies to participate in West Coast groundfish fisheries with little or no added expenses.

Prior to the implementation of the AFA in 1999, the BSAI pollock B season fishery was an over-capitalized "Olympic" fishery that lasted for an average of 46 days (Table 4). At that time, fishery participants lobbied Congress to de-capitalize the fishery, and move it from the derby fishery structure to one of a rationalized fishery. The American Fisheries Act Coalition produced a brochure supporting the adoption of the AFA (Attachment 3). The front cover of that brochure reads "*You can't feed your family working just 10 weeks a year.*

*Neither can we.*" Congress heard their cry for help, and adopted the AFA in October 1998.

After the enactment of AFA, the duration of the BSAI pollock B season was extended to an average of 142 days, due to vessels having pollock Dedicated Access Privileges (DAP). Under a DAP system, fishing cooperatives are assigned a portion of the overall sector allocation based on the historical participation levels of each of the member vessels. Those vessels are then assigned an amount of pollock by the cooperative. The vessel has the flexibility to either harvest their DAP as they see fit within the set season start and end dates, lease or trade their DAP to another vessel, or not use the DAP at all. The lengthened season allows AFA-benefited vessels to participate in other fisheries, and still achieve their pollock harvest limits. We are now seeing these AFA-benefited vessels with more "free time" participating in the West Coast groundfish fishery, specifically, the shoreside whiting fishery.

Table 4. The duration of the BSAI pollock B season from 1994 – 2006.

| Year | Start Date | End Date | Duration (Days) |
|---|---|---|---|
| 1994 | 8/15/1994 | 10/4/1994 | 50 |
| 1995 | 8/15/1995 | 10/23/1995 | 69 |
| 1996 | 9/1/1996 | 10/17/1996 | 46 |
| 1997 | 9/1/1997 | 10/16/1997 | 45 |
| 1998 | 9/1/1998 | 10/20/1998 | 49 |
| 1999-B | 8/1/1999 | 8/26/1999 | 25 |
| 1999-C | 9/15/1999 | 10/26/1999 | 41 |
| 2000* | 6/10/2000 | 11/4/2000 | 147 |
| 2001 | 6/10/2001 | 10/27/2001 | 139 |
| 2002 | 6/10/2002 | 10/25/2002 | 137 |
| 2003 | 6/10/2003 | 10/25/2003 | 137 |
| 2004 | 6/10/2004 | 11/1/2004 | 144 |
| 2005 | 6/10/2005 | 11/4/2005 | 147 |
| 2006 | 6/10/2006 | 11/1/2006 | 144 |
| | | **Average** | **94** |

* First year of AFA implementation

**Latent Capacity:**

The latent capacity of AFA-benefited vessels has greater potential to adversely impact the West Coast groundfish fishery, than that of the bottom trawl fleet due to the unique characterists of the AFA-benefited fleet.

The AFA-benefited vessels are of large capacity (the average landing by the four AFA-qualified vessels was 171.11 mt while the average landing by the remaining 33 vessels was 79.93 mt), and already have the infrastructure needed to effectively participate in the whiting fishery (described previously). In his written testimony to the Council, received August 1, 2006, Fred Yeck, managing owner of the 124 ft. F/V Seadawn, an AFA-benefited Inshore Catcher Vessel with a hold capacity of 285 mt, states "*We will happily participate in a whiting derby no matter how short it gets simply because as AFA vessels, we are fully equipped, able to delay our participation in the pollock fishery and as a result it costs us nothing to participate* (in the shoreside whiting fishery)." Brent Paine, Executive Director of United Catcher Boats agreed during his public testimony at the September Council meeting that there is an immediate potential of increased participation by AFA-benefited vessels and that we would "possibly see a shoreside and mothership fishery that is 15 days long".

The threat of increased AFA-benefited vessel participation is large. In addition to the 15 AFA-benefited vessels that participated in the 2006 shoreside whiting fishery, NMFS issued another 96 Catcher Vessel Permits to AFA-benefited vessels fishing in the BSAI pollock fishery. Twelve of those vessels have existing West Coast groundfish limited entry trawl permits. These additional vessels have the capacity to shift effort into the West Coast whiting fishery, as they already possess the infrastructure needed to effectively participate. Mr. Yeck, in his written testimony to the Council, further states "*...if the door is left open this is a capitalistic and competitive business and if my large AFA vessel owner friends from Seattle are going to be allowed to convert this fishery to a derby, I intend to enter the derby also.*"

The latent capacity within the current West Coast groundfish limited entry trawl fishery pales in comparison to that of the AFA-benefited vessels. As described in previous sections, the majority of the existing trawl vessels to not currently contain the infrastructure needed to efficiently fish in the shoreside whiting fishery. The costs associated with acquiring the needed infrastructure far outweigh the benefits gained by participation in the fishery, thus the risk of new entrants to the shoreside whiting fishery coming from the existing West Coast limited entry bottom trawl fishery is minimal.

**Management of the Current Shoreside Whiting Fishery:**

The intensive and well developed management program currently in place to manage the shoreside whiting fishery on a daily basis is unable to accommodate a fast paced "derby" fishery.

As the duration of the fishery diminishes, so does the ability of fishery management agencies to react to and adjust for problem situations. The current shoreside whiting fishery is intensively managed, using a daily processor reporting system. The current tracking system is over-burdened at the current pace of the fishery. It is expensive and difficult to try to attempt daily tracking of this fishery. Acceleration of the fishery will likely cause a breakdown in the ability to monitor the harvest of whiting as well as the impacts to species of concern and hinder the ability of fishery managers to respond to either slow the fishery or close it completely in a timely manner.

**Spillover:**

Spillover from the shoreside whiting fishery has the potential to negatively impact the bottom trawl fishery due to unanticipated increases in effort, and increased uncertainty in the inseason regulation assessment model.

A conservation concern that grows in importance as the duration of the shoreside whiting fishery shrinks is that of spillover into other groundfish fisheries. David Jinks, President of Midwater Trawlers Cooperative testified to this occurrence in his written testimony received by the Council on August 21, 2006. "*The spillover coming out of the huge Bering Sea rationalized pollock fishery has now cost most of us 30% of our income, with non-member vessels reporting 50% losses in annual revenue. The spillover is continuing, the shoreside whiting fishermen that have not participated in the traditional groundfish fishery for years are now changing over to bottomfish to make up for lost income.*" The effects from spillover from a shortened whiting fishery have the potential to affect not only the bottom trawl sector, but all groundfish fisheries on the entire west coast.

As more pressure is put on the bottom trawl fishery, the complexity of managing that fishery is increased. This fishery is intensely managed for a year-round fishery, with inseason adjustments occurring at nearly every Council meeting throughout the year. The complicated model used to forecast the effects from inseason trip limit adjustments on the bottom trawl fishery incorporates a participation module. This module uses past participation by vessels that are currently participating in the bottom trawl fishery across months, years, area, and depth to help estimate future participation under various regulation scenarios. Spillover from other fisheries-in this case, the shoreside whiting fishery-adds to the uncertainty of the model, as there would not be the historical vessel information (how and where those vessels would fish in the bottom trawl fishery) needed to accommodate the model.

3) ***Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process:***

**Current Amendment 15 Process:**

A brief description of the past Council actions relative to the Amendment 15 (protection from adverse impacts caused by the AFA) process is contained in Attachment 2 to this report.

The Council revitalized the Amendment 15 process at its September 2006 meeting, but there isn't sufficient time to complete the amendment process for implementation prior to the 2007 shoreside whiting fishery when protection from the adverse impacts previously described in this report is needed.

The next step in the Council process is to revisit the alternatives contained in the environmental assessment that was prepared by the Council in 2001. This would not occur until the spring of 2007. The Council will need to adopt alternatives for public review, a final preferred alternative, and NMFS will need to complete the full rulemaking process to implement the Council's final preferred alternative. It is not possible for this process to conclude prior to the start of the shoreside whiting fishery of the coasts of Washington and Oregon on June 15, 2007. Therefore, emergency action is needed now to implement interim measures to protect the whiting fishery from adverse impacts caused by the AFA. The process proposed here is similar to that taken by the North Pacific Fishery Management Council when they implemented AFA-sideboards in various groundfish fisheries, as well as the BSAI crab fishery and the Alaska scallop fishery. That process is detailed below.

**Recent Examples of Relevant Emergency Rules implemented in the West Coast Groundfish Fishery and the North Pacific:**

The risks of a derby fishery, expanding over-capitalization, and potential overages in bycatch limits exceed the risks and uncertainty present in 2005 when NMFS did take action by emergency rule in West Coast groundfish fisheries (open access, and Pacific whiting). Additionally, initial implementation of AFA sideboards in the BSAI and Gulf of Alaska (GOA) groundfish fisheries, the BSAI crab fishery, and the Alaska scallop fishery were done through emergency rule while the North Pacific Fishery Management Council was executing the amendment process.

West Coast Groundfish:

On May 2, 2005, NMFS implemented an emergency rule (70 CFR 23804, May 5, 2005) in response to a 124.5 ft freezer-longliner vessel that had expressed interest in targeting spiny dogfish in the waters off Washington State as a participant in the open access groundfish fishery. The public notice states "*The West Coast open access groundfish fishery is open to any vessel that is otherwise authorized to fish under U.S. Coast Guard safety, registration, and other requirements.*" Rather than limit the participation of this one vessel, NMFS placed bycatch caps on the entire groundfish directed open access fishery, using the anticipated impact amounts that were developed during the 2005 harvest specifications and management measures setting process. This action was taken absent any Council action or full Council discussion of the matter. Even though this vessel elected to not fish in 2005, NMFS again took emergency action on November 1, 2005 (70 CFR 65861, November 1, 2005) to extend the original emergency rule for an additional 180 days.

Effective August 26, 2005, NMFS implemented an emergency rule (70 CFR 51682, August 31, 2005) to establish a salmon conservation zone for the primary Pacific whiting fishery, shoreward of a boundary line approximating the 100-fm depth contour. This rule was enacted in accordance with a re-initiation of the biological opinion consultation.

North Pacific:

The catcher vessel groundfish sideboards for the BSAI and Gulf of Alaska (GOA) groundfish fisheries were originally vaguely defined in paragraphs 211(b)(1) and (2) of the AFA. NMFS implemented regulatory authority to manage these sideboards through emergency rule effective January 20, 1999 (64 CFR 3435). At its June 1999 Council meeting, the North Pacific Fishery Management Council made recommendations on adjustments to the original sideboards, including qualifying periods for BSAI groundfish catcher/processor harvest limits. There was concern expressed by members of the public that there was not enough opportunity for public comment relative to the sideboard adjustments recommended by the Council. Therefore, NMFS chose to implement sideboard amounts for 2000 through emergency rule, allowing the public further opportunity to comment on the Council recommendations.

Implementation of AFA-sideboards in the BSAI and GOA groundfish fisheries, BSAI crab fishery, and Alaska scallop fishery was done through emergency rule while the NPFMC completed the amendment process to implement sideboards in permanent rule.

In 65 CFR 380, January 5, 2000, NMFS implemented "*an emergency interim rule to implement permit requirements for vessels, processors, and cooperatives wishing to participate in the Bering Sea and Aleutian Islands management area (BSAI) pollock fishery under the American Fisheries Act (AFA) * * * and to implement sideboard restrictions to protect other Alaska fisheries from negative impacts as a result of fishery cooperatives formed under the AFA*." In this emergency rule, NMFS implemented sideboards in the BSAI crab fishery consisting of a sideboard endorsement.

In late January 2000, NMFS published a second emergency rule to "*...implement harvesting restrictions on AFA catcher vessels and AFA catcher/processors to limit effort by such vessels in other groundfish and crab fisheries...*" (65 CFR 4520, January 28, 2000). NMFS implemented BSAI groundfish fishery sideboards for catcher/processors, allowing minimal harvest on groundfish stocks thought large enough to sustain harvest by unrestricted AFA catcher/processors, and prohibiting directed fishing on groundfish stocks that were considered too small to support a directed fishery. Additionally, AFA catcher/processors were completely prohibited from fishing in the GOA. "*Using this approach, NMFS will assure that unrestricted AFA* *catcher/processors will not participate in other directed fisheries at levels that would exceed their level of participation from 1995 through 1997.*" This emergency rule also implemented catcher vessel sideboards in the BSAI crab, BSAI and GOA groundfish and the Alaska scallop fishery.

# Attachment 1

State of Washington
**DEPARTMENT OF FISH AND WILDLIFE**

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

September 29, 2006

Mr. Robert Lohn, Regional Administrator
NOAA – Fisheries
7600 Sand Point Way NE
Seattle, Washington 98115

Dear Mr. Lohn: Bob –

During the week of September 11, 2006, the Pacific Fishery Management Council (Council) passed a motion to recommend that the National Marine Fisheries Service (NMFS) adopt an emergency rule to prohibit participation in the shoreside whiting fishery by American Fisheries Act (AFA)-qualified vessels that did not participate in the shoreside fishery prior to 2006. The purpose of this letter is to express the Washington Department of Fish and Wildlife's opposition to this action and our recommendation that NMFS deny the Council's request.

The rationale that was articulated for the motion, which was made by the Oregon Department of Fish and Wildlife (ODFW) representative, is: 1) four AFA-qualified vessels participated in the shoreside whiting fishery in 2006 - one vessel had participated since 2001 in the mothership sector and three new vessels that reportedly had not participated prior to the enactment of the AFA; 2) these four new vessels "contributed to the shoreside fishery closing 7-10 days earlier than the previous year;" 3) two "traditional" shoreside participants in Oregon reported declines of 25-30% in deliveries and revenue from previous seasons; and 4) because of the relatively larger size (harvest capacity) and lack of experience of the four vessels in the shoreside fishery, these new AFA vessels have a higher potential to take rockfish, thereby, increasing the risk of exceeding the hard rockfish bycatch caps that are applicable to the entire whiting fishery (all sectors).

As the discussion ensued on the Council floor, it became clear that in addition to the four new AFA-qualified vessels there were also six additional new vessels that were non-AFA-qualified participating in the 2006 shoreside fishery. We agree that the new harvest capacity represented by the ten new vessels that entered the fishery in 2006 was a primary factor in the season being reduced in time; it is unclear from the data presented whether the shortened season was a direct result of the participation by the AFA vessels. We would also point out that the information in the ODFW report is not an accurate post-season estimate of the impact of the proposed emergency rule on the 2006 season. The information regarding the landings by these targeted AFA-qualified vessels referenced 15,928 metric tons (mt) (17.3%) of the 91,995 mt landed into Oregon and Washington. This harvest total includes the harvest by all four vessels when, in fact,

the emergency rule would only impact three of the vessels. The harvest total of the three AFA vessels affected by the rule is 11,352 mt, which is 12.3% of the Oregon/Washington total.

Washington has two processors that participate in the shoreside fishery, one in Westport and the other in Ilwaco. In 2005, 33.2% of the shoreside non-tribal whiting harvest was landed into Washington; 63.6% was landed into Oregon. In 2006, two of the three new AFA vessels landed into Westport, Washington. However, the proportion of the whiting harvest landed into Washington decreased by 3%, while Oregon's landings increased by 2%. The third new AFA vessel and five of the six non-AFA vessels all landed into Oregon. It is likely that these vessels had a more direct effect on the number of deliveries and market availability for those "traditional" participants in Oregon than the boats landing in Washington.

With regard to the potential of the new AFA vessels to have higher bycatch of overfished rockfish, the overall amount of bycatch in the shoreside sector in 2006 decreased by about 50% from 2005 for canary, darkblotched, and widow rockfish, which are the primary species of concern for this fishery. Furthermore, these particular vessels had very low individual bycatch rates of these species.

This emergency rule has the potential to significantly impact Washington's shoreside whiting fishery participants – the two AFA vessels that landed into Washington in 2006 represent about 15% of Washington's total shoreside whiting landings and over 20% of the amount delivered into Westport. The emergency rule singles out three AFA-qualified vessels, while it is well known that a large portion of the vessels participating in the shoreside fishery are AFA-qualified, some of which have maintained their AFA benefits while becoming full time participants in the West Coast whiting fishery. The emergency rule will not fix the problem associated with new entrants into the fishery and the corresponding negative impacts on the historic participants.

This emergency rule creates a limited access program in the absence of an assessment of the impacts to these participants and due process. The Council adopted two control rules relative to this fishery more than six years ago. These vessel owners made substantial investments to participate in the fishery without any knowledge that their participation would be limited to only one season. In fact, at least one vessel owner purchased a permit from an existing shoreside participant (his vessel did not add a vessel to the fleet, it replaced one). Situations such as this would likely be analyzed through a more deliberative process. From our perspective, to take this action via emergency rule rather than through a full rule making process is indefensible.

Finally, as you know, the Council has begun developing alternatives for a dedicated access program for the West Coast groundfish trawl fishery, including the whiting fishery. If additional effort limitation measures are needed in the shoreside fishery, developing and implementing such measures is more appropriately addressed through that process so that the impacts on those affected can be analyzed and considered by the Council prior to making a final decision.

If you have any questions regarding this matter, please contact Phil Anderson, Assistant Director for Intergovernmental Resource Management, at 360.902.2720.

Sincerely,

Jeff P. Koenings, Ph.D.
Director

cc: Phil Anderson
Michele Culver

# Attachment 2

Agenda Item C.5.b
Supplemental ODFW Report
September 2006

OREGON DEPARTMENT OF FISH AND WILDLIFE'S COMMENTS REGARDING AMENDMENT 15 PROTECTION FROM ADVERSE AMERICAN FISHERIES ACT (AFA) IMPACTS

The Oregon Department of Fish and Wildlife (ODFW) supports immediate completion of Amendment 15 to the West Coast Groundfish Fishery Management Plan, affording protection from AFA designated vessels that have not previously participated in the traditional shoreside Pacific whiting fishery. Delaying the protection required by AFA in this amendment will result in immediate adverse impacts to the shoreside Pacific whiting fishery, as well as other Pacific Coast groundfish fisheries. The Council stated their intent in the advanced notice of proposed rulemaking (FR Vol. 64, No. 226, Wednesday, November 24, 1999).

The American Fisheries Act (AFA) was enacted in 1998 to reduce the harvest capacity in the Alaska pollock fishery by retiring nine Bering Sea catcher/processors. It also defined conditions for creating fishery cooperatives in the pollock fleet. Vessels that participate in such cooperatives are likely to have increased flexibility in arranging their fishing schedules (vs. vessels that participate in a "derby" style fishery); this allows them to consider entering additional fisheries (including the Pacific Coast Groundfish Fishery) that occur during the traditional Alaska pollock season.

Under the requirements of the 1998 Act, (PL 105-277, Section 211 ( c)
*(3) Fisheries other than North Pacific:*

*A) By not later than July 1, 2000, the Pacific Fishery Management Council established under section 302(a)(1)(F) of the Magnuson-Stevens Act (16 U.S.C. 1852 (a)(1)(F)) shall recommend for approval by the Secretary conservation and management measures to protect fisheries under its jurisdiction and the participants in those fisheries from adverse impacts caused by this Act or by any fishery cooperative in the directed pollock fishery.*

*B) If the Pacific Council does not recommend such conservation and management measures by such date, or if the Secretary determines that such conservation and management measures recommended by the Pacific Council are not adequate to fulfill the purposes of this paragraph, the Secretary may by regulation implement adequate measures including, but not limited to, restrictions on vessels which harvest pollock under a fishery cooperative which will prevent such vessels from harvesting Pacific groundfish, and restrictions on the number of processors eligible to process Pacific groundfish.*

In the years subsequent to enacting AFA, the Council developed alternatives to afford the groundfish fishery the protection required by AFA (1999 – 2001). This process was abandoned late in 2001. A brief history is relevant:

- **Late 1999** - the Pacific Fishery Management Council adopted participation requirements and unanimously voted to initiate the development of recommendations to restrict AFA qualified vessels from participating in the Pacific Coast groundfish fishery (FR Vol. 64, No. 226, Wed, Nov 24, 1999, Advanced Notice of Proposed Rulemaking).

- **April 2000** - the Council reviewed alternatives for providing protection to Pacific Coast groundfish fisheries and its participants from AFA qualified vessels and processors that failed to meet minimum participation requirements in the Pacific Coast groundfish fisheries. In addition, the Council considered whether to restrict, suspend, or void permits registered to AFA-qualified vessels if the vessels did not meet the participation requirements.
- **September 2000** - the PFMC, as authorized by the AFA, considered management measures to recommend to the Secretary of Commerce to protect the Pacific Coast groundfish fisheries from adverse impacts caused by the AFA (FR Vol. 65, No. 178, Wed, Sept 13, 2000, Advanced Notice of Proposed Rulemaking). The intended effect of this action was to discourage speculative entry or increased effort in the Pacific Coast groundfish fisheries by entities eligible for AFA.
- **September 2001** – The Council selected a preferred alternative that restricted participation by AFA vessels that did not meet qualifying requirements and restricting the use of limited entry permits held by those vessels. It was believed this would provide the greatest protection against harm resulting from increased effort shift by AFA vessels. Restricting both the vessel and the limited entry permit associated with that vessel reduced the likelihood that an AFA beneficiary would be able to participate in West Coast groundfish fishery to the detriment of the current fishery participants.

Subsequent to this, in March of 2002, the Council voted not to continue to work on the AFA sideboard process, but voted to support a risk assessment at the November 2002 meeting to assess the potential harm of continued no action or of allowing NMFS to address the restrictions at that time. This delay was due to a workload concern in dealing with an urgent need to address overfished species rebuilding impacts on the entire fleet.

An assessment was not conducted in November of 2002, but the Council did not have information that indicated a shift in effort into Pacific Coast fisheries from AFA vessels until the 2006 Pacific whiting season. At that time, three new AFA participant vessels with no previous record of landings in the shoreside fishery prior to AFA, participated in the shoreside fishery. A single AFA vessel, which did not have Pacific coast whiting fishery participation prior to AFA, but which had participated in this fisheries since 2001, also continued to participate in 2006.

During 2006, these four large AFA qualified vessels, without participation in the shoreside whiting fishery prior to AFA, fished in the shoreside whiting EFP fishery out of a total of 37 participating vessels. These new participants had a combined total whiting catch of 15,928 mt (17.3%) of the 91,995 mt taken in the northern (Oregon and Washington) fishery. The average catch per trip by these vessels ranged from 147-218 mt compared to the average for the traditional fleet of 76 mt. This effort alone contributed to the shoreside fishery closing 7-10 days earlier than the previous year, even though the fish landed were reportedly smaller than in the past year, which should have extended the season. As AFA qualified effort increases in this fishery, the season will likely erode from a currently multiple-week-long fishery to a few days: a derby style fishery. The current management process has no way to effectively structure this type of fishery or time to react to high catches of bycatch, and the fishery has the potential to collapse (as well as to impact other groundfish fisheries).

The AFA provides that the Council shall take action to protect the west coast groundfish fisheries from potential impacts. It did not require that these impacts be documented or even realized prior to the Council taking protective actions, but required that the Council take action to prevent likely or potential impacts. It is clearly a mandate that is preventative in nature. Therefore, ODFW contends that action to protect the west coast shoreside whiting fishery at this time is appropriate. Action is clearly justified and prudent due to the effort shift from AFA vessels during the 2006 season, and would exceed the requirements in the AFA for action by the Council or NMFS to take protective measures.

Some conditions which have driven this effort shift and conservation and fishery management concerns related to it include:

* Shortly after the AFA was enacted, the North Pacific Fishery Management Council lengthened the Bering Sea pollock B Season. If the Bering Sea Fishery was still a derby fishery, it is not likely that these vessels would travel to participate in the shoreside whiting season on the West Coast (which runs from June 15$^{th}$). With the advent of the dedicated access pollock fishery and longer seasons, vessels have the time to harvest their quota when convenient and most profitable. This shift allows the large AFA vessels to come down to fish the Pacific whiting shoreside and mothership fisheries and have plenty of time to return to AK to harvest their quota of pollock in the B Season (i.e, no more derby fishery start for the B Season).

* A limited entry control date of November 6, 2003 was set by the Council for the limited entry groundfish trawl fishery ITQ program. Recently permit speculation and vessel participation has been driven by those who did not meet the control date/participation requirements.

* Price for shoreside Pacific whiting has increased significantly in 2006, attracting more vessels. In 2004 the price was .04/lb, in 2005 it was .055/lb and in 2006 .06/lb. For this high volume fishery, such price increases are a significant incentive for additional participants.

The current profile of the shoreside fishery has allowed for excellent harvest and bycatch tracking and peer pressure to enhance self-regulation of bycatch avoidance. Larger vessels not involved otherwise in west coast groundfish fisheries will have a greater likelihood of landing and less of an incentive to avoid great quantities of bycatch species when fishing in the shoreside fishery.

A primary concern of lack of action on AFA sideboards is one of conservation, particularly that of depleted rockfish species. As an example of recent federal action taken in 2005, a catcher/processor vessel speculated on participating in the open access dogfish fishery. Due to the fishing capacity of that vessel and the threat of large impacts to depleted species by that vessel, an emergency rule was enacted to cap the bycatch of the open access fishery. In a similar nature, large AFA vessels that have little experience in the shoreside whiting fishery have an even higher potential to adversely impact depleted species. New entrants with high volume vessels that are not as aware of the strategies/locations to avoid high bycatch areas add to the potential to accelerate attainment of or potentially significantly exceed the hard bycatch caps for the entire whiting fishery.

As the shoreside whiting fishery season erodes to that of a derby fishery, the incentive for bycatch reduction is likely removed. Vessels will be encouraged to prosecute the fishery as quickly as possible, with little regard to the encountered bycatch. Once the whiting allocation is achieved, some vessels return to Alaska, and many vessels revert to the traditional west coast groundfish fishery, shifting the overall concentration of effort, and thus also increasing bycatch in the traditional groundfish fishery. Additionally, the incentive to avoid salmon bycatch in the whiting fishery diminishes as the race for fish increases. In 2005, an emergency rule was enacted to restrict the whiting fishery to waters seaward of 100-fathoms due to salmon interactions, recognizing that fishing in deeper depths potentially increases bycatch of depleted darkblotched rockfish.

In addition to potential impact to resources, impact to traditional fishery participants and the existing fishery is a concern. The fishing capacity of a large vessel far out-competes that of a smaller vessel. Additionally, there is the potential for small boat markets to be replaced by larger boats, as some processors prefer accepting one large delivery versus several smaller deliveries. One traditional shoreside fishery participant reported a 25% decline in deliveries, translating into a loss of $100,000 ex-vessel value in 2006 due to the shortened season. Another shoreside vessel that participated in the fishery for 16 years, experienced a 30% loss of revenue in 2006 vs. comparable seasons. The 2006 shoreside Pacific whiting fishery had a value to coastal communities of approximately $32,500,000.

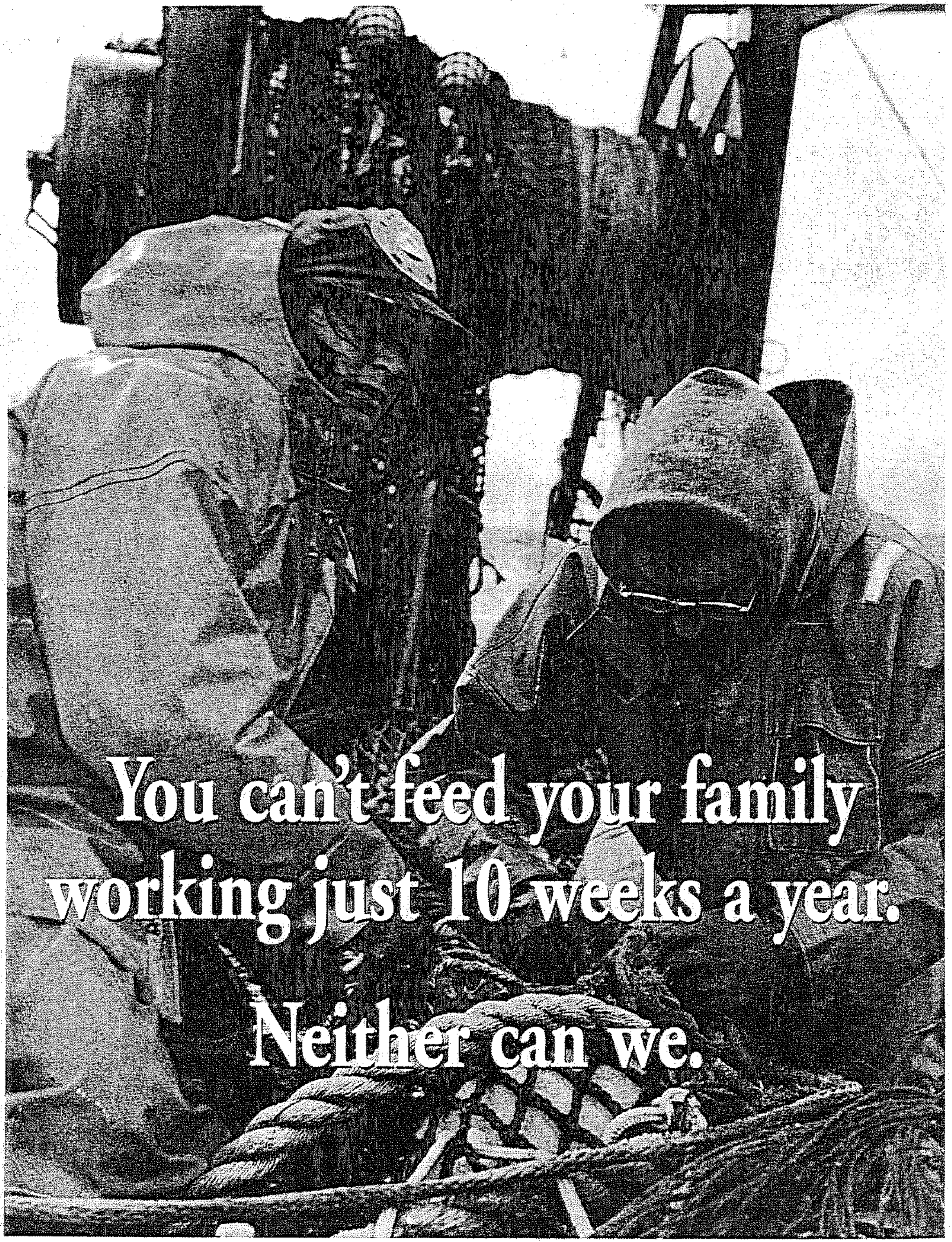
The Council repeatedly did not address the AFA sideboard requirement after 2002, due to workload priorities and assertions that there was no significant effort shift demonstrated. Clearly that effort shift occurred in 2006 and the original obligation for the Council and/or NMFS to take action (see law cited above) to protect fisheries under PFMC jurisdiction from impacts caused by any fishery cooperatives in the directed pollock fishery is of an urgent nature at this time.

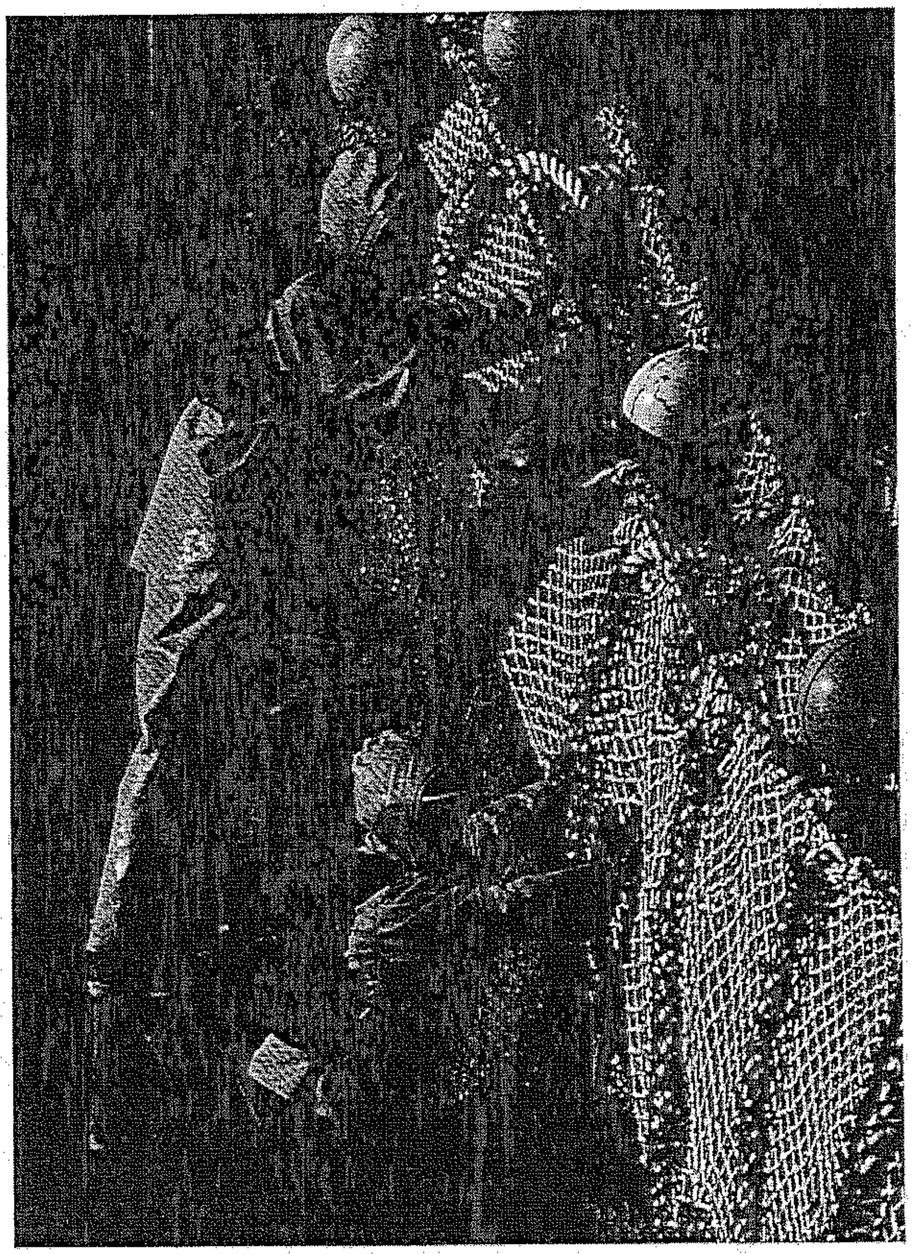
There is evidence of continued spillover by the AK dedicated access pollock fishery in to the west cost shoreside fishery. Protections required by the AFA continue to be absent and are of great urgency to implement.

**ODFW recommendations:**

1. **Move forward as soon as possible with the Amendment 15 process for establishing AFA sideboards for implementation no later than the 2008 Pacific whiting season.**
2. **National Marine Fisheries Service enact a temporary or emergency rule, in place for the 2007 shoreside whiting fishery, to prohibit participation in the shoreside whiting fishery of AFA vessels that did not participate in that fishery prior to 2006.**

# Attachment 3


You can't feed your family
working just 10 weeks a year.
Neither can we.

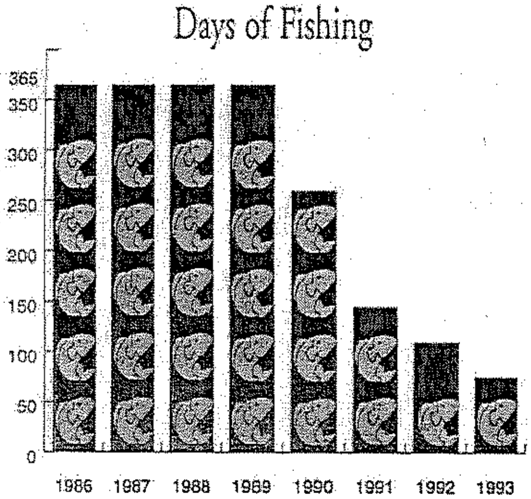


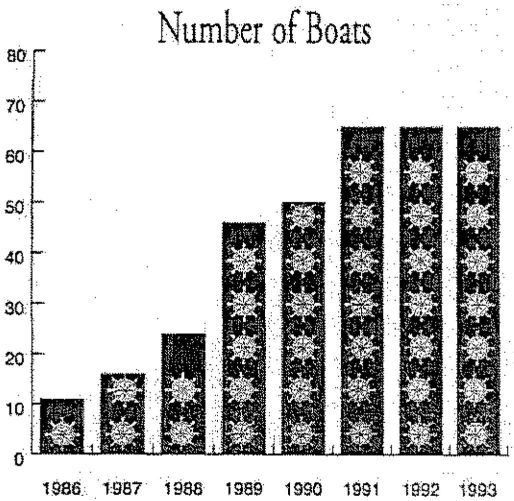
*"If the American Fisheries Act fails to become law, our country will turn its marine fishery resources over to subsidized foreign-owned fishing fleets. Let's do the right thing, before it's too late."*

— Chuck Bundrant,
President and CEO,
Seattle-based Trident Seafoods

# The American Fisheries Act will help.

*The problem:* Foreign fishing interests have used a loophole in the law to invade U.S. fisheries in the Bering Sea.



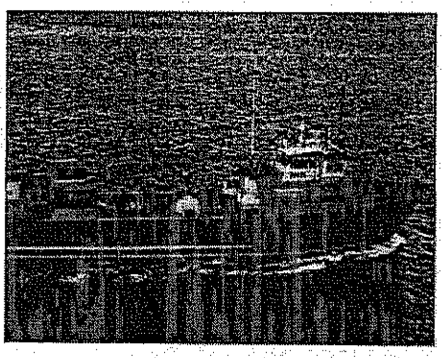




The resulting glut of boats has reduced the season for pollock, the premier fishery, from year-round to only 70 days.

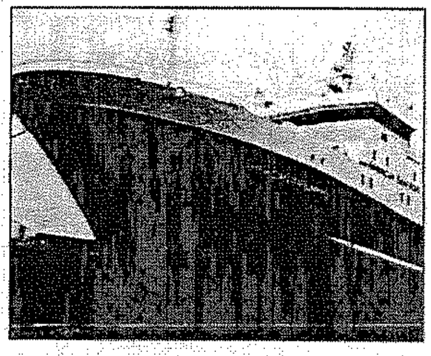
***"We used to have two full-time crews, and now we're down to one crew part-time."***

—Dave Galloway, President, Premier Pacific Seafoods of Seattle, which operates the fish processing mothership Ocean Phoenix, current crew 220, in the U.S. Bering Sea fishery

## The question is, with too many boats in the fishery, which boats should leave?



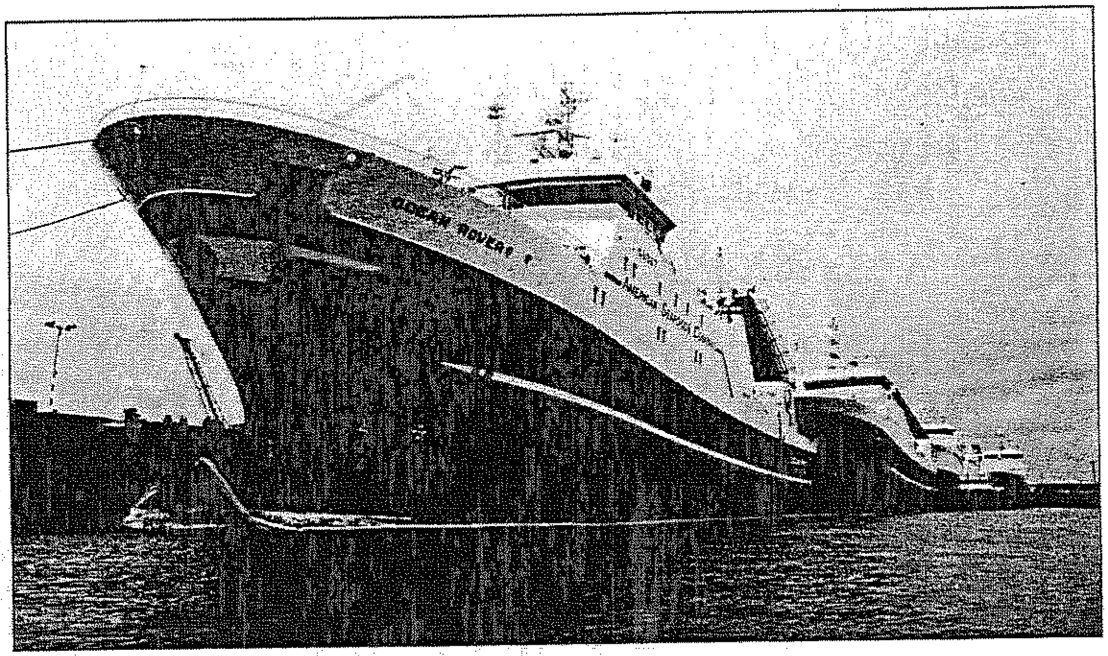
U.S. boats that played by the rules?



Or foreign-owned boats brought in through a loophole in the law?

# Foreign interests sabotaged federal law to dominate U.S. fisheries through:

- Numerous transfers of vessel ownership;
- Last minute purchase and "rebuild" contracts;
- Dramatic expansion in vessel size over what was originally intended; and
- Vessels grandfathered for use as cargo vessels but converted to factory trawlers.




## *Specific examples:*

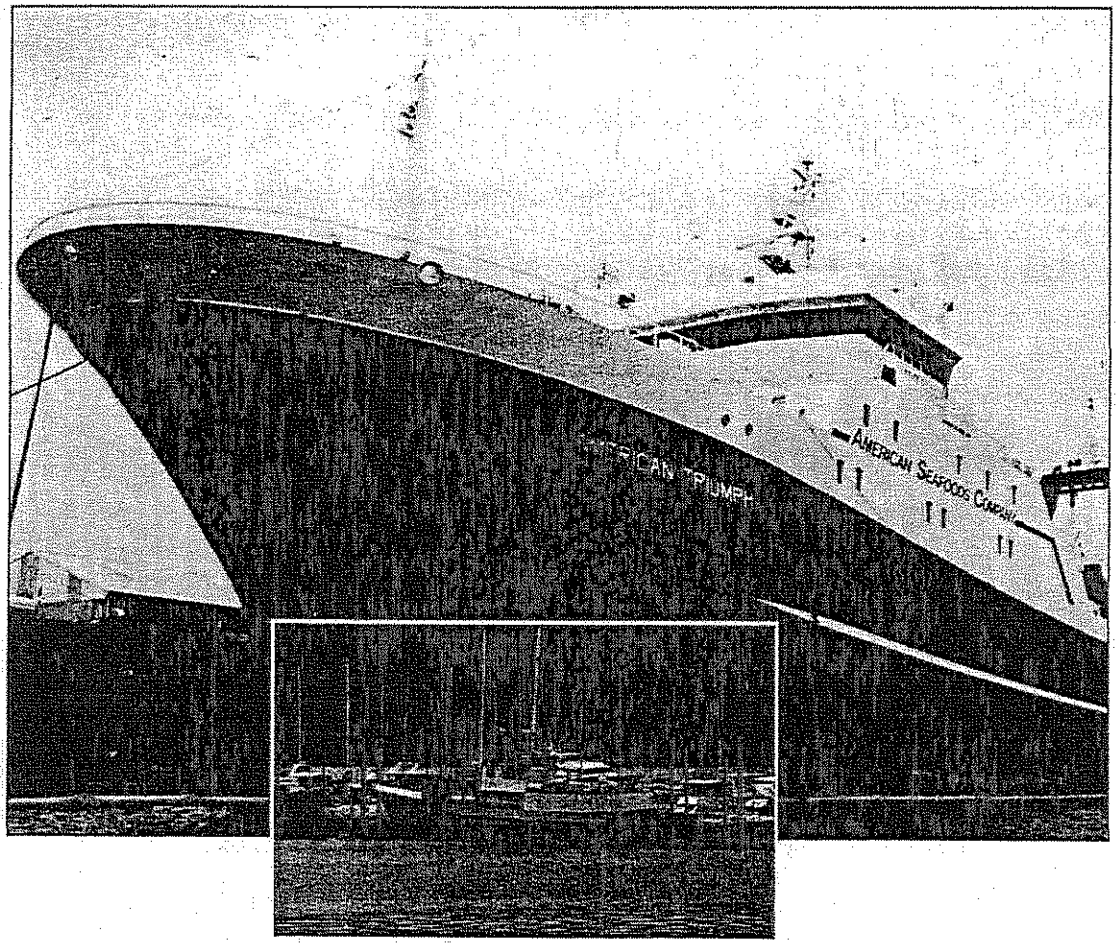
Alaska Ocean – "rebuilt" in a foreign shipyard, with a foreign subsidy, from a small offshore supply vessel of less than 500 gross tons to a 344-foot factory trawler measured at 4,555 gross tons, the largest vessel in the North Pacific, and transferred from U.S. to foreign ownership.

Northern Hawk – "rebuilt" in a foreign shipyard, with a foreign subsidy, from an offshore oil supply vessel of less than 500 gross tons to a 310-foot factory trawler of 3,582 gross tons, and transferred from U.S. to foreign ownership.

Ocean Rover – "rebuilt" in a foreign shipyard, with a foreign subsidy, from an offshore supply vessel that was originally 180 feet and 293 gross tons to a 223-foot, 4,354 gross ton factory trawler, and transferred from U.S. to foreign ownership.

Altogether, as many as 18 foreign-owned vessels were pushed through loopholes in the law, and today, these foreign-owned vessels are taking U.S. resources and U.S. jobs.

# The American Fisheries Act will plug the loopholes.




## *Do these look like the same vessel to you?*

The Acona was an 85-foot Oregon State University research vessel, until a foreign shipyard "rebuilt" it into a 286-foot factory trawler. It's now the so-called "American Triumph," but in fact it represents foreign triumph over American fisheries policy.

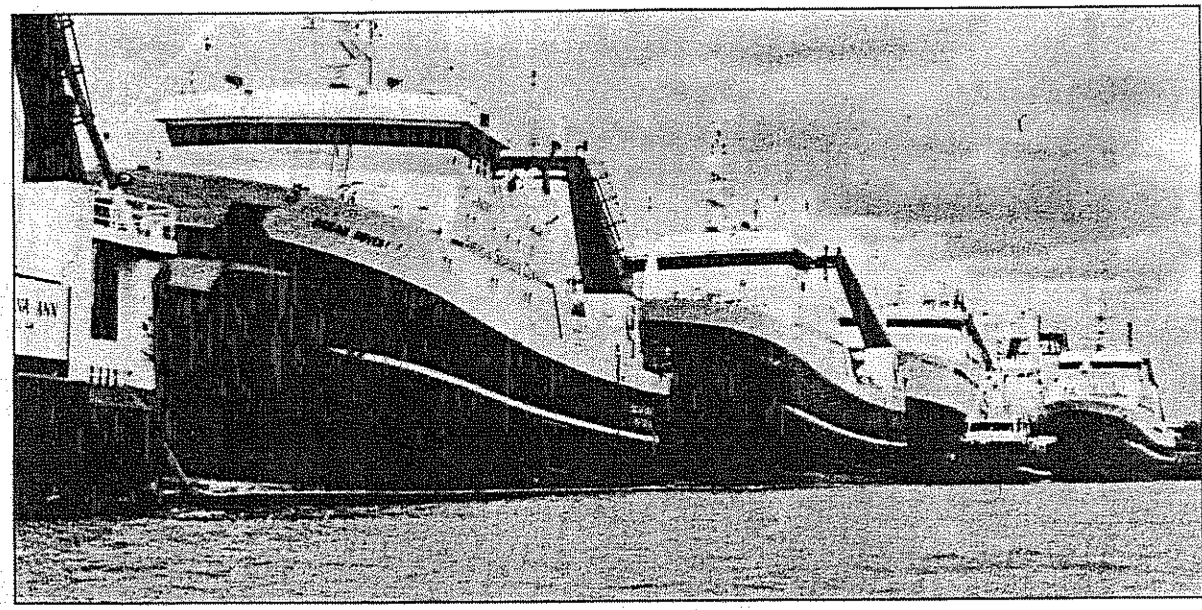
Despite the foreign rebuild and foreign ownership, it still carries an American flag and is allowed to fish in U.S. waters because it retains a fraction of its original hull.

However, the U.S. Coast Guard is investigating the allegation that a key document was fraudulently backdated to get around the law. If the allegations are true, the vessel could be banned from U.S. waters.

# The American Fisheries Act will stop foreign exploitation of our Bering Sea fishery.

One Norwegian-owned company takes 42 percent of the entire offshore pollock harvest.

Altogether, foreign-owned boats take 50 percent of the entire U.S. Bering Sea groundfish harvest.



*This massive fleet of 16 trawlers, deployed by one Norwegian company in the Bering Sea, doubled the harvesting and processing capacity of the Bering Sea fleet.*

## Federal laws are supposed to protect U.S. fisheries.

*Senator Magnuson*

*Senator Stevens*

The Magnuson-Stevens Act of 1976 gave U.S. citizens first priority to harvest fisheries within the 200-mile limit (U.S. Exclusive Economic Zone).

The Anti-Reflagging Act of 1987 required a minimum of 51 percent U.S. ownership, control by U.S. citizens, and any "rebuilding" to be done by U.S. companies.

Limited exemptions were allowed for foreign-owned vessels already fishing or contracted for purchase to fish in U.S. waters and vessels already "in the pipeline" to be rebuilt to foreign countries. But loopholes in the law were exploited to allow a flood of foreign vessels to dominate U.S. fisheries.

# The American Fisheries Act supports free and fair trade.

Some want you to believe the American Fisheries Act is not consistent with free trade* – but free trade also has to be fair trade.


Americans were outraged when we found out Airbus was subsidized to compete against Boeing.

In the Bering Sea fishery, foreign interests received massive subsidies from foreign governments, and sweetheart deals from foreign banks, to purchase the vessels of U.S. companies bankrupt because of unfair foreign competition.

Foreign-subsidized vessels take our fish, but U.S. fishermen would be heavily fined and their boats would be seized if they tried to fish in their foreign competitors' home country.

Fairness demands we stop the raiding of our fishery by foreign countries. This is one instance when all we have to do is adopt the same policy as other nations.

**Fisheries policies are excluded from free trade agreements under international law, including the UN Law of the Sea Treaty.*

# The issue for the opposition: world domination

**FISH GIANT RGI**

# "We need resources to last for 50 years"

## – Kjell Inge Røkke

> *"We definitely have the financing behind us to buy any vessel. Our goal very clearly is to be the biggest fishing company in the world."*
>
> — Bernt Bodal, CEO of American Seafoods Co., a subsidiary of Norway Seafoods, which is owned by Norwegian industrial conglomerate Aker RGI

Norwegian Fisherman Works The World's Ocean

## The Bering Sea's King Fisher

Kjell Inge Røkke's drive to expand his fisheries operations has helped make him the most powerful man in international fisheries

## Fraud alleged in factory ship deal

■ If sale documents for an American Seafoods trawler were manipulated in 1987, the vessel could lose its fishing rights

## Norwegian trawlers navigate law's loophole

## "The world's biggest fisherman"

**still seeking to expand...**

# RGI spends $50m on five trawlers

# The American Fisheries Act stands for fairness —

giving U.S. fishing companies the opportunity to compete fairly, and their employees the opportunity to earn a living wage.

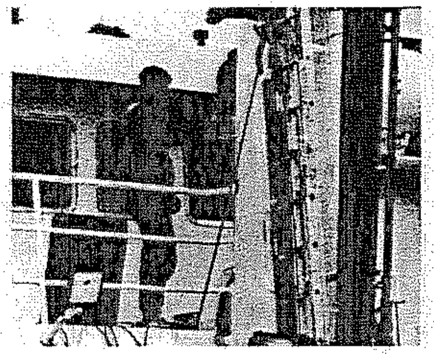
The American Fisheries Act would:

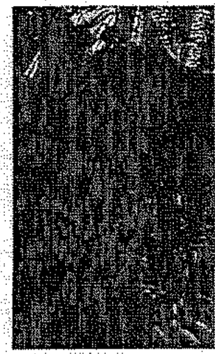
- Require 75 percent American ownership and control of all fishing vessels allowed to fish in U.S. waters;
- Revoke fishery endorsements and prohibit new fishery endorsements for foreign-owned fishing vessels that do not meet the standards of the Act;
- Eliminate from U.S. fisheries large fishing trawlers that were improperly rebuilt abroad.

The Senate Bill, S. 1221, is sponsored by a bipartisan coalition of U.S. Senators including Sen. Ted Stevens, R-Alaska; Sen. John Breaux, D-Louisiana; Sen. Ernest Hollings, D-S. Carolina; Sen. Frank Murkowski, R-Alaska; and Sen. Ron Wyden, D-Oregon. The House version of the bill is expected to be introduced soon.

# The American Fisheries Act would preserve U.S. companies and U.S. jobs.

# Who is the American Fisheries Act Coalition?





Numerous U.S. companies and thousands of individuals support the American Fisheries Act Coalition.

The American Fisheries Act Coalition members include:

- more than 75 catcher boats based in Washington, Oregon and Alaska;
- fish processing motherships such as the Ocean Phoenix of Seattle;
- U.S. companies that operate factory trawlers;
- operators of 20 shore-based processing plants in Washington, Oregon, Alaska and Minnesota;
- vendors who build, repair and supply the vessels in the U.S. fleet; and
- numerous trade associations and other individuals and groups.

The list is growing as more people learn about this issue. For a complete list of Coalition membership or more information, call 1-888-699-1221, or view the Coalition website at http://www.usafish.org

# How You Can Help: Write/Call Members of Congress and urge them to support the American Fisheries Act.

## Washington

**Sen. Slade Gorton**
730 Hart Senate Office Bldg.
Washington, DC 20510
(202) 224-3441

**Cong. Jack Metcalf**
1510 Longworth HOB
Washington, DC 20515
(202) 225-2605

**Cong. Jim McDermott**
2349 Rayburn HOB
Washington, DC 20515
(202) 225-3106

**Cong. Doc Hastings**
1323 Longworth HOB
Washington, DC 20515
(202) 225-5816

**Sen. Patty Murray**
111 Russell Senate Office Bldg.
Washington, DC 20510
(202) 224-2621

**Cong. Linda Smith**
1317 Longworth HOB
Washington, DC 20515
(202) 225-3536

**Cong. Jennifer Dunn**
432 Cannon HOB
Washington, DC 20515
(202) 225-7761

**Cong. George Nethercutt**
1527 Longworth HOB
Washington, DC 20515
(202) 225-2006

**Cong. Rick White**
116 Cannon HOB
Washington, DC 20515
(202) 225-6311

**Cong. Norm Dicks**
2467 Rayburn HOB
Washington, DC 20515
(202) 225-5916

**Cong. Adam Smith**
1505 Longworth HOB
Washington, DC 20515
(202) 225-8901

## Oregon

**Sen. Ron Wyden**
717 Hart Senate Office Bldg.
Washington, DC 20510
(202) 224-5244

**Cong. Elizabeth Furse**
316 Cannon HOB
Washington, DC 20515
(202) 225-0855

**Cong. Darlene Hooley**
1419 Longworth HOB
Washington, DC 20515
(202) 225-5711

**Sen. Gordon Smith**
359 Dirksen Senate Office Bldg.
Washington, DC 20510
(202) 224-3753

**Cong. Bob Smith**
1126 Longworth HOB
Washington, DC 20515
(202) 225-6730

**Cong. Earl Blumenauer**
1113 Longworth HOB
Washington, DC 20515
(202) 225-4811

**Cong. Peter De Fazio**
2134 Rayburn HOB
Washington, DC 20515
(202) 225-6416

## Alaska

**Sen. Ted Stevens**
522 Hart Senate Office Bldg.
Washington, DC 20510
(202) 224-3004

**Sen. Frank Murkowski**
322 Hart Senate Office Bldg.
Washington, DC 20510
(202) 224-6665

**Cong. Don Young**
2111 Rayburn HOB
Washington, DC 20515
(202) 225-5765

**For more information, call or write:**

The American Fisheries Act Coalition
601 Union St., Suite 1601
Seattle, WA 98101-4032
1-888-699-1221
or visit our website at
http://www.usafish.org

*"Over the past five years, I have witnessed more than a dozen catcher/processor companies file for bankruptcy, to see their vessels be assimilated into the empire of a foreign fishing/processing company. The American Fisheries Act is critical for our survival."*

— Frank Bohannon of Sun River, Oregon
owner of the catcher boat *Neahkanie*
and vice president of United Catcher Boats
representing more than 50 Oregon and Washington-based vessels.

*"The promise of the Magnuson-Stevens Act was the Americanization of the fishing industry within our 200 mile limit. We made investments and planned our lives and business based on the Americanization the Act called for. But the promise was smashed to bits by the mistakes of the Coast Guard, which opened the floodgates to an armada of foreign rebuilt and foreign owned and controlled factory trawlers. Before everything blows up, and only a foreign monopoly remains, we must move and pass the American Fisheries Act."*

— Cary Swasand, owner of the Seattle-based
American-built factory trawler *Starbound* and seven catcher boats,
and a member of the At-sea Processors Association.

American Fisheries Act Coalition
601 Union St., Suite 1601
Seattle, WA 98101-4032

AMERICAN FISHERIES ACT COALITION
601 UNION ST., SUITE 1601, SEATTLE, WA 98101-4032
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July 16, 1998

Mr. Barry McPherson
Oregon Dept. of Fish & Wildlife
PO Box 59
Portland, OR 97207-0059

Dear Mr. McPherson:

Fairness is a concept we all believe in. But for U.S. fishing companies and the thousands of working men and women in this state who work in the U.S. Bering Sea fishery, fairness is elusive. That's because powerful foreign interests are threatening their livelihoods, by unfairly taking U.S. fishery resources.

The Magnuson-Stevens Act that established the 200-mile fishing limit was supposed to preserve the fish resources near our coastline as a U.S. resource. But foreign interests have found and exploited loopholes until today those interests control half the groundfish harvest in America's richest fishery.

The enclosed brochure highlights the issues surrounding the American Fisheries Act. This proposed legislation will preserve the intent of the Magnuson act by closing loopholes; taking the license to fish from foreign-controlled boats that exploited and profited from the loopholes; and requiring all boats in the U.S. fishery to be at least 75 percent U.S. owned.

The foreign interests, subsidized by foreign governments, are opposing this legislation because there are millions of dollars at stake. They try to claim that fairness requires that they be allowed to remain in the fishery.

But is it fair that foreign-owned companies take half the U.S. Bering Sea harvest, but U.S. companies are forbidden to fish in those foreign companies' home waters?

Is it fair that U.S. men and women in the fishery now only work 10 weeks out of the year, because the annual season has been reduced from year-round to 70 days due to the flood of foreign vessels in our fisheries?

Is it fair that U.S. business owners made significant investments in the fishery, based on the federal policy that U.S. citizens have first preference to harvest the resource, and are now losing those investments — going bankrupt — because foreign interests have found a way to subvert U.S. policy?

The American Fisheries Act is not a radical concept. It establishes the same standard for fishing in U.S. waters that most other countries currently enforce.

The American Fisheries Act *is* about fair play. We urge you to read this material, and visit our web site for more information (http://www.usafish.org). Without this legislation, it's only a matter of time until there will be no U.S. fishing industry. Keep it alive by supporting the American Fisheries Act. It's the right thing to do.

Sincerely,

Brad Jurkovich
Executive Director

THEFT RATES OF MODEL YEAR 1995 PASSENGER MOTOR VEHICLES STOLEN IN CALENDAR YEAR 1995—Continued

| Manufacturer | Make/model (line) | Thefts 1995 | Production (mfgr's) 1995 | 1995 (per 1,000 vehicles produced) theft rate |
|---|---|---|---|---|
| 205 ROLLS-ROYCE | SIL SPIRIT/SPUR/MULS | 0 | 132 | 0.0000 |
| 206 ROLLS-ROYCE | TURBO R | 0 | 19 | 0.0000 |
| 207 VOLKSWAGEN | EUROVAN | 0 | 1,814 | 0.0000 |
| 208 VOLVO | LIMOUSINE | 0 | 6 | 0.0000 |

Issued on: August 18, 1997.

**L. Robert Shelton,**

*Associate Administrator for Safety Performance Standards.*

[FR Doc. 97–22263 Filed 8–20–97; 8:45 am]

BILLING CODE 4910–59–P

## DEPARTMENT OF COMMERCE

## National Oceanic and Atmospheric Administration

## 50 CFR Chapter VI

**[Docket No. 970728184–7184–01; I.D. 060997C]**

## Policy Guidelines for the Use of Emergency Rules

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Policy guidelines for the use of emergency rules.

**SUMMARY:** NMFS is issuing revised guidelines for the Regional Fishery Management Councils (Councils) in determining whether the use of an emergency rule is justified under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The guidelines were also developed to provide the NMFS Regional Administrators guidance in the development and approval of regulations to address events or problems that require immediate action. These revisions make the guidelines consistent with the requirements of section 305(c) of the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act.

**DATES:** Effective August 21, 1997.

**FOR FURTHER INFORMATION CONTACT:** Paula N. Evans, NMFS, 301/713–2341.

**SUPPLEMENTARY INFORMATION:**

### Background

On February 5, 1992, NMFS issued policy guidelines for the use of emergency rules that were published in the **Federal Register** on January 6, 1992 (57 FR 375). These guidelines were consistent with the requirements of section 305(c) of the Magnuson Fishery Conservation and Management Act. On October 11, 1996, President Clinton signed into law the Sustainable Fisheries Act (Public Law 104–297), which made numerous amendments to the Magnuson-Stevens Act. The amendments significantly changed the process under which fishery management plans (FMPs), FMP amendments, and most regulations are reviewed and implemented. Because of these changes, NMFS is revising the policy guidelines for the preparation and approval of emergency regulations. Another change to section 305(c), concerning interim measures to reduce overfishing, will be addressed in revisions to the national standards guidelines.

### Rationale for Emergency Action

Section 305(c) of the Magnuson-Stevens Act provides for taking emergency action with regard to any fishery, but does not define the circumstances that would justify such emergency action. Section 305(c) provides that:

1. The Secretary of Commerce (Secretary) may promulgate emergency regulations to address an emergency if the Secretary finds that an emergency exists, without regard to whether a fishery management plan exists for that fishery;

2. The Secretary shall promulgate emergency regulations to address the emergency if the Council, by a unanimous vote of the voting members, requests the Secretary to take such action;

3. The Secretary may promulgate emergency regulations to address the emergency if the Council, by less than a unanimous vote of its voting members, requests the Secretary to take such action; and

4. The Secretary may promulgate emergency regulations that respond to a public health emergency or an oil spill. Such emergency regulations may remain in effect until the circumstances that created the emergency no longer exist, provided that the public has had an opportunity to comment on the regulation after it has been published, and in the case of a public health emergency, the Secretary of Health and Human Services concurs with the Secretary's action.

### Policy

The NOAA Office of General Counsel has defined the phrase ''unanimous vote,'' in paragraphs 2 and 3 above, to mean the unanimous vote of a quorum of the voting members of the Council only. An abstention has no effect on the unanimity of the quorum vote. The only legal prerequisite for use of the Secretary's emergency authority is that an emergency must exist. Congress intended that emergency authority be available to address conservation, biological, economic, social, and health emergencies. In addition, emergency regulations may make direct allocations among user groups, if strong justification and the administrative record demonstrate that, absent emergency regulations, substantial harm will occur to one or more segments of the fishing industry. Controversial actions with serious economic effects, except under extraordinary circumstances, should be done through normal notice-and-comment rulemaking.

The preparation or approval of management actions under the emergency provisions of section 305(c) of the Magnuson-Stevens Act should be limited to extremely urgent, special circumstances where substantial harm to or disruption of the resource, fishery, or community would be caused in the time it would take to follow standard rulemaking procedures. An emergency action may not be based on administrative inaction to solve a long-recognized problem. In order to approve an emergency rule, the Secretary must have an administrative record justifying emergency regulatory action and demonstrating its compliance with the national standards. In addition, the preamble to the emergency rule should indicate what measures could be taken or what alternative measures will be considered to effect a permanent solution to the problem addressed by the emergency rule.

The process of implementing emergency regulations limits substantially the public participation in rulemaking that Congress intended under the Magnuson-Stevens Act and the Administrative Procedure Act. The Councils and the Secretary must, whenever possible, afford the full scope of public participation in rulemaking. In addition, an emergency rule may delay the review of non-emergency rules, because the emergency rule takes precedence. Clearly, an emergency action should not be a routine event.

## Guidelines

NMFS provides the following guidelines for the Councils to use in determining whether an emergency exists:

## Emergency Criteria

For the purpose of section 305(c) of the Magnuson-Stevens Act, the phrase ''an emergency exists involving any fishery'' is defined as a situation that:

(1) Results from recent, unforeseen events or recently discovered circumstances; and

(2) Presents serious conservation or management problems in the fishery; and

(3) Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment, and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process.

## Emergency Justification

If the time it would take to complete notice-and-comment rulemaking would result in substantial damage or loss to a living marine resource, habitat, fishery, industry participants or communities, or substantial adverse effect to the public health, emergency action might be justified under one or more of the following situations:

(1) Ecological—(A) to prevent overfishing as defined in an FMP, or as defined by the Secretary in the absence of an FMP, or (B) to prevent other serious damage to the fishery resource or habitat; or

(2) Economic—to prevent significant direct economic loss or to preserve a significant economic opportunity that otherwise might be foregone; or

(3) Social—to prevent significant community impacts or conflict between user groups; or

(4) Public health—to prevent significant adverse effects to health of participants in a fishery or to the consumers of seafood products.

Dated: August 14, 1997.

**Gary C. Matlock,**

*Acting Assistant Administrator for Fisheries, National Marine Fisheries Service.*

[FR Doc. 97–22094 Filed 8–20–97; 8:45 am]

BILLING CODE 3510–22–F

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# DEPARTMENT OF COMMERCE

## National Oceanic and Atmospheric Administration

## 50 CFR Part 285

**[Docket No. 970702161–7197–02; I.D. 041097C]**

**RIN 0648–AJ93**

## Atlantic Highly Migratory Species Fisheries; Import Restrictions

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Final rule.

**SUMMARY:** NMFS amends the regulations governing the Atlantic highly migratory species fisheries to prohibit importation of Atlantic bluefin tuna (ABT) and its products in any form harvested by vessels of Panama, Honduras, and Belize. The amendments are necessary to implement International Commission for the Conservation of Atlantic Tunas (ICCAT) recommendations designed to help achieve the conservation and management objectives for ABT fisheries.

**DATES:** Effective August 20, 1997. Restrictions on Honduras and Belize are applicable August 20, 1997; restrictions on Panama are applicable January 1, 1998.

**ADDRESSES:** Copies of the supporting documentation are available from Rebecca Lent, Chief, Highly Migratory Species Management Division, Office of Sustainable Fisheries (F/SF1), NMFS, 1315 East-West Highway, Silver Spring, MD 20910–3282.

**FOR FURTHER INFORMATION CONTACT:** Chris Rogers or Jill Stevenson, 301–713–2347.

**SUPPLEMENTARY INFORMATION:** The Atlantic tuna fisheries are managed under the authority of the Atlantic Tunas Convention Act (ATCA). Section 971d(c)(1) of the ATCA authorizes the Secretary of Commerce (Secretary) to issue regulations as may be necessary to carry out the recommendations of the ICCAT. The authority to issue regulations has been delegated from the Secretary to the Assistant Administrator for Fisheries, NOAA (AA).

Background information about the need to implement trade restrictions and the related ICCAT recommendation was provided in the preamble to the proposed rule (62 FR 38246, July 17, 1997) and is not repeated here. These regulatory changes will further NMFS' management objectives for the Atlantic tuna fisheries.

## Proposed Import Restrictions

In order to conserve and manage North Atlantic bluefin tuna, ICCAT adopted two recommendations at its 1996 meeting requiring its Contracting Parties to take the appropriate measures to prohibit the import of ABT and its products in any form from Belize, Honduras, and Panama. The first recommendation was that its Contracting Parties take appropriate steps to prohibit the import of ABT and its products in any form harvested by vessels of Belize and Honduras as soon as possible following the entry into force of the ICCAT recommendation. Accordingly, the prohibition with respect to these countries is effective August 20, 1997. The second recommendation was that the Contracting Parties take appropriate steps to prohibit such imports harvested by vessels of Panama effective January 1, 1998. This would allow Panama an opportunity to present documentary evidence to ICCAT, at its 1997 meeting or before, that Panama has brought its fishing practices for ABT into consistency with ICCAT conservation and management measures. Accordingly, the prohibition with respect to Panama will become effective January 1, 1998.

Under current regulations, all ABT shipments imported into the United States are required to be accompanied by a Bluefin Statistical Document (BSD). Under this final rule, United States Customs officials, using the BSD, will deny entry into the customs territory of the United States of shipments of ABT harvested by vessels of Panama, Honduras, and Belize and exported after the effective dates of the trade restrictions. Entry will not be denied for any shipment in transit prior to the effective date of trade restrictions.

Upon determination by ICCAT that Panama, Honduras, and/or Belize has brought its fishing practices into consistency with ICCAT conservation and management measures, NMFS will publish a final rule in the **Federal Register** that will remove import restrictions for the relevant party. In

DRAFT



# Report of the Groundfish Harvest Policy Evaluation (Bzero) Workshop

Southwest Fisheries Science Center

La Jolla, California

December 18-20, 2006

# Workshop Goals

1. Evaluate the performance of the Pacific Council's 40-10 harvest policy for stocks with different life history and stock-recruit patterns.

2. Evaluate alternative methods to estimate Bzero and BMSY proxies and provide recommendations on their use.

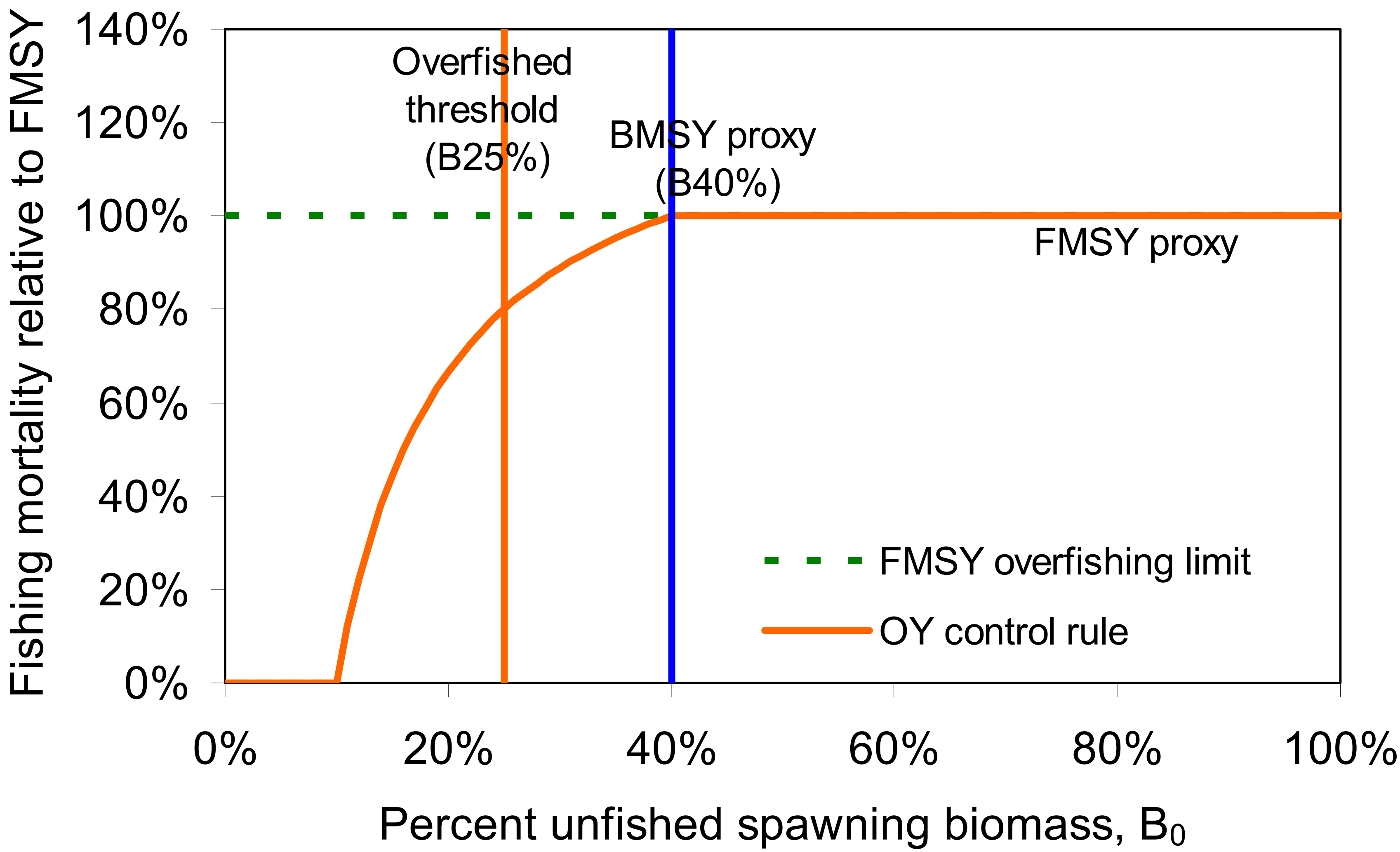
3. Provide recommendations on the use of priors for key assessment parameters in stock assessment models.

# Pacific Council's Groundfish FMP

- Establishes default proxies for FMSY, BMSY and the overfished threshold

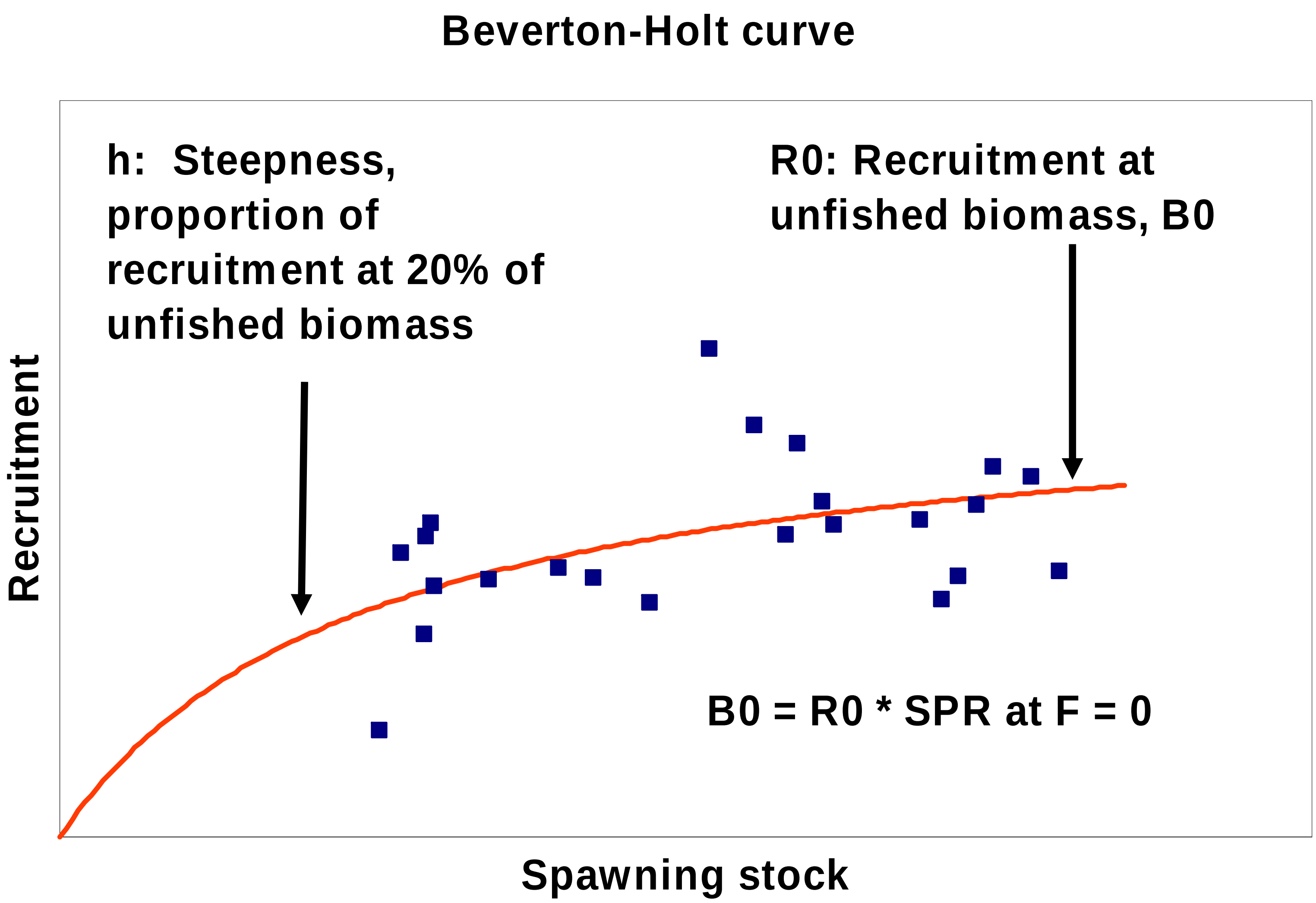
- Allows alternatives to be used if there is scientific justification

"The Council will consider any new scientific information relating to calculation of MSY or MSY proxies and may adopt new values based on improved understanding of the population dynamics and harvest of any species or group of species."



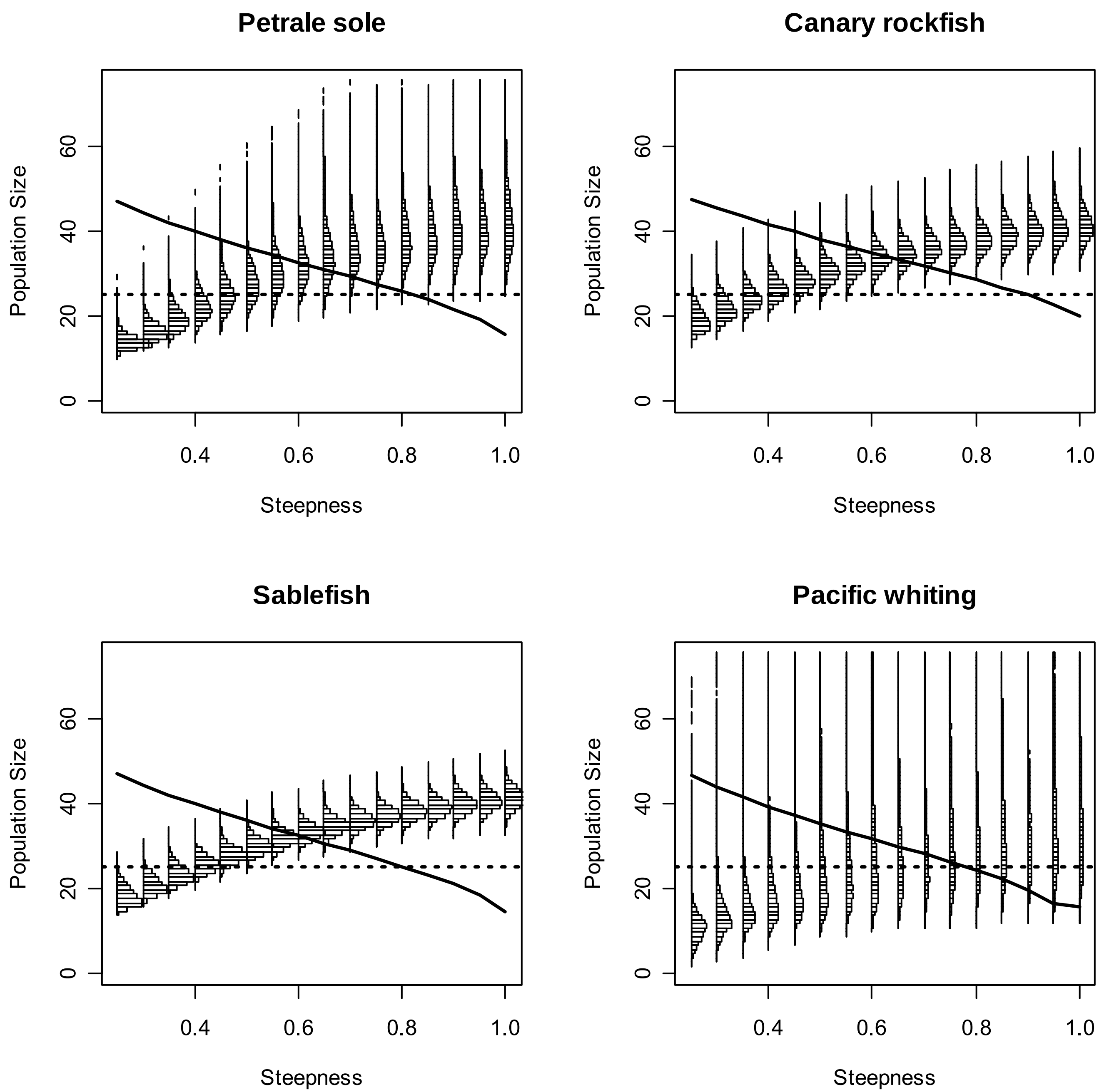

Pacific Council's harvest policy for groundfish

# Some definitions



# Harvest policy performance

- Monte Carlo simulation
- Four representative species with contrasting biology and population dynamics:  petrale sole, sablefish, canary rockfish and whiting
- Performance statistics reflect the intent of the harvest control rule
  - High stable catches
  - Low probability of dropping below the overfished threshold


Petrale sole
Canary rockfish
Sablefish
Pacific whiting
Population Size
Steepness
0
20
40
60
0.4
0.6
0.8
1.0

# Simulation results

- 40-10 with current proxies is OK for most species
- Stock-recruit steepness and recruitment variability are significant factors affecting performance
- Low steepness rockfish (all are now under rebuilding plans)
- High recruitment variability for whiting leads to frequent episodes of low stock size (below the overfished threshold)
- Sablefish?

# Estimating Bzero and Bmsy

- Review of approaches used by other councils
- Simulation/estimation tests
- Dynamic Bzero

# Review of approaches used by other Councils

- Each Council has a unique set of circumstances
- Proxies for BMSY are widely used but no other Council uses Bzero as a concept
- Proxies that are direct approximations of BMSY are used instead
- There is some variation between Councils in how the overfished limit is defined

# Simulation/estimation testing to evaluate alternative estimators for B0 and BMSY

- Simulations considered three life histories: canary rockfish, petrale sole, Pacific whiting
- Simulate the dynamics of a population
- Simulate sampling from that population to generate assessment data
- Fit a simplified stock assessment model
- Repeat multiple times to obtain statistical properties

# Sablefish simulation/estimation testing

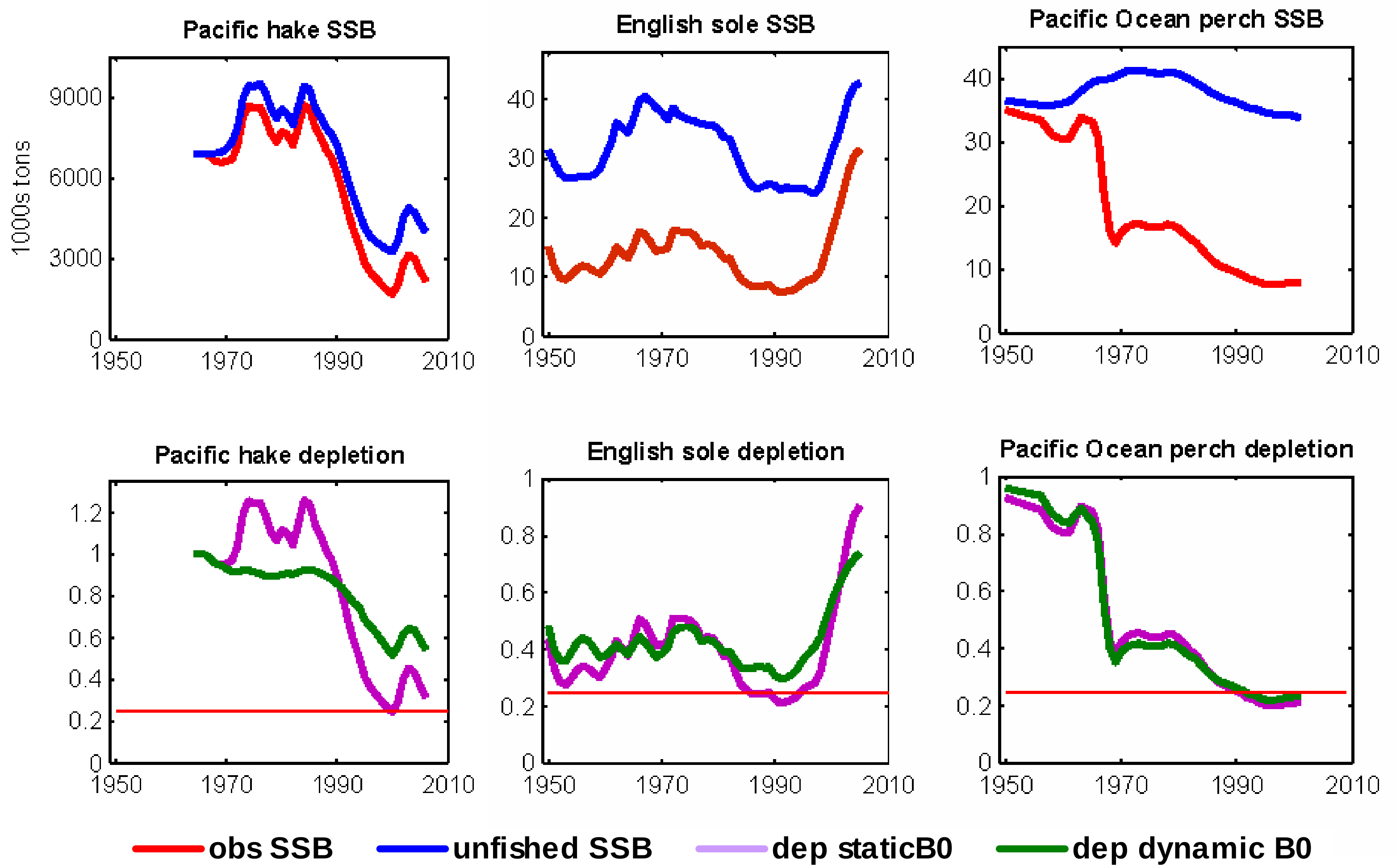
- Simulation-estimation framework developed specifically for sablefish

- Used an environmental variable to drive part of recruitment variability

- Compared the precision and bias of Bzero estimates for scenarios with and without the environmental forcing
- Preliminary results confirmed the validity of the approach

# Dynamic Bzero: An alternative approach to abundance reference points

- Basic approach is to “replay” the historical population dynamics without removing catches
- Allows implicit accounting of environmental forcing on stock abundance
- Estimates of dynamic Bzero all available West Coast assessments were examined
- Potentially useful for determining overfished and/or rebuild status


Pacific hake SSB
English sole SSB
Pacific Ocean perch SSB
1000s tons
9000
6000
3000
0
40
30
20
10
1950
1970
1990
2010
Pacific hake depletion
English sole depletion
Pacific Ocean perch depletion
1.2
1
0.8
0.6
0.4
0.2
obs SSB
unfished SSB
dep staticB0
dep dynamic B0

# Advice to assessment authors

- How to obtain a suitable value for natural mortality
- Use of priors for stock-recruit steepness

# The next steps

- A follow-up workshop is needed to develop recommendations on estimating B0 and BMSY.
- A harvest policy evaluation should be undertaken for Pacific whiting
- Management policies for data-limited stocks should be developed and evaluated.
- The harvest policies for the CPS species should be reviewed
- Harvest policies that perform robustly in the face of climatic regime shifts should be developed and evaluated.

Agenda Item E.1.c
Supplemental SSC Report
March 2007

# SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON GROUNDFISH HARVEST POLICY EVALUATION WORKSHOP

The Scientific and Statistical Committee (SSC) hosted a workshop to evaluate aspects of the Council's groundfish harvest policy. The discussions centered around three issues: (1) the performance of the 40-10 harvest policy for stocks with different life history and stock-recruitment patterns, (2) alternative methods for estimating $B_0$ and $B_{MSY}$ proxies, and (3) the use of priors for natural mortality and stock-recruitment steepness.

The SSC notes that considerable progress had been made towards addressing these topics. However, it is not possible at present to draw definitive conclusions about the first two issues as further work is required. Regarding the third issue, the SSC endorses the recommendations of the workshop regarding which empirical methods should be used to estimate natural mortality and the need for assessment authors to show the impact of the value of natural mortality on model fit by means of likelihood profiles. In addition, the SSC recommends that the work to calculate a prior for steepness for rockfish species be completed as soon as possible and the results sent to the groundfish stock assessment coordinator who should provide it to relevant assessment authors and Stock Assessment and Review (STAR) Panels.

The SSC notes that some of the work presented to the workshop indicates that stocks with high recruitment variability have a larger probability of dropping below the overfished threshold. The workshop discussed two ways in which to modify the current harvest policy for such stocks: reduce the harvest rate or change the overfished threshold. Operationalising either of these ideas will require additional work to evaluate the performance of alternatives. In principle, stocks could be classified into categories depending on perceptions regarding recruitment variation, and separate control rules developed for each category.

The SSC emphasizes the importance of providing a way to compare the trade-offs in terms of catch and risk between the 40-10 and 60-20 control rules, as the optimum yield (OYs) for several of the California nearshore groundfish are based on the 60-20 rule.

The SSC notes that the concept of "dynamic $B_0$" provides a means for evaluating stock status given "prevailing conditions". The SSC does not believe that dynamic $B_0$ has been evaluated sufficiently at present for it to form the basis for changes to the current harvest policy. However, the SSC encourages further work on developing and testing control rules based on dynamic $B_0$. Also, the SSC recommends that assessment authors report stock depletion in terms of dynamic $B_0$ in addition to current measures of depletion, to help elucidate causes for stock declines (environment versus fishing).

The SSC endorses the need to develop and examine harvest control rules for data-limited stocks. Several researchers are working on potential control rules for data-poor species and SSC review of this work in a workshop setting could provide focus for Council action in this regard. The SSC also endorses the workshop recommendation that harvest policies that account for and are robust to climate be developed and tested.

The harvest policy evaluation workshop focused on groundfish species. However, many of the considerations discussed during the workshop pertain to other Council-managed species groups. The SSC notes the importance of considering the issues discussed during the harvest policy workshop if the harvest policies for Coastal Pelagic Species (CPS) species are reviewed and possibly revised.

The workshop provided a means for reviewing and discussing the research being conducted outside the Council process in relation to its ability to improve the quality of the advice the Council receives. Interaction between the SSC and outside researchers should help focus the research so that it is of greatest benefit to the Council. The SSC therefore recommends that an additional meeting be held to review the work conducted in response to the recent workshop and perhaps begin the process of refining the harvest policy. Given time constraints, such a meeting could not occur before the next off-year and hence impact OYs for 2009-2010. Participation in the recent workshop by scientists from outside the Council family enhanced the discussions and the SSC recommends that such scientists be invited to any further meetings.

PFMC
03/06/07

# 2005 Fishing Mortality
## (Agenda Item E.2.b, Attachment 1)

- Table 15 summarizes total mortality estimates, by sector, for 31 groundfish species/groups and 2 crab species

- Table 16 compares total mortality estimates with the corresponding ABCs and OYs

# 2005 Fishing Mortality

- Only 1 ABC (Petrale sole) was exceeded
  - 4 mt (0.14%) above the 2,762 mt OY
- 4 OYs were exceeded
  - Canary was 1.9 mt (4%) above its OY
- For all rebuilding species other than canary:
  - Fishing mortality did not exceed 70% of OY
  - Average fishing mortality was 43% of OY

# Distribution of 2005 Canary Bycatch

## (Agenda Item E.2.b, Attachment 2)

The amount of canary bycatch in the northern trawl fishery was substantially higher than expected

| | North of 40°10' | South of 40°10' | Total |
|---|---|---|---|
| **Non-whiting trawl fishery** | | | |
| Landed catch (mt) | 3.7 | 0.7 | 4.4 |
| Estimated discard (mt) | 21.5 | 0.1 | 21.6 |
| Estimated total catch (mt) | **25.2** | 0.7 | 26.0 |
| **Groundfish Management Team Scorecard** | | | |
| Initial mortality estimate (mt) | | | 8.0 |
| Revised mortality estimate (mt, April 2006) | | | 9.5 |

# Northern Canary Bycatch Rates rose dramatically after 2004

| | Canary lbs per 1,000 lb of retained target species | | Ratio of new-to-old rates | |
|---|---|---|---|---|
| | depths <=75 fm | depths <=100 fm | depths <=75 fm | depths <=100 fm |
| **Rates used in late-2005 and 2006 Bycatch Models** | | | | |
| Winter | 0.836 | 3.056 | | |
| Summer | 0.986 | 1.437 | | |
| **New rates, using only data from January 2005 through April 2006** | | | | |
| Winter | 3.942 | 4.598 | 4.7 | 1.5 |
| Summer | 3.571 | 4.585 | 3.6 | 3.2 |

# Northern sub-areas used to examine patterns in canary bycatch

| 17 available sub-areas | 8 combined sub-areas |
|---|---|
| N. of Cape Alava | > N. of Cape Alava |
| Cape Alava - Queets River | > Cape Alava - Queets River |
| Queets River - Pt. Chehalis | > Queets River - Leadbetter Point |
| Pt. Chehalis - Leadbetter Pt. | |
| Leadbetter Point - WA/OR border | > Leadbetter Point - WA/OR border |
| WA/OR border - Cape Falcon | > WA/OR border - Cape Lookout |
| Cape Falcon - Cape Lookout | |
| Cape Lookout - Cascade Head | > Cape Lookout - Cape Arago |
| Cascade Head - Heceta Head | |
| Heceta Head - Cape Arago | |
| Cape Arago - Col.-Eureka area border | > Cape Arago - Humbug Mountain |
| Col.-Eureka area border - Cape Blanco | |
| Cape Blanco - Humbug Mountain | |
| Humbug Mountain - Marck Arch | > Humbug Mountain - 40o10' N. Lat. |
| Marck Arch - OR/CA Border | |
| OR/CA Border - Cape Mendocino | |
| Cape Mendocino - 40°10' | |

# Bycatch rates by sub-area / season from observer data collected 01/05-04/06

| | | All hauls less than 75 fm | | | All hauls less than 100 fm | | |
|---|---|---|---|---|---|---|---|
| | | Observer data | | Logbooks | Observer data | | Logbooks |
| Northern sub-area | Season | Total canary catch lbs | Canary lb per 100 lb of retained target sp. | Target species retained mts | Total canary catch lbs | Canary lb per 100 lb of retained target sp. | Target species retained mts |
| N. of Cape Alava | Winter | 852 | 1.003 | 119 | 1,421 | 0.971 | 199 |
| | Summer | 1,786 | 0.939 | 543 | 6,090 | 0.916 | 1,264 |
| Cape Alava - Queets River | Winter | 59 | 0.525 | 2 | 458 | 0.697 | 53 |
| | Summer | 925 | 0.270 | 714 | 2,198 | 0.420 | 1,019 |
| Queets River - Leadbetter Point | Winter | 89 | 0.095 | 143 | 89 | 0.090 | 153 |
| | Summer | 499 | 0.104 | 660 | 612 | 0.120 | 700 |
| Leadbetter Point - WA/OR border | Winter | 15 | 0.033 | 39 | 19 | 0.035 | 73 |
| | Summer | 1,521 | 0.722 | 423 | 1,597 | 0.588 | 562 |
| WA/OR border - Cape Lookout | Winter | 5 | 0.029 | 10 | 5 | 0.029 | 10 |
| | Summer | 505 | 0.143 | 861 | 610 | 0.133 | 1,146 |
| Cape Lookout - Cape Arago | Winter | 10 | 0.111 | 25 | 85 | 0.125 | 62 |
| | Summer | 61 | 0.058 | 300 | 582 | 0.188 | 780 |
| Arago - Humbug Mtn. | Summer | 1,083 | 8.178 | 97 | 1,579 | 2.375 | 175 |
| Humbug Mtn - 40°10' | Summer | 138 | 0.108 | 454 | 410 | 0.230 | 613 |
| All North of 40°10' | Winter | 1,030 | 0.394 | 340 | 2,077 | 0.460 | 549 |
| | Summer | 6,519 | 0.357 | 4,052 | 13,678 | 0.459 | 6,259 |
| | Total | 7,549 | 0.362 | 4,392 | 15,755 | 0.459 | 6,808 |

# Possible factors contributing to higher canary bycatch rates in 2005

- Prior rates were based primarily on data from the Oregon EFP, which had few observations from northern Washington
- Gear was deployed differently in the general fishery than it had been during EFP
- Changes in regulations or fishery targets

# Canary - Yellowtail Relationship

- Total yellowtail caught vs. retained yellowtail
- Only 14 of 1,913 observed tows had more than 300 lb of retained yellowtail (max=600 lb)
  - 6,342 lb of retained yellowtail; 336 lb of canary
- Little indication that significant yellowtail targeting was occurring
- Those 14 tows had a combined canary bycatch rate that was above average, but most tows were in northern WA where the general canary bycatch rate was higher

# Relationship to Pacific Cod Catch

- 54 observed hauls with 2,000 lb or more of P. cod catch:
  - Only 2 had more than 100 lb of canary catch (< 160 lb)
  - 36 (67%) had no canary catch
- 14 hauls with more than 200 lb of canary catch:
  - only 1 had more than 300 lb of P. cod catch

# Relationship between canary and yellowtail catch in northern, observed hauls <100 fm, 1/05-4/06

| | # of hauls | Canary lbs | Canary as % of target | Yellowtail rockfish catch lbs | Yellowtail rockfish ret. lbs | Yellowtail rockfish % ret. | Correlation between canary catch and yellowtail: catch | Correlation between canary catch and yellowtail: retained |
|---|---|---|---|---|---|---|---|---|
| N. of Cape Alava | 379 | 7,511 | 0.93% | 12,615 | 8,080 | 64% | 0.040 | 0.080 |
| Alava - Queets R | 246 | 2,656 | 0.45% | 7,140 | 1,826 | 26% | 0.096 | 0.101 |
| Queets R - Leadbetter | 401 | 701 | 0.12% | 8,554 | 5,499 | 64% | 0.069 | 0.166 * |
| Leadbetter - Col R | 172 | 1,616 | 0.49% | 3,345 | 945 | 28% | 0.819 ** | -0.041 |
| Col R - Lookout | 325 | 615 | 0.13% | 5,162 | 1,992 | 39% | 0.563 ** | -0.024 |
| Lookout - Arago | 262 | 667 | 0.18% | 215 | 203 | 94% | -0.102 | -0.098 |
| Arago - Humbug | 45 | 1,579 | 2.38% | 358 | 191 | 53% | 0.609 ** | -0.145 |
| Humbug - 40°10' | 83 | 410 | 0.23% | 77 | 76 | 98% | 0.454 * | 0.450 * |
| North of 40°10' | 1,913 | 15,755 | 0.46% | 37,467 | 18,811 | 50% | 0.155 ** | 0.062 |
| % of all northern observations | | | | | | | | |

** significant @ 0.01 level
* significant @ 0.05 level

# Stock Assessment of Pacific Hake (Whiting) in U.S. and Canadian Waters in 2007

***Report of the U.S.-Canada Pacific Hake Joint Technical Committee (JTC)***

Thomas E. Helser[1]
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March 1, 2007

## Executive Summary

*Stock*

This assessment reports the status of the coastal Pacific hake (*Merluccius productus*) resource off the west coast of the United States and Canada. The coastal stock of Pacific hake is currently the most abundant groundfish population in the California Current system. Smaller populations of hake occur in the major inlets of the north Pacific Ocean, including the Strait of Georgia, Puget Sound, and the Gulf of California. However, the coastal stock is distinguished from the inshore populations by larger body size, seasonal migratory behavior, and a pattern of low median recruitment punctuated by extremely large year classes. The population is modeled as a single stock, but the United States and Canadian fishing fleets are treated separately in order to capture some of the spatial variability in Pacific hake distribution.

*Catches*

Fishery landings from 1966 to 2006 have averaged 162 thousand mt, with a low of 90 thousand mt in 1980 and a peak harvest of 360 thousand mt in 2006. Recent landings have been above the long term average, at approximately 360 thousand mt in 2005 and 2006. Catches in both of these years were predominately comprised by the large 1999 year class. The United States has averaged 159 thousand mt, or 74.6% of the total landings over the time series, with Canadian catch averaging 54 thousand mt. The 2004 and 2005 landings had similar distributions, with 62.9 and 72.1%, respectively, harvested by the United States fishery. The current model assumes no discarding mortality of pacific hake.

Table a. Recent commercial fishery landings (1000s mt).

| Year | US at-sea | US shore based | US Tribal | US total | Canadian foreign and JV | Canadian shore based | Canadian total | Total |
|---|---|---|---|---|---|---|---|---|
| 1996 | 113 | 85 | 15 | 213 | 67 | 26 | 93 | 306 |
| 1997 | 121 | 87 | 25 | 233 | 43 | 49 | 92 | 325 |
| 1998 | 120 | 88 | 25 | 233 | 40 | 48 | 88 | 321 |
| 1999 | 115 | 83 | 26 | 225 | 17 | 70 | 87 | 312 |
| 2000 | 116 | 86 | 7 | 208 | 16 | 6 | 22 | 231 |
| 2001 | 102 | 73 | 7 | 182 | 22 | 32 | 54 | 236 |
| 2002 | 63 | 46 | 23 | 132 | 0 | 51 | 51 | 183 |
| 2003 | 67 | 55 | 21 | 143 | 0 | 62 | 62 | 206 |
| 2004 | 90 | 96 | 24 | 210 | 59 | 65 | 124 | 335 |
| 2005 | 150 | 86 | 24 | 260 | 15 | 85 | 100 | 360 |
| 2006 | 134 | 97 | 35 | 266 | 14 | 80 | 94 | 360 |

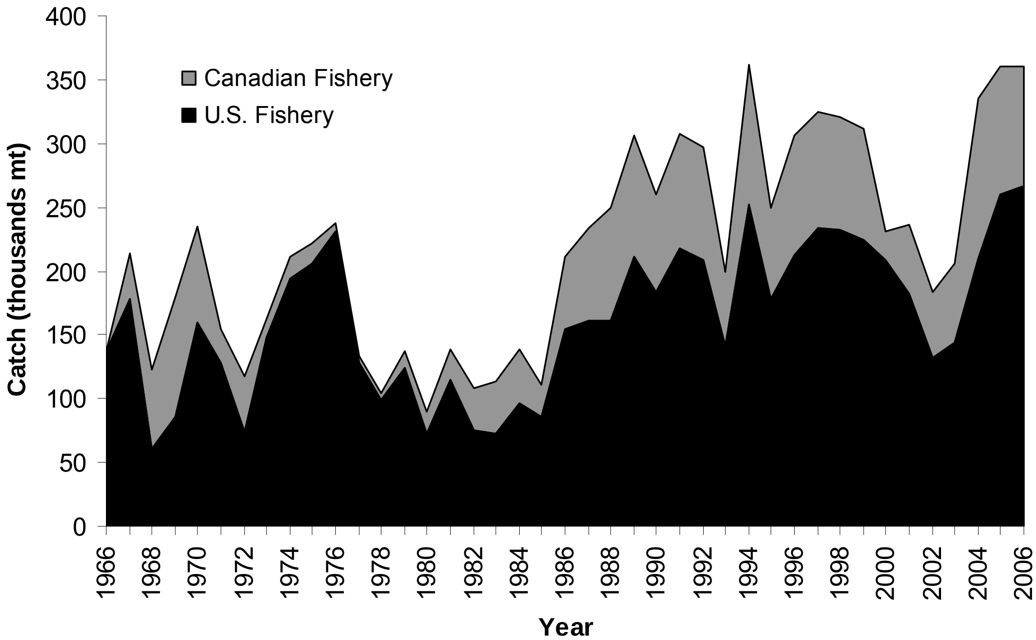



Figure a. Pacific whiting landings (1000s mt) by nation, 1966-2006.

*Data and assessment*

Age-structured assessment models of various forms have been used to assess Pacific hake since the early 1980's, using total fishery catches, fishery age compositions and abundance indices. In 1989, the hake population was modeled using a statistical catch-at-age model (Stock Synthesis) that utilizes fishery catch-at-age data and survey estimates of population biomass and age-composition data (Dorn and Methot, 1991). The model was then converted to AD Model Builder (ADMB) in 1999 by Dorn (1999), using the same basic population dynamics equations. This allowed the assessment to take advantage of ADMB's post-convergence routines to calculate standard errors (or likelihood profiles) for any quantity of interest. Since 2001, Helser et al. (2001, 2003, 2004) have used the same ADMB modeling platform to assess the hake stock and examine important assessment modifications and assumptions, including the time varying nature of the acoustic survey selectivity and catchability. The acoustic survey catchability coefficient ($q$) has been, and continues to be, one of the major sources of uncertainty in the model. Due to the lengthened acoustic survey biomass trends the assessment model was able to freely estimate the acoustic survey $q$. These estimates were substantially below the assumed value of $q$=1.0 from earlier assessments. The 2003 and 2004 assessment presented uncertainty in the final model result as a range of biomass. The lower end of the biomass range was based upon the conventional assumption that the acoustic survey $q$ was equal to 1.0, while the higher end of the range represented a $q$=0.6 assumption. In 2005, the coastal hake stock was modeled using the Stock Synthesis modeling framework (SS2 Version 1.21, December, 2006) which was written by Dr. Richard Methot (Northwest Fisheries Science Center) in AD Model Builder. Conversion of the previous hake model into SS2 was guided by three principles: 1) the incorporation of less derived data, 2) explicitly model the underlying hake growth dynamics, and 3) achieve parsimony[1] in terms on model complexity. "Incorporating less derived data" entailed

[1] Parsimony is defined as a balance between the number of parameters needed to represent a complex state of nature and data quality/quantity to support accurate and precise estimation of those parameters.

fitting observed data in their most elemental form. For instance, no pre-processing to convert length data to age compositional data was performed. Also, incorporating conditional age-at-length data, through age-length keys for each fishery and survey, allowed explicit estimation of expected growth, dispersion about that expectation, and its temporal variability, all conditioned on selectivity.

This year's assessment builds on the same SS2 (Ver 1.23E) approach and incorporates a new coast-wide recruitment index that draws upon data from the expanded SWFSC Santa Cruz and PWCC/NMFS mid-water trawl surveys. As in the previous year's assessment, two models are presented to bracket the range of uncertainty in the acoustic survey catchability coefficient, *q*. The base model with steepness fixed at *h*=0.75 and *q*=1.0 represents the endpoint of the lower range while the alternative model which places a prior on *q* (effective *q*=0.7) represents the upper endpoint of the range. As such, model estimates presented below report a range of values representing these endpoints.

*Stock biomass*

Pacific hake spawning biomass declined rapidly after 1984 (4.6-5.1million mt) to the lowest point in the time series in 2000 (0.92-1.15 million mt). This long period of decline was followed by a brief increase to 1.80-2.36 million mt in 2003 as the 1999 year class matured. In 2007 (beginning of year), spawning biomass is estimated to be 1.15 – 1.65 million mt and approximately 32.1%-39.80% of the unfished level. Estimates of uncertainty in level of depletion range from 24.3%-39.7% and 30.7%-48.8% of unfished biomass for the base and alternative models, respectively, based on asymptotic confidence intervals. It should be pointed out that the 2007 estimates of spawning biomass and depletion are not too dissimilar from last year's assessment result for 2006. The reason for this is that removal of the early SWFSC Santa Cruz pre-recruit time series and inclusion of the new coast-wide pre-recruit index has resulted is a slightly higher 1999, as well as 2003-2004, recruitment strengths. As such, spawning biomass in the most recent years is slightly greater than predicted from the 2006 assessment.

Table b. Recent trend in Pacific hake spawning biomass and depletion level from the base and alternative SS2 models.

| | ***Base Model*** | | | | | ***Alternative Model*** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | Spawning biomass millions mt | ~ 95% Interval | | Relative Depletion | ~ 95% Interval | Spawning biomass millions mt | ~ 95% Interval | | Relative Depletion | ~ 95% Interval |
| 1998 | 1.088 | 0.952 - | 1.224 | 30.4% | - | 1.299 | 1.113 - | 1.486 | 31.3% | - |
| 1999 | 0.986 | 0.850 - | 1.122 | 27.6% | - | 1.203 | 1.013 - | 1.394 | 29.0% | - |
| 2000 | 0.916 | 0.774 - | 1.057 | 25.6% | - | 1.149 | 0.946 - | 1.351 | 27.7% | - |
| 2001 | 1.111 | 0.925 - | 1.297 | 31.1% | - | 1.424 | 1.147 - | 1.701 | 34.3% | - |
| 2002 | 1.587 | 1.298 - | 1.875 | 44.4% | - | 2.058 | 1.624 - | 2.491 | 49.6% | - |
| 2003 | 1.807 | 1.460 - | 2.154 | 50.6% | - | 2.360 | 1.839 - | 2.880 | 56.9% | - |
| 2004 | 1.738 | 1.384 - | 2.093 | 48.6% | - | 2.295 | 1.764 - | 2.827 | 55.3% | - |
| 2005 | 1.496 | 1.156 - | 1.837 | 41.9% | | 2.024 | 1.514 - | 2.533 | 48.8% | |
| 2006 | 1.295 | 0.954 - | 1.637 | 36.2% | 28.9% - 43.5% | 1.806 | 1.299 - | 2.314 | 43.6% | 34.9% - 52.1% |
| 2007 | 1.146 | 0.790 - | 1.502 | 32.1% | 24.3% - 39.7% | 1.651 | 1.126 - | 2.175 | 39.8% | 30.7% - 48.8% |

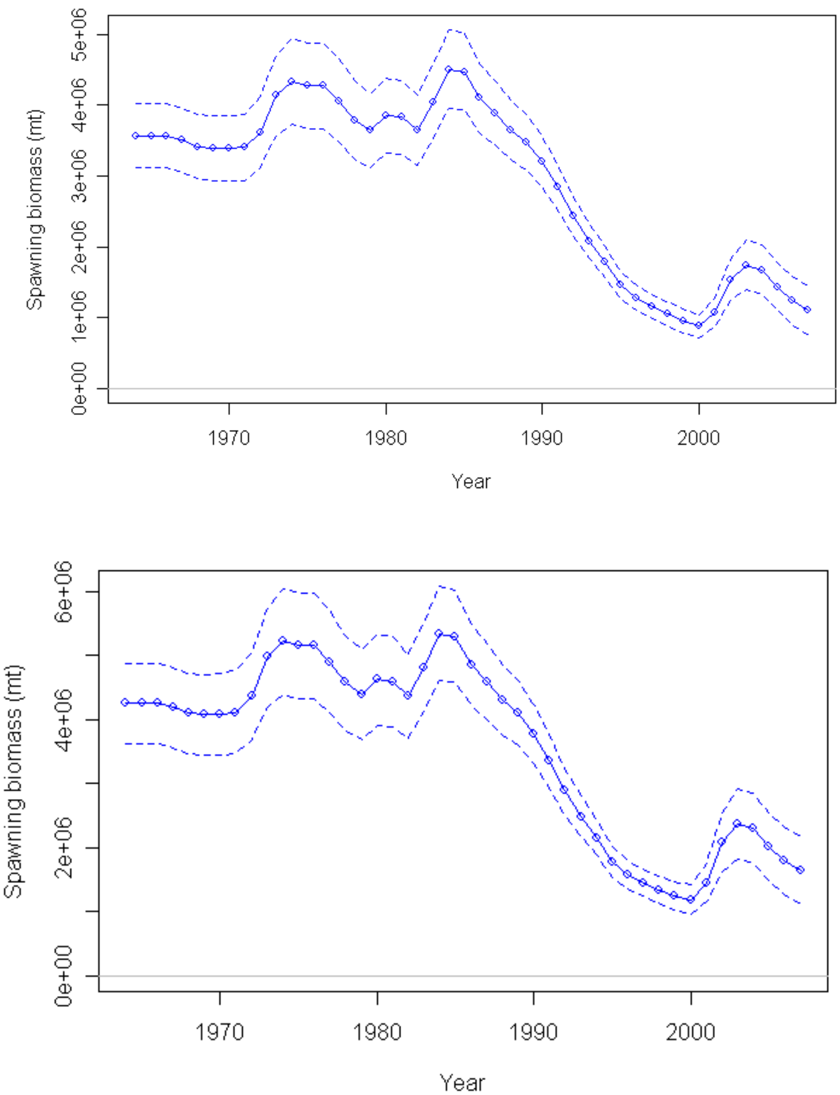



Figure b. Estimated spawning biomass time-series with approximate asymptotic 95% confidence intervals for the base (upper plot) and alternative (lower plot) models.

*Recruitment*

Estimates of Pacific hake recruitment indicate very large year classes in 1980 and 1984, with secondary recruitment events in 1970, 1973 and 1977, earlier in the time series. The recent 1999 year class was the single most dominate cohort since the late 1980s and has in large part support fishery catches during the last few years. Uncertainty in recruitment can be substantial as shown by asymptotic 95% confidence intervals. Recruitment to age 0 before 1967 is assumed to be equal to the long-term mean recruitment. Age-0 recruitment in 2003 is very uncertain, but predicted to be below the mean, despite some evidence to the contrary in the 2005 acoustic survey.

Table c. Recent estimated trend in Pacific hake recruitment.

| | Base Model | | | | Alternative Model | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Recruitment (billions) | ~ 95% Interval | | | Recruitment (billions) | ~ 95% Interval | | |
| 1998 | 2.887 | 2.435 | - | 3.423 | 3.641 | 2.977 | - | 4.453 |
| 1999 | 14.975 | 12.384 | - | 18.108 | 19.124 | 15.346 | - | 23.832 |
| 2000 | 1.044 | 0.823 | - | 1.323 | 1.355 | 1.042 | - | 1.761 |
| 2001 | 1.423 | 1.106 | - | 1.831 | 1.878 | 1.426 | - | 2.474 |
| 2002 | 0.243 | 0.168 | - | 0.352 | 0.320 | 0.217 | - | 0.471 |
| 2003 | 2.251 | 1.602 | - | 3.164 | 3.051 | 2.140 | - | 4.348 |
| 2004 | 3.030 | 1.795 | - | 5.115 | 4.099 | 2.413 | - | 6.964 |
| 2005 | 1.249 | 0.271 | - | 5.750 | 1.479 | 0.328 | - | 6.663 |
| 2006 | 0.366 | 0.113 | - | 1.187 | 0.462 | 0.142 | - | 1.503 |
| 2007 | 2.094 | 0.353 | - | 12.425 | 2.539 | 0.428 | - | 15.072 |

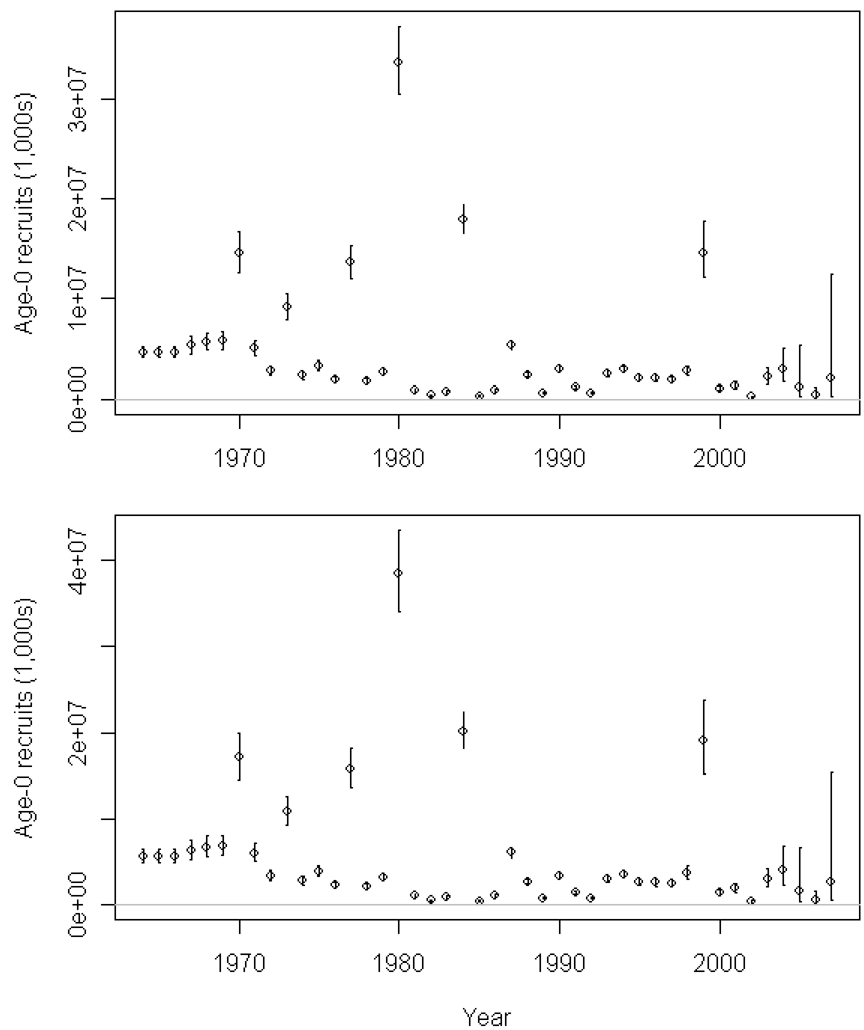
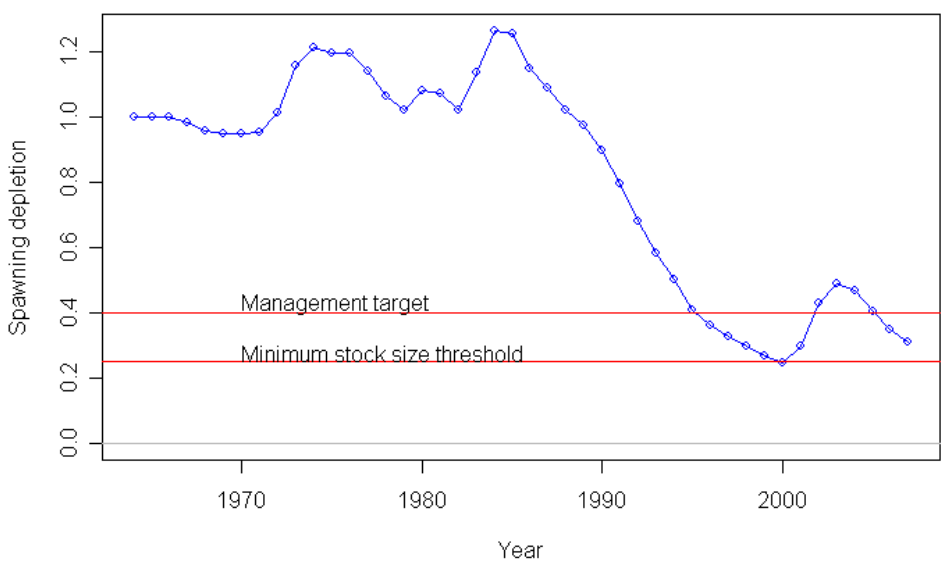



Figure c. Estimated recruitment time-series with approximate asymptotic 95% confidence intervals for the base (upper plot) and alternative (lower plot) models.

*Reference points*

Two types of reference points are reported in this assessment: those based on the assumed population parameters at the beginning of the modeled time period and those based on the most recent time period in a 'forward projection' mode of calculation. This distinction is important since temporal variability in growth and other parameters can result in different biological reference point calculations across alternative chronological periods. All strictly biological reference points (e.g., unexploited spawning biomass) are calculated based on the unexploited conditions at the start of the model, whereas management quantities (MSY, $SB_{msy}$, etc.) are based on the current growth and maturity schedules and are marked throughout this document with an asterisk (*).

Unexploited equilibrium Pacific hake spawning biomass ($B_{zero}$) from the base model was estimated to be 3.57 million mt (~ 95% confidence interval: 3.14 – 4.0 million mt), with a mean expected recruitment of 4.66 billion age-0 hake. Under the alternative model, spawning biomass ($B_{zero}$) from the base model was estimated to be 4.15 million mt (~ 95% confidence interval: 3.57 – 4.73 million mt), with a mean expected recruitment of 5.53 billion age-0 hake. Associated management reference points for target and critical biomass levels for the base model are 1.43 million mt (B40%) and 0.89 million mt (B25%), respectively. Under the alternative model, B40% and B25% are estimated to be 1.66 and 1.04 million mt, respectively. The MSY-proxy harvest amount (F40%) under the base model was estimated to be 531,565* mt (~ 95% confidence interval: 469,581-585,020), and 621,810* mt (~ 95% confidence interval: 535,186-696,527) under the alternative model. The spawning stock biomass that produces the MSY-proxy catch amount under the base model was estimated to be 0.98 million* mt (confidence interval is 0.74-1.20* million mt), and 1.15 million* mt (confidence interval is 0.82 -1.47* million mt) under the alternative model, given current life history parameters.



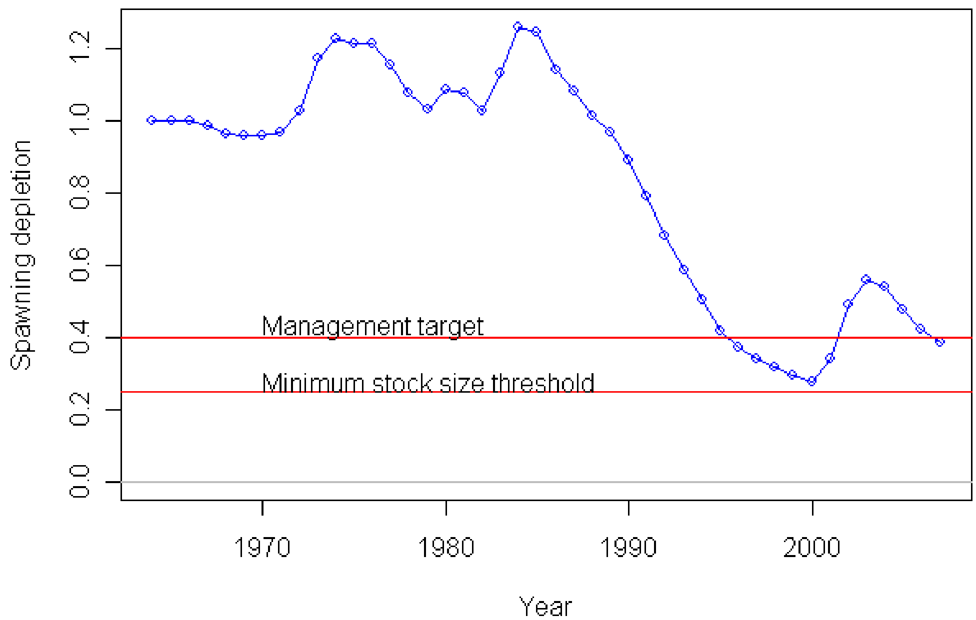


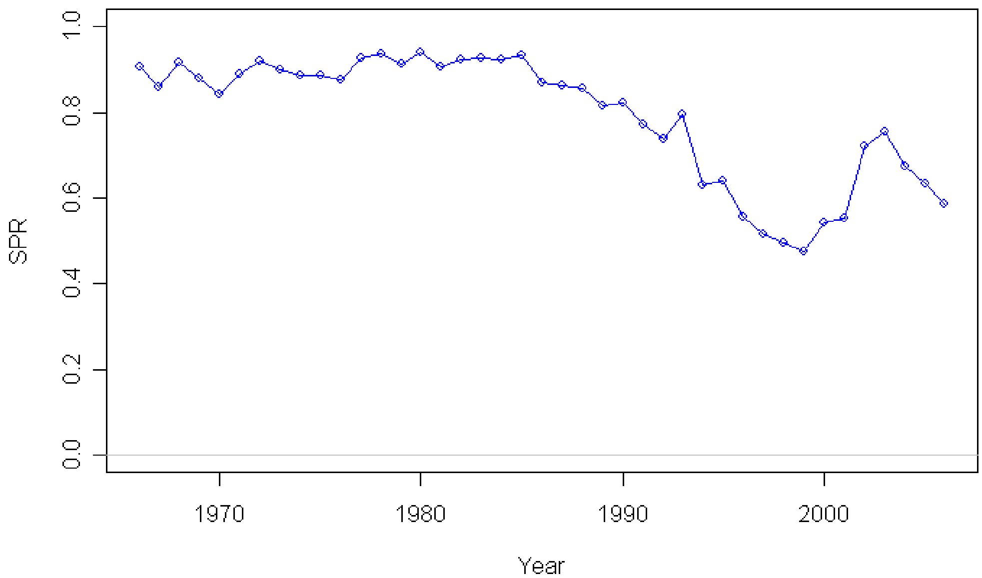

Figure d. Time series of estimated depletion, 1966-2006, for the base (upper plot) and alternative (lower plot) models.

*Exploitation status*

The estimated spawning potential ratio (SPR) for Pacific hake has been above the proxy target of 40% for the history of this fishery. In terms of its exploitation status, Pacific hake are presently below the target biomass level (40% unfished biomass) and above the target SPR rate (40%). The full exploitation history is portrayed graphically below, plotting for each year the calculated SPR and spawning biomass level (B) relative to their corresponding targets, F40% and B40%, respectively.

Table d. Recent trend in spawning potential ratio (SPR).

| | Base Model | | alternative Model | |
|---|---|---|---|---|
| Year | Estimated SPR | ~ 95% Interval | Estimated SPR | ~ 95% Interval |
| 1997 | 0.519 | - | 0.569 | - |
| 1998 | 0.498 | - | 0.556 | - |
| 1999 | 0.482 | - | 0.548 | - |
| 2000 | 0.550 | - | 0.624 | - |
| 2001 | 0.562 | - | 0.646 | - |
| 2002 | 0.730 | - | 0.796 | - |
| 2003 | 0.761 | - | 0.823 | - |
| 2004 | 0.683 | - | 0.756 | - |
| 2005 | 0.642 | - | 0.721 | - |
| 2006 | 0.579 | | 0.668 | |



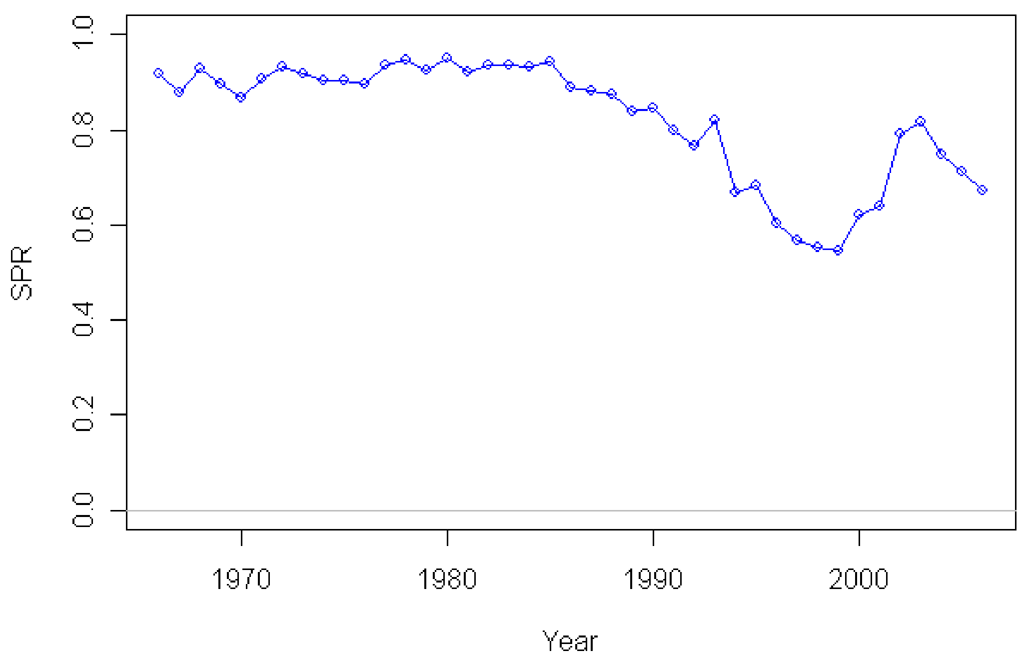




Figure e. Time series of estimated spawning potential ratio from base (upper plot) and alternative (lower plot) models.

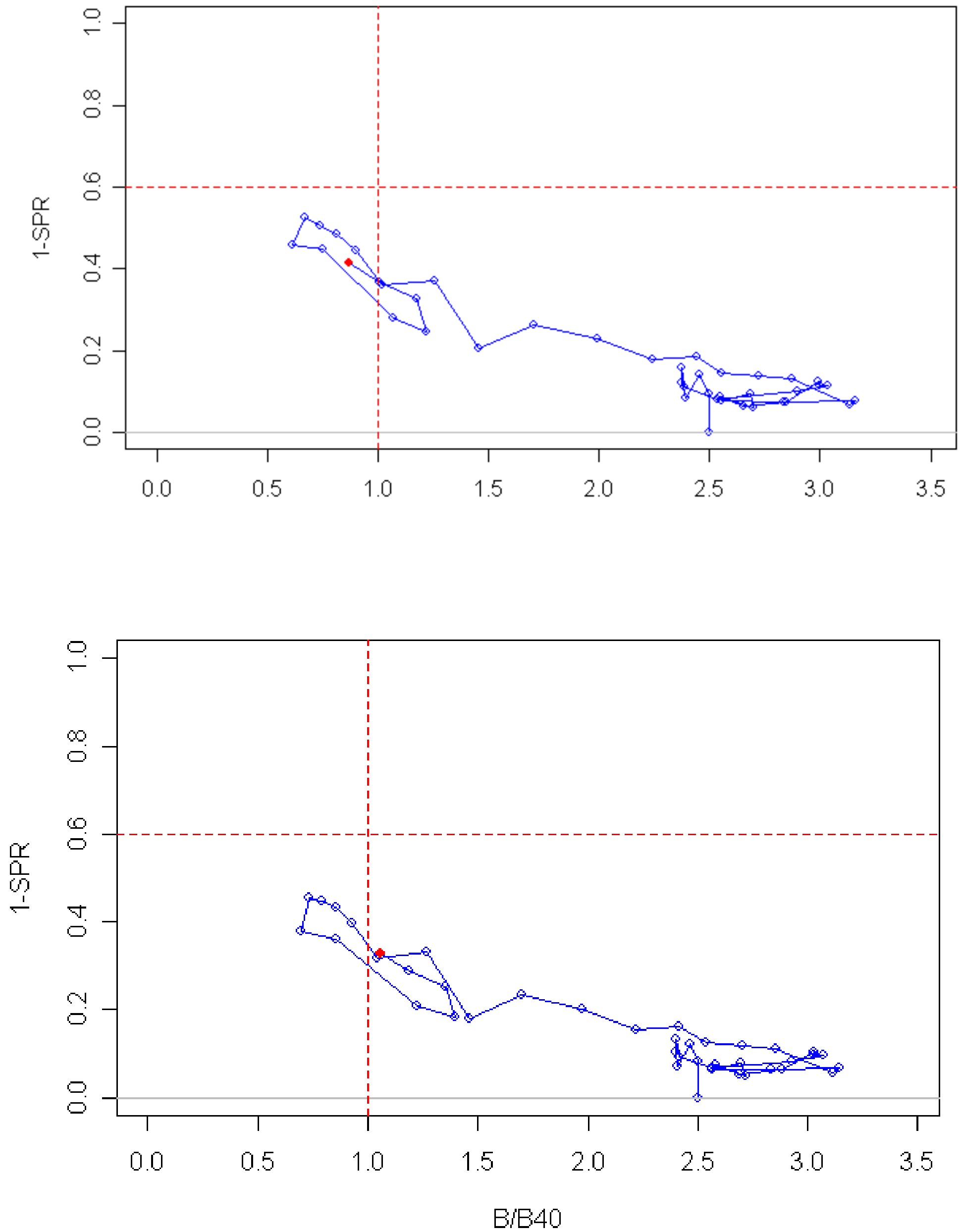



Figure f. Temporal pattern of estimated spawning potential ratio relative to the proxy target of 40% vs estimated spawning biomass relative to the proxy 40% level for base (upper plot) and alternative (lower plot) models.

*Management performance*

Since implementation of the Magnuson Fisheries Conservation and Management Act in the U.S. and the declaration of a 200 mile fishery conservation zone in Canada in the late 1970's, annual quotas have been the primary management tool used to limit the catch of Pacific hake in both zones by foreign and domestic fisheries. The scientists from both countries have collaborated through the Technical Subcommittee of the Canada-US Groundfish Committee (TSC), and there has been informal agreement on the adoption of an annual fishing policy. During the 1990s, however, disagreement between the U.S. and Canada on the division of the acceptable biological catch (ABC) between the two countries led to quota overruns; 1991-1992 quotas summed to 128% of the ABC and quota overruns have averaged 114% from 1991-1999. Since 2000, total catches have been below coastwide ABCs. A recent treaty between the United States and Canada (2003), which awaits final signature, establishes U.S. and Canadian shares of the coastwide allowable biological catch at 73.88% and 26.12%, respectively.

Table e. Recent trend in Pacific hake management performance.

| Year | Total landings (mt) | ABC |
|---|---|---|
| 1996 | 306,100 | 265,000 |
| 1997 | 325,215 | 290,000 |
| 1998 | 320,619 | 290,000 |
| 1999 | 311,855 | 290,000 |
| 2000 | 230,819 | 290,000 |
| 2001 | 235,962 | 238,000 |
| 2002 | 182,883 | 208,000 |
| 2003 | 205,582 | 235,000 |
| 2004 | 334,721 | 514,441 |
| 2005 | 360,306 | 531,124 |
| 2006 | 359,901 | 661,681 |

*Unresolved problems and major uncertainties*

The acoustic survey catchability, *q*, remains uncertain. This is largely driven by an inconsistency in the acoustic survey biomass time series and age compositions; age composition data suggest a large build up of stock biomass in the mid 1980s while the acoustic survey biomass time series is relatively flat since 1977.

*Forecasts*

Forecasts were generated assuming the maximum potential catch would be removed under 40:10 control rule for both the base and alternative models. Projections were based on the relative F contribution of 73.88% and 26.12% coast wide national allocation to the U.S. and Canada, respectively. For the base case model, the 2007 coastwide ABC is estimated to be 612,068 mt with an OY of 575,090 mt. Under the alternative model, the 2007 coastwide ABC is estimated to be 879,000 mt with an OY of 878,670 mt. Spawning stock biomass is projected to

decline with a corresponding relative depletion of 24.5% and 29.3% for the base and alternative models, respectively in 2008.

Table f. Three year projection of potential Pacific hake landings, spawning biomass and depletion for the base and alternative models under the 40:10 rule.

| Year | Expected coastwide catch (mt) | Spawning biomass millions mt | | | Depletion percent unfished biomass | | |
|---|---|---|---|---|---|---|---|
| | | Mean | 5% | 95% | Mean | 5% | 95% |
| *Base model, h=0.75, q=1.0* | | | | | | | |
| 2007 | 575,090 | 1.146 | 0.790 | 1.502 | 32.1% | 24.3% | 39.8% |
| 2008 | 377,360 | 0.876 | 0.617 | 1.136 | 24.5% | 19.5% | 29.5% |
| 2009 | 232,040 | 0.690 | 0.472 | 0.909 | 19.3% | 15.0% | 23.6% |
| 2010 | 191,600 | 0.657 | 0.334 | 0.979 | 18.4% | 10.2% | 26.6% |
| *Alt. model, h=0.75, q prior* | | | | | | | |
| 2007 | 878,670 | 1.651 | 1.126 | 2.175 | 39.8% | 30.8% | 48.8% |
| 2008 | 560,070 | 1.215 | 0.844 | 1.585 | 29.3% | 23.6% | 35.0% |
| 2009 | 334,990 | 0.921 | 0.629 | 1.214 | 22.2% | 17.6% | 26.8% |
| 2010 | 258,650 | 0.842 | 0.439 | 1.244 | 20.3% | 11.7% | 28.9% |

*Decision table*

A decision table was constructed to represent the uncertainty on the acoustic survey catchability coefficient, *q*. The base model with a *q*=1.0 represents the lower range while the alternative model which places a prior on *q* (effective *q*=0.7) represents the upper range. Below the decision table shows the consequences of management action given a state of nature. States of nature include the base model (*h*=0.75, *q*=1.0) and the alternative model (*h*=0.75, *q* prior). The management actions include the OY from each state of nature and four constant coastwide catch scenarios.

Table g. Decision table for two states of nature (base and alternative models) and four different harvest strategies given the state of nature.

| | | | State of Nature | |
|---|---|---|---|---|
| **Relative probability** | | | **0.5** | **0.5** |
| **Model** | | | **h = 0.75, q = 1.0** | **h = 0.75, q prior** |
| **Management action** | Total coast-wide Catch (mt) | Year | Relative depletion (2.5%-97.5% interval) | |
| OY Model h=0.75, q=1.0 | 575,090 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 377,360 | 2008 | 0.245 (0.195-0.295) | 0.326 (0.236-0.417) |
| | 232,040 | 2009 | 0.193 (0.150-0.236) | 0.271 (0.180-0.363) |
| | 191,600 | 2010 | 0.184 (0.102-0.266) | 0.257 (0.138-0.376) |
| OY Model h=0.75, q prior | 878,670 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 560,070 | 2008 | 0.208 (0.126-0.290) | 0.293 (0.236-0.350) |
| | 334,990 | 2009 | 0.139 (0.052-0.226) | 0.222 (0.176-0.268) |
| | 258,650 | 2010 | 0.124 (0.008-0.240) | 0.203 (0.117-0.289) |
| Total coast-wide catch = 100,000 mt | 100,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 100,000 | 2008 | 0.305 (0.230-0.379) | 0.377 (0.290-0.463) |
| | 100,000 | 2009 | 0.279 (0204-0.354) | 0.344 (0.259-0.428) |
| | 100,000 | 2010 | 0.274 (0.167-0.381) | 0.333 (0.218-0.447) |
| Total coast-wide catch = 200,000 mt | 200,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 200,000 | 2008 | 0.291 (0.216-0.367) | 0.365 (0.277-0.452) |
| | 200,000 | 2009 | 0.254 (0.177-0.332) | 0.323 (0.233-0.409) |
| | 200,000 | 2010 | 0.239 (0.131-0.348) | 0.303 (0.186-0.419) |
| Total coast-wide catch = 300,000 mt | 300,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 300,000 | 2008 | 0.278 (0.201-0.355) | 0.354 (0.266-0.442) |
| | 300,000 | 2009 | 0.230 (0.150-0.309) | 0.302 (0.213-0.389) |
| | 300,000 | 2010 | 0.205 (0.094-0.316) | 0.273 (0.155-0.392) |
| Total coast-wide catch = 400,000 mt | 400,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 400,000 | 2008 | 0.265 (0.187-0.342) | 0.343 (0.253-0.432) |
| | 400,000 | 2009 | 0.205 (0.124-0.286) | 0.280 (0.190-0.371) |
| | 400,000 | 2010 | 0.170 (0.057-0.283) | 0.244 (0.123-0.364) |

*Research and data needs*

1) The quantity and quality of biological data prior to 1988 from the Canadian fishery should be evaluated for use in developing length and conditional age at length compositions.
2) Evaluate whether modeling the distinct at-sea and shore based fisheries in the U.S. and Canada explain some lack of fit in the compositional data.
3) Compare spatial distributions of hake across all years and between bottom trawl and acoustic surveys to estimate changes in catchability/availability across years. The two primary issues are related to the changing spatial distribution of the survey as well as the environmental factors that may be responsible for changes in the spatial distribution of hake and their influences on survey catchability and selectivity.

4) Initiate analysis of the acoustic survey data to determine variance estimates for application in the assessment model. The analysis would provide a first cut to define the appropriate CV for the weighting of the acoustic data.
5) Develop an informed prior for the acoustic q. This could be done either with empirical experiments (particularly in off-years for the survey) or in a workshop format with technical experts. There is also the potential to explore putting the target strength estimation in the model directly. This prior should be used in the model when estimating the q parameter.
6) Review the acoustic data to assess whether there are spatial trends in the acoustic survey indices that are not being captured by the model. The analysis should include investigation of the migration (expansion/contraction) of the stock in relation to variation in environmental factors. This would account for potential lack of availability of older animals and how it affects the selectivity function.
7) Investigate aspects of the life history characteristics for Pacific hake and their possible effects on the interrelationship of growth rates and maturity at age. This should include additional data collection of maturity states and fecundity, as current information is limited.
8) Examine the potential use of the CalCOFI data as an index for hake spawning biomass.

Table h. Summary of recent trends in Pacific hake exploitation and stock levels; all values reported at the beginning of the year.

| **Base Model** | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Landings (1000s mt) | 325.2 | 320.6 | 311.9 | 230.8 | 236.0 | 182.9 | 205.6 | 334.7 | 360.3 | 359.9 | NA |
| ABC (1000s mt) | 290 | 290 | 290 | 290 | 238 | 208 | 235 | 514 | 265 | 661 | 612 |
| OY (1000s mt) | | | | | | | | | | | |
| SPR* | 0.520 | 0.500 | 0.483 | 0.551 | 0.562 | 0.729 | 0.760 | 0.679 | 0.637 | 0.588 | NA |
| Total biomass (millions mt) | 2.566 | 2.317 | 2.097 | 1.902 | 1.967 | 4.106 | 3.985 | 3.706 | 3.022 | 2.667 | 2.496 |
| Spawning biomass (millions mt) | 1.197 | 1.088 | 0.986 | 0.916 | 1.111 | 1.587 | 1.807 | 1.738 | 1.496 | 1.295 | 1.146 |
| ~95% interval | 1.333-<br>1.651 | 0.952-<br>1.224 | 0.850-<br>1.122 | 0.774-<br>1.057 | 0.925-<br>1.297 | 1.298-<br>1.875 | 1.460-<br>2.154 | 1.384-<br>1.093 | 1.156-<br>1.837 | 0.954-<br>1.637 | 0.790-<br>1.502 |
| Recruitment (billions) | 1.980 | 2.887 | 14.975 | 1.044 | 1.423 | 0.243 | 2.251 | 3.030 | 1.249 | 0.366 | 2.094 |
| ~95% interval | 1.617-<br>2.245 | 2.435-<br>3.423 | 12.384-<br>18.108 | 0.823-<br>1.323 | 1.106-<br>1.832 | 0.168-<br>0.352 | 1.602-<br>3.164 | 1.795-<br>5.115 | 0.271-<br>5.750 | 0.113-<br>1.187 | 0.353-<br>12.425 |
| Depletion | 33.8% | 30.4% | 27.6% | 25.6% | 31.1% | 44.4% | 50.6% | 48.6% | 41.9% | 36.2% | 32.1% |
| ~95% interval | NA | NA | NA | NA | NA | NA | NA | NA | NAS | 28.9%-<br>43.5% | 24.3%-<br>39.7% |

| **Alternative Model** | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Landings (1000s mt) | 325.2 | 320.6 | 311.9 | 230.8 | 236.0 | 182.9 | 205.6 | 334.7 | 360.3 | 359.9 | NA |
| ABC (1000s mt) | 290 | 290 | 290 | 290 | 238 | 208 | 235 | 514 | 265 | 901 | 879 |
| OY (1000s mt) | | | | | | | | | | | |
| SPR* | 0.567 | 0.553 | 0.544 | 0.620 | 0.640 | 0.791 | 0.818 | 0.750 | 0.713 | 0.673 | NA |
| Total biomass (millions mt) | 3.126 | 2.879 | 2.671 | 2.494 | 2.633 | 5.498 | 5.377 | 4.054 | 4.227 | 3.838 | 3.698 |
| Spawning biomass (millions mt) | 1.406 | 1.299 | 1.203 | 1.149 | 1.424 | 2.058 | 2.360 | 2.295 | 2.024 | 1.806 | 1.651 |
| ~95% interval | 1.150-<br>1.936 | 1.113-<br>1.486 | 1.013-<br>1.394 | 0.946-<br>1.351 | 0.147-<br>1.701 | 1.624-<br>2.491 | 1.839-<br>2.880 | 1.764-<br>2.827 | 1.514-<br>2.533 | 1.299-<br>2.314 | 1.126-<br>2.175 |
| Recruitment (billions) | 2.501 | 3.641 | 19.124 | 1.355 | 1.878 | 0.320 | 3.051 | 4.099 | 1.479 | 0.462 | 2.539 |
| ~95% interval | 2.171-<br>2.884 | 2.877-<br>4.453 | 15.346-<br>23.832 | 1.042-<br>1.761 | 1.426-<br>2.474 | 0.217-<br>0.471 | 2.140-<br>4.348 | 2.413-<br>6.964 | 0.328-<br>6.663 | 0.142-<br>1.503 | 0.428-<br>15.072 |
| Depletion | 33.9% | 31.3% | 29.0% | 27.7% | 34.3% | 49.6% | 56.9% | 55.3% | 48.8% | 43.6% | 39.8% |
| ~95% interval | NA | NA | NA | NA | NA | NA | NA | NA | NA | 34.9%-<br>52.1% | 30.7%-<br>48.8% |

Table i. Summary of Pacific hake reference points.

**Base Model**

| Quantity | Estimate | ~95% Confidence interval |
|---|---|---|
| Unfished spawning stock biomass (*$SB_0$*, millions mt) | 3.567 | 3.14 - 4.0 |
| Unfished total biomass (*$B_0$*, millions mt) | 8.511 | NA |
| Unfished age 3+ biomass (millions mt) | 7.336 | NA |
| Unfished recruitment (*$R_0$*, billions) | 4.665 | 4.098 – 5.288 |
| Spawning stock biomass at MSY (*$SB_{msy}$*)* | 0.981 | 0.776 – 1.203 |
| Basis for *$SB_{msy}$* | $F_{40\%}$ proxy | NA |
| *$SPR_{msy}$** | 40.0% | 33.2%-46.7% |
| Basis for *$SPR_{msy}$* | $F_{40\%}$ proxy | NA |
| Exploitation rate corresponding to *$SPR_{msy}$** | 24.6% | NA |
| MSY* (mt) | 531,565 | 468,853 – 595,015 |

**Alternative Model**

| Quantity | Estimate | ~95% Confidence interval |
|---|---|---|
| Unfished spawning stock biomass (*$SB_0$*, millions mt) | 4.148 | 3.57 – 4.73 |
| Unfished total biomass (*$B_0$*, millions mt) | 10.220 | NA |
| Unfished age 3+ biomass (millions mt) | 8.869 | NA |
| Unfished recruitment (*$R_0$*, billions) | 5.534 | 4.796 - 6.420 |
| Spawning stock biomass at MSY (*$SB_{msy}$*)* | 1.151 | 0.821 - 1.472 |
| Basis for *$SB_{msy}$* | $F_{40\%}$ proxy | NA |
| *$SPR_{msy}$** | 40.0% | 33.2%-46.7% |
| Basis for *$SPR_{msy}$* | $F_{40\%}$ proxy | NA |
| Exploitation rate corresponding to *$SPR_{msy}$** | 24.6% | NA |
| MSY* (mt) | 621,810 | 535,186 – 696,527 |

Agenda Item E.3.b
Supplemental GAP Report
March 2007

GROUNDFISH ADVISORY SUBPANEL REPORT ON
PACIFIC WHITING MANAGEMENT FOR 2007

The Groundfish Advisory Subpanel (GAP) received a presentation from whiting Stock Assessment Review (STAR) Panel chair Dr. Ray Conser.

**2007 Assessment**

The GAP accepts that the STAR Panel and Scientific and Statistical Committee (SSC) concluded that the current assessment is suitable for management. Notably, they consider that there are two equally plausible models – Model 1 using a q = 1.0 and Model 2 using a prior-based q.

The GAP notes the striking similarity of the 2007 assessment to the 2006 assessment. That is, the 2007 assessment estimates current SSB to range between 1.15 to 1.65 million mt (Agenda Item E.3.a., Supplemental Revised Attachment 1, table h) and current depletion to range between 32.1% (Model 1) and 39.8% (Model 2) of unfished SSB (Agenda Item E.3.a., Supplemental Revised Attachment 1, table h). These values are very similar to estimates in the 2006 assessment (see Attachment 1 to this report, a comparison of 2006 Table g and 2007 Table g). The bottom line is that we are starting 2007 at pretty much the same place we were at the start of 2006, including projected depletion estimates for the next several years.

As seen in 2007 Table g, the current assessment estimates an optimum yield (OY) for 2007 ranging from 575,090 mt (Model 1) to 878,670 mt (Model 2). (Agenda Item E.3.a., Supplemental Revised Attachment 1) As the GAP noted last year, these model estimated OYs seem unreasonably high, especially in contrast to the model's estimated depletion trend.

To address this uncertainty in 2006, the Pacific Fishery Management Council (PFMC) derived the 2006 Coastwide OY by focusing on the estimated depletion trajectory; notably which level of 2006 OY would prevent the whiting stock from crossing the 25% overfished threshold in the next two years. This action was a prudent balance of stock dynamics and needs of the fishing community; that is, the PFMC adopted the model derived ABC, but reduced the OY to a reasonable amount that met the needs of the fishing community and prevented reaching the overfished state within two years.

As in 2006, the GAP recognizes that there remains a great deal of uncertainty in the current model, for example, the virgin biomass ($B_0$) estimate seems unrealistically high, harvest level projections also seem unrealistically high, and recent recruitment, e.g. 2003 and 2004 year classes, do not appear to be fully accounted for in the model.

Specific to uncertainty of the model's estimate of $B_0$, the STAR Panel states:

- The simplified model runs [that is, Stock Assessment, Appendix 2]… suggested large uncertainty in the estimate of $B_0$, and that $B_0$ may be smaller than that estimated by SS2 Model 1 and Model 2 runs (Agenda Item E.3.a, Attachment 3, p. 6); and

- SS2 hake modelling… may be causing lack of fit to the acoustic survey and an upward bias in the Model 1 and Model 2 estimates of $SSB_0$ as well as concomitant effects in depletion estimates. These results are consistent with dozens of runs made using the simplified [Stock Assessment, Appendix 2] model that tended to estimate smaller $SSB_0$ than the Model 1 and 2 SS2 estimates (Agenda Item E.3.a, Attachment 3, p. 11).

Younger fish started to appear in the 2005 fishery and occurred more frequently in the 2006 fishery. The STAR Panel notes "[b]ased on the 2005 acoustic survey length composition data a moderately strong 2003 year-class was moving into the fishery, whereas the fishery data are consistent with a moderately strong 2004 year-class." (Agenda Item E.3.a, Attachment 3, p. 4) While their likely contribution to the stock is undetermined, the GAP believes that this recent recruitment will provide for a stable fishery. At the same time the GAP recognizes that if this recruitment is not as strong as expected, reductions in future years may be necessary.

Acoustic survey catchability ("q") continues to be a major source of uncertainty in the whiting assessment. This is the principal reason two models are put forward. For management considerations, however, the Stock Assessment states, "The acoustic survey catchability coefficient (q) has been, and continues to be, one of the major sources of uncertainty in the model. Due to the lengthened acoustic survey biomass trends the assessment model was able to freely estimate the acoustic survey q. These estimates were substantially below the assumed value of q = 1.0 from earlier assessments (Agenda Item E.3.a, Supplemental Revised Attachment 1, p. 3).

Moreover, relative to the value for survey q (i.e., 1.0 vs. freely estimated) – In response to a STAR Panel request, the STAT reported that "including the early survey data resulted in the model estimating a q of 0.062 (1977-1989) and 0.069 (1992-2005)… The precision of the selectivity estimates were not available, but the different patterns in 1977-1989 and 1992-2005 seem to provide a more realistic picture to the STAR panel, at least consistent with what is known about the survey history." (Agenda Item E.3.a, Attachment 3, p. 7)

In addition, in their review of discrepancies in the whiting assessment, the STAR Panel states: "The estimated selectivity functions for the Canadian fishery, the U.S. fishery, and the acoustic survey are all strongly dome-shaped. While plausible mechanisms were postulated for some degree of domeness, **the Panel did not find the unusually small selectivities for older fish (say age 12+) to be entirely credible.** Such model structure has management implications in that the cryptic biomass can represent a significant proportion of standing stock of SSB in some years. Since by definition the cryptic biomass can never be sampled or measured directly by either fishery or by the acoustic survey, **it is difficult to gauge the reliability of the SSB and other biomass estimates.**" (Agenda Item E.3.a, Attachment 3, p.12; emphasis added)

The whiting stock will again be assessed in 2008. The 2008 assessment will include 2007 fishery data, information from the pre-recruit index, and additionally (unlike the current assessment) the hydro-acoustic survey. These data sources should confirm the strength of recent year classes.

**Proposed Optimum Yield**

A majority of the GAP (14 in favor, 1 opposed, 1 abstention) recommends status quo management for the 2007 whiting fishery, which results in a 364,197 mt coastwide optimum yield (OY) and a 269,069 mt harvest guideline for the U.S.

Justification for status quo can be seen in Attachment 2. The projection for hitting the 25% depletion threshold by 2009 using a blend of Model 1 and Model 2 is a coastwide OY of 368, 187 mt. Status quo – 364, 197 mt – is below that projection and should provide an extra buffer to prevent reaching the overfished state by 2009. Attachment 2 also provides information on reductions in available harvest and projected revenue loss for OY values below status quo. A coastwide OY 350,000 mt would result in depletion of approximately 25.4% by 2009, but would result in a loss of $1.3 million in ex-vessel revenue, which would have downstream impacts on processors and coastal communities. Values below 350,000 mt would result in even larger economic losses.

**Management Measures**

The GAP discussed rockfish bycatch limits for the non-tribal whiting fishery. In 2006, these limits were initially set at 4.7 mt for canary rockfish, 25 mt for darkblotched rockfish, and 200 mt for widow rockfish. If any of the bycatch limits are exceeded during the directed whiting fishery any or all sectors of the whiting fishery can be closed by National Marine Fisheries Service via automatic action. Since implementation of the bycatch limits, through fleetwide communication and active avoidance of rockfish, the non-tribal whiting sectors have caught the available whiting OY without exceeding the bycatch limits. For 2006, the non-tribal whiting sectors caught 2.63 mt of canary rockfish, 13.27 mt of darkblotched rockfish, and 187.95 mt of widow rockfish.

Specific recommendations about bycatch limits for the 2007 whiting fishery will be included in the GAP Report under Agenda Item E.5 (Inseason Management).

**Minority View**

One member of the GAP does not agree with the GAP's recommended 2007 OY. Those concerns are detailed at the end of this report.

**Minority Statement 2007 Whiting OY**

The following represent issues of concern with the proposed harvest limit from the GAP for whiting in 2007.

1. This fishery has been historically dependent on uniquely large year classes to sustain commercial operations. There has only been one such successful year class in the last 20 years which was the 1999 yr. class. It would appear that spawning success was better prior to 1985 with multiple large spawning occurring within a 10 yr. period.

2. Under all harvest options presented by the scientists all future depletion levels of the resource decline.

3. The more optimistic model, where Q is .7 drops the resource level below .40 while the Q is 1 model drops to .32. This represents the 4th consecutive drop in depletion levels under either model.

4. We have 4 consecutive years of decreasing spawning mass.

5. Dr. Ray Conser suggested that with an OY of zero the depletion levels could still drop, which suggests that we have very poor aggregate year class strengths from 2003 and 2004. Nevertheless industry believes they have seen a larger 2003 yr. class in their catches. This is a critical discrepancy with the survey and what industry may be seeing.

6. It is difficult to believe that the ABC level can be 500,000 to 800,000 metric tons on a spawning biomass of 1.146 M mt with the continued decline in depletion levels. Even the Plan team and STAR committee comment on this.

7. The range of harvest levels from 100,000 mt to 800,000 mt is not useful in order to give the Council a reasonable opinion. Considering whiting has the most science to support Council actions, this type of OY range is not helpful. It suggests with all the science a large amount of uncertainty and therefore reason to be more cautious.

8. We should wait for the NMFS survey in 2007 to verify larger year classes before we harvest in excess of 200,000 mt. A 200,000 mt harvest would buy one more year under the Q is 1 model before the resource goes below .25.

9. Harvest in the range of 350,000 mt is the highest allowed for this fishery. This does not seem reasonable given all the declining graphics for spawning biomass and depletion levels.

PFMC
03/07/07

2006 Stock Assessment

Table g. Decision table for two states of nature (base and alternative models) and four different harvest strategies given the state of nature.

| | | | State of Nature | |
|---|---|---|---|---|
| **Relative probability** | | | **0.50** | **0.50** |
| **Model** | | | h = 0.75, q = 1.0 | h = 0.75, q prior |
| **Management action** | Total coast-wide Catch (mt) | Year | Relative depletion (2.5%-97.5% interval) | |
| OY Model h=0.75, q=1.0 | 593,746 | 2006 | 0.308 (0.247-0.369) | 0.380 (0.304-0.457) |
| | 358,416 | 2007 | 0.227 (0.181-0.272) | 0.310 (0.219-0.401) |
| | 213,223 | 2008 | 0.178 (0.135-0.221) | 0.263 (0.164-0.363) |
| | 183,620 | 2009 | 0.172 (0.092-0.253) | 0.254 (0.127-0.380) |
| OY Model h=0.75, q prior | 883,490 | 2006 | 0.308 (0.247-0.369) | 0.380 (0.304-0.457) |
| | 522,511 | 2007 | 0.202 (0.125-0.279) | 0.268 (0.215-0.322) |
| | 302,298 | 2008 | 0.144 (0.056-0.232) | 0.202 (0.155-0.249) |
| | 240,702 | 2009 | 0.136 (0.020-0.252) | 0.188 (0.104-0.273) |
| Total coast-wide catch = 200,000 mt | 200,000 | 2006 | 0.308 (0.247-0.369) | 0.380 (0.304-0.457) |
| | 200,000 | 2007 | 0.282 (0.209-0.354) | 0.351 (0.264-0.438) |
| | 200,000 | 2008 | 0.250 (0.167-0.333) | 0.315 (0.219-0.411) |
| | 200,000 | 2009 | 0.239 (0.125-0.352) | 0.299 (0.175-0.423) |
| Total coast-wide catch = 400,000 mt | 400,000 | 2006 | 0.308 (0.247-0.369) | 0.380 (0.304-0.457) |
| | 400,000 | 2007 | 0.258 (0.184-0.332) | 0.330 (0.241-0.419) |
| | 400,000 | 2008 | 0.207 (0.122-0.292) | 0.276 (0.177-0.375) |
| | 400,000 | 2009 | 0.178 (0.063-0.294) | 0.245 (0.118-0.372) |

2007 Stock Assessment

Table g. Decision table for two states of nature (base and alternative models) and four different harvest strategies given the state of nature.

| | | | State of Nature | |
|---|---|---|---|---|
| **Relative probability** | | | **0.5** | **0.5** |
| **Model** | | | **h = 0.75, q = 1.0** | **h = 0.75, q prior** |
| **Management action** | Total coast-wide Catch (mt) | Year | Relative depletion (2.5%-97.5% interval) | |
| OY Model h=0.75, q=1.0 | 575,090 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 377,360 | 2008 | 0.245 (0.195-0.295) | 0.326 (0.236-0.417) |
| | 232,040 | 2009 | 0.193 (0.150-0.236) | 0.271 (0.180-0.363) |
| | 191,600 | 2010 | 0.184 (0.102-0.266) | 0.257 (0.138-0.376) |
| OY Model h=0.75, q prior | 878,670 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 560,070 | 2008 | 0.208 (0.126-0.290) | 0.293 (0.236-0.350) |
| | 334,990 | 2009 | 0.139 (0.052-0.226) | 0.222 (0.176-0.268) |
| | 258,650 | 2010 | 0.124 (0.008-0.240) | 0.203 (0.117-0.289) |
| Total coast-wide catch = 100,000 mt | 100,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 100,000 | 2008 | 0.305 (0.230-0.379) | 0.377 (0.290-0.463) |
| | 100,000 | 2009 | 0.279 (0204-0.354) | 0.344 (0.259-0.428) |
| | 100,000 | 2010 | 0.274 (0.167-0.381) | 0.333 (0.218-0.447) |
| Total coast-wide catch = 200,000 mt | 200,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 200,000 | 2008 | 0.291 (0.216-0.367) | 0.365 (0.277-0.452) |
| | 200,000 | 2009 | 0.254 (0.177-0.332) | 0.323 (0.233-0.409) |
| | 200,000 | 2010 | 0.239 (0.131-0.348) | 0.303 (0.186-0.419) |
| Total coast-wide catch = 300,000 mt | 300,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 300,000 | 2008 | 0.278 (0.201-0.355) | 0.354 (0.266-0.442) |
| | 300,000 | 2009 | 0.230 (0.150-0.309) | 0.302 (0.213-0.389) |
| | 300,000 | 2010 | 0.205 (0.094-0.316) | 0.273 (0.155-0.392) |
| Total coast-wide catch = 400,000 mt | 400,000 | 2007 | 0.321 (0.243-0.397) | 0.398 (0.308-0.488) |
| | 400,000 | 2008 | 0.265 (0.187-0.342) | 0.343 (0.253-0.432) |
| | 400,000 | 2009 | 0.205 (0.124-0.286) | 0.280 (0.190-0.371) |
| | 400,000 | 2010 | 0.170 (0.057-0.283) | 0.244 (0.123-0.364) |

GAP Report E.3.b, Attachment 2, March 2007

| | | | depletion | | | Status quo | | | Alternative 2007 OYs | | | Difference from | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coastwide OY (mt) | Year | q=1.0 | q prior | average | | Coastwide | US OY (mt) | | coastwide | US OY (mt) | | Status quo (mt) | Revenue loss |
| 200,000 | 2007 | 0.321 | 0.398 | 0.360 | | 364,197 | 269,069 | | 350,000 | 258,580 | | 10,489.00 | |
| 200,000 | 2008 | 0.291 | 0.365 | 0.328 | | | 35,000 | tribal | | 35,000 | tribal | 0.00 | |
| 200,000 | 2009 | 0.254 | 0.323 | 0.289 | | | 2,000 | misc | | 2,000 | misc | 0.00 | |
| 200,000 | 2010 | 0.239 | 0.303 | 0.271 | | | 97,469 | SS | | 93,064 | SS | 4,405.40 | |
| | | | | | 2007 US | | 55,696 | MS | | 53,179 | MS | 2,516.80 | |
| 265,528 | 2010 | | | 0.250 | 196,172 | | 78,903 | CP | | 75,337 | CP | 3,565.80 | |
| | | | | | | | 232,068 | non-tribal | | 221,580 | non-tribal | 10,488.00 | $1,251,832.31 |
| 300,000 | 2007 | 0.321 | 0.398 | 0.360 | | | | | | | | | non-tribal |
| 300,000 | 2008 | 0.278 | 0.354 | 0.316 | | | | | 300,000 | 221,640 | | 47,429.00 | |
| 300,000 | 2009 | 0.230 | 0.302 | 0.266 | | | | | | 30,000 | tribal | 5,000.00 | |
| 300,000 | 2010 | 0.205 | 0.273 | 0.239 | | | | | | 2,000 | misc | 0.00 | |
| | | | | | | | | | | 79,649 | SS | 17,820.20 | |
| 350,000 | 2007 | 0.321 | 0.398 | 0.360 | | | | | | 45,514 | MS | 10,182.40 | |
| 350,000 | 2008 | 0.272 | 0.349 | 0.310 | | | | | | 64,478 | CP | 14,425.40 | |
| 350,000 | 2009 | 0.218 | 0.291 | 0.254 | | | | | | 189,640 | non-tribal | 42,428.00 | $5,064,114.06 |
| 350,000 | 2010 | 0.188 | 0.259 | 0.223 | | | | | | | | | non-tribal |
| | | | | | 2007 US | | | | 200,000 | 147,760 | | 121,309.00 | |
| 368,187 | 2009 | | | 0.250 | 272,017 | | | | | 25,000 | tribal | 10,000.00 | |
| | | | | | | | | | | 2,000 | misc | 0.00 | |
| 400,000 | 2007 | 0.321 | 0.398 | 0.360 | | | | | | 50,719 | SS | 46,749.80 | |
| 400,000 | 2008 | 0.265 | 0.343 | 0.304 | | | | | | 28,982 | MS | 26,713.60 | |
| 400,000 | 2009 | 0.205 | 0.280 | 0.243 | | | | | | 41,058 | CP | 37,844.60 | |
| 400,000 | 2010 | 0.170 | 0.244 | 0.207 | | | | | | 120,760 | non-tribal | 111,308.00 | $13,285,465.54 |
| | | | | | | | | | | | | | non-tribal |

| Coastwide OY (mt) | | | | | 2007 US |
|---|---|---|---|---|---|
| based on 40-10 | | q=1.0 | q prior | average | |
| 575,090 | 2009 | 0.193 | 0.271 | 0.232 | 424,876 |
| 878,670 | 2009 | 0.139 | 0.222 | 0.181 | 649,161 |

Note the 350,000 mt depletion estimates are averages of the 300K and 400K depletion estimates.

The SSC notes that the results from both models could be combined to form the basis for management advice giving each model equal weight. (SSC March 2006)

# GROUNDFISH MANAGEMENT TEAM REPORT ON PACIFIC WHITING HARVEST SPECIFICATIONS AND MANAGEMENT MEASURES FOR 2007

The Groundfish Management Team (GMT) reviewed the Pacific Hake (whiting) stock assessment and Stock Assessment Review (STAR) Panel report. As with last year's assessment, the STAR Panel recommended acceptance of two equally plausible models (q=1, effective q=0.7) to represent the uncertainty in the relative depletion level and productivity of the stock. When q was fixed at 1 the estimates of biomass were lower than when q was estimated with an effective q=0.7. Also similar to last year's assessment, the greatest difference from the q=1 to the q estimated scenario was a global scaling upward in total biomass and a slightly lower level of depletion in 2007.

## Whiting Stock Depletion and Risk Assessment

Both models contain a robust trend that show declining biomass in the foreseeable future. The projected optimum yields (OYs) under either model indicate that if the entire 40-10 adjusted OY for 2007 were harvested, the harvest rates and total catches would be among the highest ever observed. Year class trends suggest that the stock is still heavily comprised of the 1999 year class, with near average recruitment from the 2003 and 2004 year classes. There is no indication of another strong year class emerging. As a consequence, the management decisions facing the Council with respect to whiting harvest levels are strikingly similar to those faced in 2006; stock size is projected to continue declining even with greatly reduced harvest rates, but with more substantial declines with harvest levels closer to the status quo.

The GMT expressed concerns with the two equally plausible models and recommends that the Council consider prioritizing research and analysis that would help inform model selection, as well as continue investigating alternate models that were discussed at the STAR Panel. As in 2006, the GMT has provided OY options based on a blended model for Council consideration (Table 2).

The GMT notes that management of the whiting fishery is in transition from the Groundfish Fishery Management Plan (FMP) to the Pacific Whiting Treaty legislation where there is no minimum stock size threshold designated. The GMT would like to point out that the minimum stock size designated under the FMP (25% of unfished biomass, or $B_0$) may still be a useful reference point for stock sustainability, although the Groundfish Harvest Policy Evaluation Workshop Report (Agenda Item E.1) raised questions regarding the effectiveness of this rule for species with highly variable recruitment, such as whiting. If the Council chooses to follow the guidance outlined in the FMP for 2007 whiting, the GMT suggests that overfished thresholds should not be considered as targets, but rather as benchmarks that identify concern.

Sector Allocations and Estimated Bycatch Impacts

Sector allocations and estimated bycatch of overfished species associated with potential OY values are reported in Table 2. These five coastwide OY values were intended to bracket status quo (364,197 mt) with substantially lower and higher OYs (265,528 mt and 400,000 mt). Bycatch estimates for the 2007 whiting season were developed using the weighted average approach, similar to that used in 2004, 2005, and 2006 to predict mortality of canary, darkblotched, POP, and yelloweye. The GMT deviated from this practice for widow rockfish which shows an increasing trend and estimated widow bycatch based on a linear interpolation of the bycatch rate from 2004-2006. Bycatch rates from 2003 through 2006 are found in Figures 1-3.

In March 2004, the Council approved the inclusion of bycatch limits as a management tool available for the 2005 and 2006 fishery, and as part of this agenda item, the Council should consider continuing to use this approach in 2007. Two approaches to bycatch limit management were discussed for the nontribal sectors: fleetwide limits and sector specific limits. However, sector-specific limits likely require greater monitoring than is currently in place. Although each sector of the whiting fishery is monitored for total catch, only the at-sea sectors have a catch tracking system in place that can provide independent total catch estimates in a near real-time manner. The GMT discussed a bycatch limit for the at-sea sectors, however this would require analysis of the monitoring in all sectors to determine if it is adequate to support sector specific limits. Therefore, sector specific bycatch limits are not available for 2007.

From 2004 to 2006, participants in the Pacific whiting fishery were able to demonstrate successful avoidance of overfished species sufficient to stay within established bycatch limits, thereby attaining higher levels of whiting catch relative to predicted bycatch. However, unpredictable events of high bycatch may still occur.

Management Considerations for the 2007 Fishery

Since 2004, the Council has included bycatch limits as a management tool for use in the whiting fishery and the Council may wish to consider establishing similar bycatch limits for the 2007 fishery. A summary of bycatch limits from previous years are presented in the table below.

**Table 1. Previous range of bycatch limits (mt) set by the Council for the non-tribal whiting fishery.**

| | 2004 | 2005 | 2006 | 2007[a] |
|---|---|---|---|---|
| Canary | 6.2 – 7.3 | 4.7 | 4.0 – 4.7 | 4.7 [b] |
| Darkblotched | 9.5 | n/a | 25 | 25 |
| Widow | n/a | 200 – 212 | 200 – 220 | 200 |

[a]Year 2007 values represent the numbers currently outlined in the Federal Regulations, which can be modified by the Council under inseason action.
[b] Agenda Item B.5 Inseason, had an incorrect bycatch limit listed for the non-tribal whiting fishery (4.0 mt). Council staff checked records from previous Council action and this bycatch limit was only intended to apply during the end of 2006.

The GMT notes that the bycatch limits in the scorecard are not allocations and they may be changed inseason.

<u>Summary</u>

The GMT would like to draw the Council's attention to several considerations when managing the Pacific whiting fishery:

*ABC*

1. In 2006, the Council chose to set the ABC based on q=1.

*OY*

1. The Council could consider managing under the 40-10 harvest control rule, and follow the FMP guidance of staying above 25% of unfished biomass.

   Table 2 provides depletion levels under various OY assumptions to help inform the Council. If the Council continues to use the 40-10 harvest control rule, and follows the FMP guidance of staying above 25% of unfished biomass, then the GMT recommends that an OY is chosen that keeps the stock above 25% of unfished biomass for a minimum of two years.

2. The Council could set U.S. whiting OY constrained relative to bycatch rates.

   The Council could set a U.S. whiting OY constrained by the predicted bycatch of canary, darkblotched, and widow rockfish. The current status quo non-tribal bycatch limits for all three overfished species (canary, darkblotched, and widow rockfish) corresponds to a U.S. OY of 223,220 mt.

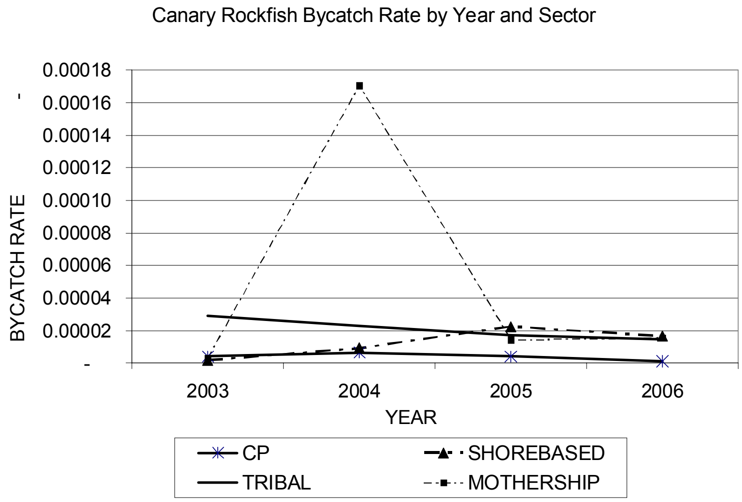
3. The Council could set the U.S. whiting OY independent of bycatch rates.

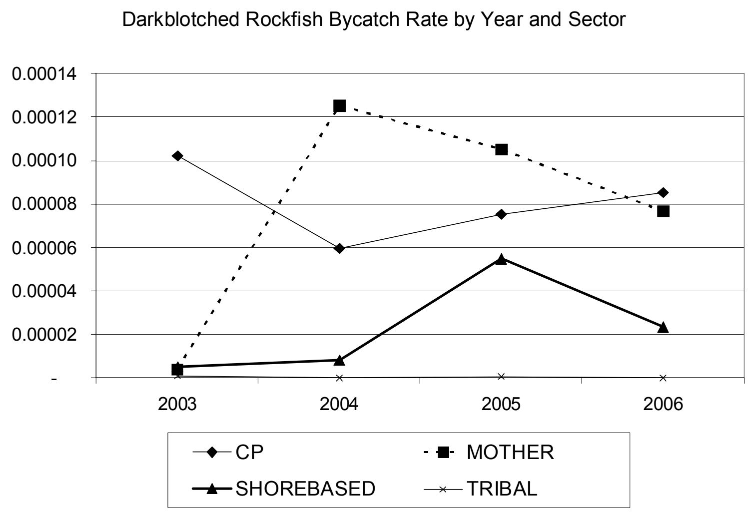
   The Council could set species bycatch limits that reasonably accommodate the fishery and close the whiting fishery sectors when the sector allocations are attained, or when a whiting fishery bycatch limit is reached – whichever comes first. The OY still needs to be set within a reasonable level relative to the bycatch limits to prevent premature fishery closure prior to OY attainment. If current bycatch limits are in place, the non-tribal fishery would close when their sector reaches 4.7 mt of canary, or when the total non-tribal whiting sector catch of widow reaches 200 mt, or when the total non-tribal whiting sector catch of darkblotched reaches 25 mt, or when the whiting OY is attained.

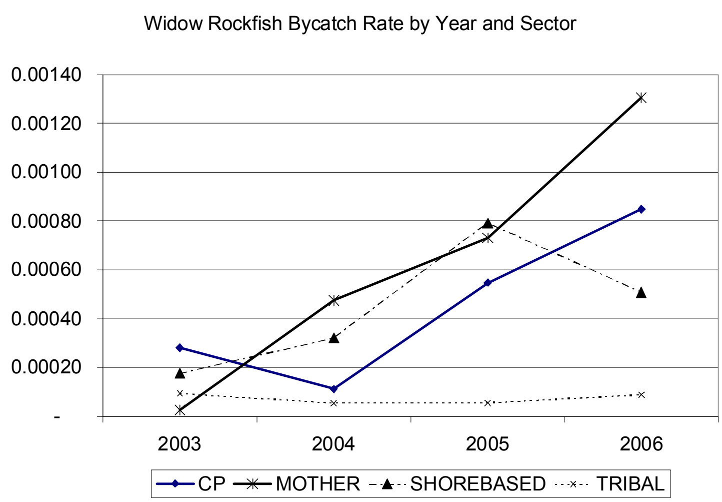
Relative to bycatch limits, the GMT recommends that, under this agenda item, the Council decide whether they want to continue using bycatch limit management in the Pacific whiting fishery for canary, widow, and/or darkblotched and whether other groundfish sectors' bycatch should be accommodated prior to setting the amount for any whiting bycatch limit. If so, the GMT notes that bycatch estimates for all fisheries in 2007 will be provided in an updated 2007 bycatch scorecard during Agenda Item E.5, Consideration of Inseason Adjustments. The scorecard will reflect the quantity of OYs not assigned to any fishery and may inform the Council when setting bycatch limits for the whiting fishery, should the Council adopt bycatch limits under this agenda item.

GMT Recommendations:

1. Adopt a coastwide ABC
2. Adopt a coastwide and U.S. whiting OY
3. Continued use of non-tribal fleetwide bycatch limits as a management tool




**Figures 1 – 3. Bycatch rates in the whiting fishery for canary, darkblotched, and widow rockfish.**

**Table 2: Relative depletion levels for various OYs in 2009 and 2010 and predictions of associated bycatch (using blended model).**

| Coastwide OY | US OY | Sector | Allocation | Canary | Darkblotched | POP | Widow | Qmid Depletion in 2009 | Qmid Depletion in 2010 |
|---|---|---|---|---|---|---|---|---|---|
| 400,000 | 294,998 | Tribal | 35,000 | 0.7 | 0.0 | 0.5 | 2.5 | 24.3% | 20.7% |
| *(largest constant harvest in decision table)* | | Mothership | 62,045 | 2.8 | 5.4 | 1.2 | 106.8 | | |
| | | CP | 87,897 | 0.3 | 6.9 | 1.9 | 106.9 | | |
| | | Shoreside | 108,578 | 1.7 | 3.0 | 0.4 | 56.7 | | |
| | | non-tribal total | 258,520 | 4.8 | 15.4 | 3.6 | 270.4 | | |
| | | Total | 293,520 | 5.4 | 15.4 | 4.1 | 272.9 | | |
| 368,187 | 271,536 | Tribal | 35,000 | 0.7 | 0.0 | 0.5 | 2.5 | 25.0% | 21.7% |
| *(OY = 25% in 2009)* | | Mothership | 56,404 | 2.5 | 4.9 | 1.1 | 97.1 | | |
| | | CP | 79,906 | 0.3 | 6.3 | 1.7 | 97.2 | | |
| | | Shoreside | 98,707 | 1.5 | 2.8 | 0.4 | 51.5 | | |
| | | non-tribal total | 235,017 | 4.4 | 14.0 | 3.2 | 245.8 | | |
| | | Total | 270,017 | 5.0 | 14.0 | 3.8 | 248.3 | | |
| 364,842 | 269,069 | Tribal | 35,000 | 0.7 | 0.0 | 0.5 | 2.5 | 25.1% | 21.8% |
| *(status quo)* | | Mothership | 55,697 | 2.5 | 4.9 | 1.1 | 95.9 | | |
| | | CP | 78,903 | 0.3 | 6.2 | 1.7 | 96.0 | | |
| | | Shoreside | 97,469 | 1.5 | 2.7 | 0.4 | 50.9 | | |
| | | non-tribal total | 232,069 | 4.3 | 13.8 | 3.2 | 242.7 | | |
| | | Total | 267,069 | 5.0 | 13.8 | 3.8 | 245.2 | | |
| 302,673 | 223,220 | Tribal | 30,000 | 0.6 | 0.0 | 0.5 | 2.2 | 26.6% | 23.9% |
| *(OY that is constrained by bycatch projections )* | | Mothership | 45,893 | 2.1 | 4.0 | 0.9 | 79.0 | | |
| | | CP | 65,015 | 0.2 | 5.1 | 1.4 | 79.1 | | |
| | | Shoreside | 80,312 | 1.2 | 2.2 | 0.3 | 41.9 | | |
| | | non-tribal total | 221,220 | 3.5 | 11.4 | 2.6 | 200.0 | | |
| | | Total | 221,220 | 4.1 | 11.4 | 3.1 | 202.2 | | |
| 265,528 | 195,825 | Tribal | 27,500 | 0.5 | 0.0 | 0.4 | 2.0 | 27.4% | 25.0% |
| *(OY = 25% in 2010)* | | Mothership | 40,001 | 1.8 | 3.5 | 0.8 | 68.9 | | |
| | | CP | 56,669 | 0.2 | 4.5 | 1.2 | 68.9 | | |
| | | Shoreside | 70,002 | 1.1 | 2.0 | 0.3 | 36.6 | | |
| | | non-tribal total | 166,672 | 3.1 | 9.9 | 2.3 | 174.3 | | |
| | | Total | 194,172 | 3.6 | 9.9 | 2.7 | 176.3 | | |

# SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON PACIFIC WHITING HARVEST SPECIFICATIONS AND MANAGEMENT MEASURES FOR 2007

Dr. Tom Helser from the Pacific Whiting Stock Assessment Team presented the Scientific and Statistical Committee (SSC) with an overview of the stock assessment of Pacific Hake (whiting) in U.S. and Canadian Waters and responded to questions arising during the SSC discussions. Dr. Ray Conser summarized the report of the joint Canadian and U.S. Pacific Whiting Stock Assessment and Review (STAR) Panel. The Panel was conducted using the Council-approved Terms of Reference for Groundfish Stock Assessments.

As in the 2006 stock assessment, two alternative models were presented based on the value of the acoustic survey catchability coefficient (q). Both models were considered equally plausible. The SSC endorses the use of the 2007 Pacific whiting assessment for management purposes and recommends that the results from both models be combined to form the basis for management advice giving each model equal weight.

The 2007 assessment was conducted using the same stock assessment package (Stock Synthesis 2) and assumptions about natural mortality and steepness as used in the 2006 assessment. However, a new coastwide recruitment index was incorporated into the 2007 assessment and the Santa Cruz pre-recruit index for the years prior to 2001, which was used in the 2006 assessment, was excluded. The removal of the early Santa Cruz time series and inclusion of the new coastwide index has resulted in slightly higher 1999 and 2003-2004 recruitments. As a result, spawning biomass in the most recent years is slightly greater than predicted by the 2006 assessment. These changes account for the similarity in the estimates of spawning biomass and depletion between the 2006 and 2007 assessments.

The projections based on the two alternative models indicate that the stock is in the precautionary range (0.25-0.40 $SSB_0$). The spawning biomass is predicted to decline in the future for almost any level of harvest because the strong 1999 year class, which has been sustaining the stock in recent years, is now past its peak biomass. Catches of 400,000 mt or more are forecast to reduce the spawning stock below the overfished threshold in two years.

$F_{40\%}$ was selected as an $F_{MSY}$ proxy for Pacific whiting based on the results of a meta-analysis that used stock and recruitment data for other whiting species. However, the Pacific whiting stock is predicted to fall below 25% $B_0$ if management is based on $F_{40\%}$ primarily due to the impact of the highly variable recruitment characteristic of this stock. There is therefore a lack of consistency for Pacific whiting between aiming to maximize yield on average and preventing depletion to below 25% of $B_0$.

The SSC again notes that there is only one fishery independent index of abundance (the hydroacoustic survey) that can be used in tuning the assessment and this index is essentially flat, in contrast to the extensive age and size composition data that indicates the stock is in decline from very high biomass levels since the mid 1980's. Model runs in which size and age composition were downweighted still resulted in a declining trend in spawning biomass. While the absolute biomass level is very sensitive to the value assumed for q, the trend is less so.

SUPPLEMENTAL PRELIMINARY QUANTITATIVE ANALYSIS –
INITIAL ALLOCATION FORMULAS AND INDUSTRY INTEGRATION

This document contains the following:

1. **Recent Participation and Drop Years:** Replacements for Tables 1-6 and Figures 1-3 of Agenda Item E.4.a, Attachment 2
2. **Buyback Permit History:** Summary Table of Harvest History for Buyback Permits
3. **Processor Horizontal Integration:** Initial List of Buyer Codes for Companies Receiving Under More than One Code
4. **Harvester Horizontal Integration:** Initial List of Permits Owned by Entities Owning Multiple Permits
5. **Vertical Integration:** An Initial List of Permits Owned by Entities that Also Have an Ownership Interest in Processing Permits

**Replacement Tables and Figures for Agenda Item E.4.a, Attachment 2**

Tables 1-6 and Figures 1-3 of Agenda Item E.4.a, Attachment 2 inadvertently included permits that are no longer in the system because they have since been combined with other permits to create single permits with larger size endorsements. Replacement tables are provided here. *A more complete description of the replacement tables and figures is provided in Attachment 2.* The following is a brief summary.

**Recent Participation**

Table 1 shows, for the shoreside non-whiting harvest sector, the number of permits with no landings, landings in only one year, landings in only two years, landings only three years, etc., for a range of six different time periods. From this table, one can see the number of permits and history that would be eliminated from the allocation depending on the recent participation period selected and minimum number of years with landings that is required during that period. Tables 2 and 3 repeat this information for the shoreside whiting and at-sea whiting catcher vessel sectors, respectively.

Figure 1 shows the number of permits (x-axis) with "Y" number of deliveries (y-axis) for three different periods for shoreside non-whiting sector. Figures 2 and 3 repeat this information for the shoreside whiting and at-sea whiting catcher vessel sectors, respectively. The information in these figures might be useful if one wanted to base a recent participation requirement on a minimum number of landings over a given period as opposed to a number of years of participation.

## Drop Years

Tables 4 though 6 show the effects on those gaining and those losing as a result of a provision that would drop each permits' worst one, two or three years of history from the formula used for calculating the initial allocation. On the right hand side of each panel is a tabulation indicating which years' histories could be counted among the "worst" for the permits. This information is provided for allocation formulas based on absolute pounds and for those based on relative pounds.

## Harvest History of Buyback Permits

For each catcher-vessel permit receiving a history-based allocation, there would also be an equal allocation of quota shares (QS) determined based on the history of the buy-back permits. The pool to be allocated this way would be based on the ratio of the history of buy-back permits to that of all permits. Table 7 shows a calculation of the proportion of history associated with buyback permits for each optimum yield (OY) species and species group.

## Horizontal and Vertical Integration

We need to know the amount of QS that different entities will receive under the initial allocation in order to understand some of the likely affects of the program. Two examples of effects that may be potentially of concern are: (1) constraints that may be imposed by accumulation limits, and (2) the potential effect of QS accumulation on relative market power.

Thus far, most of the analytical effort has been focused at the permit level without regard to whether or not the entity receiving the allocation may own multiple permits (horizontal integration) or operate at multiple levels of the production chain (vertical integration). Companies owning multiple permits or those owning multiple processing facilities would be considered horizontally integrated. Companies owning both harvesting (permits or vessels) and processing assets would be an example of a company with some vertical integration.

## Horizontal Integration

### Processor

Our current understanding of horizontal integration in the processing sector is reflected in Table 8. This table maps buyer identification numbers to the processing companies that use them. The information was put together through interviews with a number of key informants in 2004 and has not been updated since that time. We will continue to expand and update this table through interviews with key informants and other information provided through the public review process.

If the Council selects a processor allocation formula that credits (accrues) processing history either:

- to the current owner of the processing facility, or,
- to the current owner of the company that did the processing (or filled out the fish ticket).

Then, other types of data (in addition to what is provided in Table 8) will need to be collected to assess the effects of the initial distribution of quota shares.

### Harvester

At this time, horizontal integration in the harvesting sector is being assessed based on limited entry permit ownership. Table 9 groups permits that are believed to be under the same ownership, based mainly on comparison of addresses.

## Vertical Integration

Vertical integration is being assessed by first identifying those entities processing trawl caught groundfish and then determining which of them also own groundfish limited entry permits. An initial list of processors that also own permits is provided in Table 10. In some cases, permits are associated with a processor through direct ownership of the permit, as shown in the top portion of Table 10. In other cases, there may be common ownership, where an entity that participates in the ownership of a processor also participates in ownership of a permit, or there may be a closely tied economic interest (for example, a processor employee that also owns a permit). Thus far, one instance of each of these situations has been identified among current permit owners, as indicated in the bottom panel of Table 10. The degree to which these ties establish a processing company's control over QS needs to be specified in defining control accumulation limits and assessing how QS will be distributed among sectors. This is an issue that the Groundfish Allocation Committee (GAC) will be addressing in May. Prior to the May GAC meeting, analysts will be soliciting additional information on linkages between processors and the ownership or control of permits.

PFMC
03/05/07

Table 1. Shoreside non-whiting sector: number of non-buyback permits, rwt lbs, or ex-vessel revenue associated with alternative recent participation criteria (Page 1 of 3)

**Total Groundfish**

**# permits**

| Participation Period | No Landings | Landings In (exact number of years in which landings were made): 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 35 | | | | | | 261 |
| 2002-2003 | 30 | 10 | | | | | |
| 2001-2003 | 22 | 11 | 13 | | | | |
| 2000-2003 | 15 | 8 | 11 | 18 | | | |
| 1999-2003 | 7 | 8 | 9 | 10 | 21 | | |
| 1998-2003 | 6 | **W** | 8 | 10 | 12 | 20 | |

**% of permits**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 13.4% | | | | | |
| 2002-2003 | 11.5% | 3.8% | | | | |
| 2001-2003 | 8.4% | 4.2% | 5.0% | | | |
| 2000-2003 | 5.7% | 3.1% | 4.2% | 6.9% | | |
| 1999-2003 | 2.7% | 3.1% | 3.4% | 3.8% | 8.0% | |
| 1998-2003 | 2.3% | **W** | 3.1% | 3.8% | 4.6% | 7.7% |

**Total Groundfish**

**RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 59,963,871 | | | | | | 776,013,476 |
| 2002-2003 | 39,266,827 | 28,048,095 | | | | | |
| 2001-2003 | 23,088,238 | 19,551,319 | 36,329,340 | | | | |
| 2000-2003 | 8,560,183 | 14,869,129 | 19,271,268 | 38,862,637 | | | |
| 1999-2003 | 1,706,491 | 6,853,693 | 14,882,979 | 19,257,418 | 39,741,053 | | |
| 1998-2003 | 1,440,840 | **W** | 6,818,229 | 16,839,351 | 19,147,426 | 42,181,227 | |

**% of RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 7.7% | | | | | |
| 2002-2003 | 5.1% | 3.6% | | | | |
| 2001-2003 | 3.0% | 2.5% | 4.7% | | | |
| 2000-2003 | 1.1% | 1.9% | 2.5% | 5.0% | | |
| 1999-2003 | 0.2% | 0.9% | 1.9% | 2.5% | 5.1% | |
| 1998-2003 | 0.2% | **W** | 0.9% | 2.2% | 2.5% | 5.4% |

**DTS complex**

**RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 24,410,679 | | | | | | 346,680,076 |
| 2002-2003 | 15,578,672 | 12,267,117 | | | | | |
| 2001-2003 | 9,416,150 | 8,666,208 | 17,005,048 | | | | |
| 2000-2003 | 3,527,237 | 6,035,742 | 8,544,765 | 18,231,836 | | | |
| 1999-2003 | 432,050 | 3,095,187 | 6,036,097 | 8,544,410 | 18,642,188 | | |
| 1998-2003 | 292,295 | **W** | 3,081,265 | 6,768,758 | 8,605,955 | 19,114,857 | |

**% of RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 7.0% | | | | | |
| 2002-2003 | 4.5% | 3.5% | | | | |
| 2001-2003 | 2.7% | 2.5% | 4.9% | | | |
| 2000-2003 | 1.0% | 1.7% | 2.5% | 5.3% | | |
| 1999-2003 | 0.1% | 0.9% | 1.7% | 2.5% | 5.4% | |
| 1998-2003 | 0.1% | **W** | 0.9% | 2.0% | 2.5% | 5.5% |

**Petrale sole**

**RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 1,952,832 | | | | | | 36,990,585 |
| 2002-2003 | 1,597,303 | 691,719 | | | | | |
| 2001-2003 | 1,093,969 | 658,230 | 1,309,287 | | | | |
| 2000-2003 | 597,379 | 558,069 | 604,454 | 1,445,558 | | | |
| 1999-2003 | 228,009 | 369,370 | 559,925 | 602,598 | 1,510,032 | | |
| 1998-2003 | 182,442 | **W** | 366,117 | 694,063 | 539,172 | 1,510,163 | |

**% of RWT lbs**

| Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 5.3% | | | | | |
| 2002-2003 | 4.3% | 1.9% | | | | |
| 2001-2003 | 3.0% | 1.8% | 3.5% | | | |
| 2000-2003 | 1.6% | 1.5% | 1.6% | 3.9% | | |
| 1999-2003 | 0.6% | 1.0% | 1.5% | 1.6% | 4.1% | |
| 1998-2003 | 0.5% | **W** | 1.0% | 1.9% | 1.5% | 4.1% |

**"W"- Withheld for possible confidentiality concerns.**

Table 1. Shoreside non-whiting sector: number of non-buyback permits, rwt lbs, or ex-vessel revenue associated with alternative recent participation criteria (Page 2 of 3)

**Arrowtooth flounder**

| **RWT lbs** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 3,504,017 | | | | | | 62,556,088 |
| 2002-2003 | 3,466,278 | 483,754 | | | | | |
| 2001-2003 | 2,507,987 | 983,330 | 641,933 | | | | |
| 2000-2003 | 834,962 | 1,687,108 | 969,246 | 728,975 | | | |
| 1999-2003 | 35,191 | 799,771 | 1,687,108 | 969,246 | 759,905 | | |
| 1998-2003 | 35,019 | **W** | 799,771 | 1,938,239 | 719,116 | 826,146 | |

| **% of RWT lbs** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 5.6% | | | | | |
| 2002-2003 | 5.5% | 0.8% | | | | |
| 2001-2003 | 4.0% | 1.6% | 1.0% | | | |
| 2000-2003 | 1.3% | 2.7% | 1.5% | 1.2% | | |
| 1999-2003 | 0.1% | 1.3% | 2.7% | 1.5% | 1.2% | |
| 1998-2003 | 0.1% | **W** | 1.3% | 3.1% | 1.1% | 1.3% |

**Yellowtail rockfish**

| **RWT lbs** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 3,692,206 | | | | | | 47,701,923 |
| 2002-2003 | 3,540,784 | 551,769 | | | | | |
| 2001-2003 | 2,081,726 | 1,476,180 | 594,504 | | | | |
| 2000-2003 | 468,164 | 1,617,989 | 1,471,753 | 613,817 | | | |
| 1999-2003 | 48,929 | 419,235 | 1,617,989 | 1,471,753 | 765,028 | | |
| 1998-2003 | 48,507 | **W** | 419,235 | 1,705,709 | 1,384,049 | 1,289,492 | |

| **% of RWT lbs** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 7.7% | | | | | |
| 2002-2003 | 7.4% | 1.2% | | | | |
| 2001-2003 | 4.4% | 3.1% | 1.2% | | | |
| 2000-2003 | 1.0% | 3.4% | 3.1% | 1.3% | | |
| 1999-2003 | 0.1% | 0.9% | 3.4% | 3.1% | 1.6% | |
| 1998-2003 | 0.1% | **W** | 0.9% | 3.6% | 2.9% | 2.7% |

**Nearshore Rockfish**

| **RWT lbs** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 44,828 | | | | | | 151,536 |
| 2002-2003 | 2,088 | 44,451 | | | | | |
| 2001-2003 | 1,273 | 2,240 | 46,473 | | | | |
| 2000-2003 | 171 | 1,102 | 2,244 | 46,541 | | | |
| 1999-2003 | 10 | 161 | 1,108 | 2,238 | 46,541 | | |
| 1998-2003 | 8 | **W** | 167 | 1,106 | 3,110 | 47,892 | |

| **% of RWT lbs** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 29.6% | | | | | |
| 2002-2003 | 1.4% | 29.3% | | | | |
| 2001-2003 | 0.8% | 1.5% | 30.7% | | | |
| 2000-2003 | 0.1% | 0.7% | 1.5% | 30.7% | | |
| 1999-2003 | 0.0% | 0.1% | 0.7% | 1.5% | 30.7% | |
| 1998-2003 | 0.0% | **W** | 0.1% | 0.7% | 2.1% | 31.6% |

**"W"- Withheld for possible confidentiality concerns.**

Table 1. Shoreside non-whiting sector: number of non-buyback permits, rwt lbs, or ex-vessel revenue associated with alternative recent participation criteria (Page 3 of 3)

**Total Groundfish in 2005**

| **# permits** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 17 | | | | | | 122 |
| 2002-2003 | 13 | 6 | | | | | |
| 2001-2003 | 8 | 7 | 8 | | | | |
| 2000-2003 | 5 | 3 | 8 | 12 | | | |
| 1999-2003 | 4 | **W** | 4 | 7 | 14 | | |
| 1998-2003 | 3 | **W** | **W** | 5 | 7 | 14 | |

| **% of permits** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 13.9% | | | | | |
| 2002-2003 | 10.7% | 4.9% | | | | |
| 2001-2003 | 6.6% | 5.7% | 6.6% | | | |
| 2000-2003 | 4.1% | 2.5% | 6.6% | 9.8% | | |
| 1999-2003 | 3.3% | **W** | 3.3% | 5.7% | 11.5% | |
| 1998-2003 | 2.5% | **W** | **W** | 4.1% | 5.7% | 11.5% |

| **2005 GF REV $** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 3,899,029 | | | | | | 22,302,790 |
| 2002-2003 | 2,899,081 | 1,299,643 | | | | | |
| 2001-2003 | 1,967,433 | 1,231,343 | 1,747,714 | | | | |
| 2000-2003 | 1,062,612 | 904,821 | 1,388,916 | 1,993,379 | | | |
| 1999-2003 | 562,381 | **W** | 916,253 | 1,377,484 | 2,488,714 | | |
| 1998-2003 | 323,651 | **W** | **W** | 1,403,557 | 905,534 | 2,583,801 | |

| **% of 2005 GF REV $** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 17.5% | | | | | |
| 2002-2003 | 13.0% | 5.8% | | | | |
| 2001-2003 | 8.8% | 5.5% | 7.8% | | | |
| 2000-2003 | 4.8% | 4.1% | 6.2% | 8.9% | | |
| 1999-2003 | 2.5% | **W** | 4.1% | 6.2% | 11.2% | |
| 1998-2003 | 1.5% | **W** | **W** | 6.3% | 4.1% | 11.6% |

| **2005 GF REV per permit ($)** Participation Period | No Landings | Landings In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 229,355 | | | | | |
| 2002-2003 | 223,006 | 216,607 | | | | |
| 2001-2003 | 245,929 | 175,906 | 218,464 | | | |
| 2000-2003 | 212,522 | 301,607 | 173,615 | 166,115 | | |
| 1999-2003 | 140,595 | **W** | 229,063 | 196,783 | 177,765 | |
| 1998-2003 | 107,884 | **W** | **W** | 280,711 | 129,362 | 184,557 |

**"W"- Withheld for possible confidentiality concerns.**

Table 2. Shoreside whiting sector: number of non-buyback permits, rwt lbs, or ex-vessel revenue associated with alternative recent participation criteria. (Page 1 of 2)

**Total Groundfish**

**# permits** — Landings In (exact number of years in which landings were made):

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 9 | | | | | | 79 |
| 2002-2003 | 8 | 4 | | | | | |
| 2001-2003 | 5 | 4 | 4 | | | | |
| 2000-2003 | 0 | 5 | 4 | 5 | | | |
| 1999-2003 | 0 | 0 | 5 | 4 | 6 | | |
| 1998-2003 | 0 | 0 | 0 | 5 | 5 | 7 | |

**% of permits** — Landings In:

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 11.4% | | | | | |
| 2002-2003 | 10.1% | 5.1% | | | | |
| 2001-2003 | 6.3% | 5.1% | 5.1% | | | |
| 2000-2003 | | 6.3% | 5.1% | 6.3% | | |
| 1999-2003 | | | 6.3% | 5.1% | 7.6% | |
| 1998-2003 | | | | 6.3% | 6.3% | 8.9% |

**RWT lbs** — Landings In:

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 248,301,466 | | | | | | 1,643,157,246 |
| 2002-2003 | 195,839,129 | 66,968,058 | | | | | |
| 2001-2003 | 148,451,120 | 53,006,421 | 71,921,300 | | | | |
| 2000-2003 | 0 | 148,451,120 | 53,006,421 | 109,621,002 | | | |
| 1999-2003 | 0 | 0 | 148,451,120 | 53,006,421 | 139,237,579 | | |
| 1998-2003 | 0 | 0 | 0 | 148,451,120 | 63,578,076 | 164,305,656 | |

**% of RWT lbs** — Landings In:

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 15.1% | | | | | |
| 2002-2003 | 11.9% | 4.1% | | | | |
| 2001-2003 | 9.0% | 3.2% | 4.4% | | | |
| 2000-2003 | | 9.0% | 3.2% | 6.7% | | |
| 1999-2003 | | | 9.0% | 3.2% | 8.5% | |
| 1998-2003 | | | | 9.0% | 3.9% | 10.0% |

**Whiting**

**RWT lbs** — Landings In:

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 245,234,765 | | | | | | 1,631,185,045 |
| 2002-2003 | 193,403,935 | 66,246,156 | | | | | |
| 2001-2003 | 146,526,939 | 52,468,749 | 71,075,350 | | | | |
| 2000-2003 | 0 | 146,526,939 | 52,468,749 | 108,594,158 | | | |
| 1999-2003 | 0 | 0 | 146,526,939 | 52,468,749 | 137,840,166 | | |
| 1998-2003 | 0 | 0 | 0 | 146,526,939 | 62,889,695 | 162,846,747 | |

**% of RWT lbs** — Landings In:

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 15.0% | | | | | |
| 2002-2003 | 11.9% | 4.1% | | | | |
| 2001-2003 | 9.0% | 3.2% | 4.4% | | | |
| 2000-2003 | | 9.0% | 3.2% | 6.7% | | |
| 1999-2003 | | | 9.0% | 3.2% | 8.5% | |
| 1998-2003 | | | | 9.0% | 3.9% | 10.0% |

**"W"- Withheld for possible confidentiality concerns.**

Table 2. Shoreside whiting sector: number of non-buyback permits, rwt lbs, or ex-vessel revenue associated with alternative recent participation criteria. (Page 2 of 2)

**Total Groundfish in 2005**

**# permits** (Landings In:)

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | | 29 |
| 2002-2003 | **W** | **W** | | | | | |
| 2001-2003 | 0 | **W** | **W** | | | | |
| 2000-2003 | 0 | 0 | **W** | **W** | | | |
| 1999-2003 | 0 | 0 | 0 | **W** | **W** | | |
| 1998-2003 | 0 | 0 | 0 | 0 | **W** | 3 | |

**% of permits** (Landings In:)

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | |
| 2002-2003 | **W** | **W** | | | | |
| 2001-2003 | | **W** | **W** | | | |
| 2000-2003 | | | **W** | **W** | | |
| 1999-2003 | | | | **W** | **W** | |
| 1998-2003 | | | | | **W** | 10.3% |

**2005 GF REV $** (Landings In:)

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | | 11,715,640 |
| 2002-2003 | **W** | **W** | | | | | |
| 2001-2003 | 0 | **W** | **W** | | | | |
| 2000-2003 | 0 | 0 | **W** | **W** | | | |
| 1999-2003 | 0 | 0 | 0 | **W** | **W** | | |
| 1998-2003 | 0 | 0 | 0 | 0 | **W** | 1,049,743 | |

**% of 2005 GF REV $** (Landings In:)

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | |
| 2002-2003 | **W** | **W** | | | | |
| 2001-2003 | | **W** | **W** | | | |
| 2000-2003 | | | **W** | **W** | | |
| 1999-2003 | | | | **W** | **W** | |
| 1998-2003 | | | | | **W** | 9.0% |

**2005 GF REV per permit ($)** (Landings In:)

| Participation Period | No Landings | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | **W** | | | | | |
| 2002-2003 | **W** | **W** | | | | |
| 2001-2003 | | **W** | **W** | | | |
| 2000-2003 | | | **W** | **W** | | |
| 1999-2003 | | | | **W** | **W** | |
| 1998-2003 | | | | | **W** | 349,914 |

**"W"- Withheld for possible confidentiality concerns.**

Table 3. At-sea whiting catcher vessel sector: number of non-buyback permits, rwt lbs, or ex-vessel revenue associated with alternative recent participation criteria. (Page 1 of 2)

**Total Groundfish**

**# permits** — Deliveries In (exact number of years in which deliveries were made):

| Participation Period | No Deliveries | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 6 | | | | | | 37 |
| 2002-2003 | 6 | 3 | | | | | |
| 2001-2003 | 4 | 3 | 3 | | | | |
| 2000-2003 | **W** | 3 | 3 | 4 | | | |
| 1999-2003 | **W** | 0 | 3 | 3 | 6 | | |
| 1998-2003 | 0 | **W** | 0 | 3 | 5 | 5 | |

**% of permits** — Deliveries In:

| Participation Period | No Deliveries | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 16.2% | | | | | |
| 2002-2003 | 16.2% | 8.1% | | | | |
| 2001-2003 | 10.8% | 8.1% | 8.1% | | | |
| 2000-2003 | **W** | 8.1% | 8.1% | 10.8% | | |
| 1999-2003 | **W** | | 8.1% | 8.1% | 16.2% | |
| 1998-2003 | | **W** | | 8.1% | 13.5% | 13.5% |

**RWT lbs** — Deliveries In:

| Participation Period | No Deliveries | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 117,043,772 | | | | | | 897,058,717 |
| 2002-2003 | 117,043,772 | 84,762,881 | | | | | |
| 2001-2003 | 61,501,125 | 89,282,228 | 60,979,912 | | | | |
| 2000-2003 | **W** | 52,565,729 | 89,282,228 | 66,574,908 | | | |
| 1999-2003 | **W** | 0 | 52,565,729 | 89,282,228 | 97,967,759 | | |
| 1998-2003 | 0 | **W** | 0 | 52,565,729 | 129,960,727 | 58,518,986 | |

**% of RWT lbs** — Deliveries In:

| Participation Period | No Deliveries | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 13.0% | | | | | |
| 2002-2003 | 13.0% | 9.4% | | | | |
| 2001-2003 | 6.9% | 10.0% | 6.8% | | | |
| 2000-2003 | **W** | 5.9% | 10.0% | 7.4% | | |
| 1999-2003 | **W** | | 5.9% | 10.0% | 10.9% | |
| 1998-2003 | | **W** | | 5.9% | 14.5% | 6.5% |

**Whiting**

**RWT lbs** — Deliveries In:

| Participation Period | No Deliveries | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 1994-2003 Total (incl. buyback) |
|---|---|---|---|---|---|---|---|
| 2003 | 114,864,366 | | | | | | 888,448,745 |
| 2002-2003 | 114,864,366 | 83,974,025 | | | | | |
| 2001-2003 | 60,305,351 | 88,083,110 | 60,315,601 | | | | |
| 2000-2003 | **W** | 51,463,733 | 88,083,110 | 65,900,714 | | | |
| 1999-2003 | **W** | 0 | 51,463,733 | 88,083,110 | 97,082,755 | | |
| 1998-2003 | 0 | **W** | 0 | 51,463,733 | 128,460,561 | 57,924,166 | |

**% of RWT lbs** — Deliveries In:

| Participation Period | No Deliveries | 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 12.9% | | | | | |
| 2002-2003 | 12.9% | 9.5% | | | | |
| 2001-2003 | 6.8% | 9.9% | 6.8% | | | |
| 2000-2003 | **W** | 5.8% | 9.9% | 7.4% | | |
| 1999-2003 | **W** | | 5.8% | 9.9% | 10.9% | |
| 1998-2003 | | **W** | | 5.8% | 14.5% | 6.5% |

**"W"- Withheld for possible confidentiality concerns.**

Table 3. At-sea whiting catcher vessel sector: number of non-buyback permits, rwt lbs, or ex-vessel revenue associated with alternative recent participation criteria. (Page 2 of 2)

**Total Groundfish in 2005**

| **# permits** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 3 | | | | | | 16 |
| 2002-2003 | 3 | **W** | | | | | |
| 2001-2003 | **W** | 3 | **W** | | | | |
| 2000-2003 | 0 | **W** | 3 | **W** | | | |
| 1999-2003 | 0 | 0 | **W** | 3 | **W** | | |
| 1998-2003 | 0 | 0 | 0 | **W** | 4 | **W** | |

| **% of permits** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 18.8% | | | | | |
| 2002-2003 | 18.8% | **W** | | | | |
| 2001-2003 | **W** | 18.8% | **W** | | | |
| 2000-2003 | | **W** | 18.8% | **W** | | |
| 1999-2003 | | | **W** | 18.8% | **W** | |
| 1998-2003 | | | | **W** | 25.0% | **W** |

| **2005 GF REV $** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only | 2005 Total |
|---|---|---|---|---|---|---|---|
| 2003 | 673,970 | | | | | | 4,785,437 |
| 2002-2003 | 673,970 | **W** | | | | | |
| 2001-2003 | **W** | 505,719 | **W** | | | | |
| 2000-2003 | 0 | **W** | 505,719 | **W** | | | |
| 1999-2003 | 0 | 0 | **W** | 505,719 | **W** | | |
| 1998-2003 | 0 | 0 | 0 | **W** | 802,978 | **W** | |

| **% of 2005 GF REV $** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 14.1% | | | | | |
| 2002-2003 | 14.1% | **W** | | | | |
| 2001-2003 | **W** | 10.6% | **W** | | | |
| 2000-2003 | | **W** | 10.6% | **W** | | |
| 1999-2003 | | | **W** | 10.6% | **W** | |
| 1998-2003 | | | | **W** | 16.8% | **W** |

| **2005 GF REV per permit ($)** Participation Period | No Deliveries | Deliveries In: 1 yr only | 2 yrs only | 3 yrs only | 4 yrs only | 5 yrs only |
|---|---|---|---|---|---|---|
| 2003 | 224,657 | | | | | |
| 2002-2003 | 224,657 | **W** | | | | |
| 2001-2003 | **W** | 168,573 | **W** | | | |
| 2000-2003 | | **W** | 168,573 | **W** | | |
| 1999-2003 | | | **W** | 168,573 | **W** | |
| 1998-2003 | | | | **W** | 200,745 | **W** |

**"W"- Withheld for possible confidentiality concerns.**

**Table 4. Shoreside non-whiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 1 of 6)**

### Species: DTS

**$39,859** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 130 | 125 | 117 |
| $ average gain | + 600 | + 1,320 | + 2,216 |
| Percent change | +1.5% | +3.3% | +5.6% |
| # Losers | 41 | 46 | 54 |
| $ average loss | - 1,903 | - 3,587 | - 4,801 |
| Percent change | -4.8% | -9.0% | -12.0% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 24 | 13 | 5 | 9 | 20 | 13 | 20 | 37 | 43 | 31 |
| 2nd Lowest | 8 | 5 | 3 | 4 | 9 | 7 | 12 | 15 | 15 | 8 |
| 3rd Lowest | 7 | 5 | 4 | 4 | 9 | 8 | 12 | 22 | 10 | 14 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 132 | 125 | 118 |
| $ average gain | + 732 | + 1,551 | + 2,565 |
| Percent change | +1.8% | +3.9% | +6.4% |
| # Losers | 39 | 46 | 53 |
| $ average loss | - 2,479 | - 4,216 | - 5,710 |
| Percent change | -6.2% | -10.6% | -14.3% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 25 | 17 | 8 | 13 | 19 | 12 | 19 | 33 | 30 | 30 |
| 2nd Lowest | 12 | 10 | 11 | 9 | 7 | 9 | 7 | 3 | 11 | 7 |
| 3rd Lowest | 10 | 11 | 10 | 10 | 11 | 9 | 14 | 10 | 8 | 2 |

### Species: Sablefish

**$18,875** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 124 | 123 | 116 |
| $ average gain | + 247 | + 549 | + 969 |
| Percent change | +1.3% | +2.9% | +5.1% |
| # Losers | 45 | 46 | 53 |
| $ average loss | - 680 | - 1,468 | - 2,121 |
| Percent change | -3.6% | -7.8% | -11.2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 26 | 17 | 7 | 10 | 22 | 16 | 25 | 32 | 57 | 32 |
| 2nd Lowest | 10 | 5 | 2 | 1 | 18 | 4 | 4 | 7 | 27 | 7 |
| 3rd Lowest | 9 | 8 | 1 | 1 | 16 | 4 | 15 | 19 | 7 | 13 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 128 | 125 | 116 |
| $ average gain | + 356 | + 742 | + 1,256 |
| Percent change | +1.9% | +3.9% | +6.7% |
| # Losers | 41 | 44 | 53 |
| $ average loss | - 1,112 | - 2,108 | - 2,750 |
| Percent change | -5.9% | -11.2% | -14.6% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 29 | 17 | 12 | 13 | 23 | 18 | 25 | 35 | 37 | 31 |
| 2nd Lowest | 13 | 14 | 4 | 6 | 5 | 7 | 12 | 8 | 10 | 8 |
| 3rd Lowest | 9 | 12 | 11 | 14 | 9 | 10 | 7 | 14 | 5 | 8 |

**Table 4. Shoreside non-whiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 2 of 6)**

**Species: Dover** — **$18,378** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 129 | 127 | 124 |
| $ average gain | + 282 | + 606 | + 969 |
| Percent change | +1.5% | +3.3% | +5.3% |
| # Losers | 41 | 43 | 46 |
| $ average loss | - 887 | - 1,791 | - 2,612 |
| Percent change | -4.8% | -9.7% | -14.2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 27 | 12 | 6 | 11 | 17 | 11 | 18 | 35 | 39 | 30 |
| 2nd Lowest | 11 | 9 | 5 | 5 | 9 | 3 | 7 | 12 | 15 | 7 |
| 3rd Lowest | 8 | 15 | 9 | 3 | 13 | 6 | 9 | 16 | 12 | 1 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 130 | 125 | 120 |
| $ average gain | + 306 | + 658 | + 1,057 |
| Percent change | +1.7% | +3.6% | +5.8% |
| # Losers | 40 | 45 | 50 |
| $ average loss | - 994 | - 1,827 | - 2,538 |
| Percent change | -5.4% | -9.9% | -13.8% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 26 | 20 | 10 | 13 | 18 | 10 | 20 | 30 | 30 | 29 |
| 2nd Lowest | 13 | 11 | 10 | 8 | 5 | 8 | 8 | 5 | 9 | 6 |
| 3rd Lowest | 9 | 13 | 10 | 10 | 13 | 7 | 10 | 13 | 6 | 1 |

**Species: Petrale** — **$17,184** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 138 | 133 | 135 |
| $ average gain | + 136 | + 355 | + 630 |
| Percent change | +0.8% | +2.1% | +3.7% |
| # Losers | 34 | 39 | 37 |
| $ average loss | - 553 | - 1,212 | - 2,297 |
| Percent change | -3.2% | -7.1% | -13.4% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 30 | 17 | 13 | 11 | 16 | 22 | 31 | 34 | 36 | 37 |
| 2nd Lowest | 9 | 11 | 9 | 3 | 10 | 7 | 3 | 8 | 11 | 10 |
| 3rd Lowest | 11 | 13 | 6 | 8 | 12 | 10 | 6 | 9 | 8 | 8 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 139 | 133 | 132 |
| $ average gain | + 141 | + 371 | + 668 |
| Percent change | +0.8% | +2.2% | +3.9% |
| # Losers | 33 | 39 | 40 |
| $ average loss | - 593 | - 1,267 | - 2,204 |
| Percent change | -3.4% | -7.4% | -12.8% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 26 | 18 | 15 | 13 | 14 | 21 | 33 | 36 | 40 | 38 |
| 2nd Lowest | 11 | 9 | 8 | 5 | 10 | 6 | 4 | 9 | 9 | 10 |
| 3rd Lowest | 8 | 13 | 8 | 10 | 10 | 10 | 5 | 8 | 8 | 11 |

**Table 4. Shoreside non-whiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 3 of 6)**

**Species: Yellowtail** — **$135** starting avg per permit

**Absolute lbs analysis**

| SNW Yellowtail | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 129 | 127 | 123 |
| $ average gain | + 0 | + 1 | + 3 |
| Percent change | +0.2% | +0.9% | +2.2% |
| # Losers | 16 | 18 | 22 |
| $ average loss | - 2 | - 9 | - 17 |
| Percent change | -1.8% | -6.5% | -12.2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 11 | 16 | 11 | 16 | 18 | 21 | 21 | 27 | 44 | 68 |
| 2nd Lowest | 3 | 1 | 2 | 2 | 3 | 0 | 1 | 4 | 14 | 2 |
| 3rd Lowest | 1 | 2 | 2 | 5 | 3 | 4 | 2 | 17 | 6 | 4 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 132 | 129 | 127 |
| $ average gain | + 1 | + 3 | + 5 |
| Percent change | +0.8% | +2.2% | +3.9% |
| # Losers | 13 | 16 | 18 |
| $ average loss | - 12 | - 24 | - 38 |
| Percent change | -8.6% | -17.5% | -27.8% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 18 | 20 | 12 | 15 | 18 | 18 | 19 | 26 | 44 | 52 |
| 2nd Lowest | 4 | 6 | 4 | 1 | 0 | 1 | 2 | 5 | 5 | 5 |
| 3rd Lowest | 3 | 4 | 11 | 2 | 4 | 5 | 4 | 11 | 2 | 2 |

**Species: Arrowtooth** — **$1,657** starting avg per permit

**Absolute lbs analysis**

| SNW Arrowtooth | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 124 | 121 | 114 |
| $ average gain | + 11 | + 26 | + 49 |
| Percent change | +0.6% | +1.6% | +3.0% |
| # Losers | 17 | 20 | 27 |
| $ average loss | - 78 | - 157 | - 208 |
| Percent change | -4.7% | -9.4% | -12.6% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 17 | 18 | 17 | 14 | 18 | 13 | 14 | 18 | 27 | 29 |
| 2nd Lowest | 4 | 3 | 4 | 2 | 1 | 0 | 4 | 0 | 12 | 4 |
| 3rd Lowest | 4 | 6 | 5 | 4 | 4 | 1 | 5 | 8 | 3 | 1 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 125 | 121 | 115 |
| $ average gain | + 13 | + 29 | + 52 |
| Percent change | +0.8% | +1.7% | +3.1% |
| # Losers | 16 | 20 | 26 |
| $ average loss | - 102 | - 175 | - 230 |
| Percent change | -6.1% | -10.6% | -13.9% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 17 | 16 | 15 | 12 | 19 | 15 | 17 | 17 | 23 | 28 |
| 2nd Lowest | 6 | 4 | 2 | 1 | 2 | 2 | 6 | 1 | 8 | 3 |
| 3rd Lowest | 3 | 5 | 6 | 5 | 5 | 3 | 2 | 5 | 6 | 2 |

**Table 4. Shoreside non-whiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 4 of 6)**

**Species: Other Flatfish** **$3,932** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 131 | 133 | 131 |
| $ average gain | + 33 | + 71 | + 132 |
| Percent change | +0.8% | +1.8% | +3.4% |
| # Losers | 41 | 39 | 41 |
| $ average loss | - 106 | - 244 | - 421 |
| Percent change | -2.7% | -6.2% | -10.7% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 26 | 17 | 9 | 9 | 18 | 16 | 27 | 26 | 36 | 33 |
| 2nd Lowest | 7 | 11 | 2 | 6 | 9 | 4 | 12 | 16 | 11 | 4 |
| 3rd Lowest | 11 | 6 | 8 | 9 | 9 | 7 | 11 | 10 | 8 | 12 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 132 | 136 | 130 |
| $ average gain | + 36 | + 78 | + 149 |
| Percent change | +0.9% | +2.0% | +3.8% |
| # Losers | 40 | 36 | 42 |
| $ average loss | - 120 | - 294 | - 460 |
| Percent change | -3.1% | -7.5% | -11.7% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 31 | 18 | 10 | 7 | 16 | 15 | 23 | 23 | 34 | 31 |
| 2nd Lowest | 7 | 13 | 2 | 8 | 9 | 4 | 9 | 14 | 12 | 4 |
| 3rd Lowest | 11 | 8 | 9 | 8 | 7 | 9 | 14 | 12 | 7 | 8 |

**Species: Lingcod** **$361** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 149 | 133 | 122 |
| $ average gain | + 1 | + 2 | + 4 |
| Percent change | +0.2% | +0.5% | +1.2% |
| # Losers | 23 | 39 | 50 |
| $ average loss | - 4 | - 6 | - 11 |
| Percent change | -1.0% | -1.7% | -2.9% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 12 | 10 | 6 | 10 | 19 | 23 | 47 | 60 | 50 | 63 |
| 2nd Lowest | 5 | 2 | 0 | 1 | 2 | 0 | 10 | 16 | 10 | 8 |
| 3rd Lowest | 1 | 1 | 1 | 2 | 7 | 2 | 14 | 13 | 11 | 14 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 148 | 144 | 137 |
| $ average gain | + 1 | + 5 | + 9 |
| Percent change | +0.4% | +1.3% | +2.6% |
| # Losers | 24 | 28 | 35 |
| $ average loss | - 9 | - 24 | - 36 |
| Percent change | -2.5% | -6.7% | -10.1% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 19 | 14 | 16 | 16 | 18 | 19 | 40 | 54 | 49 | 62 |
| 2nd Lowest | 14 | 4 | 8 | 11 | 2 | 1 | 3 | 5 | 9 | 3 |
| 3rd Lowest | 5 | 15 | 11 | 13 | 8 | 3 | 5 | 7 | 5 | 5 |

**Table 4. <u>Shoreside non-whiting sector</u>: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 5 of 6)**

**Species: POP** — **$250** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 127 | 126 | 125 |
| $ average gain | + 1 | + 3 | + 6 |
| Percent change | +0.5% | +1.3% | +2.2% |
| # Losers | 14 | 15 | 16 |
| $ average loss | - 11 | - 26 | - 43 |
| Percent change | -4.3% | -10.6% | -17.3% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 13 | 14 | 9 | 14 | 14 | 15 | 24 | 25 | 36 | 36 |
| 2nd Lowest | 0 | 0 | 2 | 1 | 2 | 0 | 9 | 7 | 7 | 7 |
| 3rd Lowest | 3 | 5 | 4 | 1 | 1 | 2 | 3 | 12 | 7 | 7 |

**Relative lbs analysis**

| | | | |
|---|---|---|---|
| # Winners | 130 | 127 | 126 |
| $ average gain | + 2 | + 6 | + 11 |
| Percent change | +1.0% | +2.4% | +4.2% |
| # Losers | 11 | 14 | 15 |
| $ average loss | - 29 | - 55 | - 89 |
| Percent change | -11.4% | -22.0% | -35.6% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 15 | 16 | 12 | 15 | 17 | 16 | 20 | 22 | 38 | 32 |
| 2nd Lowest | 2 | 1 | 5 | 2 | 2 | 2 | 4 | 9 | 4 | 3 |
| 3rd Lowest | 12 | 5 | 3 | 2 | 2 | 5 | 2 | 5 | 5 | 3 |

**Species: Darkblotched** — **$233** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 147 | 139 | 133 |
| $ average gain | + 1 | + 2 | + 4 |
| Percent change | +0.2% | +0.8% | +1.7% |
| # Losers | 22 | 30 | 36 |
| $ average loss | - 4 | - 8 | - 14 |
| Percent change | -1.6% | -3.5% | -6.1% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 15 | 9 | 5 | 5 | 11 | 11 | 18 | 28 | 41 | 36 |
| 2nd Lowest | 5 | 2 | 0 | 1 | 1 | 3 | 6 | 17 | 11 | 14 |
| 3rd Lowest | 4 | 5 | 2 | 2 | 2 | 2 | 3 | 17 | 17 | 16 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 142 | 138 | 137 |
| $ average gain | + 2 | + 3 | + 6 |
| Percent change | +0.7% | +1.5% | +2.6% |
| # Losers | 27 | 31 | 32 |
| $ average loss | - 8 | - 16 | - 25 |
| Percent change | -3.4% | -6.7% | -10.9% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 20 | 12 | 7 | 4 | 11 | 8 | 13 | 22 | 30 | 26 |
| 2nd Lowest | 6 | 8 | 9 | 2 | 9 | 1 | 5 | 9 | 4 | 10 |
| 3rd Lowest | 5 | 8 | 12 | 5 | 13 | 7 | 4 | 10 | 11 | 1 |

**Table 4. Shoreside non-whiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 6 of 6)**

**Species: Canary** — **$21** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 157 | 143 | 137 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | +0.0% | +0.2% | +0.4% |
| # Losers | 15 | 29 | 35 |
| $ average loss | - 0 | - 0 | - 0 |
| Percent change | -0.5% | -0.8% | -1.5% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 13 | 10 | 8 | 13 | 17 | 21 | 33 | 55 | 55 | 80 |
| 2nd Lowest | 0 | 1 | 1 | 0 | 0 | 0 | 8 | 8 | 8 | 6 |
| 3rd Lowest | 4 | 5 | 1 | 0 | 2 | 3 | 8 | 13 | 6 | 5 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 159 | 148 | 145 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | +0.2% | +0.7% | +1.6% |
| # Losers | 13 | 24 | 27 |
| $ average loss | - 1 | - 1 | - 2 |
| Percent change | -2.4% | -4.3% | -8.5% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 23 | 19 | 16 | 14 | 19 | 21 | 33 | 51 | 54 | 84 |
| 2nd Lowest | 6 | 7 | 10 | 6 | 1 | 3 | 2 | 4 | 3 | 0 |
| 3rd Lowest | 6 | 12 | 8 | 7 | 4 | 5 | 3 | 6 | 5 | 2 |

**Species: Yelloweye** — **$1** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 157 | 154 | 141 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | +0.0% | +0.0% | +0.1% |
| # Losers | 4 | 7 | 20 |
| $ average loss | - 0 | - 0 | - 0 |
| Percent change | -0.5% | -0.7% | -0.6% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 16 | 15 | 5 | 12 | 24 | 15 | 64 | 59 | 61 | 74 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| 3rd Lowest | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 2 | 8 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 157 | 152 | 147 |
| $ average gain | + 0 | + 0 | + 0 |
| Percent change | +0.0% | +0.1% | +0.5% |
| # Losers | 4 | 9 | 14 |
| $ average loss | - 0 | - 0 | - 0 |
| Percent change | -1.0% | -2.3% | -5.4% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 20 | 21 | 9 | 20 | 25 | 17 | 69 | 64 | 66 | 83 |
| 2nd Lowest | 2 | 2 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 1 |
| 3rd Lowest | 3 | 4 | 1 | 3 | 1 | 6 | 1 | 2 | 2 | 2 |

**Table 5. Shoreside whiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 1 of 2)**

**Species: Whiting** — **$167,457** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 51 | 49 | 48 |
| $ average gain | + 1,856 | + 5,018 | + 8,907 |
| Percent change | +1.1% | +3.0% | +5.3% |
| # Losers | 10 | 12 | 13 |
| $ average loss | - 9,466 | - 20,492 | - 32,887 |
| Percent change | -5.7% | -12.2% | -19.6% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 23 | 19 | 15 | 11 | 17 | 17 | 17 | 19 | 23 | 19 |
| 2nd Lowest | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 5 |
| 3rd Lowest | 1 | 2 | 2 | 0 | 1 | 0 | 0 | 2 | 5 | 6 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 52 | 49 | 48 |
| $ average gain | + 2,003 | + 5,951 | + 10,569 |
| Percent change | +1.2% | +3.6% | +6.3% |
| # Losers | 9 | 12 | 13 |
| $ average loss | - 11,570 | - 24,298 | - 39,023 |
| Percent change | -6.9% | -14.5% | -23.3% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 23 | 19 | 15 | 11 | 17 | 17 | 18 | 19 | 21 | 20 |
| 2nd Lowest | 0 | 3 | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 0 |
| 3rd Lowest | 1 | 2 | 4 | 3 | 1 | 3 | 0 | 1 | 1 | 3 |

**Species: Widow** — **$1,224** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 51 | 51 | 47 |
| $ average gain | + 1 | + 1 | + 3 |
| Percent change | +0.0% | +0.1% | +0.3% |
| # Losers | 2 | 2 | 6 |
| $ average loss | - 15 | - 35 | - 26 |
| Percent change | -1.2% | -2.9% | -2.2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 18 | 18 | 15 | 13 | 15 | 16 | 16 | 22 | 25 | 26 |
| 2nd Lowest | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 4 | 5 |
| 3rd Lowest | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 6 | 4 | 4 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 45 | 47 | 45 |
| $ average gain | + 2 | + 5 | + 11 |
| Percent change | +0.1% | +0.4% | +0.9% |
| # Losers | 8 | 6 | 8 |
| $ average loss | - 10 | - 41 | - 61 |
| Percent change | -0.8% | -3.3% | -5.0% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 18 | 19 | 16 | 14 | 15 | 16 | 15 | 23 | 21 | 27 |
| 2nd Lowest | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 4 | 2 |
| 3rd Lowest | 0 | 0 | 1 | 1 | 3 | 1 | 0 | 4 | 4 | 3 |

**Table 5. Shoreside whiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 2 of 2)**

**Species: Canary** — **$46** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 44 | 42 |
| $ average gain | - | + 0 | + 0 |
| Percent change | - | +0.2% | +0.6% |
| # Losers | 0 | 6 | 8 |
| $ average loss | - | - 1 | - 1 |
| Percent change | - | -1.4% | -3.1% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 39 | 27 | 23 | 15 | 17 | 14 | 18 | 20 | 24 | 27 |
| 2nd Lowest | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 2 |
| 3rd Lowest | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 44 | 42 |
| $ average gain | - | + 0 | + 0 |
| Percent change | - | +0.2% | +0.8% |
| # Losers | 0 | 6 | 8 |
| $ average loss | - | - 1 | - 2 |
| Percent change | - | -1.4% | -4.0% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 39 | 27 | 23 | 15 | 17 | 14 | 18 | 20 | 24 | 27 |
| 2nd Lowest | 0 | 1 | 2 | 0 | 2 | 0 | 1 | 1 | 0 | 0 |
| 3rd Lowest | 1 | 0 | 3 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |

**Species: Yellowtail** — **$2,587** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 50 | 49 | 47 |
| $ average gain | + 7 | + 17 | + 33 |
| Percent change | +0.3% | +0.7% | +1.3% |
| # Losers | 4 | 5 | 7 |
| $ average loss | - 86 | - 171 | - 224 |
| Percent change | -3.3% | -6.6% | -8.7% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 20 | 16 | 14 | 14 | 15 | 12 | 15 | 18 | 21 | 23 |
| 2nd Lowest | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 4 | 2 |
| 3rd Lowest | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 6 | 5 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 51 | 50 | 49 |
| $ average gain | + 9 | + 32 | + 58 |
| Percent change | +0.3% | +1.2% | +2.2% |
| # Losers | 3 | 4 | 5 |
| $ average loss | - 150 | - 402 | - 566 |
| Percent change | -5.8% | -15.5% | -21.9% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 22 | 17 | 15 | 15 | 16 | 13 | 15 | 17 | 21 | 22 |
| 2nd Lowest | 0 | 3 | 0 | 2 | 2 | 2 | 1 | 1 | 1 | 0 |
| 3rd Lowest | 0 | 1 | 3 | 1 | 4 | 0 | 0 | 1 | 5 | 2 |

**Table 6. At Sea whiting catcher vessel sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 1 of 2)**

**Species: Whiting** — **$125,199** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 31 | 28 | 28 |
| $ average gain | + 1,644 | + 4,321 | + 7,446 |
| Percent change | +1.3% | +3.5% | +5.9% |
| # Losers | 5 | 8 | 8 |
| $ average loss | - 10,192 | - 15,123 | - 26,060 |
| Percent change | -8.1% | -12.1% | -20.8% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 10 | 16 | 15 | 11 | 11 | 12 | 13 | 18 | 24 | 23 |
| 2nd Lowest | 1 | 2 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 3rd Lowest | 2 | 0 | 1 | 0 | 0 | 2 | 1 | 4 | 0 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 31 | 28 | 26 |
| $ average gain | + 1,581 | + 3,990 | + 7,257 |
| Percent change | +1.3% | +3.2% | +5.8% |
| # Losers | 5 | 8 | 10 |
| $ average loss | - 9,803 | - 13,964 | - 18,868 |
| Percent change | -7.8% | -11.2% | -15.1% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 12 | 13 | 16 | 11 | 12 | 12 | 13 | 17 | 24 | 23 |
| 2nd Lowest | 2 | 3 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 |
| 3rd Lowest | 1 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 0 | 0 |

**Species: Widow** — **$853** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 33 | 31 | 27 |
| $ average gain | + 0 | + 2 | + 9 |
| Percent change | +0.0% | +0.3% | +1.1% |
| # Losers | 3 | 5 | 9 |
| $ average loss | - 1 | - 13 | - 28 |
| Percent change | -0.1% | -1.6% | -3.2% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 9 | 13 | 14 | 12 | 10 | 12 | 13 | 18 | 23 | 26 |
| 2nd Lowest | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 |
| 3rd Lowest | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 1 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 33 | 30 | 28 |
| $ average gain | + 2 | + 8 | + 17 |
| Percent change | +0.2% | +0.9% | +2.0% |
| # Losers | 3 | 6 | 8 |
| $ average loss | - 21 | - 40 | - 59 |
| Percent change | -2.4% | -4.6% | -7.0% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 10 | 14 | 14 | 13 | 10 | 12 | 13 | 18 | 23 | 23 |
| 2nd Lowest | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3rd Lowest | 0 | 1 | 1 | 1 | 3 | 1 | 2 | 0 | 0 | 1 |

**Table 6. At Sea whiting catcher vessel sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop-year allocation options (page 2 of 2)**

**Species: Canary** — **$21** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 0 | 32 |
| $ average gain | - | - | + 0 |
| Percent change | - | - | +0.0% |
| # Losers | 0 | 0 | 1 |
| $ average loss | - | - | - 0 |
| Percent change | - | - | -1.5% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 17 | 20 | 25 | 18 | 19 | 22 | 20 | 18 | 20 | 26 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3rd Lowest | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 0 | 32 |
| $ average gain | - | - | + 0 |
| Percent change | - | - | +0.0% |
| # Losers | 0 | 0 | 1 |
| $ average loss | - | - | - 0 |
| Percent change | - | - | -0.9% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 19 | 20 | 27 | 20 | 21 | 24 | 22 | 20 | 22 | 28 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3rd Lowest | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Species: Yellowtail** — **$727** starting avg per permit

**Absolute lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 33 | 31 |
| $ average gain | - | + 0 | + 2 |
| Percent change | - | +0.0% | +0.3% |
| # Losers | 0 | 3 | 5 |
| $ average loss | - | - 3 | - 13 |
| Percent change | - | -0.4% | -1.8% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 9 | 13 | 20 | 10 | 10 | 11 | 12 | 18 | 23 | 29 |
| 2nd Lowest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 |
| 3rd Lowest | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 4 | 2 |

**Relative lbs analysis**

| | Drop 1 yr | Drop 2 yrs | Drop 3 yrs |
|---|---|---|---|
| # Winners | 0 | 32 | 30 |
| $ average gain | - | + 1 | + 8 |
| Percent change | - | +0.1% | +1.1% |
| # Losers | 0 | 4 | 6 |
| $ average loss | - | - 8 | - 41 |
| Percent change | - | -1.0% | -5.7% |

Number of permits that recorded relatively low catch history each year

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 9 | 13 | 20 | 10 | 10 | 11 | 12 | 18 | 23 | 29 |
| 2nd Lowest | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 3rd Lowest | 0 | 3 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |

**Table 7. Buyback permits: 1994 - 2003 aggregate catch history share (%).**

| Species Group | **Percent of Catcher Vessel Fleet History (1994-2003)** |
|---|---|
| Lingcod - coastwide | 43.70% |
| N. of 42° (OR & WA) | 45.31% |
| S. of 42° (CA) | 39.27% |
| Pacific Cod | 50.92% |
| Pacific Whiting (Coastwide) | 5.46% |
| Sablefish (Coastwide) | 44.88% |
| N. of 36° (Monterey north) | 45.19% |
| S. of 36° (Conception area) | 36.71% |
| **PACIFIC OCEAN PERCH** | 41.89% |
| Shortbelly Rockfish | **39.76%** |
| **WIDOW ROCKFISH** | 33.80% |
| **CANARY ROCKFISH** | 44.04% |
| Chilipepper Rockfish | 19.98% |
| **BOCACCIO** | 18.30% |
| Splitnose Rockfish | 24.89% |
| Yellowtail Rockfish | **35.71%** |
| Shortspine Thornyhead - coastwide | 44.51% |
| N. of 34°27' | 49.07% |
| S. of 34°27' | 33.49% |
| Longspine Thornyhead - coastwide | 45.71% |
| N. of 34°27' | 45.71% |
| S. of 34°27' | 35.64% |
| Other thornyheads | 38.15% |
| **COWCOD** | 55.88% |
| **DARKBLOTCHED** | 47.81% |
| **YELLOWEYE** | 33.70% |
| Black Rockfish - coastwide | 21.27% |
| Black Rockfish (WA) | **57.83%** |
| Black Rockfish (OR-CA) | 15.97% |
| **Minor Rockfish North** | 43.76% |
| **Nearshore Species** | 58.81% |
| **Shelf Species** | 43.38% |
| BOCACCIO: N. of Monterey | 46.72% |
| Chilipepper Rockfish: Eureka | **66.62%** |
| Redstripe Rockfish | 34.87% |
| Silvergrey Rockfish | 46.31% |
| Other Northern Shelf Rockfish | 39.09% |
| **Slope Species** | 44.23% |
| Bank Rockfish | 67.74% |
| Sharpchin Rockfish, north | 48.04% |
| Splitnose Rockfish: N. of Monterey | **46.86%** |
| Yellowmouth Rockfish | 31.53% |
| Other Northern Slope Rockfish | 43.34% |
| **Minor Rockfish South** | 31.28% |
| **Nearshore Species** | 28.69% |
| **Shelf Species** | 24.95% |
| Redstripe Rockfish | 45.57% |
| Yellowtail Rockfish | 35.69% |
| Other Southern Shelf Rockfish | 16.29% |
| **Slope Species** | 33.26% |
| Bank Rockfish | 34.14% |
| Blackgill Rockfish | 30.01% |
| Sharpchin Rockfish | 45.77% |
| Yellowmouth Rockfish | 21.57% |
| Other Southern Slope Rockfish | 30.89% |
| California scorpionfish | 3.74% |
| Cabezon (off CA only) | 4.11% |
| Dover sole (total) | 45.56% |
| English Sole | 38.61% |
| Petrale Sole (coastwide) | 47.46% |
| Arrowtooth Flounder (total) | 53.20% |
| Starry Flounder | 12.14% |
| Other Flatfish | 33.50% |
| Kelp Greenling | 10.02% |
| Spiny Dogfish | 58.62% |
| Other Fish | 41.00% |
| Total Groundfish (except whiting) | 42.30% |

Table 8. Initial identification of buyers with multiple identifiers on fish tickets. (page 1 of 2)

| Agency | Identifier on Landing Receipt | Last Year of this Ownership (As of 2003) | PacFIN Description | Group | Current Ownership (If Different) |
|---|---|---|---|---|---|
| C | 0455102 | 1999 | ALIOTO FISH CO INC CRESCENT CITY | AL | TO |
| C | 0455100 | -- | ALIOTO FISH CO INC SAN FRANCISCO | AL | BE |
| C | 0243605 | 2002 | BAY FRESH MOSS LANDING | BF | DEVELOPED |
| C | 6032500 | -- | BAY FRESH SEAFOODS MOSS LANDING | BF | AS |
| C | 6032501 | -- | BAY FRESH SEAFOODS MOSS LANDING | BF | NECESSARY |
| C | 6045000 | -- | B J ENTERPRIZES NIPOMO | BJ | |
| C | 6045001 | 2000 | B J ENTERPRIZES NIPOMO | BJ | |
| O | 0721 | -- | BORNSTEIN SEAFOOD INC NEWPORT NEWPORT OR | BO | |
| W | 0090 | -- | BORNSTEIN SEAFOODS INC | BO | |
| O | 0646 | -- | BORNSTEIN SEAFOODS OF OREGON ASTORIA OR | BO | |
| C | 0283205 | -- | CAITO FISHERIES INC | CF | |
| C | 0283207 | -- | CAITO FISHERIES INC | CF | |
| C | 0283202 | -- | CAITO FISHERIES INC CRESCENT CITY | CF | |
| C | 0283203 | -- | CAITO FISHERIES INC EUREKA | CF | |
| C | 0283201 | -- | CAITO FISHERIES INC FORT BRAGG | CF | |
| C | 0283200 | -- | CAITO FISHERIES INC FORT BRAGG | CF | |
| C | 0283204 | -- | CAITO FISHERIES INC SAN FRANCISCO | CF | |
| C | 3161400 | -- | OCEAN FRESH SEAFOOD PRODUCTS, JV FORT BRAGG | ?? | |
| C | 0243603 | -- | OCEAN FRESH SEAFOODS FORT BRAGG | ?? | |
| O | 2020 | -- | CHUCKS SEAFOODS INC CHARLESTON OR | CH | |
| C | 0686601 | -- | CENTRAL COAST SEAFOOD ATASCADERO | CN | |
| C | 0686600 | -- | CENTRAL COAST SEAFOOD INC ATASCADERO | CN | |
| W | 5462 | 1998 | ASTORIA SEA PRODUCTS LLC | CO | |
| C | 4071100 | -- | COSTARELLA SEAFOODS SAN FRANCISCO | CO | |
| C | 4071101 | -- | COSTARELLA SEAFOODS SAN FRANCISCO | CO | |
| C | 0500400 | 2001 | SEA PRODUCTS CO/CONSOLIDATED FACTORMONTEREY | CO | |
| C | 2017501 | -- | CARVALHO FISHERIES EUREKA | CR | |
| C | 2017500 | -- | CARVALHO FISHERIES MCKINLEYVILLE | CR | |
| O | 0680 | -- | CARVALHO FISHERIES INC NEWPORT OR | CR | |
| C | 0433301 | -- | BUGATTO ENT INC BODEGA BAY | CS | |
| C | 0433300 | -- | BUGATTO ENT INC BODEGA BAY | CS | |
| C | 0425001 | -- | CALIFORNIA SHELLFISH CRESCENT CITY | CS | |
| C | 0425009 | -- | CALIFORNIA SHELLFISH CO SAN FRANCISCO | CS | |
| C | 0425003 | 2000 | CALIFORNIA SHELLFISH CO INC CRESCENT CITY | CS | |
| C | 2026800 | 2001 | CRAB SHACK EUREKA | CS | |
| O | 1505 | -- | HALLMARK FISHERIES CHARLESTON OR | CS | |
| C | 0425000 | -- | HALLMARK FISHERIES CHARLESTON | CS | |
| C | 0425015 | -- | HALLMARK FISHERIES CRESCENT CITY | CS | |
| O | 0242 | -- | POINT ADAMS PACKING CO - HAMMOND HAMMOND OR | CS | |
| C | 0425007 | -- | POINT ST GEORGE FISHERIES EUREKA | CS | |
| C | 0425002 | 2000 | WEST COAST CRAB CRESCENT CITY | CS | |
| C | 0425004 | 1998 | WEST COAST CRAB COMPANY CRESCENT CITY | CS | |
| C | 6008800 | -- | DEL MAR SEAFOODS INC SALINAS | DL | |
| C | 6008801 | -- | DEL MAR SEAFOODS INC SALINAS | DL | |
| C | 4078500 | -- | FITZ EL GRANADA | FZ | |
| C | 4078501 | -- | FITZ HALF MOON BAY | FZ | |
| C | 6041201 | -- | GIOVANNIS WHOLESALE FISH MORRO BAY | GI | |
| C | 6041200 | -- | GIOVANNIS WHOLESALE FISH MORRO BAY | GI | |
| C | 0446500 | 2000 | H & N FISH CO SAN FRANCISCO | HN | |
| C | 0446503 | 2000 | H & N FISH COMPANY SAN FRANCISCO | HN | |
| C | 0449100 | -- | LUCAS WHARF INC BODEGA BAY | LW | |
| C | 0449101 | -- | LUCAS WHARF INC BODEGA BAY | LW | |
| C | 7087300 | -- | MING DYNASTY FISH CO GOLETA | MD | |
| C | 7087301 | 1997 | MING DYNASTY FISH CO GOLETA | MD | |
| C | 0455600 | -- | MORGAN FISH SAN FRANCISCO | MF | |
| C | 0455601 | -- | MORGAN FISH SAN FRANCISCO | MF | |
| C | 7111001 | 1999 | CRAWFORD SANTA YNEZ | MO | |
| C | 7110101 | -- | MOORES SEAFOOD INC CAMARILLO | MO | |
| C | 0405300 | -- | MORNING STAR FISHERIES EL GRANADA | MS | |
| C | 0405301 | -- | MORNING STAR FISHERIES EL GRANADA | MS | |
| C | 0248321 | 2001 | Nor-Cal | NC | |
| C | 0248309 | 2001 | EUREKA FISHERIES INC MORRO BAY | NC | |
| C | 0248307 | 2001 | EUREKA FISHERIES INC RICHMOND | NC | |
| C | 0248308 | 2001 | EUREKA FISHERIES INC TRINIDAD | NC | |
| C | 0248302 | 2001 | EUREKA ICE & COLD STORAGE EUREKA | NC | |
| C | 4070800 | -- | NOR CAL SEAFOOD INC OAKLAND | NC | |
| C | 0248304 | 2001 | NOR CAL SEAFOODS EUREKA | NC | |

Table 8. Initial identification of buyers with multiple identifiers on fish tickets. (page 2 of 2)

| Agency | Identifier on Landing Receipt | Last Year of this Ownership (As of 2003) | PacFIN Description | Group | Current Ownership (If Different) |
|---|---|---|---|---|---|
| C | 3123801 | -- | NORTH COAST FISHERIES INC SANTA ROSA | NO | |
| C | 3123800 | -- | NORTH COAST FISHERIES INCORPORATED SANTA ROSA | NO | |
| O | 0059 | 1999 | OCEAN BEAUTY - ASTORIA ASTORIA OR | OB | |
| O | 0084 | 1998 | OCEAN BEAUTY - CHARLESTON CHARLESTON OR | OB | |
| W | 0840 | -- | OCEAN BEAUTY SEAFOODS INC | OB | |
| O | 0544 | -- | OCEAN BEAUTY SEAFOODS INC NWF NEWPORT OR | OB | |
| O | 0060 | 1999 | OCEAN BEAUTY SEAFOODS INC/NEWPORT NEWPORT OR | OB | |
| C | 3068403 | -- | PACIFIC FRESH | PF | |
| C | 3068400 | -- | PACIFIC FRESH SEA FOOD COMPANY SACRAMENTO | PF | |
| O | 0698 | -- | BANDON PACIFIC INC CHARLESTON OR | PG | |
| W | 0051 | 2002 | BAY FISH LLC | PG | |
| C | 0243602 | -- | PACIFIC CHOICE SEAFOOD CO CRESCENT CITY | PG | |
| C | 0243601 | -- | PACIFIC CHOICE SEAFOOD COMPANY EUREKA | PG | TO |
| C | 0243600 | -- | PACIFIC CHOICE SEAFOOD COMPANY EUREKA | PG | BE |
| O | 0736 | -- | PACIFIC CHOICE SEAFOODS BROOKINGS OR | PG | DEVELOPED |
| O | 0081 | -- | PACIFIC COAST SEAFOODS COMPANY WARRENTON OR | PG | AS |
| O | 0654 | -- | PACIFIC SHRIMP COMPANY NEWPORT OR | PG | NECESSARY |
| O | 0586 | 1997 | S & S SEAF00D CO INC PORTLAND OR | PG | |
| O | 0679 | 2000 | S & S SEAFOOD COMPANY INC PORTLAND OR | PG | |
| W | 0921 | -- | WASHINGTON CRAB PRODUCERS INC | PG | |
| C | 4077700 | 2000 | PACIFIC SEAFOOD SAN FRANCISCO | PX | |
| C | 7058100 | -- | PIERPONT SEAFOOD VENTURA | PI | |
| C | 7058101 | 2000 | STATE FISH CO VENTURA | PI | |
| C | 4077903 | 2002 | PILLAR POINT SEAFOOD | PP | |
| C | 4077901 | 2002 | PILLAR POINT SEAFOOD EL GRANADA | PP | |
| C | 0460600 | -- | PRINCETON SEAFOOD CO EL GRANADA | PS | |
| C | 0460601 | -- | PRINCETON SEAFOOD CO EL GRANADA | PS | |
| C | 0581700 | -- | ROYAL SEAFOODS INC MONTEREY | RS | |
| C | 0581701 | -- | ROYAL SEAFOODS INC MONTEREY | RS | |
| C | 0581702 | 2000 | ROYAL SEAFOODS INC SALINAS | RS | |
| C | 4113101 | -- | SOLOMON LIVE FISH MOSS LANDING | SL | |
| C | 4113100 | -- | SOLOMON LIVE FISH MOSS LANDING | SL | |
| C | 0564101 | -- | STAGNARO BROS SEAFOOD INC SANTA CRUZ | ST | |
| C | 0564100 | -- | STAGNARO BROS SEAFOOD INC SANTA CRUZ | ST | |
| C | 0564103 | -- | STAGNARO BROS SEAFOOD INC SANTA CRUZ | ST | |
| C | 0460900 | -- | THREE CAPTAINS SEA PRODUCTS EL GRANADA | TC | |
| C | 0460901 | -- | THREE CAPTAINS SEA PRODUCTS EL GRANADA | TC | |
| C | 4098800 | -- | W F ALBER INC SAN FRANCISCO | WF | |
| C | 4098801 | -- | W F ALBER, INC SAN FRANCISCO | WF | |

Table 9. Initial identification of groups permits believed to be under the same ownership. (page 1 of 1)

| | PERMIT | Vessel | Permit Owner | City |
|---|---|---|---|---|
| | GF0706 | PIONEER | PENNISI, GIUSEPPE AND PENNISI II, GIUSEPPE | MONTEREY |
| | GF0707 | SAN GIOVANNI | PENNISI, GIUSEPPE | MONTEREY |
| | GF0708 | UNIDENTIFIED | PENNISI, GIUSEPPE AND PENNISI, BILLIE ELAINE | MONTEREY |
| | GF0464 | PHYLLIS J | FORTADO SR, LARRY | EL GRANADA |
| | GF0922 | LYNDIE J | FORTADO SR, LARRY | EL GRANADA |
| | GF0185 | MORIAH LEE | BETTENCOURT, DAVID E AND BETTENCOURT, DONNA L AND BETTENCOURT, GEOFFREY AND BETTENCOURT, MORIAH LEE | HALF MOON BAY |
| | GF0946 | UNIDENTIFIED | BETTENCOURT, DAVID E AND BETTENCOURT, DONNA L | HALF MOON BAY |
| | GF0008 | UNIDENTIFIED | THE NATURE CONSERVANCY | SAN FRANCISCO |
| | GF0068 | UNIDENTIFIED | THE NATURE CONSERVANCY | SAN FRANCISCO |
| | GF0110 | UNIDENTIFIED | THE NATURE CONSERVANCY | SAN FRANCISCO |
| | GF0453 | UNIDENTIFIED | THE NATURE CONSERVANCY | SAN FRANCISCO |
| | GF0470 | UNIDENTIFIED | THE NATURE CONSERVANCY | SAN FRANCISCO |
| | GF0589 | UNIDENTIFIED | THE NATURE CONSERVANCY | SAN FRANCISCO |
| | GF0433 | SEA CLIPPER | CALIFORNIA SHELLFISH COMPANY INC | SAN FRANCISCO |
| | GF0622 | WESTERN SEAS | CALIFORNIA SHELLFISH COMPANY INC | SAN FRANCISCO |
| | GF0152 | ALOHA | FARALLONES TRAWL CORPORATION | BODEGA BAY |
| | GF0157 | RENABEL | FARALLONES TRAWL CORPORATION | BODEGA BAY |
| | GF0303 | MISS HAILEE | KELLEY, EUGENE M AND KELLEY, VERNA L | FORT BRAGG |
| | GF0305 | MISS KELLEY | KELLEY, EUGENE M AND KELLEY, VERNA L | FORT BRAGG |
| | GF0307 | MISS KELLEY II | KELLEY, EUGENE M AND KELLEY, VERNA L | FORT BRAGG |
| | GF0222 | UNIDENTIFIED | JOHNSON, CARROLL R | EUREKA |
| | GF0705 | STORMBRINGER | JOHNSON, CARROLL R | EUREKA |
| | GF0196 | JOY ANN | F/V ROSE MARIE INC | CRESCENT CITY |
| | GF0328 | MADELINE | F/V ROSE MARIE INC | CRESCENT CITY |
| | GF0261 | FISHWISH | HUNTER, G A | FIELDS LANDING |
| | GF0265 | WARRIOR II | HUNTERS OFFSHORE ENTERPRISES INC | FIELDS LANDING |
| | GF0078 | PACIFIC FUTURE | PACIFIC FUTURE LLC | CLACKAMAS |
| | GF0315 | PRIVATEER | PACIFIC CHOICE SEAFOOD COMPANY | CLACKAMAS |
| | GF0323 | UNIDENTIFIED | S & S SEAFOOD CO INC | CLACKAMAS |
| | GF0417 | UNIDENTIFIED | PACIFIC CHOICE SEAFOOD COMPANY | CLACKAMAS |
| | GF0487 | PACIFIC CONQUEST | PACIFIC CONQUEST INC | CLACKAMAS |
| | GF0956 | PACIFIC HOOKER | PACIFIC HOOKER LLC | CLACKAMAS |
| | GF0126 | SEA PRINCESS | SEA PRINCESS LLC | CLACKAMAS |
| | GF0208 | TRIPLE STAR | TRIPLE STAR LLC | CLACKAMAS |
| | GF0064 | MARIE KATHLEEN | HODGES MICHAEL E AND JOHN MORELAND FISHING INC | ASTORIA |
| | GF0239 | SOJOURN | HODGES MICHAEL E AND JOHN MORELAND FISHING INC | ASTORIA |
| | GF0492 | ASHLYNE | RANKIN, DENNIS J | ASTORIA |
| | GF0494 | STEVE C. | RANKIN, DENNIS J | ASTORIA |
| | GF0250 | KEN & AL | KEN & AL INC | GARIBALDI |
| | GF0251 | GEORGE ALLEN | GEORGE ALLEN INC | GARIBALDI |
| | GF0017 | MISS SUE | MISS SUE FISHERIES INC | NEWPORT |
| | GF0018 | PACIFIC | F/V PACIFIC INC | NEWPORT |
| | GF0109 | SEEKER | F/V SEEKER INC | NEWPORT |
| | GF0090 | BLUE FOX | PACIFIC DRAGGERS INC AND H B LEE INC | NEWPORT |
| | GF0572 | SEADAWN | F Y FISHERIES INC AND BLUE DAWN FISHERIES INC AND HARVEST MOON FISHERIES INC AND YAQUINA SEA DAWN INC AND JINCKS INC | NEWPORT |
| | GF0143 | TWO SAINTS | RIPKA, GARY A AND RIPKA, SHERRI | NEWPORT |
| | GF0280 | WESTERN BREEZE | RIPKA, GARY A AND RIPKA, SHERRI | NEWPORT |
| | GF0144 | LESLIE LEE | F/V LESLIE LEE INC | NEWPORT |
| | GF0947 | UNIDENTIFIED | F/V LESLIE LEE INC | NEWPORT |
| | GF0254 | PERSEVERANCE | COOPER, MARK | NEWPORT |
| | GF0256 | PREDATOR | PATIENCE FISHERIES INC | NEWPORT |
| | GF0320 | BAY ISLANDER | BAY ISLANDER INC | NEWPORT |
| | GF0321 | NEW LIFE | F/V NEW LIFE INC | NEWPORT |
| | GF0053 | NOAH'S ARK | PETTINGER, DAVID WALTER | HARBOR |
| | GF0168 | SEA OTTER | PETTINGER, DAVID WALTER | HARBOR |
| | GF0084 | ALEX | PETTINGER, BRADLEY G | BROOKINGS |
| | GF0823 | SPIRIT OF AMERICA | PETTINGER, BRADLEY G | BROOKINGS |
| | GF0218 | CAPE SEBASTIAN | WHALEY, LLOYD D | BROOKINGS |
| | GF0219 | B. J. THOMAS | WHALEY, LLOYD D AND SPARKS, WENDY | BROOKINGS |
| | GF0220 | MISS SARAH | WHALEY, LLOYD D AND WHALEY, TODD | BROOKINGS |
| | GF0063 | MASTER CHRIS | COAST PRIDE FISHERIES INC | CHARLESTON |
| | GF0146 | COAST PRIDE | GUNNARI, GERALD OR GUNNARI, JEAN L | CHARLESTON |
| | GF0353 | STORMIE C | SHAUN FISHERIES INC | CHARLESTON |
| | GF0355 | BERNADETTE | BERNADETTE FISHERIES INC | CHARLESTON |
| | GF0357 | CAPE FOULWEATHER | PACIFIC TRAWLERS INC | CHARLESTON |
| | GF0210 | SEA STORM | SEA STORM FISHERIES INC | SEATTLE |
| | GF0374 | NEAHKAHNIE | F/V NEAHKAHNIE LLC | SEATTLE |
| | GF0154 | CAITLIN ANN | WEST COAST FISHERY INVESTMENTS LLC | SEATTLE |
| | GF0639 | UNIDENTIFIED | WEST COAST FISHERY INVESTMENTS LLC | SEATTLE |
| | GF0685 | UNIDENTIFIED | WEST COAST FISHERY INVESTMENTS LLC | SEATTLE |
| | GF0031 | FATE HUNTER | LARKIN, MARION JEAN | MOUNT VERNON |
| | GF0136 | OCEAN HUNTER | LARKIN, MARION JEAN | MOUNT VERNON |
| uncertain | GF0051 | PACIFIC FURY | FURY GROUP INC | SEATTLE |
| uncertain | GF0675 | NORDIC FURY | FURY GROUP INC | SEATTLE |
| uncertain | GF0043 | MARK I | MARK I INC | SEATTLE |
| uncertain | GF0111 | TRAVELER | TRAVELER FISHERIES LLC | SEATTLE |
| uncertain | GF0362 | WESTERN DAWN | SUPREME ALASKA SEAFOODS INC | SEATTLE |
| | GF0011 | UNIDENTIFIED | IRON LADY INC | SOUTH BEND |
| | GF0057 | UNIDENTIFIED | BISBEE, PATRICIA R AND BISBEE, WILLIAM | SOUTH BEND |
| | GF0345 | IRON LADY | JACKPOT INC | SOUTH BEND |

Table 10. Permits owned by processors or entities that also have an interest in a processing company (initial list, for comment and modification).

| Limited Entry Catcher Vessel Permits Believed to be Directly Owned by a Processing Company | |
|---|---|
| PermitNo. | Registered To |
| Processor Interest: | **CALIFORNIA SHELLFISH COMPANY INC** |
| GF0433 | CALIFORNIA SHELLFISH COMPANY INC |
| GF0622 | CALIFORNIA SHELLFISH COMPANY INC |
| Processor Interest: | **DEL MAR SEAFOOD** |
| GF0026 | CASSANDRA ANNE LLC |
| Processor Interest: | **PACIFIC SEAFOOD** |
| GF0078 | PACIFIC FUTURE LLC |
| GF0126 | SEA PRINCESS LLC |
| GF0208 | TRIPLE STAR LLC |
| GF0315 | PACIFIC CHOICE SEAFOOD COMPANY |
| GF0323 | S & S SEAFOOD CO INC |
| GF0417 | PACIFIC CHOICE SEAFOOD COMPANY |
| GF0487 | PACIFIC CONQUEST INC |
| GF0956 | PACIFIC HOOKER LLC |

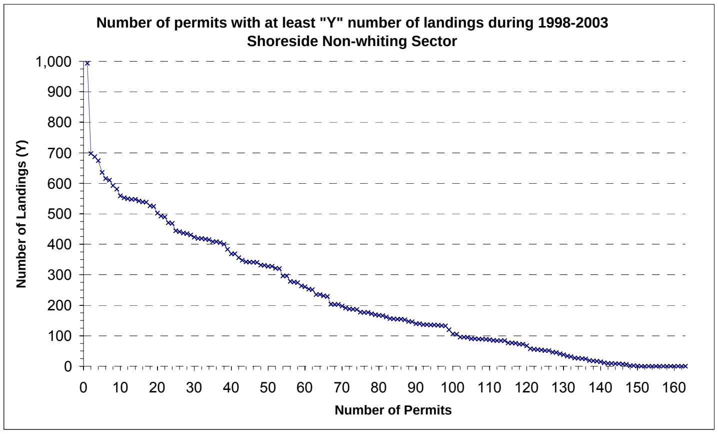
In addition to the above, there are at least two other permits that might be considered linked to processors, depending on the criteria applied.

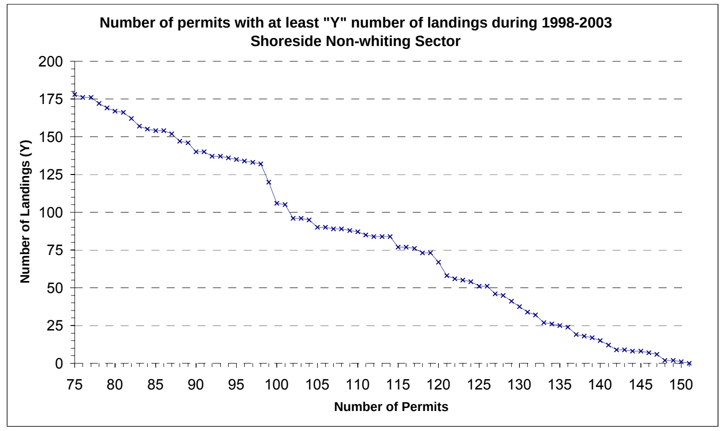
| | Registered To |
|---|---|
| | Person also owning a substantial interest in a processing company |
| | Plant manager for a processor |

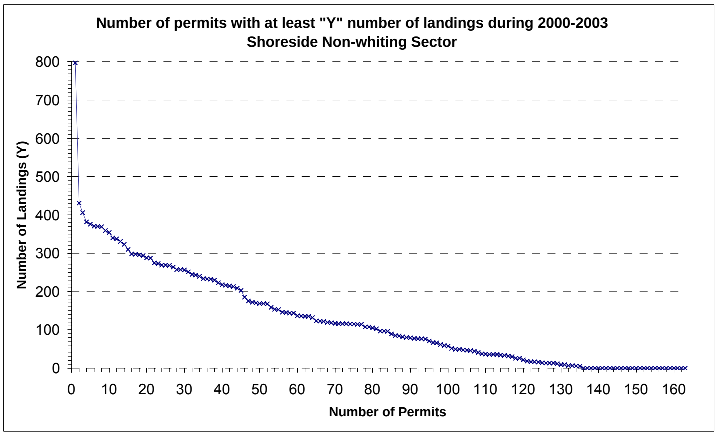
At this time there is an open policy question as to whether or not these should be considered permits linked to (controlled by) processing interests.

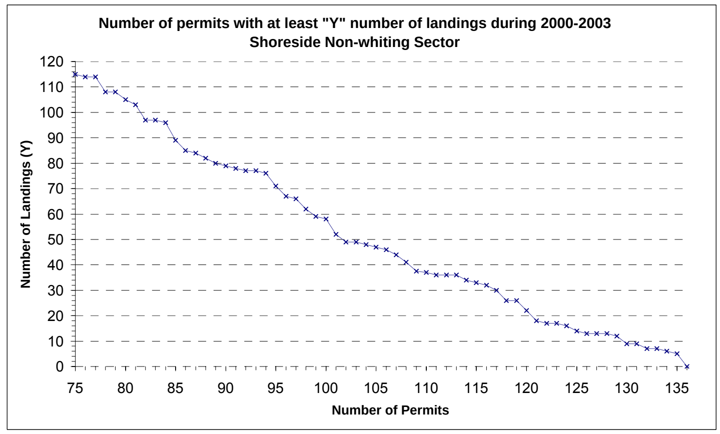
Figure 1. Shoreside non-whiting sector: number of permits landing during alternative recent participation periods.

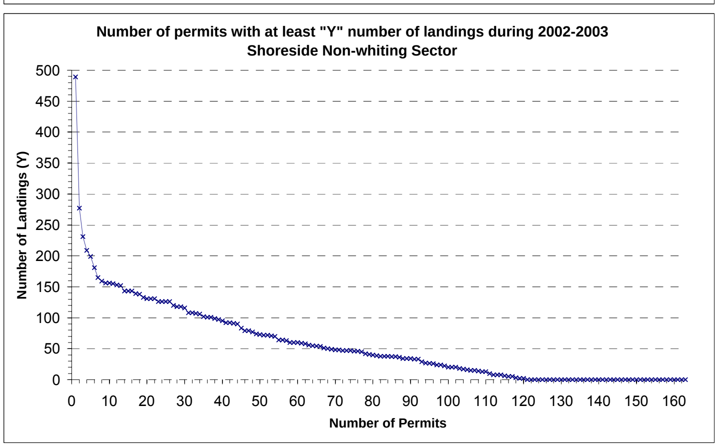
**Entire Sector** | **Detailed View**



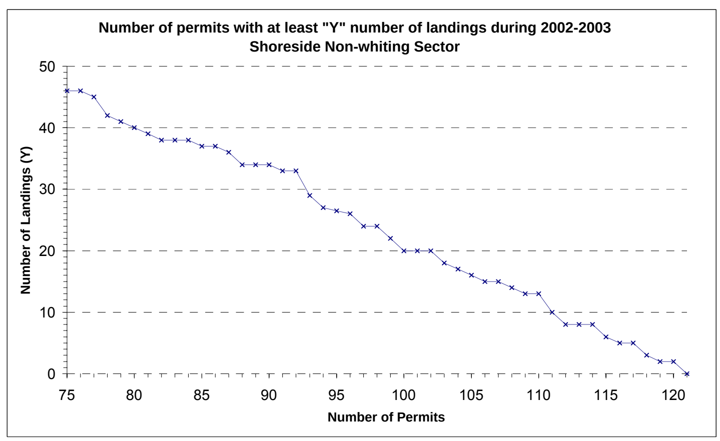



Figure 2. Shoreside whiting sector: number of permits landing during alternative recent participation periods.

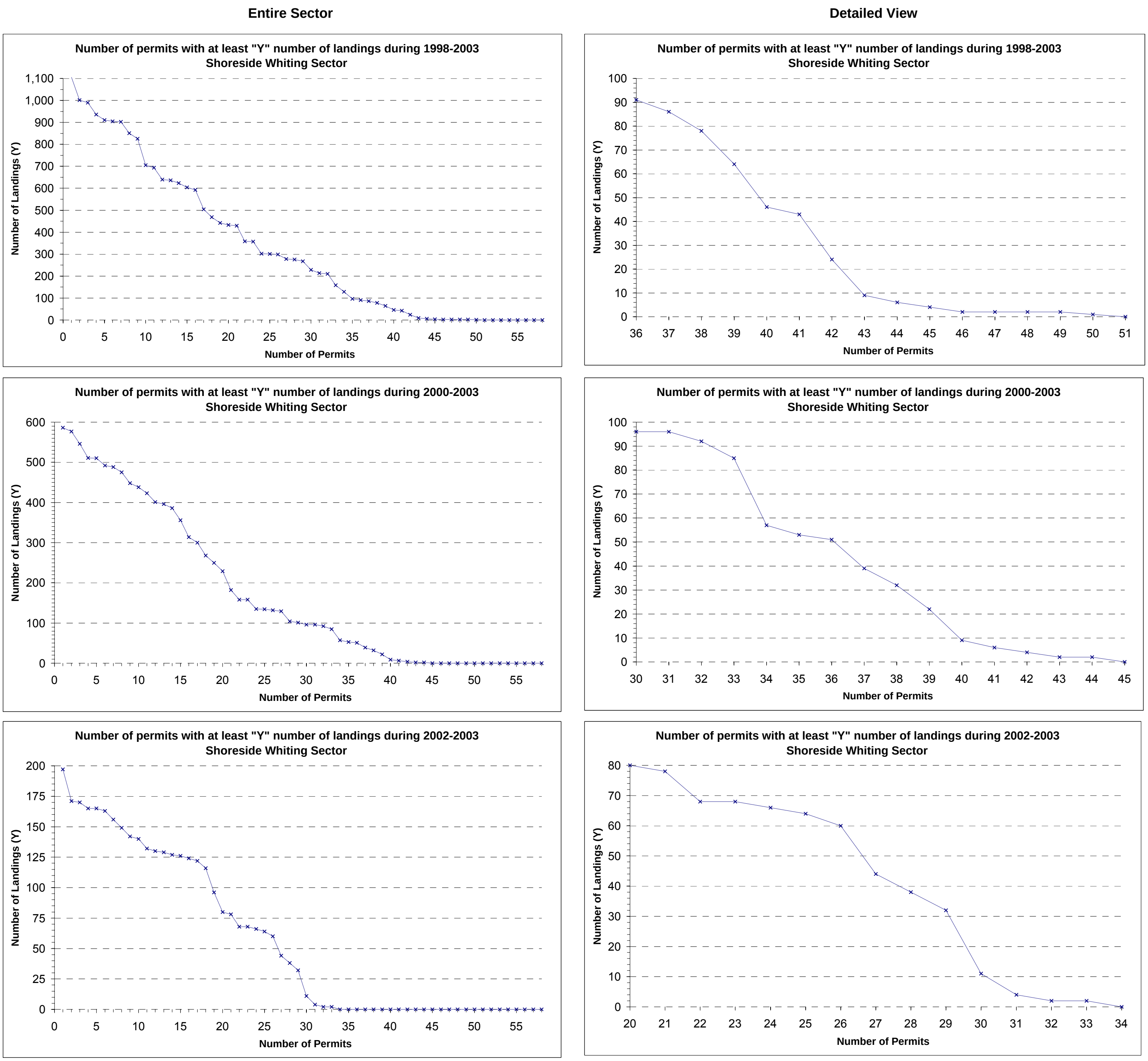
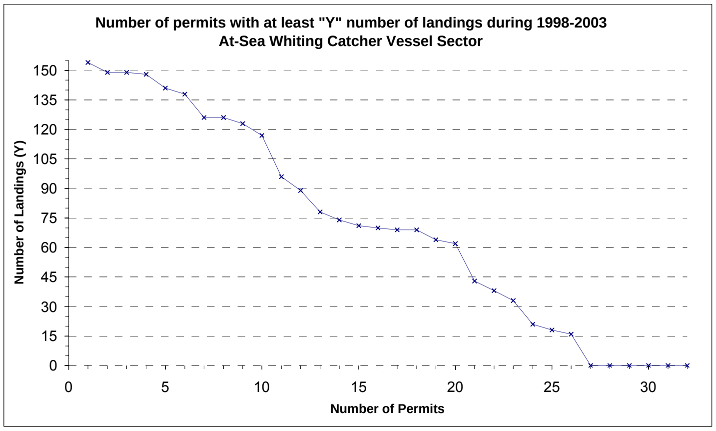
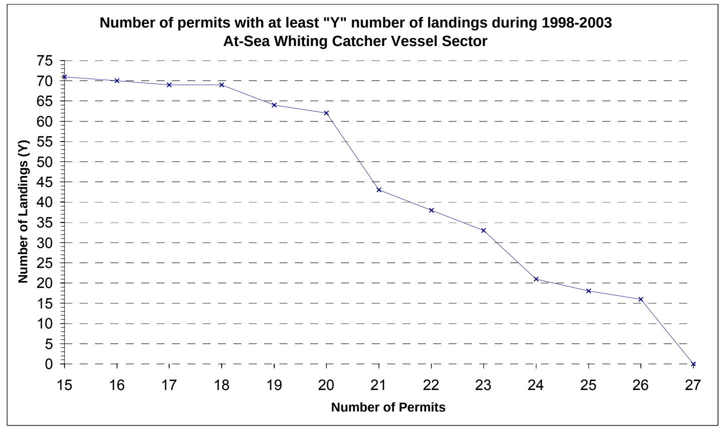
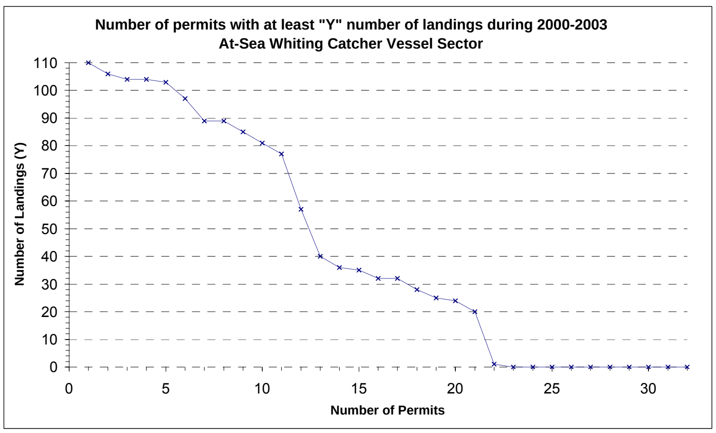


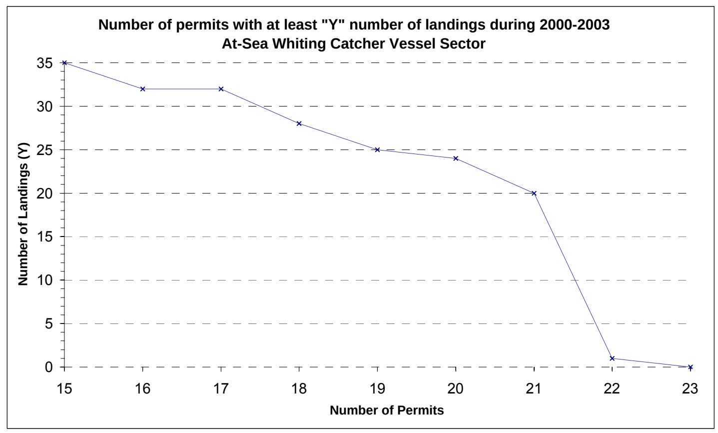
Figure 3. At-sea whiting catcher vessel sector: number of permits landing during alternative recent participation periods.

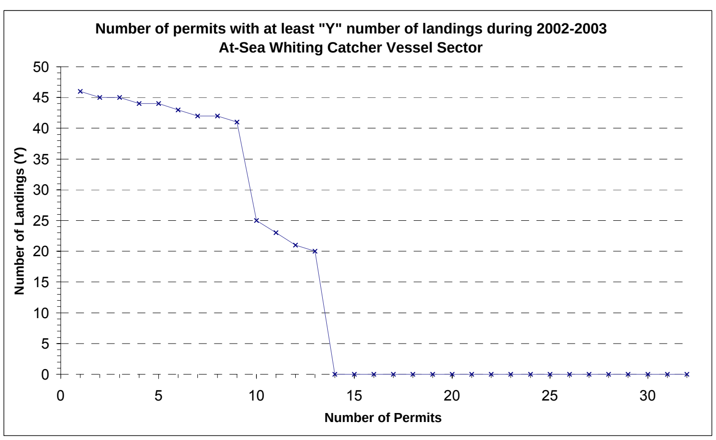
**Entire Sector** | **Detailed View**

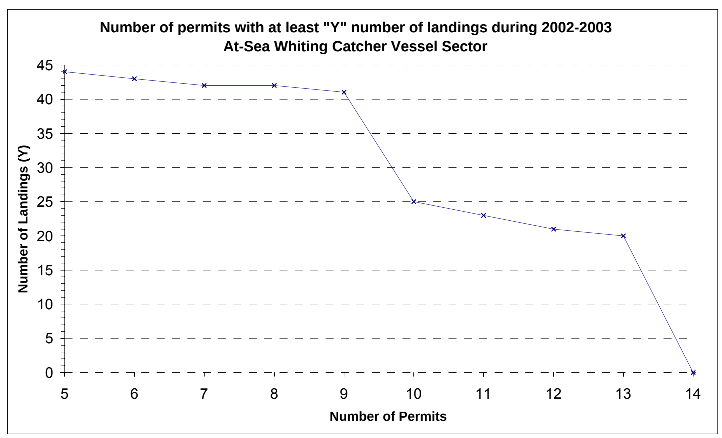


Agenda Item E.4.c
Supplemental TIQC Report
March 2007

TRAWL INDIVIDUAL QUOTA COMMITTEE (TIQC) REPORT ON TRAWL RATIONALIZATION

The TIQC met February 20-22, 2007, reviewed proposed changes to the goals and objectives, the Groundfish Allocation Committee (GAC) report (Agenda Item E.4.b), and the Groundfish Management Team (GMT) report (Agenda Item E.4.d). The TIQC has the following comments and recommendations on these attachments along with some independent recommendations provided at the end of this report. The TIQC reviewed the language in the Magnuson-Stevens Fishery Conservation and Management Act that requires the Council to deliver to Congress a proposal to rationalize the trawl groundfish whiting fisheries within 24 months. Meeting that deadline was part of the debate when discussing specific components.

**Goals and Objectives**

The TIQC review offers the following recommendations with respect to the proposed modifications to the goals and objectives.

**Goal.** Adopt the modified goal, with the following change:

> "Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of ~~healthy stocks~~ <u>the trawl sector allocation</u>, and achieves individual accountability of catch and bycatch."

**Objective 3.** Do not delete "discard mortality" from the objective. The objective should be revised to read:

> ~~Reduce~~ <u>Promote practices that reduce</u> bycatch and discard mortality.

**Constraint and Guiding Principle 1.** Revise to indicate more clearly that the specifics provided are examples:

> Taking into account the biological structure of the stocks including, ~~such factors as~~ <u>but not limited to,</u> populations and genetics.

**Constraint and Guiding Principle 3.** Revise by eliminating the sector references, so that it reads:

> Taking into account the need to ensure that the total optimum yields (OYs) and allowable biological catch (ABC)~~ for the trawl and all other sectors~~ are not exceeded.

**Constraint and Guiding Principle 9.** Add a reference to the co-op alternative:

> Take into account the management and administrative costs of implementing and overseeing the individual fishing quota (IFQ) <u>or co-op</u> program and

complementary catch monitoring programs and the limited state and federal resources available.

A footnote should be added to indicate that the term “bycatch” is being used as it is defined in the Magnuson-Stevens Act.

**TIQC Comments on GAC Recommendations**

The TIQC reviewed the recommendations in the GAC report and has the following comments:

**GAC Recommendation 5.** The TIQC disagrees with the GAC recommendation to analyze options for one trawl sector and four trawl sectors. Instead, the TIQC recommends that the Council analyze options for three trawl sectors and four trawl sectors and that the one trawl sector option be eliminated. The TIQC felt that a single sector would lead to migration of quota to the more vertically integrated catcher-processor sector and that multiple sectors would better protect communities and regions once the fishery was rationalized.

**GAC Recommendation 8.** With one exception, TIQC members present at the meeting supported this GAC recommendation (“Narrow the range of the initial allocation of IFQ to processors such that the most that would be allocated specifically to processors is 25%.”)

**GAC Recommendation 14.** The TIQC expressed concern that the GAC proposed remedy for entry level opportunity (one-time allocation of 5% of quota shares to new entrants) is a one year solution. Supporting the opportunity for new entry is a long term and ongoing problem. Feasible opportunity for new entry is necessary to allow others to exit.

**GAC Recommendation 16.** Consistent with its earlier recommendation, the TIQC does not support a minimum holding requirement (a vessel should not be required to hold a certain number of quota pounds prior to departure).

**TIQC Comments on GMT Recommendations**

The TIQC reviewed the GMT recommendations and has the following comments:

**Sideboards.** The TIQC disagrees with the GMT premise that halibut bycatch will increase under a TIQ program; however, the TIQC concurs with the GMT recommendations for trawl-prohibited species caps (TPSCs) for halibut. While at present there is no pressure on the trawl fishery to reduce bycatch, if the halibut biomass or trawl allocations decline, there may be a need to provide incentives to individuals to reduce their halibut bycatch.

The TIQC recommends that the Council consider adjusting Rockfish Conservation Area (RCA) boundaries inseason to close high bycatch areas when triggers are reached. Triggers might be set at a level lower than the total trawl allocation.

The TIQC recommends that the alternative indicates that the Council may consider establishing different RCA boundaries for trawl vessels switching to longline gears but such an adjustment may not be needed for pot gear.

The TIQC concurs with the GMT recommendation not to create sideboards for increased effort in non-trawl fisheries.

**Area Management.** The TIQC notes that implementing area management will be easier now than after the program is implemented. Areas should not be created just to have area management. Socio-economic issues should be considered as a reason for area management but non-biological reasons would need to be well justified. The TIQC supports the creation of areas, as needed, to address biological concerns.

**Allocation of Overfished Species Based on Proxy Species.** When a stock moves in or out of overfished status, the allocation among sectors should be adjusted.

The proxy species approach might be modified to address a general concern that individual may try to control the fishery by acquiring quota shares (QS) for overfished species and then not making the quota pounds (QP) available for harvest. A use-of-lose provision has been under consideration to address this concern. However, another approach that might reduce such a risk would be to not allocate QS for overfished species. Instead, target species QS would serve as a proxy QS for overfished species. QP for overfished species would be issued to holders of target species QS annually based on bycatch ratios. The concern about non-use of bycatch species is one that applies to the IFQ alternative but not the co-op alternative.

**Buffers.** The TIQC notes that, for some species, the amounts of fish are already small and constraining and full access is needed to prosecute target fisheries. There may be a greater need for buffers for nontrawl sectors. It is very likely that, for constraining species that are available only in small quantities, fishers will find ways to manage risk by creating their own buffers, possibly joining together in co-ops or other business arrangements through which IFQ might be pooled.

**Use-or-Lose.** The TIQC recommends moving ahead with consideration of a use-or-lose provision that includes the following as part of the option:

Require that all quota shares (QS) be assigned to a vessel with a limited entry permit.

**Discard Credit.** The TIQC supports consideration of discard mortality credits.

## Other TIQC Recommendations

### Elimination of IFQ Options for the Mothership and Catcher-Processor Sectors

### Accumulation Limits

Accumulation limits include caps on use, ownership and control. The majority of the TIQC opposes the option of having no accumulation limits. Below, specific percentages are provided for the accumulation limit options for the shoreside whiting and nonwhiting sectors. If these two sectors are combined into a single sector (the three sector option) the accumulation limit options should be combined. Also, depending on the rules adopted for defining control, more conservative or liberal limits may be needed. The percentages provided are for the purpose of initiating analysis. After preliminary analysis, some adjustments may be needed.

#### Ownership Caps

The ownership cap applies to the aggregate of QS and QPs. The ownership cap options proposed are also intended to serve as options for control limits, once control is defined.

There will be a grandfather clause for the ownership caps. If a person is initially allocated QS in amounts in excess of the cap, that person may maintain ownership of the QS. The grandfather clause will expire with a change in ownership of the QS. Change in ownership is as defined below. Additionally, if the owner divests him or herself of some of the QS, the owner may not reacquire QS or QP in excess of the cap. Once under the cap, the grandfather clause expires and additional QS or QP may be acquired but not in excess of the ownership caps.

**Change in Ownership:** For the purpose of the grandfather clause, ownership of a legal entity is defined to change with the addition of a new member to the corporation, partnership or other legal entity. Members may leave without causing the grandfather clause to expire for that entity.

#### Use Caps

Use caps would apply to the permit rather than being a vessel use cap. The use cap applies to the aggregate of the QS and QPs. To be effective in distributing catch among vessels, permit stacking would have to be limited.

There will be a grandfather clause for permits. If a permit is initially allocated QS in excess of the use cap, those QS may be maintained in association with that permit. All of the QPs issued for the QS associated with that permit may be used with the vessel for which the permit is registered. The grandfather clause will expire with a change in ownership of the permit. Change in ownership is as defined for the ownership caps. Additionally, if the owner of the permit divests him or herself of some of the QS associated with the permit, the owner may not reacquire QS or QP for use with that permit, until under the permit cap. Once under the cap, the grandfather clause expires and additional QS or QPs may be acquired for use with the permit but not in excess of the use caps.

**Shoreside Nonwhiting Cap Options**

**Ownership Cap.** Options (all groundfish): 1.5%, 2.1%, 3%, and 5%.

| | |
|---|---|
| Sablefish | 1.7% |
| Dover sole | 1.95% |
| Petrale sole | 3.0% |
| English sole | 7.0% |
| Sanddabs | 27.6% |
| Other flats | 9.1% |
| Longspine | 2.1% |
| Shortspine | 2.0% |
| Widows | 3.6% |
| Yellowtail | 3.5% |
| Canary | 6.0% |
| Other Sebastes | 6.6% |

**Use Cap.** Options: Double the ownership caps.

**Shoreside Whiting Sector Cap Options**

**Ownership Cap.** Options: 5%, 10%, and 15%.

**Use Cap.** Options: 7.5%, 10%, and 12%.

**Mothership Whiting Sector Cap Options**

**Ownership Cap.** Options: 10%, 15%, and 25%.
50% rule for ownership affiliation.

**Use Cap.** Options: 20%, 30%, and 50%.

**Catcher-Processor Cap Options**

The catcher-processor sector will provide a proposal for caps.

**Whiting Sectors (Combined Shoreside/Mothership/Catcher-Processor)**

The following would be cross sector caps for the entire whiting fishery.

**Ownership Caps.** Options: 15%, 25%, 40%.

**Use Cap.** Options: 25%, 40%, 50%.

**Evaluation of Concentration of Ownership**

The TIQC recommends that the Council request NMFS initiate the collection of ownership information as part of the limited entry permit renewal process. This information should allow us to determine common ownership interests among corporations and partnerships.

**Equal Allocation Based on the Harvest History of Buyback Permits**

The TIQC recommends that an option be analyzed that is based only on harvest history (i.e. an option with no equal sharing of buyback). The other option would continue (i.e., equal sharing of the QS pool associated with the history of the buyback permits plus an allocation to each permit based on that permit's history). The QS pool associated with the buyback permits will be the buyback permit history as a percent of the total fleet history for the allocation period. The calculation will be based on total absolute pounds with no other adjustments.

**Tracking, Monitoring and Enforcement**

The TIQC was asked for advice on the amount of time within which final catch data should be available after a landing. This information will be used in developing cost estimates for the tracking, monitoring, and enforcement system. The TIQC recommends a system in which final data is available within 1 hour of the landing for both whiting and nonwhiting deliveries.

**Recent Participation and Dropping Years**

The TIQC had a brief discussion of recent participation requirements and options that would drop a permit's worst years from the initial allocation formula. Discussion was limited because the data provided included that for combined permits. During the discussion, it was determined that the TIQC continues to favor the inclusion of options that require recent participation in order to qualify for an initial allocation. It was also noted that the drop years options help avoid the need to consider hardship provisions.

**Next Meeting**

The next TIQC meeting has been scheduled for May 3-4, 2007. Depending on the amount of work to be conducted and the agenda for the May 1-2, 2007 GAC meeting, the TIQC meeting may start on the afternoon of May 2, 2007.

PFMC
03/05/07

Agenda Item E.4.d
Supplemental GAP Report
March 2007

# GROUNDFISH ADVISORY SUBPANEL (GAP) REPORT ON TRAWL RATIONALIZATION (TRAWL INDIVIDUAL QUOTA (TIQ) PROGRAM)

The Groundfish Advisory Subpanel (GAP) heard a presentation from Mr. Jim Seger, Council Staff, on the current status of the Trawl Individual Quota Program. In particular, the GAP reviewed the Groundfish Allocation Committee and Trawl Individual Quota Committee (TIQC) reports and has the following comments and recommendations.

First and foremost, the GAP continues to stress the importance of moving forward with the trawl rationalization process without delay.

## Goals and Objectives

The GAP reviewed the revised goals and objectives drafted by Mr. Phil Anderson (Agenda Item E.4.b) and recommends the Council adopt the revised goals with all of the amendments offered by the TIQC.

## Groundfish Allocation Committee

The GAP supports incorporating all of the recommendations proposed by the Groundfish Allocation Committee (Agenda Item E.4.b, GAC Report) for analysis with the following exceptions:

1. On GAC Recommendation 5, the GAP supports the TIQC recommendation to eliminate the one trawl sector option and analyze the three and four trawl sector options.
2. On GAC Recommendation 14, the GAP agrees with the concerns expressed by the TIQC with regards to the remedy for entry level opportunity. The GAP believes a placeholder should be inserted under this issue while a more comprehensive solution to allowing new entrants into the fishery is developed.
3. On GAC Recommendation 16, the GAP agrees with the TIQC that minimum holding requirement options should be eliminated.

A majority of the GAP (14 of 15) does not agree with the TIQC recommendation to eliminate the analysis of individual fishing quota options for the at sea mothership and catcher processor sectors. We believe both forms of rationalization should be fully analyzed for all sectors of the trawl fishery.

Lastly the GAP notes that the TIQC Report should be amended to correctly reflect the use it or lose it options that are recommended for analysis.

PFMC
03/07/07

# GROUNDFISH MANAGEMENT TEAM (GMT) REPORT ON TRAWL RATIONALIZATION (TRAWL INDIVIDUAL QUOTA (TIQ) PROGRAM)

The GMT reviewed the proposed work plan and timeline for developing and considering the TIQ alternatives, and discussed the two overfished species allocation options described in Agenda Item E.4.d, GMT Report.

With regard to the draft work plan and timeline, the GMT created a subcommittee to develop recommendations on the proposed schedule and identify items that will take a significant amount of time to research and/or analyze. Another GMT subcommittee was appointed to identify which issues need to be addressed through initial implementation of a TIQ program vs. those that could potentially be added later to an established program. The GMT plans to submit the results of these subcommittees to the Groundfish Allocation Committee at their meeting in May.

After further discussion on the two options for Overfished Species Allocation Based on Proxy Species, in Agenda Item E.4.d, GMT Report (Section 3, page 2), the GMT no longer recommends Option 2. Option 2 applies the weighted average bycatch rate from the West Coast Groundfish Observer Program for the 2003-2006 period to target species catch from 1994-2003 (i.e., proposed period for target species allocation). The primary problem with this approach is that the list of target species has changed over time, as rockfish conservation areas (RCA) were implemented and overfished species optimum yields have decreased. Therefore, the bycatch rates from target species caught in 2003-2006 (i.e., “apples”) would be applied to target species caught historically (i.e., “oranges’). The GMT recommends retaining Option 1 (i.e., applying the bycatch rates from 2003-2006 to the target species catch from 2003-2006) for analysis. The GMT notes that these approaches are both independent of the time period used for calculating target species allocations.

Also, the GMT notes that 13 permits have been identified that do not have any target species landings in the 2003-2006 period; under Option 1, it is unclear whether or how these permits would initially be allocated any overfished species. Therefore, the GMT identified two approaches to address this issue: (a) not providing an initial allocation of overfished species to these permits; or (b) providing an equal allocation of some minimum amount to each of these permits. The GMT would like to discuss these options further with the Trawl Individual Quota Committee.

Additionally, the GMT relies on logbook data to determine the aggregate bycatch rates to apply, depending on whether the vessel fished north or south, seaward or shoreward of the RCA, and the period of fishing (i.e., summer or winter). However, the GMT has identified trips with fish tickets that are missing corresponding logbooks. For those trips, the GMT recommends we continue to review the composition of the landings to help inform us as to the location of catch and, therefore, which bycatch rates to apply to the allocation formula. For example, fish tickets with petrale sole in the winter would be assumed to be from trips taken seaward of the RCA.

GMT Recommendations:

1. Forward for analysis only Option 1 for Overfished Species Allocation Based on Proxy Species, as presented in Agenda Item E.4.d, GMT Report
2. Approve the use of landing composition from fish tickets to help determine catch location, if logbooks for those trips are not available

PFMC
03/07/07

# SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON TRAWL RATIONALIZATION (TRAWL INDIVIDUAL QUOTA (TIQ) PROGRAM)

Mr. Jim Seger briefed the Scientific and Statistical Committee (SSC) on the status of the Council's efforts towards rationalizing the limited entry trawl fishery by implementing a Trawl Individual Quota (TIQ) system of management. Although a variety of briefing materials was made available to the SSC, the presentation was primarily limited to a review of Table 2 (Summary of IFQ alternatives) in the Groundfish Allocation Committee (GAC) report on trawl rationalization (Agenda Item E.4.b, GAC Report, March 2007). It is clear that the package of alternatives that is now being considered by the Council has been simplified since September 2006, when the SSC last considered this topic. This simplification will serve to highlight the key policy decisions that the Council will make as the TIQ issue moves forward. However, the link between the revised set of options and the stated objectives of the TIQ program is still not clearly articulated.

Following the presentation, the SSC's discussion largely centered on the topic of area-based management and, in particular, the GAC's request that "the SSC groundfish subcommittee identify species susceptible to localized depletion and other factors to consider in establishing biological regions." This is now an important issue because the GAC also made the recommendation to "eliminate the community stability program and rely on other measures to address community concerns (e.g., area-based management and potential regional fishery management associations.)"

The SSC notes that the term "localized depletion" is extremely ambiguous and may have different meanings to different people. If defined as the fraction of current spawning biomass relative to the unfished level (e.g., the 40:10 rule that regulates groundfish harvests), it would be impossible to determine "depletion" on localized and/or regional spatial scales with our current level of knowledge for almost all species. However, if defined simply as a site-specific relative reduction in catch rate more progress could be achieved. Hence, the first issue to resolve is: what is the precise concern about localized depletions? Although unstated, the implied concern is that implementation of a TIQ system will cause fishing effort to undergo a spatial shift that concentrates fishing effort and leads to localized depletions.

To respond to the GAC's request and to move things forward, the SSC agreed to hold a meeting of the groundfish subcommittee sometime before September to consider several issues. These would include a consideration of different ways of defining localized depletion and identification of data sources that would be useful in describing spatial and temporal patterns in the distribution and abundance of trawl-caught groundfish on the US West Coast. These data sources would likely include port-specific landings, trawl logbooks, NMFS fishery-independent surveys, and observer data. It would then be helpful to identify a reasonable set of analytical procedures that could be applied to the data and, finally, to task the work to a team of analysts. Once completed, the SSC notes that a significant ancillary benefit of this type of analysis would be to formalize a methodology for apportioning a coastwide optimum yield (OY) into smaller spatial units (e.g., States, INPFC areas, etc).

In addition, the SSC has the following three specific comments regarding the TIQ options as they are currently framed:

1. With respect to the use of area-based management tools as a means to protect and stabilize fishing communities, the SSC notes that area-based management may or may not be the best way to achieve this goal, if it is desired. Area-based management may more closely correspond to the protection of regional economies rather than individual communities.

2. The overall economic rationale for TIQs is to reduce excess capacity in the harvesting sector. Consequently, it is not obvious why quota shares should be allocated to the processing sector. Therefore, a clear justification for this option should be developed.

3. The SSC recommends that the option for an expanded voluntary program for collection of socio-economic data be dropped, and that the collection of such information be mandatory under the TIQ program. It is also important that the specific types of data collected should allow subsequent evaluation of the effectiveness of the program in achieving its goals and objectives. In particular, the collection of *ex-ante* and *ex-post* data is necessary to accomplish this.

PFMC
03/07/07

Agenda Item E.4.d
Supplemental HC Report
March 2007

# HABITAT COMMITTEE REPORT ON TRAWL RATIONALIZATION (TRAWL INDIVIDUAL QUOTA [TIQ] PROGRAM)

The Habitat Committee (HC) reviewed the proposed revised Goals and Objectives (Agenda Item E.4.b) and noted that the original wording and intention of both Goal 1 and Objective 3 were changed. These sections have omitted reference to furthering environmental benefits and minimizing ecological impacts. In addition, nothing in the guiding principles acknowledges the importance of minimizing habitat impacts. The HC recommends adding a guiding principle to minimize negative impacts on habitat, and restoring an explicit mention of environmental concerns in Goal 1 and Objective 3. These issues are important for the reasons below.

Overall, these new management tools need to take broader impacts on habitat into consideration. This is appropriate given the Magnuson-Stevens Act's call for "integration of ecosystem consideration into fishery management." The HC recommends that any new program incorporate this goal.

The TIQ program has potential for both positive and negative ecological impacts. For example, negative impacts from area management could include a shift in fishing effort to sensitive habitats. Additionally, any bottom-tending gear can have habitat impacts, so impacts of gear switching should be considered. On the positive side, increased efficiency can reduce fishing effort and reduce the fishing footprint, minimizing bycatch and habitat impacts.

The TIQ program's proposed goals and objectives therefore, should be broad enough to address these issues and reduce potential negative impacts on habitat. The program must be broad enough not only to consider the immediate effects on the fishing fleet, but on the larger context in which this change is being implemented. For example, it is important to ensure that area management is flexible enough to adapt to changes in species distributions and habitat types that will occur in response to changing ocean conditions related to global climate change.

In Section 3, General Management, the HC recommends that the Council consider incorporating a statement about access to information needed for management, including information on fishing effort as it relates to habitat. For example, the North Pacific Fishery Management Council has a mandatory data collection system related to their individual quota programs. The development of the TIQ program offers the opportunity to enhance and expand our data collection activities and establish criteria for making such information available for research and management. Enhancing our data collection activities will improve our ability to conserve habitat.

If the Council moves forward with a TIQ program, the HC would like to ensure that it is one where fishermen have a stake in decreasing impacts on groundfish habitat, reducing bycatch, and sustaining a healthy ecosystem.

PFMC
03/06/07

# ADDENDUM TO
# TRAWL INDIVIDUAL QUOTA COMMITTEE (TIQC) REPORT ON
# TRAWL RATIONALIZATION

Text insert for the top of page 4.

## Other TIQC Recommendations

### Elimination of IFQ Options for the Mothership and Catcher-Processor Sectors

The majority of the TIQC favors dropping the mothership and catcher-processor sectors from the IFQ program alternative. Participants in those sectors strongly support co-op management and have voiced little or no support for an IFQ program in their sectors. It was felt that by eliminating analysis of an IFQ program for those sectors, it will allow the staff to better focus on other elements of the analysis and assist the Council in meeting the 24 month delivery deadline of a rationalization program to Congress.

PFMC
03/08/07

AGENDA ITEM E.4
March 8, 2007

**Da Yang Seafood Inc.**

**Seafood Processing & Trading**

March 10th, 2007

Dear Council Members,

Thank you for the opportunity to provide our perspective on the groundfish rationalization process. We are writing to object to any proposed alterations that include processor shares or processing rights granted through historical landings.

I am writing on behalf of Da Yang Seafood, a small processing plant in Astoria. We started participating in the shore-side hake progam in 2006. We are a small hake processor in Astoria. Our products include frozen HGT and whole round whiting and our markets are based upon exports to China, Europe and Russia. As a small processor, we must be creative in our marketing and production techniques to ensure our niche market for hake overseas. It has given us an opportunity to continue our investment and our operation in Astoria and help promote the local economy.

The addition of the whiting production has extended our plant season from 3 months to 4 months out of a year, including our sardine production. Two whiting vessels deliver to our plant and we employ over a hundred workers in our processing plant. In early 2007, we continued investing in our plant and upgrading our production capacity to meet the needs of our global customers.

Fisherman benefit when new processors enter the market participating against the bigger players and competition between processors to buy fish from fishermen is an essential component to the success of our fishery – at all levels. Any exclusive grant to a processor to buy hake will stifle competition, limit advancments in technology and product forms, and drive down the price to the fisherman - as such an arrangement have done in the Alaska crab fishery after implementation of a "two pie system." We strongly oppose any plan which includes such an element.

However, in the event that the Council includes some type of processor allocations or rights as a component of the alternatives, we request that (1) a significant portion of the allocation (>25%) be available on the open market without restrictions allowing new processors to enter the fishery and buy hake, and (2) that any qualifiying period for shore based processing include the years 2006, 2007, and 2008.

Thank you for your consideration of these issues.

Sincerely Yours,

Chih Yuan, Wang
President and CEO

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Chen Kaohsiung 803 R.O.C
Taiwan

Supp Public Comment E.4.e
Supplemental
Public Comment

# Local Economic Contributions By Processors of Groundfish And Pacific Whiting In California Oregon and Washington

**For**

**West Coast Seafood Processors Association**
**Portland, Oregon**

**By**

**Globalwise Inc.**
**Vancouver, Washington**

globalwise inc.

**March 2, 2007**

## Introduction

Shore-based seafood processors in California, Oregon and Washington have provided data on their employment and local expenditures associated with processing Pacific whiting and groundfish in 2006. Data was provided by seven processors operating 13 processing facilities across the three state area.

This study was funded by the West Coast Seafood Processors Association. The objective is to document the level of economic contributions that seafood processors make in the local communities where they are located. The processors were asked to break out their employment and expenses in key categories for the local communities where their plants are located (within the county or no more than one county away). The data was provided directly to Globalwise from company records. In order to maintain confidentiality and independence, none of the raw data were provided to WCSPA members, employees or contractors other than Globalwise.

All processors handle other species in addition to the categories of Pacific whiting and other groundfish as reported here. The employment and expenditures data are allocated to Pacific whiting and groundfish species by the percentages of landed weight processed. In other words, if 25 percent of a processors total landed volume was whiting in 2006, that percentage was used to allocate total employment to whiting processing.

## Data Presentation

Tables 1 and 2 follow on the next two pages and present the aggregated data for each of the three states.

**Table 1**

**Local Economic Contributions by Pacific Whiting Processors in 2006**

| Economic Contribution | California | Oregon | Washington | Total |
|---|---|---|---|---|
| ***Employment*** | | | | |
| Total Persons | 140 | 963 | 1,092 | 2,195 |
| Total Hours | 62,669 | 420,749 | 917,040 | 1,400,458 |
| **Total Payroll** | $1,176,596 | $5,984,219 | $9,477,856 | $16,638,671 |
| | | | | |
| ***Local Services Expenditures*** | | | | |
| Electricity | $85,504 | $324,851 | $863,937 | $1,274,292 |
| Water | $31,465 | $123,155 | $157,469 | $312,089 |
| Sewer/Solid Waste | $70,815 | $698,124 | $2,097,785 | $2,866,724 |
| Plant Supplies | $58,596 | $168,805 | $3,120,663 | $3,348,064 |
| Equipment Purchases | $23,484 | $1,455,083 | $1,284,613 | $2,763,180 |
| Equipment Repair | $80,267 | $330,379 | $256,083 | $666,729 |
| Other Services | $57,194 | $361,712 | $55,189 | $474,095 |
| **Total Local Services** | $407,325 | $3,462,108 | $7,835,739 | $11,705,172 |
| | | | | |
| ***Taxes & Fees*** | | | | |
| Local Property Taxes | $19,588 | $122,052 | $70,849 | $212,489 |
| Local Utility Taxes | $364 | $1,344 | $83,283 | $84,991 |
| Other Local Charges | $0 | $12,270 | $3,500 | $15,770 |
| State Property Taxes[1] | $0 | $0 | $70,425 | $70,425 |
| State Income Taxes | $96,898 | $140,339 | $0 | $237,237 |
| State Waterway/ Tideland Fees | $0 | $8,000 | $0 | $8,000 |
| Other Local Fees or Permits | $0 | $5,929 | $4,543 | $10,472 |
| **Total Local & State Taxes & Fees** | $116,850 | $289,935 | $232,600 | $639,385 |

Source: Globalwise, based on data supplied by seafood processing companies

[1] In Washington, B & O taxes are included with state property taxes.

**Table 2**

**Local Economic Contributions by Groundfish Processors in 2006**

| Economic Contribution | California | Oregon | Washington | Total |
|---|---|---|---|---|
| ***Employment*** | | | | |
| Total Persons | 777 | 1,125 | 227 | 2,129 |
| Total Hours | 380,783 | 663,269 | 202,084 | 1,246,136 |
| **Total Payroll** | $6,072,700 | $10,064,224 | $3,781,127 | $19,918,051 |
| | | | | |
| ***Local Services Expenditures*** | | | | |
| Electricity | $364,214 | $497,022 | $147,106 | $1,008,342 |
| Water | $73,417 | $438,926 | $83,523 | $595,866 |
| Sewer/Solid Waste | $241,878 | $1,596,963 | $88,961 | $1,927,802 |
| Plant Supplies | $624,389 | $350,815 | $72,559 | $1,047,763 |
| Equipment Purchases | $54,797 | $1,447,944 | $1,125,374 | $2,628,115 |
| Equipment Repair | $312,192 | $478,345 | $139,102 | $929,639 |
| Other Services | $157,993 | $174,834 | $13,778 | $346,605 |
| **Total Local Services** | $1,828,880 | $4,984,849 | $1,670,403 | $8,484,132 |
| | | | | |
| ***Taxes & Fees*** | | | | |
| Local Property Taxes | $73,120 | $196,403 | $30,291 | $299,814 |
| Local Utility Taxes | $848 | $3,137 | $3,961 | $7,946 |
| Other Local Charges | $0 | $0 | $8,461 | $8,461 |
| State Property Taxes[2] | $0 | $0 | $56,897 | $56,897 |
| State Income Taxes | $226,095 | $327,457 | $0 | $553,552 |
| State Waterway/ Tideland Fees | $3,560 | $7,000 | $0 | $10,560 |
| Other Local Fees or Permits | $11,389 | $0 | $1,007 | $12,396 |
| **Total Local & State Taxes & Fees** | $315,012 | $533,997 | $100,617 | $949,626 |

Source: Globalwise, based on data supplied by seafood processing companies

[2] In Washington, B & O taxes are included with state property taxes.

## Conclusions

West coast seafood processors are making major contributions to the economies of the communities in which they are located. Tables 1 and 2 show that the processors employ large numbers of persons with major payrolls because they are processing Pacific whiting and groundfish.

The processors are also spending significant amounts for utilities and services because of their processing activities associated with whiting and groundfish. This in turn greatly supports other businesses and general employment in addition to the direct processor employment base.

Finally, the taxes and fees paid by processors from the whiting and groundfish business support the full range of government services at the local and state levels.

# Shoreside Whiting Cooperative Proposal for Analysis

**March 8, 2007**

## As presented by David Jincks and Tom Libby

**Permit Qualification for a Catcher Vessel Shoreside [CV(SS)] Endorsement.**
A limited entry permit will qualify for a CV(SS) endorsement (referred to as "CV(SS) permits) if it has a total of more than 500mt of whiting landings to shoreside processors from 2001 through 2004.

**CV(SS) Co-op(s)**
CV(SS) permits shall be assigned to an initial Co-op with linkage to a qualified processor.

The linkage between CV(SS) permits and initial Co-Op qualified processors shall be determined on a pro-rata basis—based on a CV(SS) permit's proportional landings to each qualified processor as a percent of the permit's total landing history during the permit's 10 best landings years from 1994 through 2004.

The initial Co-op assignment shall be for a mandatory two (2) years.

Most CV(SS) permits will likely make landings to more than one qualified shoreside processor during the first season of this program. Transfer of Co-op quota between permit holders will allow for a permit holder's future seasons' landings to be made exclusively to one processor.

For the purpose of the endorsement and initial Co-op allocation, CV(SS) permit landing history includes that of permits that were combined to generate the current permit.

Landing history, for vessels no longer in existence, shall be distributed on a pro-rata basis to each of the initial Co-ops. Landing history, for vessels with landings to a processor whose assets were purchased and the landing history expressly identified as an asset in the purchase agreement, shall remain with the purchasing entity. For landings history associated with a defunct or non-qualifying processor, that portion of a vessels quota would be linked to their other cooperatives on a proportional or pro-rata basis.

**CV(SS) Permit Ownership:**
No individual or entity may own CV(SS) permits for which the allocation totals greater than [XX]% of the total whiting shoreside allocation.

**Co-op Allocation:**
In every year, following the completion of the 2 year mandatory obligation, NMFS will determine the distribution to be given to each Co-op and to the non Co-op segment based on landing history calculations of CV(SS) permits registered to participate in each of the two segments for that year.

**Non Co-op Fishery:**
The total of all quota shares assigned to non Co-op participants shall be the quota for the non Co-op segment. That quota shall be available to all permit holders regardless of Co-op quota shares assigned to individual permit holders.

**Annual Registration.**
In every year, following the completion of the 2 year mandatory obligation, shoreside processors and CV(SS) permits participating in the shoreside sector must register with NMFS. At that time they must declare in which Co-op they will participate or if they plan to participate in the non-Co-op fishery for that declaration year.

Co-op agreements will be submitted to NMFS. Co-op agreements must distribute landings allocations to members based on the permit specific landing history calculation outlined above.

**Shoreside Processor Co-op Eligibility:**
An initial Co-op qualified shoreside processor is one that processed at least 1,000 mt of whiting in each of any two years from 1998 through 2004. Only these processors are eligible to participate in whiting cooperative in the first year of the program. Thereafter, any processor could be eligible to partner with vessels in a whiting cooperative, subject to the other provisions of this plan.

**A shoreside processor** is an operation, working on US soil, that takes landings of trawl-caught groundfish that has not been "processed at-sea" and that has not been "processed shoreside"; and that thereafter engages that particular fish in "shoreside processing." Entities that received fish that have not undergone "at-sea processing" or "shoreside processing" (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a "processor" for purposes of QS/QP allocations.

**"Shoreside Processing"** is defined as either of the following:
1. Any activity that takes place shoreside; and that involves:
cutting groundfish into smaller portions; OR
freezing, cooking, smoking, drying groundfish; OR
packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.
2. The purchase and redistribution into a wholesale or retail market of live groundfish from a harvesting vessel.

**Movement between Shoreside Processors.**
Following the two (2) year mandatory commitment to the initial assigned Co-op, permit holders can opt to be released of obligations to their assigned Co-op by participating in the non-Co-op fishery for a period of two to four years.

**Mutual Agreement Exception:**
By mutual agreement of the CV(SS) permit owner and shoreside processor to which the permit is obligated, at any time a permit may deliver to any shoreside processor other than that to which it is obligated. That transfer, or any transfer, may be made permanent if by mutual agreement between the original co-op processor and permit holder.

**Temporary Transfer of Allocation to CV(SS) Endorsed and unendorsed Permits:**
Owners of valid limited entry permits that are members of Co-ops are permitted to transfer Co-op allocations amongst other Co-op members. Such inter- or intra Co-op transfers must deliver Co-op shares to the shoreside processor to which the allocation is obligated unless released by mutual agreement. Also, a Co-op allocation may be harvested by any catcher vessel holding a valid trawl limited entry permit (including one that does not have a CV(SS) endorsement). Whiting allocations are not permanently separable from a trawl limited entry permit Allocations may not be transferred from the shoreside sector to another sector.

**CV(SS) Permit Combination to Achieve a Larger Size Endorsement:**
A CV(SS) endorsed permit that is combined with a limited entry trawl permit that is not CV(SS) endorsed or one that is CV(MS) endorsed will be reissued with the CV(SS) endorsement. If the other permit is CV(MS) endorsed, the CV(MS) endorsement will also be maintained on the resulting permit. However, CV(SS) and CV(MS)

landings histories will be maintained separately on the resulting permit and be specific to participation in the sectors and to the processor for which the landings histories were originally determined. If a CV(SS) permit is combined with a CP permit, the CV(SS) endorsement and history will not be reissued on the combined permit. The size endorsement resulting from permit combinations will be determined based on the existing permit combination formula.

**Bycatch:**
Subdivide bycatch species allocation among each of the whiting sectors (see Sector Allocation).

**Sector Allocation**
Existing whiting trawl allocations to remain intact between shoreside whiting sector (42%), mothership sector (24%) and catcher-processor sector (34%). Bycatch species shall be allocated between the whiting sectors. The allocations will be made on a *pro-rata* basis relative to whiting allocated to each sector.

**Bycatch Rollover:**
Bycatch may be rolled over to the following year or transferred to another sector.

March. E.4.e Sup Pub Com 3

To: *Pacific Fisheries Management Council* *March 6, 2007*

*We, the following, oppose any and all plans to give processing or individual fishing quotas to any select group or separate party for Pacific Whiting or Pacific ground fish. We oppose any "Rationalization Plan" or the use by the Pacific Management Council to spend public money to explore such a scheme that limits existing shore plants and trawl licensed fishing vessels from participating in the harvest and processing of this public resource.*

*Any "ITQ" or "IFQ" program grants ownership to a private entity of a public resource with no compensation to the resource owner, the citizens of the United States. As an example, we as a society would never give a major timber company trees in our National Forest or exclude others from competing in a timber harvest because they had not previously participated in past purchase of trees. Privatizing citizen owned resources destroys competition and excludes rural coastal seafood companies from expanding and growing their business.*

*The value of these seafood resources will continue to increase and should not be given to a few because of past participation in a portion of the seafood industry. Other management tools exist that give an opportunity for the entire industry to participate if they choose.*

*ITQ, IFQ, processor shares and rationalizations are not management tools. They are an economic split of the resource only and give the resource to a privileged few.*

*Jessies Ilwaco Fish*
*Del Mar*
*Bay Ocean Seafoods*
*Bell Buoy Crab*
*Bell Buoy – Seaside*
*Custom Seafood Processors*
*Breaters Seafood*
*New Day Fisheries*
*Smoki Foods*
*West Bay Seafoods*
*Albers Seafood*

*Fishhawk Fisheries*
*Dungeness Crab Development*
*Nelson Crab*
*American Canadian/Ocean Star*
*South Bend Packers*
*Da Yang*
*Westport Seafood Exchange*
*D & M Live Crab*
*Oregon Ocean*
*Boundary Fish*
*Carvalho Fisheries*

**Table 2. Summary of the IFQ Alternatives**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| A. | ***Trawl Sector Management*** | | **Same for All Alternatives** |
| A.1 | Scope for IFQ Management, Including Gear Switching | | Catch based system: QP (quota pounds) required to cover groundfish catch (including all discards).<br>Gear switching allowed (vessels with limited entry trawl permits can use directed groundfish gears (including open access, longline and fishpot) to harvest their QP). |
| A.2 | IFQ Management Units, Including Latitudinal Area Management | | Quota-Shares/QP will be species, area and sector specific.<br>Species and areas will be as specified in the ABC/OY table, unless it is determined that additional area subdivisions are desirable.<br>**(Process Option**: Initiate a group to address area management)<br>QS may be subdivided after initial allocation. |
| A.3 | General Management and Trawl Sectors ” | | Unless otherwise specified, status quo regulations, other than trip limits, will remain in place. Including season closures, as necessary. **For trawl vessels fishing IFQ with longline gear, RCAs may need to be more conservative.**<br>**Option 1:** ~~One~~ **Three** trawl sector**s (shoreside, mothership, and catcher-processors)**.<br>**Option 2**: Four trawl sectors: shoreside nonwhiting, shoreside whiting, mothership, and catcher-processors. |
| A.4 | Management of NonWhiting Trips | | Trip limits will apply to whiting incidental catch in the nonwhiting fishery (in addition to the requirement that catch be covered with for whiting QP). |
| A.5 | Management of Whiting Trips | | At-sea whiting will be closed through a prohibition on at-sea deliveries (including catcher-processor harvest).<br><br>~~If the trawl sector is divided into subsectors:~~<br>~~**Option 1:** Whiting QP rollover provision.~~<br>~~**Option 2:** No whiting QP rollover provision.~~**[Note: QP can be sold, let market handle it]** |
| A.6 | Special Overfished Species Management Provisions | (placeholder) | No special provisions (except with respect to initial allocation and carryovers (see below)). |
| A.7 | Sideboards | (placeholder) | ~~No special provisions at this time. Issue is being evaluated.~~ **None.** |
| B | ***IFQ System*** | | |
| B.1 | **Initial Allocation** | | |
| B.1.1 | Eligible Groups | Groups and Initial Split of QS | **Option 1:** 100% to permit owners<br>**Option 2:** 75% to permit owners and 25% to processors **for groundfish, 50% to permit owners and 50% to processors for whiting.** |

**Table 2. Summary of IFQ alternatives (continued)**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| | | Permit History | Landings/deliveries history goes with the permit. |
| | | Processing Definition | Only the first processing counts as processing. A special definition of processors and processing is provided. |
| | | Attributing and Accuring Processing History | Attribute to the first receiver, but for shoreside<br>**Option 1:** Attribute to the receiver reported on the landing receipt.<br>**Option 2:** Same as Option 1, except history may be reassigned to an entity not on the landings receipt, if parties agree or thru an adjudication process. Additionally, history transfers with the facility (unless the facility is leased, in which case it goes to the lease holder). |
| B.1.2 | Recent Participation | Permits (including catcher-processor permits) | ~~**Option 1:** Recent participation is not required.~~<br>~~**Option 2:**~~ Recent participation required (~~one~~**zero, five, or ten** landing**s**/deliver**ies**~~y~~ from 1998-2003)<br>~~**Option 3:** Recent participation required (1998-2003) [level of activity to be determined]~~ |
| | | Processors (motherships) | Recent participation required: ([level of activity to be determined] from 1999-2004 |
| | | Processors (shoreside) | Recent participation required: [level of activity to be determined] from 1999-2004 |
| B.1.3 | Allocation Formula | Permits with catcher vessel history | Allocation based on<br>(1) permit history, plus<br>(2) an equal division of QS for buy-back permits<br>For each species/species group to be allocated QS, the history used for allocation will be that for:<br>**Allocation Species Option 1 (Nominal[a] Species):** the species/species group being allocated.<br>**Allocation Species Option 2 (Nominal or Proxy Species):** Use proxy species for nontarget-overfished species and other incidental species (LIST TO BE PROVIDED IN FOOTNOTE)<br>Allocation period: 1994-2003 drop two worst years for whiting trips<br>drop three worst years for nonwhiting trips.[b]<br>Relative pounds. Use a vessels pounds relative to the rest of the fleet to calculate history for each year. |
| | | Permits with catcher-processor history | **Option 1:** Schedule developed by unanimous consent of catch processors.<br>**Option 2:** Permit history: 1994-2003 (no option to drop years) use relative pounds[c]. |
| | | Processors (motherships) | Motherships: 1998-2003 (no option to drop years) use relative pounds.<br>Apply the Allocation Species Options listed above |
| | | Processors (shoreside) | Shoreside Processors: 1994-2004, drop two worst years, use relative pounds.<br>Apply the Allocation Species Options listed above |
| B.1.4 | History for Combined Permits and Other Exceptional Situations | | Permit history for combined permits include the history for all the permits that have been combined.<br>EFPs landings in excess of cumulative limits for the non-EFP fishery will not count.<br>Compensation fish will not count.[de] |
| B.1.5 | Initial Issuance Appeals | | No Council appeals process. NMFS will develop a proposal for an internal appeals process. |

**Table 2. Summary of IFQ alternatives (continued)**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| B.2 | **Permit/Holding Requirements and Acquisition** | | |
| B.2.1 | Permit/IFQ Holding Requirement | | 1. Limited entry trawl permit required.<br>2. 30 days to cover catch with QP<br>3. For a vessel to use QP, they must be in the vessel's QP account.<br>4. If a vessel does not have QP to cover its catch, it may not fish until the overage is covered.<br>5. A vessel with a deficit could not transfer its LE permit.<br>**Option:** XXX QP must be held prior to departure from port. |
| B.2.2 | IFQ Annual Issuance | Start-of-Year QP Issuance | Quota pounds would be issued annually to quota share holders. |
| | | Carryover (Surplus or Deficit) | ~~**Non-overfished Species Option 1:** 5% carryover for non-overfished species~~<br>**Non-overfished Species Option 2:** 10% carryover for non-overfished species<br>~~**Non-overfished Species Option 3:** 30% carryover for non-overfished species~~<br><br>~~**Overfished Species Option 1:** No carryover for overfished species~~<br>**Overfished Species Option 2:** ~~5~~**10**% carryover for overfished species<br>~~**Overfished Species Option 3:** Same carryover as for overfished species~~ |
| | | Quota Share Use-or-Lose Provisions | None. ~~Consider during program review.~~ |
| | | Entry Level Opportunities | ~~**Option 1:** No special provisions.~~<br>~~**Option 2**: Lottery for revoked shares. One time distribution of 5% of QS at start of program, possibly through and auction.~~<br>**Infinitely divisible, buy-in slowly.** |
| B.2.3 | IFQ Transfer Rules | Eligible Owners/Holders | Any entity eligible to own or control a US documented fishing vessel with certain AFA and treaty exceptions. **Use North Pacific Council language.** |
| | | Transfers and Leasing | ~~**Option 1:** Transferable QP/QS.~~<br>**Option 2:** Transferable QP/QS but leasing QS prohibited. |
| | | Temporary Transfer Prohibtion | Temporary prohibitions on QS transfers, as necessary for program administration (to be determined by NMFS). |
| | | Divisibility | Unrestricted for quota shares. Whole pound units for quota pounds. |
| | | Liens | Liens could be placed on quota shares and quota pounds. |
| | | Accumulation Limits (Vessel **and,** Own~~ership,~~ **or** Control) | Limits may vary by species/species group, areas, and sector. **Use options provided in TIQC report and North Pacific rules for defining ownership or control.** ~~Data needed to narrow options. New definition of "control" and other provisions needed. The following options are being considered.~~<br>~~**Option 1:** No limits~~ ~~**Option 4:** 10% limits~~<br>~~**Option 2:** 50% limits~~ ~~**Option 5:** 5% limits~~<br>~~**Option 3:** 25% limits~~ ~~**Option 6:** 1% limits~~<br>Note: Limits for groundfish or a complex may be applied in addition to the species/species group limits. |

**Table 2. Summary of IFQ alternatives (continued)**

| | Element | SubElement | IFQ Alternative |
|---|---|---|---|
| B.3 | **Program Administration** | | |
| B.3.1 | Tracking and Monitoring NMFS will explore the possibility of less than 100% at-sea monitoring and report back on the possibility. | | **Option 1:** 100% at-sea compliance monitors/observers (small vessel exception, if feasible).<br>Discarding would be allowed. Allowing discarding would require that the timeliness of discard reporting be improved to match that for landings reporting. Such timeliness would be necessary to track quota pound usage. VMS would be required.<br>Electronic landings tracking, advance notice of landings, unlimited landing hours. Some shoreside monitoring.<br>Some costs would be controlled through a requirement that delivery sites be licensed. Site licenses would ensure that certain standards would be met that would facilitate monitoring and would aid work force planning. Any landing not made at a licensed site would be illegal.<br>QP account information for vessels would be available in the field. A central lien registry system would include only essential ownership information.<br><br>**Option 2:** Same as Option 1 except as follows. No small vessel exception. There would be full retention and 100% shoreside monitoring, so the discard reporting system would not need to be upgraded. The site licensing program would be replaced by a limitation on the ports to which deliveries could be made. Costs would be further controlled by limiting landing hours. A central lien registry system would contain expanded ownership information.<br><br>**Option 3:** Same as Option 1 except as follows. No small vessel exception. Cameras might be provided as an option for vessels to use in place of compliance observers (feasibility to be determined). Discards would be allowed (except when cameras are used). Instead of creating an electronic state fish ticket system, a Federal system would be created to track trawl landings. A central lien registry system would contain expanded ownership information. |
| B.3.2 | Socio-Economic Data Collection | | ~~**Option 1:** Expanded data collection, voluntary compliance. Include transaction prices in a central QS ownership registry.~~<br>**Option 2:** Expanded data collection, mandatory compliance. Include transaction prices in a central QS ownership registry. |
| B.3.3 | Program Costs Some cleanup is needed so that the options all cover the same issues. | Cost Transfer and Recovery | **Option 1:** Recover IFQ program costs but not enforcement or science costs<br>A maximum of 3% of ex-vessel value.<br>**Option 2:** Full cost recovery through landing fees plus privatization of certain elements of the management system. |
| | | Fee Structure | To be determined. TIQC recommends a fee structure that reflects usage. |
| B.3.4 | Program Duration and Modification | | Four-year review process **to start four years after implementation**.<br>Community advisory committee to review IFQ program performance. |

[a] As used here, "nominal" refers to the species attributed to the vessel after the application of species composition ratios in the PacFIN system. The estimates for nominal species are based on fleet averages and so may vary from actual vessel catch. However, these are the best estimates available of actual vessel catches, specified to the needed levels of species group desegregation.

**Table 2. Summary of IFQ alternatives (continued)**

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[b] State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries and observer data wil motherships.

[c] Based on observer data

[d] **Stacked permits:** On rare occasions two trawl permits have been assigned to the same vessel. During the time more than o single vessel . . . Options: A. Divide landing/delivery history equally among both permits. B. Assign all landing/delivery registered for use with the vessel. This issue will not affect the analysis. Therefore, until the issue is decided Option A will be

[e] Illegal landings/deliveries do not count toward history for QS allocation.

Attachment C to GAC Report, March 2007.

Agenda Item E.5.b
Supplemental GMT Report
March 2007

# THE GROUNDFISH MANAGEMENT TEAM (GMT) REPORT ON CONSIDERATION OF INSEASON ADJUSTMENTS

The GMT reviewed several inseason management issues and have identified the following issues for consideration by the Council.

## RECREATIONAL

### *Washington*

At its January meeting, the GMT heard proposed Rockfish Conservation Area (RCA) changes for the Washington recreational fishery. The recommended changes, which are based on the 2006 harvest estimates for the Washington recreational fishery would modify the RCAs adopted for 2007 and 2008 so they are the same RCAs as those that were in effect in 2006. During the biennial specifications process, WDFW staff used harvest data through 2005 to project the amount of canary and yelloweye rockfish that would be harvested in the Washington recreational fishery and identified additional restrictions that could be in place, if needed. However, with the depth restrictions that were in place during 2006, the Washington recreational fishery stayed under its harvest targets, harvesting 1.28 mt of canary and 1.70 mt of yelloweye rockfish, and therefore the GMT supports this change.

### *California*

The GMT received a report from CDFG regarding groundfish estimates from the California Recreational Fisheries Survey (CRFS), which detailed problems in the CRFS estimation process. The report described the changes that CDFG and Pacific States Marine Fishery Commission (PSMFC) are working to address and provided a timeline for completing revised estimates for 2004-2006. The GMT discussed the scope of the planned changes and proposed deadlines. When changes are completed, final 2006 catch and total mortality estimates will be produced by CDFG. CDFG will input the catch estimates into the recreational catch projection model to re-estimate projected 2007 catches for key species of interest and rebuilding species, based on the current season structure. The revised estimates will be provided to the GMT and reviewed at the June Council meeting.

COMMERCIAL

*Limited Entry Trawl North of 40°10' N lat.*

*Non-whiting Trawl Fishery*

Canary Rockfish Bycatch

Based on information from the most recent release of observer data, the encounter rate for canary rockfish is several times higher than originally predicted. Using the bycatch rates developed from observations during the 2005 through April 2006 time period, the estimated catch of canary rockfish in the 2007 non-whiting trawl fishery is 20 mt under status quo management measures, which results in projected total catches for all fisheries that, in combination, would exceed the canary rockfish optimum yield. The GMT discussed tools that are available to the Council through a regular inseason action and these include adjustments to cumulative limits, adjustments to RCA boundaries, and the use of commonly used geographic coordinates.

Staff at the Northwest Fishery Science Center compiled area-specific bycatch rates in the context of tools that are available for routine inseason management. These area specific analyses allow for more refined options to reduce canary rockfish impacts instead of more dramatic and sweeping area closures. Several areas of the coast were identified with distinctly different bycatch rates north of 40°10' N lat. This information is shown as Table 4 under Agenda item E.2.b Attachment 2. That information shows that the three areas with the highest canary bycatch rates are: a) that area shoreward of the trawl RCA north of Cape Alava; b) that area shoreward of the trawl RCA between Leadbetter Point and the OR/WA border; and c) that area shoreward of the trawl RCA between Cape Arago and Humbug Mountain.

The GMT considered several different approaches for reducing canary rockfish impacts in the trawl fishery north of 40°10' N lat. that would help minimize the economic impact to trawl fishers and communities given the constraints of managing within overfished species OY levels and the need to reduce canary rockfish catch levels. Some of the approaches considered:

1) Moving the shoreward boundary of the trawl RCA to 75 fm north of 40°10' N lat. for the entire year
2) Reducing cumulative limits with selective flatfish trawl gear and moving the shoreward boundary of the RCA to 75 fm
3) Closing the shoreward area between Cape Arago and Humbug Mountain, closing the shoreward area north of Cape Alava, moving the shoreward RCA to 75 fm in other areas north of 40°10' N lat. and reducing cumulative limits
4) The options outlined in #3, except that the area shoreward of the trawl RCA between the OR/WA border and Leadbetter Point is closed to the shore
5) Providing for more liberal RCA boundaries and cumulative limits in areas seaward of the trawl RCA in order to encourage effort to move offshore
6) Various combinations of more restrictive RCA boundaries in the three identified areas along with changes in cumulative limits

Based on these analyses, options that keep the shoreward areas open north of Cape Alava and between Cape Arago and Humbug Mountain require reductions in cumulative limits that make trawling with selective flatfish gear not economically worthwhile for many participants in the non-whiting trawl fishery. Opportunities exist that leave the Leadbetter Point to OR/WA border area open to fishing depending on the cumulative limits and the amount of effort that is predicted to shift offshore.

In an attempt to shift fishing effort offshore, the GMT considered fishing opportunities in the area seaward of the RCA. Seaward fishing opportunities are primarily constrained by darkblotched rockfish and, to a lesser extent, Pacific Ocean perch. Data from the NMFS trawl survey, logbook data, and anecdotal information from the trawl industry shows that species in general are scattered at shallower depths in the north and move to deeper depths as one moves down the coast toward Cape Mendocino. This is true for target species and for darkblotched rockfish. For example, a 200 fm seaward boundary in areas north of 40°10’ N lat. during the summer months would provide for fishing opportunity in the seaward areas for vessels fishing off southern Oregon and northern California, but a 200 fm seaward boundary during the summer months would exclude the availability of target species off northern Oregon and Washington in areas seaward of the RCA. The GMT considered RCA boundaries that would take into account this trend in species abundance in order to provide access to target species in the seaward area. In addition, the GMT considered increases in cumulative limits for DTS species and for lingcod in areas seaward of the trawl RCA.

The GAP requested that the GMT explore liberalizing the seaward RCA boundary north of 40°10’ N lat. to induce vessels off northern Oregon and Washington to fish in areas seaward of the trawl RCA. In response, the GMT analyzed breaking the seaward boundary of the trawl RCA at the OR/WA border and, alternatively, breaking the seaward RCA boundary at Cascade Head. To the north of the specified latitudinal break the seaward boundary would be set at 150 fm, and to the south of the specified latitude the seaward boundary would be set at 200 fm. Based on a review of RCA coordinates, logbook data, survey data, and feedback from the GAP, a break in the seaward boundary of the RCA at Cascade head would provide for a greater incentive to fish seaward of the RCA while providing protection for darkblotched rockfish.

In addition to providing incentives for vessels to fish seaward of the trawl RCA, the GMT considered the varying regional target strategies that fishermen exhibit along the coast and how these target strategies can be taken into account to minimize economic impacts and keep canary impacts at acceptable levels. Several vessels tend to target other flatfish off of Oregon, while other vessels tend to target arrowtooth off Washington. Combining these two cumulative limit categories into a single cumulative limit (i.e., creating one cumulative limit that combines other flatfish and arrowtooth) was considered in order to reduce overall target species catch in areas where constraining overfished species are found (and thus reduce overfished species impacts), but to continue providing for those regional target strategies. This approach allows for greater opportunities for those particular target strategies, but the total catch – and overfished species impacts – is estimated to be less than if separate limits were specified for both cumulative limit categories.

The area between Leadbetter Point and the OR/WA border has a canary bycatch rate that is relatively higher than other areas north of 40°10’ N lat., but during the winter months that bycatch rate is substantially reduced. Keeping that area open during the winter months is expected to provide an aggregate coastwide bycatch rate that is less than if that area is closed. The GMT explored options that provide for fishing opportunity in this area while keeping canary rockfish bycatch at acceptable levels in addition to other factors.

One additional factor in particular is the interaction with soft-shelled crab that occurs when the trawl fleet moves to areas closer to shore. Based on a review of RCA boundaries, the shoreward 60 fm RCA boundary in this area is further off-shore compared to other areas along the coast, and therefore, the GMT believes that the interactions between crab fishers and trawlers would be minimal if a 60 fm boundary is put in place. However, the GMT acknowledges the potential impacts to crab in this area, especially in the summer months. Based on these considerations, the GMT analyzed the effect of a 60 fm RCA boundary in the area between Leadbetter Point and the OR/WA border during the summer months to determine if this opportunity could be provided. While keeping this area open to fishing during the summer months results in higher canary impacts than if this area is closed, those impacts are predicted to be within acceptable levels.

Petrale Sole Catches

Petrale sole catches through the end of February are estimated to be between 850-900 mt, compared to an original projection of approximately 500 mt. To maintain a year round petrale sole target opportunity, the GMT considered reductions in cumulative limits. Trawl industry representatives indicated that petrale sole limits less than 20,000 lbs per two months is not economically sustainable. However, in order to slow the catch of petrale sufficiently to stay within the OY and reduce canary impacts, trip limit reductions were necessary (Table 1). The GMT recommends reducing the petrale sole limits in the north from 25,000 to 20,000 lbs per two months from period 3 through 6 and reducing the period 6 limit in the north from 50,000 to 30,000 lbs per two months. The GMT also recommends reducing the trip limits in the south from 30,000 to 25,000 lbs per two months in period 3 through 5. The canary savings from this action were taken into account in the overall analysis for inseason.

GMT Inseason Proposal

Based on the above considerations, the GMT is proposing one combined option for inseason adjustments to the non-whiting trawl fishery. This option creates an RCA configuration based on more refined area management that is substantially more complex than status quo. Adjustments to cumulative limits were also included to reduce canary and petrale sole impacts while providing increased opportunity in the seaward area. Proposed inseason adjustment measures that reduce canary rockfish impacts include;

- Closing the shoreward area north of Cape Alava;
- Closing the shoreward area between Cape Arago and Humbug Mountain;

- Restricting the shoreward area between Leadbetter Point and the OR/WA border to 60 fm from April 1 through period 5;
- Reducing cumulative limits for selective flatfish trawl gear in the north for sablefish, dover sole, petrale sole, and combining arrowtooth and other flatfish into one group and setting that limit at 70,000 lbs.;
- Establishing a 150 fm RCA seaward boundary north of Cascade Head beginning April 1 through period 4 and setting a 200 fm seaward RCA boundary from Cascade Head to 40°10' N lat.; and
- Increasing opportunities for lingcod and shortspine thornyhead in areas seaward of the trawl RCA in the north.

To control the catch of darkblotched rockfish, slope rockfish limits are reduced in the north to 1,500 lbs per two months beginning in period 3 through 6.

Figure 1 shows the proposed RCA configurations, select latitudinal areas, and the states of Washington and Oregon. Table 3, which was taken from the NWFSC report, details bycatch and target species catch by area, depth, and season.

**Table 1 Proposed Adjustments to RCA Boundaries and Cumulative Limits**

| | | RCA BOUNDARIES | | CUMULATIVE LIMITS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SUBAREA | PERIOD | INLINE | OUTLINE | SABLEFISH | LONGSPN | SHORSPN | DOVER | OTR FLAT & ARROW | PETRALE | SLOPE RK |
| North Large and Small Footrope | 1 | 75 | 250* | 13,000 | 22,000 | 7,500 | 80,000 | 210,000 | 50,000 | 4,000 |
| | 2 | | | 13,000 | 22,000 | 7,500 | 80,000 | 210,000 | 30,000 | 4,000 |
| | 3 | see RCA config below | | 15,000 | 22,000 | 10,000 | 60,000 | 110,000 | 20,000 | 1,500 |
| | 4 | | | 15,000 | 22,000 | 10,000 | 60,000 | 110,000 | 20,000 | 1,500 |
| | 5 | | 200 | 15,000 | 22,000 | 10,000 | 60,000 | 110,000 | 20,000 | 1,500 |
| | 6 | | 200* | 13,000 | 22,000 | 10,000 | 80,000 | 110,000 | 30,000 | 1,500 |
| North SFFT Limits | 1 | 75 | 250* | 5,000 | 3,000 | 3,000 | 40,000 | 180,000 | 16,000 | 4,000 |
| | 2 | | | 8,000 | 3,000 | 3,000 | 40,000 | 180,000 | 25,000 | 4,000 |
| | 3 | see RCA config below | | 5,000 | 3,000 | 3,000 | 38,000 | 70,000 | 20,000 | 1,500 |
| | 4 | | | 5,000 | 3,000 | 3,000 | 38,000 | 70,000 | 20,000 | 1,500 |
| | 5 | | 200 | 5,000 | 3,000 | 3,000 | 38,000 | 70,000 | 15,000 | 1,500 |
| | 6 | | 200* | 5,000 | 3,000 | 3,000 | 25,000 | 30,000 | 8,000 | 1,500 |
| 38 - 40 10 | 1 | 100 | 200* | 14,000 | 22,000 | 7,500 | 70,000 | 120,000 | 50,000 | 15,000 |
| | 2 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 120,000 | 30,000 | 15,000 |
| | 3 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 25,000 | 15,000 |
| | 4 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 25,000 | 10,000 |
| | 5 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 25,000 | 10,000 |
| | 6 | 100 | 200* | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 50,000 | 15,000 |
| S 38 | 1 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 120,000 | 50,000 | 40,000 |
| | 2 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 120,000 | 30,000 | 40,000 |
| | 3 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 25,000 | 40,000 |
| | 4 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 25,000 | 40,000 |
| | 5 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 25,000 | 40,000 |
| | 6 | 100 | 150 | 14,000 | 22,000 | 7,500 | 70,000 | 110,000 | 50,000 | 40,000 |

note: Splitnose limits are equivalent to slope rock limits in the south
Lingcod limits increase in this proposal to 4,000 lbs per 2 months for large footrope in the north and to 4,000 lbs in the south.
Other Flatfish and Arrowtooth limits are separate in periods 1 and 2. The cumulative limits shown in thes periods represents the sum of the two limits

**Table 2 Proposed RCA Configuration North of 40°10' N lat.**

NORTH OF 40 10 RCA CONFIGURATION

| | | MONTH | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RCA | AREA | JAN/FEB | MARCH | APRIL | MAY/JUNE | JULY/AUG | SEPT/OCT | NOV/DEC |
| SEAWARD BOUNDARY | N OF CASCADE HD | 250* | 250 | 150 | 150 | 150 | 200 | 200* |
| | S OF CASCADE HD | | | 200 | 200 | 200 | | |
| SHOREWARD BOUNDARY | NORTH OF CP ALAVA | 75 | 75 | SHORE | SHORE | SHORE | SHORE | SHORE |
| | LEADBETTER POINT TO OR/WA BORDER | 75 | 75 | 60 | 60 | 60 | 60 | 75 |
| | CP ARAGO TO HUMBUG MT | 75 | 75 | SHORE | SHORE | SHORE | SHORE | SHORE |
| | ALL OTHER AREAS | 75 | 75 | 75 | 75 | 75 | 75 | 75 |

note: a 250* or 200* indicates a 250 or 200 RCA line with petrale areas

**Table 3.--Sub-area summary of canary rockfish bycatch observed by the West Coast Groundfish Observer Program from January 2005 through April 2006 on trawl vessels fishing shoreward of the RCA and north of 40°10' N. Latitude, with associated 2005 logbook totals for hauls and retained target tonnage.**

| | | All hauls less than 75 fm | | | | | | All hauls less than 100 fm | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Observer data | | | | Logbook data | | Observer data | | | | Logbook data | |
| Northern s | Season [2] | # of hauls in stratum | Target species [1] retained mts | Total canary catch lbs | Canary lb per 100 lb of retained target sp. [1] | # of hauls in stratum | Target species [1] retained mts | # of hauls in stratum | Target species [1] retained mts | Total canary catch lbs | Canary lb per 100 lb of retained target sp. [1] | # of hauls in stratum | Target species [1] retained mts |
| N. of Cape Alava | | | | | | | | | | | | | |
| | Winter | 86 | 39 | 852 | 1.003 | 203 | 119 | 117 | 66 | 1,421 | 0.971 | 272 | 199 |
| | Summer | 93 | 86 | 1,786 | 0.939 | 592 | 543 | 262 | 302 | 6,090 | 0.916 | 1,204 | 1,264 |
| Cape Alava - Queets River | | | | | | | | | | | | | |
| | Winter | 15 | 5 | 59 | 0.525 | 7 | 2 | 34 | 30 | 458 | 0.697 | 58 | 53 |
| | Summer | 136 | 155 | 925 | 0.270 | 560 | 714 | 212 | 237 | 2,198 | 0.420 | 797 | 1,019 |
| Queets River - Leadbetter Point | | | | | | | | | | | | | |
| | Winter | 93 | 43 | 89 | 0.095 | 263 | 143 | 95 | 45 | 89 | 0.090 | 273 | 153 |
| | Summer | 295 | 218 | 499 | 0.104 | 970 | 660 | 306 | 231 | 612 | 0.120 | 1,020 | 700 |
| Leadbetter Point - WA/OR border | | | | | | | | | | | | | |
| | Winter | 52 | 20 | 15 | 0.033 | 83 | 39 | 61 | 25 | 19 | 0.035 | 121 | 73 |
| | Summer | 91 | 95 | 1,521 | 0.722 | 608 | 423 | 111 | 123 | 1,597 | 0.588 | 818 | 562 |
| WA/OR border - Cape Lookout | | | | | | | | | | | | | |
| | Winter | 31 | 8 | 5 | 0.029 | 28 | 10 | 31 | 8 | 5 | 0.029 | 28 | 10 |
| | Summer | 249 | 161 | 505 | 0.143 | 1,325 | 861 | 294 | 208 | 610 | 0.133 | 1,624 | 1,146 |
| Cape Lookout - Cape Arago | | | | | | | | | | | | | |
| | Winter | 13 | 4 | 10 | 0.111 | 28 | 25 | 67 | 31 | 85 | 0.125 | 81 | 62 |
| | Summer | 90 | 48 | 61 | 0.058 | 435 | 300 | 195 | 140 | 582 | 0.188 | 911 | 780 |
| Cape Arago - Humbug Mountain | | | | | | | | | | | | | |
| | Summer | 15 | 6 | 1,083 | 8.178 | 143 | 97 | 45 | 30 | 1,579 | 2.375 | 223 | 175 |
| Humbug Mountain - 40°10' N. Lat. | | | | | | | | | | | | | |
| | Summer | 68 | 58 | 138 | 0.108 | 607 | 454 | 83 | 81 | 410 | 0.230 | 721 | 613 |
| All North c | Winter | 290 | 119 | 1,030 | 0.394 | 612 | 340 | 405 | 205 | 2,077 | 0.460 | 833 | 549 |
| | Summer | 1,037 | 828 | 6,519 | 0.357 | 5,240 | 4,052 | 1,508 | 1,353 | 13,678 | 0.459 | 7,318 | 6,259 |
| | Total | 1,327 | 946 | 7,549 | 0.362 | 5,852 | 4,392 | 1,913 | 1,558 | 15,755 | 0.459 | 8,151 | 6,808 |

[1] Target species include retained amounts of all flatfish, sablefish, thornyheads, Pacific cod, skates, and spiny dogfish.

[2] Winter season includes bi-monthly periods 1, 2, 6 (January-April; November-December); the Summer season includes bi-monthly periods 3, 4, 5 (May-October).

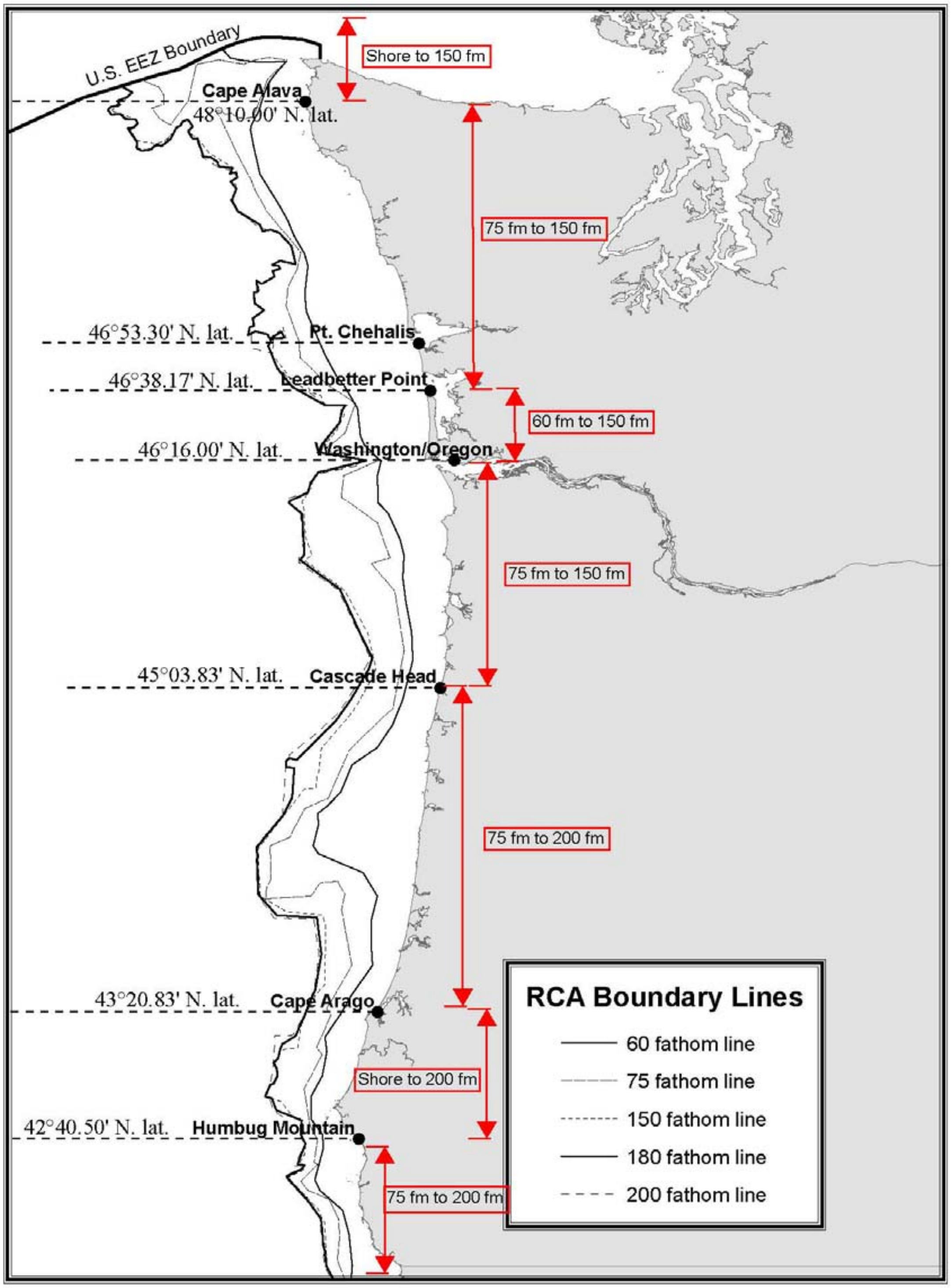


**Figure 1 GMT Proposed Limited Entry Trawl RCA Configurations North of 40°10.00' N lat.**
Note: Proposed RCA boundary for April-August.

*Area Management Implications For Inseason Management*

Area management options available to the Council in the current "toolbox," consist of the current broad RCAs which approximate various isobaths along the coast. Fisheries closures conforming to RCA boundaries by default assume homogeneous distribution of fish, fisheries and bycatch rates within the closed area. Many species, most importantly overfished rockfish species, have much more patchy distributions. In the past, the GMT has noted that as additional information is assembled from the West Coast Groundfish Observer Program, fishery logbooks and resource surveys, we might better identify fishing areas that avoid concentrations of overfished species and be able to focus fishing effort on target species having associated bycatch rates of overfished species lower than those currently assumed. Additionally, VMS tracking makes more discrete fishing closures more practical than in the past.

The inseason RCA closures of canary bycatch "hotspots" currently being considered result in differential impacts on geographically localized segments of the fishing fleet. To the extent that bycatch "coldspots" within these closed areas could be identified, these differential fleet impacts might be mitigated, while maintaining protective measures for overfished species. The GMT recommends that an effort be made to develop information to support more refined area management approaches, and notes that the area-based management work proposed as part of the TIQ process could prove valuable in moving this effort forward.

*Pacific Whiting*

Under agenda item E.3. the Council adopted a whiting OY, but deferred discussion of bycatch limit management to this agenda item. The projected bycatch of overfished species associated with the 2007 OY recommended by the Council is shown in the table below.

The fleetwide bycatch limits specified in Federal Regulation for the 2007 whiting fishery are: 4.7 mt for canary rockfish, 25 mt for darkblotched rockfish, and 200 mt for widow rockfish. The projected bycatch of darkblotched rockfish is well below the current bycatch limit of 25 mt. However, the GMT recommends maintaining the 25 mt limit to encourage the fleet to fish in deeper areas where they can avoid canary and widow rockfish. The GMT reminds the Council that this bycatch limit is not intended to constrain the fishery, but rather to provide a safeguard. With the 2007 OY, the catch of widow rockfish is projected to exceed the current bycatch limit of 200 mt. The GMT supports increasing the widow rockfish limit from 200 mt to 220 mt to accommodate interactions that may occur with an increasing widow rockfish biomass.

| U.S. whiting OY (mt) | Commercial OY (mt) | Commercial Sector | Allocation (mt) | Projected catch (mt) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Canary | Darkblotched | POP | Widow |
| 242,591 | 208,091 | Mothership | 49,942 | 2.3 | 4.4 | 1.0 | 86 |
| | | Catcher Processor | 70,751 | 0.2 | 5.6 | 1.5 | 86 |
| | (242,591 mt minus 2,000 mt for research and other fishery catch, minus 32,500 mt for the tribal allocation) | Shoreside | 87,398 | 1.4 | 2.4 | 0.3 | 45.6 |
| | | Total | 208,091 | 3.9 | 12.4 | 2.9 | 217.6 |

In 2006, there was a large increase (more than 200 times the 2005 amount) in landings in the shore-based whiting fishery by non-EFP vessels using mid-water trawl gear. Some of the non-EFP landings in 2006 were headed and gutted at-sea. The GMT discussed the increased landings and the possibility of additional vessels fishing outside the EFP in 2007. This is particularly a concern because EFP participants will be required to pay for electronic monitoring systems (EMS) beginning in 2007. EMS was previously paid for by the Northwest Fishery Science Center while it was in an experimental phase. This provides an economic incentive to join the non-EFP fishery instead of the EFP fishery. The ability to manage the whiting fishery with bycatch limits for canary, widow and darkblotched rockfish could become difficult if more whiting is landed by non-EFP vessels. This is because catch data from non-EFP vessels, including discarded catch data for bycatch limits species, would not be available for inseason bycatch limit management in the whiting fishery, even if a vessel had West Coast Groundfish Observer Program coverage. The GMT discussed the bycatch concerns and thought that non-EFP vessels should be restricted from fishing in the RCAs, but was unable to find the regulatory structure to accomplish this prior to the start of the 2007 whiting fishery. However, the GMT believes that the Council could recommend that constraints to unmonitored fishing be considered within the Amendment 10 analysis.

There is currently a 20,000 lb/trip limit for whiting taken with large and small footrope trawl gear prior to the start of the primary season. During and after the primary season, a 10,000 lb/trip limit is in place for large and small footrope gear. The GMT reviewed PacFIN data and found that since the start of 2005, only one bottom trawl vessel landed whiting, with no cumulative 2-month landings above 4,000 lbs. The GMT received word that there may be some interest in utilizing the current suite of bottom trawl whiting limits to land a value-added whiting product. The GMT has not modeled the potential bycatch impacts into either our whiting, or non-whiting bycatch models. Since selective flatfish trawl cannot effectively target whiting the fishery, by default, would be prosecuted seaward of the RCA so that canary bycatch would likely be small. If the Council wishes to constrain the fishery to current levels, the GMT recommends a 4,000 lb/trip limit for large and small footrope throughout the year. If the Council chooses to retain the current trip limit structure that may provide for an expanded fishery, the GMT notes that the associated bycatch rates may not be known until participating vessels are incorporated into the next annual complement of the West Coast Groundfish Observer Program.

<u>*Limited Entry Trawl South of 40°10' N lat.*</u>

*Chilipepper Rockfish*

The GMT received a request to consider increasing small footrope chilipepper rockfish limits in the areas shoreward and seaward of the RCAs. To reduce discards of chilipepper rockfish in the flatfish fisheries, chilipepper rockfish was removed from the overall 300 lb/month small footrope limit for minor shelf rockfish, and a 500 lb/month limit was established specifically for chilipepper at the beginning of 2007. The GMT recognizes that a small footrope chilipepper rockfish limit could be linked to a flatfish ratio to accommodate bycatch occurring in the flatfish fishery. The GMT would like to **delay consideration of this issue until April** so West Coast Observer Program data can be examined in an attempt to identify chilipepper rockfish/flatfish catch ratios and bycatch correlations and to explore the concern that potential targeting of chilipepper rockfish may occur with cumulative limits in excess of 1,000 lb/2months. If chilipepper targeting were to occur, there is a concern about accurately accounting for bocaccio bycatch rates.

<u>*Limited Entry Fixed Gear*</u>

*Lingcod*

The GMT received a request to increase lingcod limits in the nearshore and offshore areas both south and north of 40°10' N lat. The GMT has **postponed this issue until April** to determine if the nearshore bycatch model can be used to analyze canary and yelloweye rockfish bycatch concerns related to the targeting of lingcod.

The GMT also received a request to consider an increase lingcod limits specifically for pot vessels in nearshore area. Some pot gear fishers believe that their gear can be used to target lingcod with a much lower catch rate of rockfish than the other fixed gears. However, a provision to separate pot gear from other fixed gear was not considered in the 2007-2008 management cycle and was not analyzed in the EIS, therefore it is not a routine management measure and would require a two meeting process with an analysis and proposed and final rulemaking.

*Minor Shelf Rockfish South of 40°10' N lat.*

The GMT received a request to consider a limit that combines widow, chilipepper and bocaccio between the trawl and fixed gear sectors and the southern and central California regions (Agenda Item E.5.e, Public Comment 1). Bycatch concerns of shelf rockfish, particularly, canary rockfish, resulted in lower limits for this area in 2007. The GMT has **postponed this issue until April** to allow more data to be available for further analysis.

*Open Access*

*Lingcod*

The GMT received a request to increase lingcod limits in the nearshore and offshore both south and north of 40°10' N lat. The GMT has **postponed this issue until April** to determine if the nearshore bycatch model can be used to analyze bycatch concerns related to the targeting of lingcod.

*Minor Shelf Rockfish South of 34°27' N lat.*

The GMT does not recommend approval of the inseason request contained in Agenda Item E.5.e, Supplemental Public Comment 2. This request is to allow retention of shelf rockfish south of 34°27' N lat. for the remainder of the March-April cumulative period. This 2-month shelf rockfish closure is in place to align with the two-month nearshore rockfish closure that has been in place since 2004 to prevent bycatch and discard of nearshore species while targeting shelf species. In 2006, trip limit tables erroneously included shelf rockfish trip limits for March and April, suggesting that the fishery had been opened. This error was corrected in subsequent trip limit tables, and the closure was reincorporated into 2007 and 2008 regulations as intended. As bycatch concerns still exist, the GMT recommends that the closure continue as scheduled.

*All Gears*

*Bronzespotted rockfish South of 40°10' N lat.*

At their January meeting, the GMT heard a presentation from SWFSC staff on a preliminary data review conducted on bronzespotted rockfish. The results of the review suggest that bronzespotted rockfish maybe at very low levels of abundance. Because bronzespotted rockfish have similar life histories and habitat preferences as cowcod, the CCAs have likely been providing defacto protection for the stock. The GMT believes that further consideration of needed action should be given to the issue under the 2009-2010 management measures.

*Future Inseason Considerations*

As evidenced by this report, the GMT continues to receive a variety of requests from the commercial and recreational fisheries for inseason changes to management measures. The GMT views the inseason process as the avenue to take corrective actions for management measures that were analyzed and adopted through the biennial specifications process. Management proposals brought forward that were not analyzed in the specification's EIS, require additional analyses and multi-meeting Council attention. The GMT will continue to work with the GAP to keep lines of communications open and facilitate the process.

GMT Recommendations

1. Adopt Washington recreational RCA changes.

2. Adopt RCA boundary changes and appropriated trip limits

- Closing the shoreward area north of Cape Alava;
- Closing the shoreward area between Cape Arago and Humbug Mountain;
- Restricting the shoreward area between Leadbetter point and the OR/WA border to 60 fm from April 1 through period 5;
- Reducing cumulative limits for selective flatfish trawl gear in the north for sablefish, dover sole, petrale sole, and combining arrowtooth and other flatfish into one group and setting that limit at 70,000 lbs.;
- Establishing a 150 fm RCA seaward boundary north of Cascade Head beginning April 1 through period 4 and setting a 200 fm seaward RCA boundary from Cascade Head to 40°10' N lat.; and
- Increasing opportunities for lingcod and shortspine thornyhead in areas seaward of the trawl RCA in the north.
- To control the catch of darkblotched rockfish, slope rockfish limits are reduced in the north to 1,500 lbs per two months beginning in period 3 through 6.

3. Consider increasing lingcod trawl limits to 4,000 lb/ 2 month for large and small footrope trawl gear seaward of the RCA north of $40^{o}10'$ N lat. and south of $40^{o}10'$N lat.

4. Consider modifications to the current whiting fishery bycatch limits for canary, darkblotched, and widow rockfish.

5. If the Council wishes to constrain the non-primary whiting fishery to current catch levels, the GMT recommends a 4,000 lb/trip limit for large and small footrope throughout the year. If the Council chooses to retain the current trip limit structure that may provide for an expanded fishery, the GMT notes that the associated bycatch rates may not be known until participating vessels are incorporated into the next annual complement of the West Coast Groundfish Observer Program.

6. Analyze regulations for unmonitored vessels that are targeting whiting with midwater trawl gear in the RCA during the primary season within the Amendment 10 analysis.

## Table 3 (North) to Part 660, Subpart G -- 2007-2008 Trip Limits for Limited Entry Trawl Gear North of 40°10' N. Lat.

**Other Limits and Requirements Apply -- Read § 660.301 - § 660.399 before using this table**

112006

| | | JAN-FEB | MAR-APR | MAY-JUN | JUL-AUG | SEP-OCT | NOV-DEC |
|---|---|---|---|---|---|---|---|
| | **Rockfish Conservation Area (RCA)**[6/]**:** | | | | | | |
| | North of 48°10.00' N. lat. | 75 fm - modified 250 fm 7/ | 75 fm - 250 fm | shore - 150 | | shore - 200 | shore - 200 7/ |
| | 48°10.00' N. lat. - 46°38.17' N. lat. | | | 75 fm - 150 fm | | 75 fm - 200 fm | 75 fm - 200 fm 7/ |
| | 46°38.17' N. lat. - 46°16.00 N. lat. | | | 60 fm -150 fm | | 60 fm -200 fm | 75 fm - 200 fm 7/ |
| | 46°16.00 N. lat. - 45°03.83 N. lat. | | | 75 fm - 150 fm | | 75 fm - 200 fm | 75 fm - 200 fm 7/ |
| | 45°03.82' N. lat. - 43°20.83' N. lat. | | | 75 fm - 200 fm | | | 75 fm - 200 fm 7/ |
| | 43°20.83' N. lat. - 42°40.50' N. lat. | | | shore - 200fm | | | shore - 200 fm 7/ |
| | 42°40.50' N. lat. -40°10.00' N. lat. | | | 75 fm - 200 fm | | | 75 fm - 200 fm 7/ |

Selective flatfish trawl gear is required shoreward of the RCA; all trawl gear (large footrope, selective flatfish trawl, and small footrope trawl gear) is permitted seaward of the RCA. Midwater trawl gear is permitted only for vessels participating in the primary whiting season.

**See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).**

State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.

| | | JAN-FEB | MAR-APR | MAY-JUN | JUL-AUG | SEP-OCT | NOV-DEC |
|---|---|---|---|---|---|---|---|
| 1 | **Minor slope rockfish**[2/] **& Darkblotched rockfish** | 4,000 lb/ 2 months | | 1,500 lb/ 2 months | | | |
| 2 | **Pacific ocean perch** | 3,000 lb/ 2 months | | | | | |
| 3 | **DTS complex** | | | | | | |
| 4 | Sablefish | | | | | | |
| 5 | large & small footrope gear | 13,000 lb/ 2 months | | 15,000 lb/ 2 months | | | 13,000 lb/ 2 months |
| 6 | selective flatfish trawl gear | 5,000 lb/ 2 months | 8,000 lb/ 2 months | 5,000 lb/ 2 months | | | |
| 7 | multiple bottom trawl gear [8/] | 5,000 lb/ 2 months | 8,000 lb/ 2 months | 5,000 lb/ 2 months | | | |
| 8 | Longspine thornyhead | | | | | | |
| 9 | large & small footrope gear | 22,000 lb/ 2 months | | | | | |
| 10 | selective flatfish trawl gear | 3,000 lb/ 2 months | | | | | |
| 11 | multiple bottom trawl gear [8/] | 3,000 lb/ 2 months | | | | | |
| 12 | Shortspine thornyhead | | | | | | |
| 13 | large & small footrope gear | 7,500 lb/ 2 months | | 10,000 lb/ 2 months | | | |
| 14 | selective flatfish trawl gear | 3,000 lb/ 2 months | | | | | |
| 15 | multiple bottom trawl gear [8/] | 3,000 lb/ 2 months | | | | | |
| 16 | Dover sole | | | | | | |
| 17 | large & small footrope gear | 80,000 lb/ 2 months | | 60,000 lb/ 2 months | | | 80,000 lb/ 2 months |
| 18 | selective flatfish trawl gear | 40,000 lb/ 2 months | | 38,000 lb/ 2 months | | | 25,000 lb/ 2 months |
| 19 | multiple bottom trawl gear [8/] | 40,000 lb/ 2 months | | 38,000 lb/ 2 months | | | 25,000 lb/ 2 months |
| 20 | **Whiting** | | | | | | |
| 21 | midwater trawl | Before the primary whiting season: CLOSED. -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED. | | | | | |
| 22 | large & small footrope gear | Before the primary whiting season: 20,000 lb/trip. - | | 4,000 lb/trip | | | |
| 23 | **Flatfish** (except Dover sole) | | | | | | |
| 24 | Arrowtooth flounder | | | | | | |
| 25 | large & small footrope gear | 100,000 lb/ 2 months | | Arrowtooth included within other flatfish limits | | | |
| 26 | selective flatfish trawl gear | 90,000 lb/ 2 months | | | | | |
| 27 | multiple bottom trawl gear [8/] | 90,000 lb/ 2 months | | | | | |

TABLE 3 (North)

*Table 3 (North). Continued*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 28 | **Flatfish** (except Dover sole) *(con't)* | | | | | | |
| 29 | Other flatfish [3/], English sole, starry flounder, & Petrale sole | | | | | | |
| 30 | large & small footrope gear for Other flatfish [3/], English sole, & starry flounder | 110,000 lb/ 2 months | 110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole. | 110,000 lb/ 2 months (including arrowtooth), no more than 20,000 lb/ 2 months of which may be petrale sole. | | | 110,000 lb/ 2 months (including arrowtooth) |
| 31 | large & small footrope gear for Petrale sole | 50,000 lb/ 2 months | | | | | 30,000 lb/ 2 months |
| 32 | selective flatfish trawl gear for Other flatfish [3/.] English sole, & starry flounder | 90,000 lb/ 2 months, no more than 16,000 lb/ 2 months of which may be petrale sole. | 90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole. | 70,000 lb/ 2 months (including arrowtooth), no more than 20,000 lb/ 2 months of which may be petrale sole. | | 70,000 lb/ 2 months (including arrowtooth), no more than 15,000 lb/ 2 months of which may be petrale sole. | 30,000 lb/ 2 months (including arrowtooth), no more than 8,000 lb/ 2 months of which may be petrale sole. |
| 33 | selective flatfish trawl gear for Petrale sole | | | | | | |
| 34 | multiple bottom trawl gear [8/] | 90,000 lb/ 2 months, no more than 16,000 lb/ 2 months of which may be petrale sole. | 90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole. | 70,000 lb/ 2 months (including arrowtooth), no more than 20,000 lb/ 2 months of which may be petrale sole. | | 70,000 lb/ 2 months (including arrowtooth), no more than 15,000 lb/ 2 months of which may be petrale sole. | 30,000 lb/ 2 months, no more than 8,000 lb/ 2 months of which may be petrale sole. |
| 35 | **Minor shelf rockfish [1/], Shortbelly, Widow & Yelloweye rockfish** | | | | | | |
| 36 | midwater trawl for Widow rockfish | Before the primary whiting season: CLOSED. -- During primary whiting season: In trips of at least 10,000 lb of whiting, combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED. | | | | | |
| 37 | large & small footrope gear | 300 lb/ 2 months | | | | | |
| 38 | selective flatfish trawl gear | 300 lb/ month | | 1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish | | | 300 lb/ month |
| 39 | multiple bottom trawl gear [8/] | 300 lb/ month | | 300 lb/ 2 months, no more than 200 lb/ month of which may be yelloweye rockfish | | | 300 lb/ month |
| 40 | **Canary rockfish** | | | | | | |
| 41 | large & small footrope gear | CLOSED | | | | | |
| 42 | selective flatfish trawl gear | 100 lb/ month | | 300 lb/ month | | 100 lb/ month | |
| 43 | multiple bottom trawl gear [8/] | CLOSED | | | | | |
| 44 | **Yellowtail** | | | | | | |
| 45 | midwater trawl | Before the primary whiting season: CLOSED. -- During primary whiting season: In trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED. | | | | | |
| 46 | large & small footrope gear | 300 lb/ 2 months | | | | | |
| 47 | selective flatfish trawl gear | 2,000 lb/ 2 months | | | | | |
| 48 | multiple bottom trawl gear [8/] | 300 lb/ 2 months | | | | | |
| 49 | **Minor nearshore rockfish & Black rockfish** | | | | | | |
| 50 | large & small footrope gear | CLOSED | | | | | |
| 51 | selective flatfish trawl gear | 300 lb/ month | | | | | |
| 52 | multiple bottom trawl gear [8/] | CLOSED | | | | | |
| 53 | **Lingcod** [4/] | | | | | | |
| 54 | large & small footrope gear | 1,200 lb/ 2 months | | 4,000 lb/ 2 months | | | |
| 55 | selective flatfish trawl gear | | | 1,200 lb/2 months | | | |
| 56 | multiple bottom trawl gear [8/] | | | | | | |
| 57 | **Pacific cod** | 30,000 lb/ 2 months | | 70,000 lb/ 2 months | | | 30,000 lb/ 2 months |
| 58 | **Spiny dogfish** | 200,000 lb/ 2 months | | 150,000 lb/ 2 months | 100,000 lb/ 2 months | | |
| 59 | **Other Fish** [5/] | Not limited | | | | | |

**TABLE 3 (North) con't**

1/ Bocaccio, chilipepper and cowcod are included in the trip limits for minor shelf rockfish.
2/ Splitnose rockfish is included in the trip limits for minor slope rockfish.
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 250 fm" line is modified to exclude certain petrale sole areas from the RCA.
8/ If a vessel has both selective flatfish gear and large or small footrope gear on board during a cumulative limit period (either simultaneously or successively), the most restrictive cumulative limit for any gear on board during the cumulative limit period applies for the entire cumulative limit period.

**To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.**

**Table 3 (South) to Part 660, Subpart G -- 2007-2008 Trip Limits for Limited Entry Trawl Gear South of 40°10' N. Lat.**

**Other Limits and Requirements Apply -- Read § 660.301 - § 660.399 before using this table**

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| | | JAN-FEB | MAR-APR | MAY-JUN | JUL-AUG | SEP-OCT | NOV-DEC |
|---|---|---|---|---|---|---|---|
| | **Rockfish Conservation Area (RCA)[6/]:** | | | | | | |
| | 40°10' - 38° N. lat. | 100 fm - modified 200 fm [7/] | 100 fm - 150 fm | | | | 100 fm - modified 200 fm [7/] |
| | 38° - 34°27' N. lat. | 100 fm - 150 fm | | | | | |
| | South of 34°27' N. lat. | 100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands | | | | | |
| | Selective flatfish trawl gear is required shoreward of the RCA; all trawl gear (large footrope, selective flatfish trawl, and small footrope trawl gear) is permitted seaward of the RCA. | | | | | | |
| | **See § 660.370 and § 660.381for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 and §§ 660.396-660.399 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).** | | | | | | |
| | State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California. | | | | | | |
| *1* | **Minor slope rockfish[2/] & Darkblotched rockfish** | | | | | | |
| *2* | 40°10' - 38° N. lat. | 15,000 lb/ 2 months | | | 10,000 lb/ 2 months | | 15,000 lb/ 2 months |
| *3* | South of 38° N. lat. | 40,000 lb/ 2 months | | | | | |
| *4* | **Splitnose** | | | | | | |
| *5* | 40°10' - 38° N. lat. | 15,000 lb/ 2 months | | | 10,000 lb/ 2 months | | 15,000 lb/ 2 months |
| *6* | South of 38° N. lat. | 40,000 lb/ 2 months | | | | | |
| *7* | **DTS complex** | | | | | | |
| *8* | Sablefish | 14,000 lb/ 2 months | | | | | |
| *9* | Longspine thornyhead | 22,000 lb/ 2 months | | | | | |
| *10* | Shortspine thornyhead | 7,500 lb/ 2 months | | | | | |
| *11* | Dover sole | 70,000 lb/ 2 months | | | | | |
| *12* | **Flatfish** (except Dover sole) | | | | | | |
| *13* | Other flatfish[3/], English sole, & starry flounder | | | | | | |
| *14* | 40°10' - 38° N. lat. | 110,000 lb/ 2 months | Other flatfish, English sole, starry flounder & Petrale sole: 110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole. | Other flatfish, English sole, starry flounder, arrowtooth flounder & Petrale sole: 110,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole. | | | 110,000 lb/ 2 months (including arrowtooth) |
| *15* | South of 38° N. lat. | | | | | | |
| *16* | Petrale sole | 50,000 lb/ 2 months | | | | | 50,000 lb/ 2 months |
| *17* | Arrowtooth flounder | | | | | | |
| *18* | 40°10' - 38° N. lat. | 10,000 lb/ 2 months | | Arrowtooth included within other flatfish limits | | | |
| *19* | South of 38° N. lat. | | | | | | |
| *20* | **Whiting** | | | | | | |
| *21* | midwater trawl | Before the primary whiting season: CLOSED. -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED. | | | | | |
| *22* | large & small footrope gear | Before the primary whiting season: 20,000 lb/trip. - | | 4,000 lb/trip | | | |

TABLE 3 (South)

*Table 3 (South). Continued*

| | | | | |
|---|---|---|---|---|
| 23 | **Minor shelf rockfish[1/], Chilipepper, Shortbelly, Widow, & Yelloweye rockfish** | | | |
| 24 | large footrope or midwater trawl for Minor shelf rockfish & Shortbelly | 300 lb/ month | | |
| 25 | large footrope or midwater trawl for Chilipepper | 2,000 lb/ 2 months | 12,000 lb/ 2 months | 8,000 lb/ 2 months |
| 26 | large footrope or midwater trawl for Widow & Yelloweye | CLOSED | | |
| 27 | small footrope trawl for Minor Shelf, Shortbelly, Widow & Yelloweye | 300 lb/ month | | |
| 28 | small footrope trawl for Chilipepper | 500 lb/ month | | |
| 29 | **Bocaccio** | | | |
| 30 | large footrope or midwater trawl | 300 lb/ 2 months | | |
| 31 | small footrope trawl | CLOSED | | |
| 32 | **Canary rockfish** | | | |
| 33 | large footrope or midwater trawl | CLOSED | | |
| 34 | small footrope trawl | 100 lb/ month | 300 lb/ month | 100 lb/ month |
| 35 | **Cowcod** | CLOSED | | |
| 36 | **Minor nearshore rockfish & Black rockfish** | | | |
| 37 | large footrope or midwater trawl | CLOSED | | |
| 38 | small footrope trawl | 300 lb/ month | | |
| 39 | **Lingcod[4/]** | | | |
| 40 | large footrope or midwater trawl | 1,200 lb/ 2 months | 4,000 lb/ 2 months (Seaward of the RCAs only) | |
| 41 | small footrope trawl | | | |
| 42 | **Pacific cod** | 30,000 lb/ 2 months | 70,000 lb/ 2 months | 30,000 lb/ 2 months |
| 43 | **Spiny dogfish** | 200,000 lb/ 2 months | 150,000 lb/ 2 months | 100,000 lb/ 2 months |
| 44 | **Other Fish[5/] & Cabezon** | Not limited | | |

TABLE 3 (South) con't

1/ Yellowtail is included in the trip limits for minor shelf rockfish.
2/ POP is included in the trip limits for minor slope rockfish
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ Other fish are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 200 fm" line is modified to exclude certain petrale sole areas from the RCA.
**To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.**

**Estimated Mortality in the bottom trawl fishery under the GMT's proposed inseason adjustments.**

Estimated Mortality in the Bottom Trawl Fishery (mt)

| | | North | South | Total |
|---|---|---|---|---|
| Rebuilding Species | Canary | 7.1 | 1.1 | 8.1 |
| | POP | 89.8 | 0.0 | 89.8 |
| | Darkbltch | 211.5 | 35.9 | 247.4 |
| | Widow | 1.5 | 0.0 | 1.6 |
| | Bocaccio | 0.0 | 26.1 | 26.1 |
| | Yelloweye | 0.4 | 0.0 | 0.4 |
| | Cowcod | 0.0 | 1.5 | 1.5 |
| Target Species | Sablefish | 2091.2 | 512.8 | 2604.0 |
| | Longspine | 662.5 | 382.2 | 1044.6 |
| | Shortspine | 1097.4 | 277.7 | 1375.1 |
| | Dover | 7317.4 | 1852.8 | 9170.2 |
| | Arrowt'th | 3049.3 | 89.3 | 3138.6 |
| | Petrale | 1995.4 | 458.6 | 2454.1 |
| | Other Flat | 1571.1 | 567.0 | 2138.1 |
| | Slope Rock | 130.7 | 155.2 | 285.8 |

**2007 Projected mortality impacts (mt) under current regulations. March 2007 update prior to inseason adjustments. a/**

**1/31/2007**

| Fishery | Bocaccio b/ | Canary | Cowcod | Dkbl | POP | Widow | Yelloweye |
|---|---|---|---|---|---|---|---|
| **Limited Entry Trawl- Non-whiting** | **47.9** | **20.0** | **2.1** | **194.3** | **71.6** | **0.7** | **0.1** |
| **Limited Entry Trawl- Whiting** | | | | | | | |
| At-sea whiting motherships | | | | | **1.0** | | **0.0** |
| At-sea whiting cat-proc | | **4.7** | | 25.0 | **2.9** | **200.0** | **0.0** |
| Shoreside whiting | | | | | **1.8** | | **0.0** |
| Tribal whiting | | **0.7** | | **0.0** | **0.6** | **6.1** | **0.0** |
| **Tribal** | | | | | | | |
| Midwater Trawl | | 1.8 | | 0.0 | 0.0 | 40.0 | 0.0 |
| Bottom Trawl | | 0.8 | | 0.0 | 3.7 | 0.0 | 0.0 |
| Troll | | 0.5 | | 0.0 | 0.0 | | 0.0 |
| Fixed gear | | 0.3 | | 0.0 | 0.0 | 0.0 | 2.3 |
| **Limited Entry Fixed Gear** | | **1.1** | | 1.3 | 0.4 | | 2.9 |
| Sablefish | 13.4 | | 0.0 | | | 0.0 | |
| Non-Sablefish | | | 0.1 | | | 0.5 | |
| **Open Access: Directed Groundfish** | | **1.0** | | | | | |
| Sablefish DTL | 0.0 | | | 0.2 | 0.1 | 0.0 | **0.5** |
| Nearshore (North of 40°10' N. lat.) | 0.0 | **1.7** | 0.1 | 0.0 | 0.0 | **0.1** | **2.0** |
| Nearshore (South of 40°10' N. lat.) | 0.0 | | | 0.0 | 0.0 | | |
| Other | 10.6 | | | 0.0 | 0.0 | 0.0 | **0.1** |
| **Open Access: Incidental Groundfish** | | | | | | | |
| CA Halibut | 0.1 | **0.0** | | 0.0 | 0.0 | | |
| CA Gillnet c/ | 0.5 | | | 0.0 | 0.0 | 0.0 | |
| CA Sheephead c/ | | | | 0.0 | 0.0 | 0.0 | 0.0 |
| CPS- wetfish c/ | 0.3 | | | | | | |
| CPS- squid d/ | | | | | | | |
| Dungeness crab c/ | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| HMS b/ | | 0.0 | 0.0 | 0.0 | | | |
| Pacific Halibut c/ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Pink shrimp | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |
| Ridgeback prawn | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Salmon troll | 0.2 | **0.8** | 0.0 | 0.0 | 0.0 | 0.3 | 0.2 |
| Sea Cucumber | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Spot Prawn (trap) | | | | | | | |
| **Recreational Groundfish e/** | | | | | | | |
| WA | | 5.7 | | | | | 6.2 |
| OR | | | | | | 1.4 | |
| CA | 98.0 | 8.3 | 0.4 | | | 8.0 | 1.7 |
| **Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs. f/** | | | | | | | |
| | 2.0 | **7.5** | 0.1 | 3.8 | 3.6 | 0.9 | 2.0 |
| **TOTAL** | 173.2 | 55.0 | 2.8 | 224.7 | 85.7 | 258.1 | 18.2 |
| **2007 OY** | **218** | **44.0** | **4.0** | **290** | **150** | **368** | **23** |
| **Difference** | 44.8 | -11.0 | 1.2 | 65.4 | 64.3 | 110.0 | 4.8 |
| **Percent of OY** | 79.4% | 125.0% | 70.0% | 77.5% | 57.1% | 70.1% | 79.0% |
| Key | | = either not applicable; trace amount (<0.01 mt); or not reported in available | | | | | |

a/ All numbers reflect projected annual total catches except that the non-tribal "Limited Entry Trawl- Whiting" numbers are the total bycatch caps for canary, darkblotched, and widow rockfish. Only cells in bold font borders have been updated.

b/ South of 40°10' N. lat.

c/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

d/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

e/ Values in scorecard represent projected impacts. However, harvest guidelines for 2007 are as follows: canary in WA and OR combined = 8.2 mt and in CA = 9.0 mt; yelloweye in WA and OR combined = 6.8 mt and in CA = 2.1 mt.

f/ Research projections only updated for canary rockfish in November 2006. The other species' updates will be updated in March 2007.

# GROUNDFISH ADVISORY SUBPANEL REPORT ON CONSIDERATION OF INSEASON ADJUSTMENTS

The Groundfish Advisory Subpanel (GAP) discussed inseason adjustments for commercial and recreational fisheries. The GAP understands that only adjustments to limited entry trawl fisheries and Washington recreational fisheries will be presented by the Groundfish Management Team (GMT) at this meeting and thus has the following unanimous comments and recommendations.

The GAP is skeptical that 2007 fisheries will mirror the performance of 2005 fisheries and questions the use of the 2005 fisheries observer data to force additional cuts to an already struggling trawl fleet. The GAP believes that the observer data is outdated and in some cases incorrect. Furthermore, the GAP is disappointed that in order to liberalize fishing regulations it is necessary for several years of data or a time series to prove a trend. In the case of the observer data which is much less then 100% actually observed, we are relying on 1 year and 4 months of data – hardly a time series.

The GAP is also aware that the law requires the Council to stay within certain limits for fisheries and that we are working with miniscule amounts of canary rockfish.

Limited Entry Trawl Non-Whiting

The GAP reluctantly supports the GMT recommendations for the limited entry non-whiting trawl sector beginning April 1st.

The GAP also recommends a process be developed for opening “cold” spots within the Rockfish Conservation Zones. This process should begin immediately, not with the next specifications process. Additional “hot” spots outside of the Rockfish Conservation Area (RCA) continue to be proposed to assist in reduction of interaction with depleted species. The GAP recommends a process be developed that uses all available data including the survey data to identify areas within the RCA where low interactions with species of concern have occurred. Now that all limited entry trawl vessels are using Vessel Monitoring Systems, this should allow enforcement and monitoring for this type of action and afford the trawl fleet some economic opportunity to make up some of what they have lost in recent years.

Washington Recreational Fishery

The GAP supports the Washington State proposal articulated in Agenda Item E.5.c.

Whiting Fishery

*Bycatch Caps Primary Season*

The GAP supports setting the following bycatch caps in the whiting fishery for 2007 with the intent to revisit the issue on an as needed basis throughout the year.

1. Canary rockfish: 4.7 mt
2. Darkblotch rockfish: 25 mt
3. Widow rockfish: 220 mt

*Whiting Trip Limits for Non-primary Season*

The GAP recommends no change to current trip limits prior to and following the primary whiting season. The GAP was briefed by Brian Culver on the GMT rationale for proposing a reduction in trip limits for this fishery. The GAP finds the rationale currently unjustified and recognizes the following:

- Current levels of participation in this fishery are very low
- This fishery operates outside of the RCA
- This fishery operates with legal bottom trawl gear and thus bycatch rates are known
- This is a target fishery for a direct niche market
- Clarification over how and where this fishery is currently prosecuted would likely end speculation and unjustified fears surrounding the fishery
- Implementation of a trawl IQ program will eliminate these types of management issues

PFMC
03/08/07

# GROUNDFISH ADVISORY SUBPANEL REPORT ON EMERGENCY RULE LIMITING 2007 WHITING VESSEL PARTICIPATION

The Groundfish Advisory Subpanel (GAP) had a thorough discussion of the proposed emergency rule recommended by the Council in September of 2006 and the subsequent denial of the request by the National Marine Fisheries Service. The GAP heard testimony from several stakeholders in the fishery including processors and fishermen for and against action.

The GAP continues to believe that some action should be taken specific to the 2007 whiting fishery to limit new effort from American Fisheries Act (AFA)-vessels without prior history in the whiting fishery. The GAP also firmly believes that the Amendment 15 process should be expedited with clear direction and a timeline for completion in time for the start of the 2008 fishery.

The GAP also continues to believe that the law (American Fisheries Act) clearly directs the Council to protect the whiting fishery from adverse impacts– and that has not changed. Conservation concerns continue to drive our call for immediate action.

## Bycatch limits and preemption

Bycatch limits (caps) are in place to protect the non-whiting groundfish fisheries. If the bycatch caps are exceeded by any sector of the whiting fishery NMFS has the authority to automatically close the directed whiting fishery. The at-sea sectors start May 15, shoreside starts June 15. A race-for-fish could result in exceedence of one or more of the bycatch caps prior to June 15. This would pre-empt the shoreside fishery. While pre-emption is not a conservation concern, the fact that 38 groundfish limited entry vessels would be idled and likely enter other fisheries is a conservation concern. Bycatch management in these fisheries is already very hard and the management system would likely collapse under a rapid influx of vessels.

## Bycatch under a race-for-fish

The bycatch caps were designed based on expectations about how the current whiting fishery operates. Most notably, managers expect whiting fishery sectors to actively avoid and minimize rockfish bycatch to stay within the caps. Under a race-for-fish, the bycatch caps provide no protection to the non-whiting groundfish fisheries. It is likely that a series of disaster tows would occur and result in rockfish bycatch far in excess of the bycatch caps before managers could act to close the fishery. It is conceivable that, in a race-for-fish mode, the whiting fishery could exceed the entire canary rockfish optimum yield (OY) (44 mt) either on its own or in combination with other groundfish fisheries that occurred prior to the whiting fishery.

NMFS research cruises

NMFS has several research surveys scheduled for 2007, including the hake acoustic survey, pre-recruit surveys, and NMFS bottom trawl survey. If the canary rockfish OY is exceeded or near to be exceeded by these research surveys, which all do some trawling to sample fish, directed groundfish fisheries would be jeopardized because research catch of overfished stocks is not exempt from the species OY. If the research cruises are canceled because there isn't rockfish to accommodate them, essential science is lost. This will harm the ability to assess many West Coast groundfish stocks; most importantly, assessing the rebuilding status of overfished rockfish would be impaired.

Salmon bycatch

Currently, the whiting fishery generally does a good job of avoiding and minimizing bycatch of Endangered Species Act (ESA)-listed salmon. With increased participation, a race-for-fish would develop, likely increasing salmon bycatch. This increase will likely occur when the fishery is close to the California/Oregon border (that is, early in the season) increasing the likelihood of encountering ESA-listed salmon.

Conclusions

1. Conservation concerns necessitate action prior to the 2007 fishery.
2. Conservation concerns also become economic concerns when fisheries are pre-empted, severely restricted or closed.
3. The Amendment 15 process must be expedited without delay.
4. The Council should recommend an emergency rule that would prohibit participation in the shorebased, mothership, and catcher/processor sectors of the 2007 Pacific whiting season by AFA-qualified vessels without historic participation in those sectors prior to 2006.

PFMC
03/08/07

**Agenda Item E.6.c**
**Supplemental ODFW Report**
**March 2007**

# OREGON DEPARTMENT OF FISH AND WILDLIFE COMMENTS REGARDING THE NEED FOR A TEMPORARY RULE LIMITING AFA VESSEL PARTICIPATION IN THE WEST COAST WHITING FISHERY

The Oregon Department of Fish and Wildlife (ODFW) asserts that it is necessary and in the public's interest to implement protection from vessels receiving benefits under the American Fisheries Act (AFA) for the Pacific whiting fishery and west coast groundfish fisheries through enactment of Amendment 15 to the Groundfish Fishery Management Plan. ODFW further asserts that it is necessary, urgent, and in the public's interest to implement protection from vessels receiving benefits under the AFA for the Pacific whiting fishery in 2007 and until the Council acts to amend the groundfish FMP to protect west coast fisheries from AFA vessel effort shifts.

The Pacific Fishery Management Council (Council), in September, 2006 expressed its desire to prevent adverse impacts to west coast fisheries from AFA-qualified vessels by requesting that the National Marine Fisheries Service (NMFS) enact an emergency rule – a request which NMFS denied – which would prohibit AFA-qualified vessels from participating in any sector of the Pacific whiting fishery unless they had participated in that sector prior to December 31, 2005. The motion that was made at the September 2006 Council meeting held in Foster City, California by Mr. Curt Melcher, ODFW, and amended by Mr. Dale Meyers, is as follows:

*1) The Council shall continue working expeditiously on Amendment 15. 2) The Council recommends to NMFS that there be an adoption of an emergency rule prior to the 2007 Pacific whiting fishery that would prohibit participation in the shoreside, catcher/processor, and mothership sectors of the Pacific whiting fishery by AFA-qualified vessels that do not have a historic participation record in those sectors prior to 2006.*

The motion stipulated that participation in the shoreside, catcher-processor, or mothership sector by December 31, 2005 was required for participation in the 2007 fishery. There was no provision in that motion for cross-over between sectors. That is, historical participation in the mothership sector would not qualify a vessel to participate in the shoreside sector in 2007.

The state of Oregon and the Council (Agenda Item E.6.a. Attachment 1, March 2007) provided evidence that this situation meets or exceeds the criteria for an emergency rule as specified in 62 CFR 44421, August 21, 1997 as documented in this March 2007 Agenda Item E.6.a, Attachment 5. We would like to reiterate the following points:

*1)* <u>Participation of AFA-qualified vessels results in increased bycatch risk and ecomonic instability</u>: The 2006 shoreside Pacific whiting season demonstrated differentially high risks of bycatch and economic instability from new AFA-qualified vessel entrants as a result of changes in fishery behavior inherent in a derby fishery. This conservation concern is perpetuated by the unique characteristics of AFA-qualified vessels. In 2007, there are several reports of additional participation by AFA-qualified vessels expected in all sectors of the Pacific whiting fishery. This was not factored in to the denial of emergency rule action by NMFS (Agenda Item E.6.a Attachment 2, March 2007). Supporters of the emergency rule point out that this is not an allocation issue, but one of differential impacts on the fishery, which therefore will adversely impact fishery conservation and the economics of this fishery.

*2)* **AFA vessels pose a disproportional threat vs non-AFA vessels to the west coast whiting fishery:** The latent capacity of AFA-qualified vessels has greater potential than the west coast bottom trawl fleet to adversely impact the west coast groundfish fishery due to the unique characteristics of the AFA-qualified fleet. The infrastructure needed to effectively fish in the Pacific whiting fishery is expensive and unattainable for most of the existing bottom trawl fleet vessels. However, the needed infrastructure currently exists for AFA-qualified vessels, as the same equipment is used in the Bering Sea/Aleutian Islands (BSAI) pollock fishery, and the current structure of the BSAI pollock fishery grants AFA-qualified vessels the flexibility needed to participate in west coast groundfish fisheries with little or no added expense. (Detailed in Agenda Item E.6.a. Attachment 5, March 2007) .

*3)* **The Council's schedule for Amendment 15 will not protect the 2007 fishery from impacts**. Due to the risks posed by the addition of new AFA vessels in 2006, the Council has revitalized the effort to develop an amendment to the West Coast Groundfish Fishery Management Plan (Amendment 15) to establish protection from adverse impacts caused by the AFA. There was not sufficient time to complete the amendment process for implementation prior to the 2007 Pacific whiting fishery when first indications of rapid increase in AFA vessel participation surfaced. Protection from the adverse impacts is urgently needed due to new AFA vessel participation in 2006 and information demonstrating interest in additional AFA participation in 2007. Additionally, the AFA-qualified fleet has been notified multiple times that their participation in West Coast groundfish fisheries, and more specifically, the Pacific whiting fishery, would be limited, beginning with the enactment of the AFA by the Congress. Congressional language (AFA/Public Law 105-277 Section 211(c)(3)(B)) mandated the Council act to implement such protections and that absent Council actions, NMFS should be positioned to take action to prevent such effort shifts by AFA vessels: …

> *".If the Pacific Council does not recommend such conservation and management measures by such date [July 1, 2000], or if the* ***Secretary determines that such conservation and management measures recommended by the Pacific Council are not adequate to fulfill the purposes of this paragraph****, the Secretary may by regulation implement adequate measures including, but not limited to, restrictions on vessels which harvest pollock under a fishery cooperative which will prevent such vessels from harvesting Pacific groundfish, and restrictions on the number of processors eligible to process Pacific groundfish."*.

Additionally, it is clear that an emergency rule that may be in effect a maximum of 366 days (as allowed in the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act) would not afford the Pacific whiting fishery protection from adverse impacts generated by AFA-qualified vessels until such time that permanent protection can be implemented through limited access privilege programs, individual fishing quota programs, or the FMP Amendment 15.

Therefore, due to the delay in protective action, ODFW recommends the Council adopt an expedited rule to be implemented on a temporary basis (with a two year time limit), based on AFA protections mandated, and mirroring the provisions in the motion for an emergency rule adopted by the Council in September 2006. It is recommended that such a rule be effective through December 31, 2008, or such time as permanent protections through an FMP amendment or other Council actions resulting in a similar protection from AFA vessel effort shifts are in place.

There is a great urgency to putting these expedited protections in place, as the primary Pacific whiting fishery will commence on April 1, 2007, with the start of the California early season shoreside fishery. The off-shore fishery (mothership and catcher/processor sectors) opens on May 15, 2007, with 9 motherships and 9 catcher/processor vessels that are prepared to start fishing when this fishery opens. These vessels are reported to be committed to continuously fishing until the Pacific whiting allocation for those sectors is attained. One of the proposed catcher/processors is an AFA-qualified vessel that is new to the fishery, and is not a member of the Pacific Whiting Conservation Co-operative (PWCC). The PWCC is a private business arrangement with approval from the Department of Justice, comprised of four companies, which own all of the catcher/processor vessels that have fished in this sector prior to 2007. These companies divide between themselves the Pacific whiting allocation received by this sector (34% of the allowed non-tribal Pacific whiting harvest). The entry of the above mentioned AFA-qualified vessel effectively voids the PWCC, creating a "race for fish" in the catcher/processor sector of the Pacific whiting fishery. **The additional AFA-qualified vessels that fished in the 2006 shoreside whiting fisheries and these new AFA-qualified vessels in the 2007 fishery pose a specific threat to the conservation and value of this fishery that did not exist prior to 2006**.

**The 2006 Shoreside Pacific Whiting Fishery:**

In 2006, there were four vessels without AFA benefits that entered the Pacific whiting shoreside fishery for the first time. Those four vessels landed a total of 2,578 mt of whiting or 3% of the coastwide shoreside landings. The remaining 30 vessels have prior participation in the Pacific whiting shoreside fishery, most participating continuously since the inception of the EFP fishery in 1992

Finalized catch data show a total of 97,296 metric tons (mt) of Pacific whiting harvested in the primary shoreside season in 2006. There were 37 total vessels that landed Pacific whiting in the 2006 shoreside fishery; two of those vessels elected to sort-at-sea and not participate in the exempted fishing permit fishery (EFP). The proposed temporary rule would exclude three AFA qualified vessels that fished in the shoreside fishery for the first time in 2006. Those three vessels landed a total of 11,166 mt of Pacific whiting, or 11% of the coastwide landings. Two of the three vessels had bycatch rates (excluding salmon and Pacific halibut) that were higher than the overall bycatch rate of 0.0036 mt of bycatch per mt of Pacific whiting landed. Those three vessels would be allowed to continue operating in the mothership sector, where they fished previously, and their AFA privileges in Alaska would not be affected by the proposed rule. Allowing these three vessels into the shoreside fishery through Council action now, would argue that the additional AFA vessels without prior participation in the whiting fishery prior to December 31, 2005 that anticipate entering the fishery in 2007 have some differential impact on the fishery. There is no difference between the newly participating 2006 AFA vessels and the newly participating 2007 AFA vessels. The point at which the Council expressed concern about negative AFA impacts was in 2006 due to the three additional new AFA vessels which were added in 2006. The concern is exacerbated by the additional potential for more vessels in 2007, but it is the same concern and **to allow those three new 2006 AFA vessels into the shoreside fishery under a rule intended to protect the shoreside fishery from detrimental effects of the AFA would be inconsistent and contradictory to the intent of the protections described in the AFA law.**

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As stated above, there are reports of increased participation in all sectors of the 2007 Pacific whiting fishery, including the previously mentioned 9 motherships and 9 catcher/processor vessels that are prepared to start fishing on May 15, 2007, when the off-shore Pacific whiting fishery opens. There are also reports of several AFA-qualified vessels securing processor contracts to deliver Pacific whiting shoreside. This increased participation of large capacity vessels contributes substantively to reduced season duration, and thus promotes the “race for fish”. As this fishery changes rapidly into a derby style fishery, any incentive to maintain low bycatch levels is at risk. Additionally, coastal communities and local economies dependent on this fishery will suffer, as the employment duration of plant personnel hired specifically for this fishery will decrease. The quality of the product and conduct of this fishery are reflected negatively in per-vessel ex-vessel revenues and community economic impacts. It is impractical for the Council and NMFS to delay action further due to the threats to both the fishery and the economies that are dependant on the Pacific whiting shoreside fishery from this increased effort by AFA-qualified vessels.

**Latent Capacity:**

As detailed in Agenda Item E.6.a, Attachment 5, March 2006, AFA-qualified vessels possess the infrastructure needed to effectively participate in the shoreside whiting fishery, including vessel size and horsepower, appropriate electronics and fishing gear, and refrigeration and tanking capabilities, as it is exactly the same equipment that is used in the BSAI pollock fishery. For those vessels that lack the equipment and specifications needed, the cost of outfitting a vessel outweighs the potential profit and is prohibitively expensive ($195,000-$800,000) and unattainable for most of the existing bottom trawl fleet. The existing whiting fleet has been relatively stable since the inception of the EFP fishery in 1992, primarily due to the prohibitive cost of re-fitting the vessel.

The threat of latent AFA-qualified vessel participation is large. A total of 15 AFA-qualified vessels participated in the 2006 shoreside whiting fishery (12 of those vessels fished prior to 2006 and thus traditional participants in the shoreside Pacific whiting fishery). In addition, NMFS issued another 96 Catcher Vessel Permits to AFA-qualified vessels fishing in the BSAI pollock fishery. Twelve of the 96 vessels have existing west coast groundfish limited entry trawl permits, and the infrastructure and flexibility to effectively participate in the Pacific whiting fishery.

The latent capacity within the current west coast groundfish limited entry trawl fishery pales in comparison to that of the AFA-qualified vessels. As imparted in Agenda Item E.6.a, Attachment 5, Brad Pettinger, Executive Director of the Oregon Trawl Commission, reviewed the non-AFA-qualified vessels that currently hold a West Coast groundfish limited entry trawl permit (142 catcher vessels). He concluded that approximately 21 vessels could potentially fish for whiting in the future, with hold capacities ranging from 80,000 – 120,000 lbs. Only five of those vessels are currently tanked, and not one of the 21 trawl vessels is currently configured to fish for whiting without additional equipment and alteration of their current business plans.

**Justification for waiver of public notice and comment periods:**

The Administrative Procedures Act (APA) defines the guidelines under which expedited rulemaking can occur. Section 553(a)(3)(B) of the APA specifies that *"Except when notice or hearing is required by statute, this subsection does not apply... (B) When the agency for good cause finds (and incorporates the finding and a brief statement of reasons therefore in the rules issued) that notice and public procedure thereon are impracticable, unnecessary, or contrary to the public interest."* (5 USC 553). This situation is one in which not forgoing the public notice and comment period is impracticable, unnecessary, and contrary to the public interest due not only to the conservation and biological concerns detailed in Agenda Item E.6.a, Attachment 5, but also for economic concerns.

**To date, there has already been significant public notice and comment/involvement in this issue**: This recommendation for timely rulemaking that waives public notice and comment is justified by the urgency to protect against an AFA vessel effort shift noted above. In addition, the processing and vessel participants in this fishery, the public, and state agencies managing this fishery have been fully engaged in a public discussion of the Amendment 15/ AFA vessel effort shift and the need for regulatory protections in the public setting of the Council since September of 2006. The Council has noticed this meeting and the past meetings in 2006 with agenda items on this topic and the clear intent by the motion of the Council in September of 2006 was to provide public notice of the need for such protections by the Secretary. Industry participants and regulators testified at these PFMC meetings and provided significant written comment prior to this Council meeting (Agenda Item E.6. March 2006). Extensive public comment and notice has been provided and no further action is necessary. The Pacific Council's mandate, specified within AFA in October 1998, to prevent spillover was clear. The Council should act to protect west coast groundfish fisheries from effort shift by AFA qualified vessels.

Furthermore, AFA-qualified vessels have been given ample notice of potential restrictions in west coast groundfish fisheries. Notice was first given to AFA-qualified vessels when the AFA was signed into federal law in October 1998. Section 211(c)(3)(A) of the AFA states "*By not later than July 1, 2000, the Pacific Fishery Management Council established under section 302(a)(1)(F) of the Magnuson-Stevens Act (16 U.S.C. 1852 (a)(1)(F)) shall recommended for approval by the Secretary conservation and management measures to protect fisheries under its* *jurisdiction and the participants in those fisheries from adverse impacts caused by this Act or by any fishery cooperatives in the directed pollock fishery*."

The Council subsequently adopted control dates on two separate occasions in response to the directive clearly stated in the AFA. On November 24, 1999, NMFS published an advance notice of proposed rulemaking in Vol. 64, No. 226 of the Federal Register. The summary of the action was as follows: "*This document announces a control date of September 16, 1999, after which vessels eligible for benefits under the American Fisheries Act (AFA) may be subject to restrictions on participation in the Pacific coast groundfish fisheries. The intended effect of announcing this control date is to discourage speculative entry into the Pacific coast groundfish fisheries by AFA-qualified vessels while the Pacific Fishery Management Council (Council) develops recommendations to protect the Pacific Coast groundfish fisheries from adverse impacts caused by the AFA*." The document further cautions AFA-qualified vessels: "*The control date provides notice to AFA-qualified vessels that might seek to participate in the Pacific Coast groundfish fisheries that current requirements for accessing these fisheries may change. Vessels entering the fisheries after the control date may be subject to new restrictions that do not currently exist, and they may not receive credit for fishing after the control date… If catch history is used as a basis for participation, it is likely that AFA-qualified vessel participation in the fishery after the control date will receive little or no credit. Fishers are not guaranteed future participation in the groundfish fishery, regardless of their date of entry or level of participation in the fishery*."

Again, on September 13, 2000, NMFS published another advance notice of proposed rulemaking in Vol. 65, No. 178 of the Federal Register, notifying fishery participants of the adoption of a second control date, with the same stated intentions and cautions as those published for public comment previously. This item has remained a potential agenda item in the planning of the Council workload ever since, signifying the Council's intent to complete the amendment should the urgency of the problem of an AFA effort shift be presented.

In 2006, the potential harm to west coast groundfish fisheries, specifically to the shoreside whiting fishery, from entry by three new AFA vessels was realized. At the June 2006 meeting, the Council voted to re-initiate discussion on implementing sideboards protecting the west coast groundfish fishery from adverse impacts caused by AFA vessels. At the September 2006 meeting, the Council voted to prohibit participation of AFA-qualified vessels in the shoreside, catcher/processor, or mothership whiting fisheries, without participation in those fisheries prior to 2006 by emergency rule. This action further conveyed the Council's desire to protect the west coast groundfish fisheries from adverse impacts caused by AFA-qualified vessels, and notified those vessels that potential restrictions were being considered. There has been significant public participation and testimony resulting from these Council agenda items.

However, no such notice has been given to the traditional west coast groundfish trawl fleet. To restrict participation of traditional bottom trawl vessels, as is suggested in the letter to the Council dated February 13, 2007 from Mr. Bob Lohn, NMFS (Agenda Item E.6.a, Attachment 3), without similar notice as that received by AFA-qualified vessels would be an injustice. As demonstrated in Agenda Item E.6.a, Attachment 5, the latent capacity and threat of adverse impacts from the traditional trawl fleet is substantially less than from AFA-qualified vessels.

In conclusion, with the justification above, the following points argue for expedited rulemaking:

1. AFA vessels pose a unique threat to west coast groundfish/whiting fisheries.

2. The additional AFA vessels in the 2006 shoreside whiting fisheries and additional AFA vessels in the 2007 fishery pose a specific threat to the conservation and value of this fishery that did not exist prior to 2006.

3. To allow the three new AFA vessels into the shoreside fishery in 2006, while prohibiting other AFA vessels entering after 2006 under a rule intended to protect the shoreside fishery from detrimental effects of the AFA would be inconsistent and contradictory to the intent of the desired protections.

4. There has been significant public notice and comment on this concern through past Council actions and the recent Council process.

5. There is an urgency to address the problem that was identified in 2006 prior to exacerbating the problem of new AFA vessel entrants throughout the whiting fishery sectors in the 2007 season and in future years pending Council/NMFS action to establish protections as directed by the original AFA legislation.

The Pacific whiting fishery, especially the shoreside component makes significant contributions to the economic resources of coastal communities. Shoreside vessels made landings in 6 coastal ports (Westport, Ilwaco, Astoria, Newport, Charleston, and Eureka).

It is documented in the *Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2007-2008 Pacific Coast Groundfish Fishery Final Environmental Impact Statement* (Table 7-50) that the whiting fishery (all sectors combined) generated $29,562,000 in ex-vessel revenue in 2005, which was 43% of the total for all commercial groundfish fisheries. Due to higher price per pound paid for whiting in 2006, the ex-vessel revenue generated increased to $42,934,281. The shoreside sector of the fishery generated $13,727,881 in ex-vessel revenue, or 32% of the 2006 non Tribal Pacific whiting fishery total.

Many processing plants specialize in the processing of Pacific whiting, converting to equipment and personnel specific to the process. The Pacific whiting shoreside fishery employs not only the plant personnel needed to process the catch, convert to value-added surimi, but also additional personnel required to observe off-loading, sort bycatch, and collect biological data. As with all industries, there is significant economic compounding value which supports all aspects of the communities that depend on this fishery such as restaurants, and marine supply/repair businesses. As the fishery duration is shortened, the employment duration of the staff hired specifically to fulfill the unique needs of this fishery is also shortened, causing undue hardship to those individuals, and the communities in which they reside.

**Amendment 15**

In addition to the justification for immediate action contained in Agenda Item E.6.a, Attachment 5 and this report, it is clear that the normal regulatory and amendment process may not be completed before the adverse impacts to the Pacific whiting fishery and the economies dependent upon it is realized in 2007 and possibly in 2008, furthering the need for protections to be put in place now.

**ODFW Recommendations:**

1. **National Marine Fisheries Service enact an expedited rule to be in place until December 31, 2008 or such time as permanent provisions are afforded, prohibiting participation in any sector of the Pacific whiting fishery by AFA-qualified vessels that did not participate in that sector prior to December 31, 2005.**
2. **Direct the Pacific Fishery Management Council to provide staff resources to lead continuing work on Amendment 15, permanently protecting West Coast groundfish fisheries from potential or realized adverse impacts from AFA-qualified vessels no later than 2008.**

YOUNG deNORMANDIE
*Counsel beyond the obvious.*



**MARK SCHEER**
mscheer@ydnlaw.com

February 27, 2007

**VIA EMAIL AND FIRST CLASS MAIL**

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, OR 97220

Re: *Opposition to Implementation of Emergency Rule*

Dear Mr. Hansen:

Young deNormandie, P.C. represents Starbound, LLC, the owner of the catcher/processor STARBOUND, and West Coast Fishery Investments, LLC[1], and presents the following on their behalf.

A motion to recommend that NOAA/NMFS adopt and implement an emergency rule prohibiting the participation of vessels without harvesting history prior to December 31, 2006 in the shoreside, mothership and catcher processor sectors of the Pacific whiting fishery off of the coast of Washington and Oregon ("ER") will be brought before the Pacific Fishery Management Council ("Council") for consideration on March 9, 2007. The purpose of this letter is to voice Starbound's opposition to the implementation of the emergency rule for the reasons identified herein and, secondly, to identify some, but certainly not all, of the legal and factual issues precluding the implementation of an emergency rule in the Catcher/Processor sector of the Pacific whiting fishery.

## I. WHO IS STARBOUND?

Aleutian Spray Fisheries, Inc. -- the manager and majority member of Starbound -- is and has been a long term participant in the North Pacific and Pacific fisheries. The company was founded by Henry Swasand nearly forty years ago. It is now operated by his son and daughter, Cary Swasand and Svanee Swasand and the third generation of the Swasand family. The newest members have taken on management positions only after years of running boats and working in

[1] Starbound, LLC is the sole member and the manager of West Coast Fishery Investments, LLC, the owner of the permit(s) discussed below.

the family business. Over the years, the Swasand family partnered up with other fishing families so that it might remain a viable force in the fishing community and compete with the larger corporate competitors. Starbound, LLC is one such example. It is notable to recognize that the primary competitors and those who are working most vigorously to prevent the STARBOUND from participating in the Whiting Fishery have been and continue to be the same entities who own the vessels that comprise the catcher/processor sector of the Pacific whiting fishery.

Aleutian Spray and its partner families are supporters and active participants in the fishing community, charities, Coast Guard Foundations, and innovative leaders in identifying and solving safety issues. The company and its affiliates have scores of long-term employees and have long believed in using American shipyards and local vendors even when others in the industry were saving money by going to Europe or other places. In 1989 the Swasand family and their partners took a tremendous risk and invested the majority of their capital into building the STARBOUND. Consistent with its dedication to promoting local businesses, the construction took place at Dakota Creek in Anacortes Washington. This vessel entered and continues to be active in the Alaska Pollock fishery as a member of the Pollock Conservation Coop.

Beginning as early as 2002, Starbound determined that the Pacific whiting fishery was the only fishery outside of Pollock in which the STARBOUND was expressly allowed to participate. Indeed, it was informally encouraged to participate by certain principals of members of the Pacific Whiting Conservation Cooperative. Accordingly and in reliance on the regulations that have been and continue to regulate the fishery – Starbound has since invested millions of dollars and many man-hours in the acquisition of a number of West Coast Groundfish Limited Entry Permits necessary to enter the Pacific whiting fishery as a Catcher/Processor.

## II. DISCUSSION

It is within the context of these facts that Starbound objects to the passage and implementation of an ER which precludes it from participating in the Catcher/Processor sector of the whiting fishery during the 2007 season. Furthermore, it is difficult to contemplate any scenario in which the implementation of an emergency rule which includes the Catcher/Processor Sector will meet the elevated requirements under § 305(c) and 50 C.F.R. Chapter VI and each National Standard.[2]

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[2] 50 C.F.R. Chapter VI, Policy Guidelines for the Use of Emergency Rules, a copy of which is attached as Exhibit A hereto. This is a copy of the handout provided by NOAA General Counsel at the September Pacific Fisheries Management Council meetings. It is referred to herein as the "Guidelines". According to the Guidelines, in order to approve an emergency rule, the Secretary must have an administrative record justifying emergency regulatory action and demonstrating its compliance with the national standards.

Section 305(c) of the MSA and 50 C.F.R. Chapter VI[3] provide the parameters for an emergency action. In Section 305(c)(3) of the MSA which states that "[t]he Secretary **may** promulgate emergency regulations to address the emergency if the Council, by less than a unanimous vote of its voting members, requests the Secretary to take such action." (emphasis added). The term "may" is discretionary and, without a unanimous vote, is not a mandate to act on the recommendation. Pursuant to the Guidelines, an "emergency action should not be a routine event . . . should be limited to extremely urgent, special circumstances . . . [and] . . . may not be based on administrative inaction to solve a long recognized problem.[4]

Each of the emergency criteria must be satisfied to warrant the imposition of an emergency rule. For the purposes of section 305(c), an emergency is defined in the Guidelines as one which "(1) Results from recent, unforeseen events or recently discovered circumstances, and (2) Presents serious conservation or management problems in the fishery; and (3) Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment, and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process." As each are modified by the inclusion of "and" the failure to satisfy any one criterium renders the emergency action illegal.

There is simply no emergency which would support or give rise to an emergency rule under the relevant standard. The regulations allow the STARBOUND to participate in the fishery. The inclusion of the Starbound does not reflect an increase in actual harvesting capacity in the Pacific whiting fishery – to the contrary, it reflects an actual benefit to the other catcher vessels in the Mothership and Shoreside sectors. Any proposed emergency rule precluding the Starbound from deploying in the Catcher/Processor sector of the whiting fishery must be refused.

A. *NOAA already rejected the emergency rule process to address the same issues likely to be raised in the anticipated proposal*.

NOAA previously rejected the Emergency Rule process to address the same concerns that are likely to be voiced in support of a new emergency rule.[5] Market conditions, not some perceived increase in harvesting capacity (and not, as discussed below, a transfer of capacity from the mothership sector or the transfer of a historically active permit from one vessel to another) created the impetus to for perceived change in the makeup of the fishery.

NOAA concluded that competition and market were the driving forces behind any perceived or alleged increase in harvesting capacity in the fishery and that the number of vessels participating in the shoreside fishery "will depend largely on whiting availability and price per

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[3] *Id.*

[4] *Id.*.

[5] See letter dated January 11, 2007 from NOAA Regional Administrator D. Robert Lohn to Donald Hansen, Chair, Pacific Fishery Management Council and attached hereto as Exhibit B.

pound."[6] NOAA also concluded that "[h]igher whiting prices and new market for whiting filets attracted new interest from shoreside fish processors that had not previously participated in the primary shoreside season. . . Higher whiting prices also affected the mothership sector which, for the first time in several years, took its complete allocation before the end of the calendar year."[7]

Additionally, in the context of a much smaller group of impacted vessels – specifically, vessels authorized to harvest pollock under the American Fisheries Act – NOAA concluded that a Council request for an emergency rule "may be considered a controversial action with serious economic effect for those vessels that would be excluded from the fishery."[8] NOAA cited the requirement in the Guidelines, "which state, in part, that 'Controversial actions with serious economic effects, except under extraordinary circumstances, should be done through normal notice-and-comment rulemaking.'" Now, it is our understanding that the proposed rule will be expanded to include all vessels, not only the AFA vessels, significantly broadening the scope of potentially impacted vessels. In such a case, the economic effect and the potential for controversy would only increase, making it even more compelling that the matter be pursued through the "normal notice-and-comment rulemaking" process and not the emergency rule provisions under 305(c) of the MSA and 50 C.F.R. Chapter VI. Starbound respectfully requests that this Council, like NOAA did with respect to the previous version of the ER, should reject any emergency rule which restricts access to the Catcher/Processor sector.

B. *No emergency exists warranting the implementation of an emergency rule and current regulations allow Starbound to participate in the fishery.*

The regulations relating to the purchase, acquisition and combining permits have remained virtually unchanged for many years. [9] Indeed, in reliance of these regulations, parties such as Starbound, have regularly invested in permits, combined permits, lease and placed permits on various vessels. Throughout this time, nothing has prevented the Council from utilizing the normal rule making process to modify or change these rules. Given that "[t]he Secretary cannot implement an emergency regulation to solve a long-recognized but ignored problem. Rather, the genesis of the emergency regulation must involve 'recent, unforeseen events or recently discovered circumstances . . . ."[10] To now contend that a recent and unforeseen circumstance exists and warrants an emergency action is unfounded, rendering the use of the emergency rule provisions of 305(c) of the MSA and 50 C.F.R. Chapter VI inapplicable and illegal.

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[6] *Id.*

[7] *Id.*

[8] *Id.*

[9] See 50 C.F.R. § 660, *et seq.*

[10] *Trawler Diane Marie, Inc. v. Brown*, 918 F. Supp. 921, 926 (D.N.C. 1995).

Although it may conceptually be possible, it is exceedingly unlikely that another party that is not already licensed and participating in the fishery will have a suitable vessel, the means and the opportunity to acquire sufficient Vessel Capacity Points such that it could deploy for the catcher/processor sector of the whiting fishery – assuming any permits were even available for purchase at a reasonable price. For example, it took Starbound over three years and several million dollars to become eligible to participate in the Catcher/Processor sector of the fishery.

Certainly the likelihood of these events occurring prior and another vessel deploying in the Catcher/Processor sector for the 2007 season is immeasurably small and far below the showing required for protection by emergency rule. Even if another such acquisition was possible, the record would have to reflect an analysis and conclusion identifying the likelihood of another deployment during 2007 and detail whether there actual and significant potential harm to the fishery (not the individual participants) should the Starbound be allowed to participate as a member of the cooperative. Failing such a showing, the emergency rule must be rejected.

Finally, a limited entry program currently exists in the groundfish fishery. There is no basis to create a new program by emergency rule, obviating the normal rule-making process and due process. There are no restrictions in the regulations regarding additional motherships participating in the fishery, indeed, there are no federal regulations. In contrast, there are licensing requirements to harvest fish, such as Catcher/Processors and catcher vessels. Starbound expended substantial time and considerable expense to acquire active whiting harvesting permits so that it would qualify under the laws and regulations currently in place and enter the whiting fishery. For the council to now effectively nullify existing regulations without the utilizing the normal rule-making process would be an inexcusable violation of due process and result in substantial economic losses to Starbound.

C. *The deployment of the F/V STARBOUND is expected to benefit to the other sectors and catcher vessels.*

Presumably, the STARBOUND will be allowed to participate as a member of the Pacific Whiting Conservation Cooperative.[11] As with all members of the Pacific Whiting Conservation Cooperative, the STARBOUND would likely be allocated an agreed and set percentage of the Catcher/Processor Sector allocation, capping its total production. It will not be competing in an "Olympic Style" fishery – nor will it be competing with the shoreside or mothership harvesting vessels for the by-catch or whiting allocated to that sector.

It is Starbound's intention to seamlessly and responsibly enter the fishery. Starbound, LLC and the personnel aboard the STARBOUND are highly professional fishermen with a long and illustrious record of being responsible and conscientious stewards of the fishery. Indeed, to insure such a transition, the STARBOUND will be staffed with officers and mates possessing extensive experience in the Pacific whiting fishery. That experience, coupled with a set amount

[11] Starbound recognizes that its participation in the Cooperative is not a Council issue, rather, it is dictated by the by-laws of the cooperative and other Federal and State laws.

of available harvest, allows the STARBOUND to minimize its by-catch and immediately operate in concert with the other Catcher/Processor operations in the cooperative to collectively prosecute the fishery in the most responsible manner possible. Moreover, the catcher/processor sector is a 100% observed sector. By closely monitoring catch and actual by-catch, conservation efforts are enhanced and by-catch is minimized.

Additionally, Starbound and the other members of the Pacific Whiting Conservation Cooperative, such as Trident and American Seafoods, have worked together for years as part of the same cooperatives in Alaska. They are very familiar with the operation and management of fisheries prosecuted in the context of a cooperative and the principals of each cooperative member. Indeed, Starbound and Aleutian Spray Fisheries, Inc. regularly engage in business transactions with several of the current members of the Cooperative.

Based on earlier testimony and the record provided in support of the ER rejected by NOAA, the primary issue is the perceived increase in harvesting capacity and the potential for excessive by-catch in the shoreside fishery – indeed, the inclusion of the offshore sectors were a last minute amendment, without any supporting analysis or evidence of an increase in harvesting capacity or substantial harm. The facts have not changed between the end of last season and the current Council meeting. Indeed, it is expected that the deployment of the STARBOUND will the shoreside catcher vessels.

The primary permits targeted and acquired by Starbound have significant and recent history in the Pacific whiting fishery. The permits do not constitute new effort or new capacity in the whiting fishery. Specifically, Starbound's acquisition takes existing Pacific whiting fishery harvesting capacity[12] from the mothership and/or shoreside sector and transfers that capacity to the catcher/processor sector. At worst, the licensing and deployment of the STARBOUND is expected to effectively result in a zero net sum with respect to the total Vessel Capacity Rating points historically deployed in the Pacific whiting fishery.

However, given that the separate permits collectively and historically harvested as much as 10,000 metric tons per year of whiting, and an agreed allocation as a member of the Pacific Whiting Conservation Cooperative will likely be significantly less, the effect of the deployment of the STARBOUND in the fishery will constitute a net <u>reduction</u> in actual harvest by the permits combined and licensing the STARBOUND. Simply put, by removing the permits and reducing their total actual harvest, the other historical participants in the shoreside and mothership sectors will be provided the opportunity to harvest additional whiting.

Assuming limiting the harvesting capacity and associated by-catch in shoreside fishery is the primary goal of any proposed emergency rule, the inclusion of the STARBOUND will provide a net benefit to the other whiting fishery participants. Furthermore, there is no evidence that there will be an increase in by-catch resulting from the STARBOUND's participation. The

[12]As determined by the total Vessel Capacity Rating points (50 C.F.R. § 660, *et seq.*) deployed in the Pacific whiting fishery.

benefit derived from such an action cannot provide a rational and defensible basis for the implementation of an emergency rule.

D. *The STARBOUND's participation in the fishery will benefit Washington.*

The STARBOUND is a family owned business, is a Washington business and is operated and managed by long-time Washington fishing families. Its participation will provide a real economic and social benefit to the State of Washington – all the while reducing the amount of competition for the shoreside and mothership catcher vessels. As stated in the Washington Department of Fish and Game's letter to Robert Lohn, Washington only has two processors that participate in the shoreside fishery.[13] Between 2005 and 2006, the total amount of non-tribal whiting delivered into Washington declined by 3%. Not only will the crews and production personnel from Washington benefit from the additional revenue generated, the inclusion of the STARBOUND will assist in the recovery of some of the recent decline in the economic benefits from the whiting fishery.

E. *The Starbound provides the most efficient, effective and highest value use of the resource.*

There is little dispute that at-sea harvesting produces the highest quality and value products and is arguably the most efficient and effective use of the resource. The STARBOUND uses some of the most advanced equipment available for holding and processing seafood. It has the capacity to fillet whiting and produce *surimi* from otherwise discarded components of the fish. The STARBOUND's participation will result in higher recoveries, produce higher value product forms, such as fillets and deliver fresher, better quality fish products to the marketplace, resulting in an elevated value from the resource. In conjunction with the benefits provided to Washington, the reduction in harvesting capacity and by-catch in the mothership and shoreside sectors, there are substantial and demonstrative benefits to the STARBOUND's participating in the fishery.

F. *The record must reflect an actual analysis and adherence to each of the National Standards.*

It is unequivocally established that the "National Standards are to be adhered to even when the Secretary takes emergency action."[14] National Standard Two requires that the "conservation and management measures be based upon the best scientific information available."[15] The evidence in the record must clearly support the action[16] and conclusory

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[13] See letter dated September 29, 2006 from Jeff P. Koenings, Ph.D., Director of the Washington Department of Fish and Wildlife to Robert Loan, Regional Administrator, NOAA – Fisheries, a copy of which is attached hereto as Exhibit C.

[14] *Ibid.* at 928.

[15] 16 U.S.C. § 1851(a)(2).

statements regarding the consideration of scientific data are not sufficient.[17] In particular, the agency must examine the relevant data and articulate a satisfactory explanation for its action including a "rational connection between the facts found and the choice made" and "explain its result."[18] There must be a record indicating adherence to all of the National Standards. That record must specifically support the inclusion of the Catcher/Processor sector in any proposed emergency rule restricting access to the fishery.

To meet the requirements under National Standard Two, the record must include, *inter alia,* specific analyses as to whether: (1) the market conditions which NOAA concluded gave rise to the perceived increase in harvesting capacity will continue; (2) there is an actual increase in the potential for by-catch; (3) there is an identifiable basis for determining that AFA or vessels new to the fishery will have higher by-catch rates; (4) there will be any actual and significant <u>new</u> harvesting capacity deployed in the whiting fishery, rather than simply a redistribution of existing historical capacity or permits actively and historically involved in the whiting fishery which have been designated to vessels which have not previously been deployed in the fishery; (5) better fishing techniques or strategies from existing harvesting capacity resulted in higher catch rates per unit effort; (6) the fishing during 2006 was simply better, with more fish available, resulting in an increased catch per unit effort; and (7) the degree of which any of the above components individually or in combination resulted in a situation which would warrant an emergency action. The information necessary is available to fisheries managers.

It is Starbound's contention that if the Council conducted the required analyses utilizing the "best scientific information available," it should conclude that any emergency rule would violate the National Standards, including National Standard Number Two. As a corollary, if the Council fails to conduct the appropriate analysis, any emergency rule promulgated on such a record would constitute an illegal agency action.

## III. <u>CONCLUSION</u>

As discussed above, any assertions positing that the deployment of the STARBOUND will result in irreprerable damage to the Pacific Whiting fishery ignores almost forty years of the Swasand family history indicating otherwise. To be perfectly clear, it is not and has not been Starbound's intention to be a disruptive and irresponsible participant in the Pacific whiting fishery; rather it has always intended to be a voluntary and participatory member of the Pacific Whiting Conservation Cooperative, to uphold the highest standards of efficiency, be a leader in harvesting and processing technology and, most importantly, to be a responsible and conscientious steward of the fishery by constantly striving to minimize by-catch, support

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[16] *Hadaja, Inc. v. Evans*, at 354 (D.R.I. 2003).

[17] *Ibid.* at 354.

[18] *Ibid* at 351 (citing *Motor Vehicle Mfrs. Ass'n, Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 103 S. Ct. 2856, 77 L. Ed. 2d 443 (1983) (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168, 83 S. Ct. 239, 245-246, 9 L. Ed. 2d 207 (1962)).

research and efforts for sustainability in the fishery. Indeed, as discussed above, there are many identifiable benefits to inclusion of the STARBOUND in the whiting fishery.

Moreover, the facts simply do not support the implementation of an emergency rule resulting in the creation of limited access program without the normal council review and public comment process. Any emergency rule promulgated or recommended under these facts will likely be determined to be ". . . (1) arbitrary and capricious or an abuse of discretion; (2) unconstitutional; (3) in excess of statutory jurisdiction; or (4) was promulgated without observance of procedure required by law."[19] Therefore, Starbound respectfully requests that the Council reject any proposed Emergency Rule which has the effect of prohibiting the STARBOUND from deploying as a Catcher/Processor for the 2007 harvesting season.

Please also be advised that, in the event that the emergency rule is implemented which includes the Catcher/Processor sector, it will be unsupportable under the law and my client will be forced to continue its opposition using all available means, including judicial review.[20]

Thank you for your consideration of the foregoing and should you have any additional questions, comments or would like additional information, please feel free to contact me or Craig Cross.

Sincerely,

YOUNG deNORMANDIE, P.C.

Mark Scheer

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[19] *Trawler Diane Marie, Inc. v. Brown*, 918 F. Supp. 921, 925 (D.N.C. 1995) (citations omitted).

[20] The MSA incorporates the APA standard of review and an emergency action may be invalidated by the Court. *Trawler Diane Marie, Inc. v. Brown*, 918 F. Supp. 921, 925 (D.N.C. 1995) (citations omitted).

# EXHIBIT A

Guidelines

THEFT RATES OF MODEL YEAR 1995 PASSENGER MOTOR VEHICLES STOLEN IN CALENDAR YEAR 1995—Continued

| | Manufacturer | Make/model (line) | Thefts 1995 | Production (mfgr's) 1995 | 1995 (per 1,000 vehicles produced) theft rate |
|---|---|---|---|---|---|
| 205 | ROLLS-ROYCE | SIL SPIRIT/SPUR/MULS | 0 | 132 | 0.0000 |
| 206 | ROLLS-ROYCE | TURBO R | 0 | 19 | 0.0000 |
| 207 | VOLKSWAGEN | EUROVAN | 0 | 1,814 | 0.0000 |
| 208 | VOLVO | LIMOUSINE | 0 | 6 | 0.0000 |

Issued on: August 18, 1997.

**L. Robert Shelton,**

*Associate Administrator for Safety Performance Standards.*

[FR Doc. 97–22263 Filed 8–20–97; 8:45 am]

BILLING CODE 4910–59–P

## DEPARTMENT OF COMMERCE

## National Oceanic and Atmospheric Administration

## 50 CFR Chapter VI

**[Docket No. 970728184–7184–01; I.D. 060997C]**

## Policy Guidelines for the Use of Emergency Rules

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Policy guidelines for the use of emergency rules.

**SUMMARY:** NMFS is issuing revised guidelines for the Regional Fishery Management Councils (Councils) in determining whether the use of an emergency rule is justified under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The guidelines were also developed to provide the NMFS Regional Administrators guidance in the development and approval of regulations to address events or problems that require immediate action. These revisions make the guidelines consistent with the requirements of section 305(c) of the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act.

**DATES:** Effective August 21, 1997.

**FOR FURTHER INFORMATION CONTACT:** Paula N. Evans, NMFS, 301/713–2341.

**SUPPLEMENTARY INFORMATION:**

### Background

On February 5, 1992, NMFS issued policy guidelines for the use of emergency rules that were published in the **Federal Register** on January 6, 1992 (57 FR 375). These guidelines were consistent with the requirements of section 305(c) of the Magnuson Fishery Conservation and Management Act. On October 11, 1996, President Clinton signed into law the Sustainable Fisheries Act (Public Law 104–297), which made numerous amendments to the Magnuson-Stevens Act. The amendments significantly changed the process under which fishery management plans (FMPs), FMP amendments, and most regulations are reviewed and implemented. Because of these changes, NMFS is revising the policy guidelines for the preparation and approval of emergency regulations. Another change to section 305(c), concerning interim measures to reduce overfishing, will be addressed in revisions to the national standards guidelines.

### Rationale for Emergency Action

Section 305(c) of the Magnuson-Stevens Act provides for taking emergency action with regard to any fishery, but does not define the circumstances that would justify such emergency action. Section 305(c) provides that:

1. The Secretary of Commerce (Secretary) may promulgate emergency regulations to address an emergency if the Secretary finds that an emergency exists, without regard to whether a fishery management plan exists for that fishery;

2. The Secretary shall promulgate emergency regulations to address the emergency if the Council, by a unanimous vote of the voting members, requests the Secretary to take such action;

3. The Secretary may promulgate emergency regulations to address the emergency if the Council, by less than a unanimous vote of its voting members, requests the Secretary to take such action; and

4. The Secretary may promulgate emergency regulations that respond to a public health emergency or an oil spill. Such emergency regulations may remain in effect until the circumstances that created the emergency no longer exist, provided that the public has had an opportunity to comment on the regulation after it has been published, and in the case of a public health emergency, the Secretary of Health and Human Services concurs with the Secretary's action.

### Policy

The NOAA Office of General Counsel has defined the phrase "unanimous vote," in paragraphs 2 and 3 above, to mean the unanimous vote of a quorum of the voting members of the Council only. An abstention has no effect on the unanimity of the quorum vote. The only legal prerequisite for use of the Secretary's emergency authority is that an emergency must exist. Congress intended that emergency authority be available to address conservation, biological, economic, social, and health emergencies. In addition, emergency regulations may make direct allocations among user groups, if strong justification and the administrative record demonstrate that, absent emergency regulations, substantial harm will occur to one or more segments of the fishing industry. Controversial actions with serious economic effects, except under extraordinary circumstances, should be done through normal notice-and-comment rulemaking.

The preparation or approval of management actions under the emergency provisions of section 305(c) of the Magnuson-Stevens Act should be limited to extremely urgent, special circumstances where substantial harm to or disruption of the resource, fishery, or community would be caused in the time it would take to follow standard rulemaking procedures. An emergency action may not be based on administrative inaction to solve a long-recognized problem. In order to approve an emergency rule, the Secretary must have an administrative record justifying emergency regulatory action and demonstrating its compliance with the national standards. In addition, the preamble to the emergency rule should indicate what measures could be taken or what alternative measures will be considered to effect a permanent solution to the problem addressed by the emergency rule.

The process of implementing emergency regulations limits substantially the public participation in rulemaking that Congress intended under the Magnuson-Stevens Act and the Administrative Procedure Act. The Councils and the Secretary must, whenever possible, afford the full scope of public participation in rulemaking. In addition, an emergency rule may delay the review of non-emergency rules, because the emergency rule takes precedence. Clearly, an emergency action should not be a routine event.

### Guidelines

NMFS provides the following guidelines for the Councils to use in determining whether an emergency exists:

### Emergency Criteria

For the purpose of section 305(c) of the Magnuson-Stevens Act, the phrase "an emergency exists involving any fishery" is defined as a situation that:

(1) Results from recent, unforeseen events or recently discovered circumstances; and

(2) Presents serious conservation or management problems in the fishery; and

(3) Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment, and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process.

### Emergency Justification

If the time it would take to complete notice-and-comment rulemaking would result in substantial damage or loss to a living marine resource, habitat, fishery, industry participants or communities, or substantial adverse effect to the public health, emergency action might be justified under one or more of the following situations:

(1) Ecological—(A) to prevent overfishing as defined in an FMP, or as defined by the Secretary in the absence of an FMP, or (B) to prevent other serious damage to the fishery resource or habitat; or

(2) Economic—to prevent significant direct economic loss or to preserve a significant economic opportunity that otherwise might be foregone; or

(3) Social—to prevent significant community impacts or conflict between user groups; or

(4) Public health—to prevent significant adverse effects to health of participants in a fishery or to the consumers of seafood products.

Dated: August 14, 1997.

**Gary C. Matlock,**

*Acting Assistant Administrator for Fisheries, National Marine Fisheries Service.*

[FR Doc. 97-22094 Filed 8-20-97; 8:45 am]

BILLING CODE 3510-22-F

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## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

### 50 CFR Part 285

**[Docket No. 970702161-7197-02; I.D. 041097C]**

**RIN 0648-AJ93**

## Atlantic Highly Migratory Species Fisheries; Import Restrictions

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Final rule.

**SUMMARY:** NMFS amends the regulations governing the Atlantic highly migratory species fisheries to prohibit importation of Atlantic bluefin tuna (ABT) and its products in any form harvested by vessels of Panama, Honduras, and Belize. The amendments are necessary to implement International Commission for the Conservation of Atlantic Tunas (ICCAT) recommendations designed to help achieve the conservation and management objectives for ABT fisheries.

**DATES:** Effective August 20, 1997. Restrictions on Honduras and Belize are applicable August 20, 1997; restrictions on Panama are applicable January 1, 1998.

**ADDRESSES:** Copies of the supporting documentation are available from Rebecca Lent, Chief, Highly Migratory Species Management Division, Office of Sustainable Fisheries (F/SF1), NMFS, 1315 East-West Highway, Silver Spring, MD 20910-3282.

**FOR FURTHER INFORMATION CONTACT:** Chris Rogers or Jill Stevenson, 301-713-2347.

**SUPPLEMENTARY INFORMATION:** The Atlantic tuna fisheries are managed under the authority of the Atlantic Tunas Convention Act (ATCA). Section 971d(c)(1) of the ATCA authorizes the Secretary of Commerce (Secretary) to issue regulations as may be necessary to carry out the recommendations of the ICCAT. The authority to issue regulations has been delegated from the Secretary to the Assistant Administrator for Fisheries, NOAA (AA).

Background information about the need to implement trade restrictions and the related ICCAT recommendation was provided in the preamble to the proposed rule (62 FR 38246, July 17, 1997) and is not repeated here. These regulatory changes will further NMFS' management objectives for the Atlantic tuna fisheries.

### Proposed Import Restrictions

In order to conserve and manage North Atlantic bluefin tuna, ICCAT adopted two recommendations at its 1996 meeting requiring its Contracting Parties to take the appropriate measures to prohibit the import of ABT and its products in any form from Belize, Honduras, and Panama. The first recommendation was that its Contracting Parties take appropriate steps to prohibit the import of ABT and its products in any form harvested by vessels of Belize and Honduras as soon as possible following the entry into force of the ICCAT recommendation. Accordingly, the prohibition with respect to these countries is effective August 20, 1997. The second recommendation was that the Contracting Parties take appropriate steps to prohibit such imports harvested by vessels of Panama effective January 1, 1998. This would allow Panama an opportunity to present documentary evidence to ICCAT, at its 1997 meeting or before, that Panama has brought its fishing practices for ABT into consistency with ICCAT conservation and management measures. Accordingly, the prohibition with respect to Panama will become effective January 1, 1998.

Under current regulations, all ABT shipments imported into the United States are required to be accompanied by a Bluefin Statistical Document (BSD). Under this final rule, United States Customs officials, using the BSD, will deny entry into the customs territory of the United States of shipments of ABT harvested by vessels of Panama, Honduras, and Belize and exported after the effective dates of the trade restrictions. Entry will not be denied for any shipment in transit prior to the effective date of trade restrictions.

Upon determination by ICCAT that Panama, Honduras, and/or Belize has brought its fishing practices into consistency with ICCAT conservation and management measures, NMFS will publish a final rule in the **Federal Register** that will remove import restrictions for the relevant party. In

# EXHIBIT B

January 11, 2007 Letter from NOAA Regional Administrator D. Robert Lohn to Donald Hansen, Chair, Pacific Fishery Management Council

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, OR 97220

JAN 11 2007

Dear Mr. Hansen: Don

The purpose of this letter is to advise the Pacific Fishery Management Council (Council) that the National Marine Fisheries Service (NMFS) has determined that the Council's request regarding an emergency rule limiting participation in the Pacific whiting fishery should not be approved. The Council had requested that NMFS "approve an emergency rule to be implemented for the 2007 [whiting] season to prohibit participation of AFA-qualified vessels with no sector specific catch history in the fishery prior to 2006 (effectively December 31, 2005) in the shore-based, mothership, or catcher-processor sectors of the 2007 Pacific whiting fishery." (quoted from your letter of November 9, 2006.)

The Council had made the above request in order to "prevent imminent harm to fisheries in 2007," based on its anticipation that it could not complete Amendment 15 to the fishery management plan (FMP) prior to the 2008 primary whiting season. Amendment 15, which the Council tabled in 2001, was intended to respond to Section 211(c)(3) of the American Fisheries Act (AFA), which required that "By not later than July 1, 2000, the Pacific Fishery Management Council...shall recommend for approval by the Secretary [of Commerce] conservation and management measures to protect fisheries under its jurisdiction and the participants in those fisheries from adverse impacts caused by this Act or by any fishery cooperatives in the directed pollock fishery."

The decision on whether to grant the emergency rule request depended on whether the perceived harm to the Pacific whiting fishery was caused by the AFA itself, and if there were harm from the AFA, whether the potential harm to the fishery during the 2007 season outweighs the benefits of Council's full rulemaking process. Even if NMFS had found harm from AFA vessels it would not be enough; the harm would need to be traced to the AFA.

Although the 2006 shoreside whiting season was shorter than in past years, the fishery's duration was shortened by new participation from both AFA and non-AFA vessels. Higher whiting prices and new markets for whiting filets attracted new interest from shoreside fish processors that had not previously participated in the primary shoreside season. These processors sought out vessels to deliver whiting, contracting with both AFA and non-AFA vessels. Higher whiting prices also affected the mothership sector which, for the first time in several years, took its complete allocation before the end of the calendar year.

NMFS issued 39 shoreside whiting exempted fishing permits (EFPs) for the 2006 primary whiting season; 15 of those EFPs were held by AFA vessels. Of the 15 AFA vessels with 2006 EFPs, four were new participants in the 2006 shoreside whiting sector. Of the four new AFA vessel participants in the shoreside whiting sector, only one was newly associated with a groundfish limited entry permit in 2006. The remaining three AFA vessels new to the shoreside whiting sector have been registered for use with their same limited entry permits since the early to mid-1990s, and have participated in either the groundfish bottom trawl fishery, the mothership whiting sector, or both.

Even if NMFS were to approve the Council's request for an emergency rule prohibiting AFA vessel participation in the shoreside whiting fishery, participation in the 2007 whiting primary season would remain open to any non-AFA vessel that currently has or is able to purchase or lease a limited entry trawl permit. For this reason, the Northwest Region does not believe that the AFA itself is the cause of increased participation in the shoreside whiting fishery, nor does the Region believe that prohibiting AFA vessels from participating in the whiting fishery would solve the concern expressed by the Council and members of the public about the shorter season duration in 2006 and the potential for a shorter duration season in 2007. The Northwest Region believes that the number of vessels participating in the 2007 whiting season will depend largely on whiting availability and price per pound.

Although NMFS's consideration of this emergency rule request is governed by the AFA and the effect of that law, we also believe that it is appropriate to look to agency guidelines on implementing emergency rules under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). On August 21, 1997, NMFS issued policy guidelines for the use of emergency rules under Section 305(c) of the Magnuson-Stevens Act (62 FR 44421). Those guidelines state, in part, that "Controversial actions with serious economic effects, except under extraordinary circumstances, should be done through normal notice-and-comment rulemaking." The Northwest Region of NMFS believes that this Council request may be considered a controversial action with serious economic effects for those vessels that would be excluded from the fishery.

For the reasons discussed above, and because the Northwest Region of NMFS believes that groundfish allocation decisions are more appropriately handled through the Council's full rulemaking process (as described in Section 6.2(D) of the FMP) than through an emergency rule process, I have denied the Council's request for an emergency rule. I note that the recently passed congressional amendments to the Magnuson-Stevens Act contain several provisions specific to the West Coast Pacific whiting fishery. NMFS looks forward to working with you in the coming year as you develop new management measures for the whiting fishery, whether in furtherance of Amendment 15 or in response to a new Magnuson-Stevens Act.

Sincerely,

Bob Lohn

D. Robert Lohn
Regional Administrator

# EXHIBIT C

Letter dated September 29, 2006 from Jeff P. Koenings, Ph.D., Director of the Washington Department of Fish and Wildlife to Robert Loan, Regional Administrator, NOAA – Fisheries

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State of Washington
**DEPARTMENT OF FISH AND WILDLIFE**

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

September 29, 2006

RECEIVED
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Mr. Robert Lohn, Regional Administrator
NOAA – Fisheries
7600 Sand Point Way NE
Seattle, Washington 98115

Dear Mr. Lohn: Bob –

During the week of September 11, 2006, the Pacific Fishery Management Council (Council) passed a motion to recommend that the National Marine Fisheries Service (NMFS) adopt an emergency rule to prohibit participation in the shoreside whiting fishery by American Fisheries Act (AFA)-qualified vessels that did not participate in the shoreside fishery prior to 2006. The purpose of this letter is to express the Washington Department of Fish and Wildlife's opposition to this action and our recommendation that NMFS deny the Council's request.

The rationale that was articulated for the motion, which was made by the Oregon Department of Fish and Wildlife (ODFW) representative, is: 1) four AFA-qualified vessels participated in the shoreside whiting fishery in 2006 - one vessel had participated since 2001 in the mothership sector and three new vessels that reportedly had not participated prior to the enactment of the AFA; 2) these four new vessels "contributed to the shoreside fishery closing 7-10 days earlier than the previous year;" 3) two "traditional" shoreside participants in Oregon reported declines of 25-30% in deliveries and revenue from previous seasons; and 4) because of the relatively larger size (harvest capacity) and lack of experience of the four vessels in the shoreside fishery, these new AFA vessels have a higher potential to take rockfish, thereby, increasing the risk of exceeding the hard rockfish bycatch caps that are applicable to the entire whiting fishery (all sectors).

As the discussion ensued on the Council floor, it became clear that in addition to the four new AFA-qualified vessels there were also six additional new vessels that were non-AFA-qualified participating in the 2006 shoreside fishery. We agree that the new harvest capacity represented by the ten new vessels that entered the fishery in 2006 was a primary factor in the season being reduced in time; it is unclear from the data presented whether the shortened season was a direct result of the participation by the AFA vessels. We would also point out that the information in the ODFW report is not an accurate post-season estimate of the impact of the proposed emergency rule on the 2006 season. The information regarding the landings by these targeted AFA-qualified vessels referenced 15,928 metric tons (mt) (17.3%) of the 91,995 mt landed into Oregon and Washington. This harvest total includes the harvest by all four vessels when, in fact,

the emergency rule would only impact three of the vessels. The harvest total of the three AFA vessels affected by the rule is 11,352 mt, which is 12.3% of the Oregon/Washington total.

Washington has two processors that participate in the shoreside fishery, one in Westport and the other in Ilwaco. In 2005, 33.2% of the shoreside non-tribal whiting harvest was landed into Washington; 63.6% was landed into Oregon. In 2006, two of the three new AFA vessels landed into Westport, Washington. However, the proportion of the whiting harvest landed into Washington decreased by 3%, while Oregon's landings increased by 2%. The third new AFA vessel and five of the six non-AFA vessels all landed into Oregon. It is likely that these vessels had a more direct effect on the number of deliveries and market availability for those "traditional" participants in Oregon than the boats landing in Washington.

With regard to the potential of the new AFA vessels to have higher bycatch of overfished rockfish, the overall amount of bycatch in the shoreside sector in 2006 decreased by about 50% from 2005 for canary, darkblotched, and widow rockfish, which are the primary species of concern for this fishery. Furthermore, these particular vessels had very low individual bycatch rates of these species.

This emergency rule has the potential to significantly impact Washington's shoreside whiting fishery participants – the two AFA vessels that landed into Washington in 2006 represent about 15% of Washington's total shoreside whiting landings and over 20% of the amount delivered into Westport. The emergency rule singles out three AFA-qualified vessels, while it is well known that a large portion of the vessels participating in the shoreside fishery are AFA-qualified, some of which have maintained their AFA benefits while becoming full time participants in the West Coast whiting fishery. The emergency rule will not fix the problem associated with new entrants into the fishery and the corresponding negative impacts on the historic participants.

This emergency rule creates a limited access program in the absence of an assessment of the impacts to these participants and due process. The Council adopted two control rules relative to this fishery more than six years ago. These vessel owners made substantial investments to participate in the fishery without any knowledge that their participation would be limited to only one season. In fact, at least one vessel owner purchased a permit from an existing shoreside participant (his vessel did not add a vessel to the fleet, it replaced one). Situations such as this would likely be analyzed through a more deliberative process. From our perspective, to take this action via emergency rule rather than through a full rule making process is indefensible.

Finally, as you know, the Council has begun developing alternatives for a dedicated access program for the West Coast groundfish trawl fishery, including the whiting fishery. If additional effort limitation measures are needed in the shoreside fishery, developing and implementing such measures is more appropriately addressed through that process so that the impacts on those affected can be analyzed and considered by the Council prior to making a final decision.

If you have any questions regarding this matter, please contact Phil Anderson, Assistant Director for Intergovernmental Resource Management, at 360.902.2720.

Sincerely,

Jeff P. Koenings, Ph.D.
Director

cc: Phil Anderson
Michele Culver

APICDA

February 26, 2007

Chairman Donald Hansen
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, Oregon 97220

Dear Chairman Hansen:

APICDA (Aleutian Pribilof Island Community Development Community Association) is a 501(c) 3 non-profit corporation created in 1992 through the CDQ (Community Development Quota) program; developed by the North Pacific Fishery Management Council in 1991.

APICDA's purpose is to develop stable local economies based upon the fishing industry in each of the communities that we serve. We are tasked with providing economically disadvantaged communities in western Alaska with the opportunity to generate capital to achieve this purpose.

The APICDA Board of Directors charged its Management team with identifying a dedicated seafood industry harvesting partner to harvest its CDQ quota and maximizing return to the APICDA Corporation and the communities it serves.

APICDA identified this partner and has maintained a fourteen year relationship with Starbound, LLC. They initially met our strict investment guidelines and continue to meet and exceed our requirement and expectations as a harvesting partner in the Bering Sea fisheries. We find them to be a very good partner; safe, responsible and prudent in their business practices.

Lastly, Starbound, LLC has an excellent reputation and compliance record in the Bering Sea fisheries.

If you have any questions at all, please do not hesitate to contact me.

Sincerely,

Everette Anderson
Business Development/Corporate Relations Specialist

cc: Craig Cross, Starbound, LLC

5470 Shilshole Avenue NW, Suite 430, Seattle, Washington 98107
Phone: 206.782.1776 Fax: 206.782.1721

# ALEUTIAN SPRAY FISHERIES, INC.

Suite 300
5470 Shilshole Avenue N.W.
Seattle, Washington 98107

Phone (206) 784-5000
Fax (206) 784-5500

February 26, 2007

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, Oregon 97220

Re: Opposition to Possible Implementation of Emergency Rule

Dear Mr. Hansen:

I am Cary Swasand, president of Aleutian Spray Fisheries Inc., the managing partner of Starbound LLC and the C/P Starbound.

On March $9^{th}$, the Pacific Fishery Management Council ("PFMC") is scheduled to consider an Emergency Rule that would limit vessels in the 2007 Pacific Whiting fishery ("Whiting") in order to address alleged negative conservation impacts of new entrants into the fishery. Aleutian Spray Fisheries, Inc. strongly opposes this action, particularly as it affects the catcher processor sector.

The fishing families and partners that own the C/P Starbound have spent the better part of three years and millions of dollars to acquire the necessary permits to participate in the 2007 Pacific Whiting fishery. Our investment in the fishery was in full compliance of all existing Federal laws and regulations. Moreover, our activity was guided by the adopted conservation and policy objectives of the National Marine Fisheries Service ("NMFS"), the PFMC, the industry, and environmental community.

Our investment included the purchasing of catcher vessel permits and a catcher vessel. Taken together, these investments will remove approximately 10,000mt of current Whiting harvest and bycatch out of the fully-utilized and over-capitalized in-shore sector. We plan to use the C/P Starbound to harvest between 6,000 to 7000mt of Whiting in the catcher processor sector – this will make more Whiting available for those remaining in the catcher vessel sector, which delivers to coastal communities and Motherships. This transfer of catch from a partially observed sector to a 100% observed catcher processor sector, which closely monitors catch and bycatch actually, enhances conservation efforts.

We have moved these permits and history to the catcher processor sector and have proposed joining the voluntary Pacific Whiting Cooperative ("Cooperative"). For the past 10 years the Cooperative has testified many times before the PFMC that it is best equipped to deal with bycatch issues. We believe the transfer of Whiting from the in-shore sector to the catcher processor sector and our membership in the Cooperative to be a benefit to the Whiting fishery biologically, and for the coastal communities, motherships and catcher vessels economically and socially. The Whiting will be harvested on a larger, classed vessel making the harvest safer. We will directly employ over a hundred people, and we will store the product in a local cold storage before selling.

There should be no conservation concerns in regard to the C/P Starbound entering the fishery. Aleutian Spray Fisheries, Inc. is a highly regarded member in many cooperatives, many of which include the current Pacific Whiting Cooperative members. We have received rewards and recognition from the Pollock Conservation Cooperative for our low bycatch. Members of our wheelhouse crew participated in the Whiting fishery as have our factory personnel. We are knowledgeable of bycatch avoidance techniques for this fishery, and the requirements necessary to get the greatest recovery and utilization, and therefore the most economic benefit.

We have followed the rules, we have invested our time and money, and we have listened to the intent and interests of the Council, communities, industry, the environmental community and NMFS. We have a proven track record of good stewardship of the resource. We are doing the right thing for the right reasons we are fully prepared to enter the Pacific Whiting fishery and want to be a member of the catcher processor cooperative.

In our view there are no biological or safety reasons that would dictate an Emergency Rule closing the catcher processor sector and not allowing the C/P Starbound to fish in the 2007 Pacific Whiting fishery. This is ensuring harvest in a sector with 100% observer coverage and in a sector that has the benefits of a cooperative structure in place, which is a conservation benefit. This is a classed vessel regulated under very strict safety standards. We see it as a benefit for the coastal communities, motherships, catcher vessels, and the social economics of the industry as a whole.

We ask that the emergency rule not be put in place for the catcher processor sector.

Sincerely,

Cary K. Swasand

Cary K. Swasand

February 27, 2007

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, OR 97220

Dear Mr. Hansen,

I have been the captain and part owner of the C/P Starbound for the past 14 years and an employee of Aleutian Spray Fisheries for the past 20 years. In that time I have come to know and respect the company for its fishing practices and well managed fleet.

Aleutian Spray Fisheries has been and continues to be a family run and operated company. The managers of Starbound have also served time as captain. There is a crew of long standing aboard Starbound that concerns itself continually with clean fishing and a quality product. In addition, the other wheelhouse crew has experience in the Pacific whiting fishery aboard other vessels.

Starbound also has been a successful partner with APICDA and has been a member of the PCC since its inception, being rewarded for its clean fishing practices.

I would like to add my testimony as captain and partner of C/P Starbound and as a long standing employee of Aleutian Spray Fisheries that our entry into the Pacific whiting fishery will be as well managed and maintained as the record shows of our fishing practices in the Bering Sea. It is my personal pledge to continue our record of good standing.

Sincerely,

Karl H. Bratvold
Captain, C/P Starbound

# STARBOUND LLC

Suite 300
5470 Shilshole Avenue N.W.
Seattle, Washington 98107

Phone (206) 784-5000
Fax (206) 784-5500

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, Oregon 97220

Re: Opposition to Implementation of Emergency Rule

Dear Mr. Hansen: February 26 2007

My name is Barry B. Ohai and I am one of the owners of the C/P Starbound as well as the managing partner. We have made the necessary steps to participate in the 2007 Whiting fishery. This letter is meant to address our entry into the fishery and the implementation of an emergency rule that would preclude us from doing so.

Our presence in the fishery is not a recent appearance, for most of us have spent many years in the Bering Sea doing what we do best. As always we have maintained a very high standard not only in our actions but also the equipment and personnel we surround ourselves with. The product which we produce reflects the manner in which we operate and our team continues to remain with us year after year.

The type of production which is involved here is not something that will require us to go through a learning process for this is something we have done on board for 18 years. Our personnel not only have experience catching but also processing the fish into a usable resource.

This is not an entry into a fishery that is sudden or not well thought out, we have been preparing for and perusing this for three years, we have spent millions of dollars, and now finally have the "package" in order.

There really is no acceptable reason for us be denied the membership in this fishery as our credentials for being there are no less than any of the current players.

We are prepared to begin fishing on May 15th 2007, the permits are in place, the crew and management are ready, and the owners are committed to being a prudent and successful participant in the Whiting fishery.

Barry B. Ohai

Barry B. Ohai

ITEM E.6
UCB
Public Comment

**2006 Shoreside Vessel Bycatch Summary (best available data as of October 26, 2006)**

| VESSEL | CHINOOK SALMON (count) | YELLOWTAIL RF (avg. kg/trip) | WIDOW RF (avg. kg/trip) | Yelloweye RF (avg. kg/trip) | CANARY RF (avg. kg/trip) | Darkblotched RF (avg. kg/trip) | Sablefish (avg. kg/trip) |
|---|---|---|---|---|---|---|---|
| ANNETTE | 0 | 37.96 | 1.59 | 0 | 0.06 | 0 | 0.75 |
| BAY ISLANDER | 50 | 58.26 | 5.22 | 0 | 0.02 | 0 | 13.46 |
| BLUE FOX | 14 | 24.55 | 32.87 | 0.17 | 1.98 | 0.48 | 7.62 |
| CHELLISSA | 12 | 259.96 | 0.75 | 0.11 | 0.68 | 0 | 3.52 |
| COLLIER BROTHERS | 16 | 118.59 | 24.97 | 0 | 3.1 | 0 | 1.83 |
| DEFIANT | 0 | 126.4 | 460.02 | 0 | 0 | 0 | 0.5 |
| EXCALIBUR | 22 | 12.69 | 4.11 | 0.12 | 0.36 | 0 | 0.57 |
| FISHWISH | 4 | 0.23 | 25.4 | 0 | 0 | 59.06 | 0 |
| GEORGE ALLEN | 0 | 7.13 | 1.27 | 0 | 0.16 | 0 | 0.98 |
| GRUMPY J | 2 | 32.85 | 0.45 | 0 | 0.19 | 0 | 2.75 |
| JAMIE MARIE | 38 | 248.59 | 56.07 | 0 | 0.63 | 0 | 0 |
| JEANETTE MARRIE | 8 | 24.29 | 2.75 | 0.07 | 2.49 | 0.1 | 0.67 |
| LAST STRAW | 17 | 57.49 | 31.59 | 0.03 | 1.74 | 0.29 | 0.26 |
| LISA MELINDA | 13 | 54.84 | 7.54 | 0.09 | 2.15 | 0 | 242.71 |
| MARATHON | 39 | 808.96 | 10.68 | 0 | 0.65 | 0.65 | 0.19 |
| MARK-1 | 27 | 363.83 | 136.3 | 0 | 1.61 | 0 | 0.75 |
| MISS BERDIE | 111 | 8.99 | 17.39 | 0.13 | 1.42 | 13.21 | 1.66 |
| MISS SARAH | 32 | 34.44 | 58.99 | 0.45 | 5.09 | 0.05 | 3.48 |
| MISS SUE | 83 | 10.4 | 12.84 | 0.06 | 0.64 | 2.43 | 2.78 |
| MUIR MILACH | 32 | 499.89 | 656.03 | 0 | 0.64 | 0 | 5.49 |
| NICOLE | 6 | 117.03 | 10.79 | 0 | 0.29 | 0.06 | 0.71 |
| NORDIC FURY | 11 | 264.68 | 3.63 | 0.24 | 4.1 | 0 | 2.7 |
| OCEAN HUNTER | 4 | 326.98 | 60.95 | 0.65 | 1.58 | 0 | 0.13 |
| PACIFIC | 43 | 5.48 | 35.48 | 0.03 | 0.47 | 4.84 | 12.91 |
| PACIFIC CHALLENGER | 44 | 528.93 | 32.42 | 0 | 8.29 | 0.32 | 0 |
| PACIFIC FUTURE | 8 | 80.58 | 1.65 | 0 | 0.63 | 0 | 0.83 |
| PACIFIC RAM | 34 | 39.1 | 51.76 | 0 | 1.61 | 0.15 | 0.39 |
| PEGASUS | 30 | 123.94 | 11.44 | 0 | 3.02 | 0 | 10.36 |
| PERSEVERANCE | 9 | 76.31 | 25.39 | 0 | 0.4 | 0.05 | 1.31 |
| PREDATOR | 18 | 277.78 | 0.31 | 0 | 0.58 | 0 | 1.2 |
| RAVEN | 40 | 242.52 | 5.77 | 0 | 2.35 | 0 | 3.47 |
| SEA CLIPPER | 11 | 353.01 | 6.37 | 0 | 0.53 | 0 | 0.14 |
| SEEKER | 27 | 90.68 | 3.3 | 0 | 1.29 | 0 | 4.22 |
| STARWARD | 18 | 620.41 | 49.6 | 0 | 1.6 | 0.03 | 1.87 |
| WARRIOR II | 16 | 84.01 | 13.73 | 0.14 | 0.36 | 6.59 | 0 |
| **FISHERY TOTAL (mt)** | **839 Fish** | **155.36** | **49.38** | **0.08** | **1.63** | **2.28** | **11.12** |

**As of October 26, 2006, the overall salmon bycatch rate for the fishery was 0.009 Chinook per mt hake.**

Source ODF&W Website http://www.dfw.state.or.us/MRP/hake/Main%20Pages/Weekly%20Landings/

**2006 Year To Date Catch, Whiting Shoreside Catcher Vessels Delivering into Washington Ports**

**Sorted for Canary Rockfish Rates, Decending**

| | BYCATCH RATES | | |
|---|---|---|---|
| **Boat Name** | **Canary** | **Widow** | **Yellowtail** |
| PACIFIC CHALLENGE | 0.0061% | 0.0143% | 0.243% |
| OCEAN HUNTER | 0.0042% | 0.1606% | 0.863% |
| COLLIER BROTHERS | 0.0028% | 0.0248% | 0.132% |
| **MARK I** | 0.0011% | 0.0925% | 0.238% |
| SEA CLIPPER | 0.0008% | 0.0093% | 0.493% |
| JAMIE MARIE | 0.0006% | 0.0577% | 0.256% |
| CHELLISSA | 0.0006% | 0.0007% | 0.240% |
| PREDATOR | 0.0006% | 0.0003% | 0.298% |
| MUIR MILACH | 0.0005% | 0.3680% | 0.388% |
| MARATHON | 0.0005% | 0.0080% | 0.610% |
| WARRIOR II | 0.0001% | 0.0013% | 0.452% |
| DEFIANT | 0.0000% | 1.4097% | 0.375% |
| GRUMPY J | 0.0000% | 0.0002% | 0.002% |
| **STARWARD** | 0.0000% | 0.0000% | 0.109% |

**Sorted for Yellowtail Rockfish Rates, Decending**

| | BYCATCH RATES | | |
|---|---|---|---|
| **Boat Name** | **Canary** | **Widow** | **Yellowtail** |
| OCEAN HUNTER | 0.0042% | 0.1606% | 0.8634% |
| MARATHON | 0.0005% | 0.0080% | 0.6096% |
| SEA CLIPPER | 0.0008% | 0.0093% | 0.4934% |
| WARRIOR II | 0.0001% | 0.0013% | 0.4521% |
| MUIR MILACH | 0.0005% | 0.3680% | 0.3884% |
| DEFIANT | 0.0000% | 1.4097% | 0.3747% |
| PREDATOR | 0.0006% | 0.0003% | 0.2978% |
| JAMIE MARIE | 0.0006% | 0.0577% | 0.2558% |
| PACIFIC CHALLENGER | 0.0061% | 0.0143% | 0.2427% |
| CHELLISSA | 0.0006% | 0.0007% | 0.2395% |
| **MARK I** | 0.0011% | 0.0925% | 0.2375% |
| COLLIER BROTHERS | 0.0028% | 0.0248% | 0.1325% |
| **STARWARD** | 0.0000% | 0.0000% | 0.1088% |
| GRUMPY J | 0.0000% | 0.0002% | 0.0021% |

**Sorted for Widow Rockfish Rates, Decending**

| | BYCATCH RATES | | |
|---|---|---|---|
| **Boat Name** | **Canary** | **Widow** | **Yellowtail** |
| DEFIANT | 0.0000% | 1.4097% | 0.3747% |
| MUIR MILACH | 0.0005% | 0.3680% | 0.3884% |
| OCEAN HUNTER | 0.0042% | 0.1606% | 0.8634% |
| **MARK I** | 0.0011% | 0.0925% | 0.2375% |
| JAMIE MARIE | 0.0006% | 0.0577% | 0.2558% |
| COLLIER BROTHERS | 0.0028% | 0.0248% | 0.1325% |
| PACIFIC CHALLENGE | 0.0061% | 0.0143% | 0.2427% |
| SEA CLIPPER | 0.0008% | 0.0093% | 0.4934% |
| MARATHON | 0.0005% | 0.0080% | 0.6096% |
| WARRIOR II | 0.0001% | 0.0013% | 0.4521% |
| CHELLISSA | 0.0006% | 0.0007% | 0.2395% |
| PREDATOR | 0.0006% | 0.0003% | 0.2978% |
| GRUMPY J | 0.0000% | 0.0002% | 0.0021% |
| **STARWARD** | 0.0000% | 0.0000% | 0.1088% |

Source: WDF&G

PWCC E.6.d
Supp. public comment
March 2007
Submitted 03/09/07

# Emergency Rule Criteria

## (1) Results from recent, unforeseen events or recently discovered circumstances

- 10% reduction in 2007 whiting OY will increase race for fish
- Lower pollock and cod TACs in Bering Sea will increase incentive for North Pacific vessels to enter whiting fishery
- STARBOUND, HIGHLAND LIGHT and other vessels are threatening to enter the 2007 whiting fishery
- Scientific research catch of canary rockfish has been much higher than projected creating management difficulties
- Non-whiting trawl bycatch of canary rockfish has been much higher than projected creating management difficulties
- Council and NMFS staff project significantly higher bycatch rate of widow rockfish by the catcher processor and mothership sectors in the 2007 whiting fishery
- Measures to reduce canary rockfish bycatch in the non-whiting trawl fishery are likely to lead to increased bycatch of darkblotched rockfish

## (2) Presents serious conservation or management problems in the fishery

- Entry of new catcher processors will terminate the CP coop and lead directly to a race for fish beginning May 15 with at least 11 catcher processors
- Concentration of catcher processor effort in the May 15 – June 15 period will result in huge increases in salmon bycatch (rates in May 15 – June 15 period are historically more than 25 times higher than in period from June 15 to close of season)
- The race for fish and potential effort by 3 times as many catcher processors on May 15 will almost certainly lead to dramatic increases in bycatch rates of canary and widow rockfish
- The spillover impacts of increased bycatch will create a domino effect in the shoreside whiting and non-whiting trawl fisheries causing huge impacts on scorecard management of fisheries
- A significant lightning strike of canary rockfish could close all fisheries including research activities
- A race for fish by high capacity catcher processors could generate a dramatic wastage problem if vessels encounter large numbers of 2003 and 2004 year class whiting

(3) **Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment, and deliberative consideration of the impacts on participants to the same extent as would be expected under the normal rulemaking process**

The bar on this criteria is set very low because the process followed by the Council in adopting this emergency rule has allowed opportunity for notice, comment and consideration nearly equal to that provided in a full blown rulemaking process.

- **Notice** – The owners of each of the vessels impacted by the proposed rule have been frequently and consistently put on notice that the Council intended to promulgate rules that would prevent these vessels from entering the fishery. The express language of the American Fisheries Act put these vessels on notice. The control dates for Amendment 15 and the ITQ program put these vessels on notice. Two letter from the Council in 2006 urging Congress to prohibit new AFA catcher processors from entering the fishery put some of these vessels on notice. The prior Council action on this identical issue in 2006 put these vessels on notice.

- **Public Comment** – All potentially affected parties have had ample opportunity for public comment. Because this issue was previously addressed by the Council, each potentially affected party has been represented in this Council process and has been given full opportunity to submit written and public testimony.

- **Deliberative Consideration** – Because this specific issue has been in front of the Council on two separate occasions, the Council has given this matter deliberative consideration equal to the consideration routinely given to similar matters

## Summary

When this proposed emergency rule is judged against standards described in the "Policy Guidelines for the Use of Emergency Rules", 50 CFR Chapter VI, it is clear under the announced rationale, policy and criteria that (1) an "emergency" exists and (2) the proposed emergency rule is necessary, strongly supported and consistent with the law.

Pacific Whiting Conservation Cooperative
March 9, 2007

E.6.d
Supp. Public Comment
March 2007

**SEA STATE**

P.O. Box 74, Vashon, WA 98070

Ph: (206)463-7370
Fax: (206)463-7371
Email: karl@seastateinc.com

March 7, 2007

*Early season bycatch rates in whiting (May 15 – June 15)*

| Year | Whiting catch (mt) | Canary rate (kg/mt) | Widow rate (kg/mt) | Chinook rate (N/mt) |
|---|---|---|---|---|
| 2003-2006 | 104,022 | 0.004 | 0.713 | 0.026 |

*Later-season bycatch rates in whiting (June 15 onward)*

| Year | Whiting catch (mt) | Canary rate (kg/mt) | Widow rate (kg/mt) | Chinook rate (N/mt) |
|---|---|---|---|---|
| 2003-2006 | 168,115 | 0.004 | 0.331 | 0.001 |

Ratio (early season rate / later-season rates)

| RATIO | Canary rate (kg/mt) | Widow rate (kg/mt) | Chinook rate (N/mt) |
|---|---|---|---|
| 2003-2006 | 1.14 | 2.15 | 23.27 |

Pacific Whiting Conservation Cooperative
March 9, 2007