

Appendix H - Analytical Team Reports & Other Background

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Groundfish Trawl Individual Quota Analytical Team October 2004 Report^{1/}

The TIQ Analytical Team has been working on analyses that will (1) be applicable regardless of the type of IFQ program the Council considers, and (2) help the Council prioritize when it specifies initial options for preliminary analysis at the November 2004 Council meeting. The following topics are covered in this report:

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1/ This document ordinarily appeared as an exhibit under Agenda Item E.6.b at the November 2004 PFMC Meeting, Portland, OR.

Executive Summary

Status Quo Management Regulations

What is the status quo against with IFQs and other management alternatives will be measured?

Status quo for management measures for the trawl fishery is generally characterized by cumulative landing limits and season management for Pacific whiting. A list of management measures entailed in status quo is provided in the first column of Table 1.

Increases in bycatch monitoring are anticipated under status quo and there is a need for an increase in enforcement effort associated with status quo regulations. These and other such changes under status quo should not attributed as costs of the IFQ program.

Harvest Levels Under Status Quo Harvest Policies

What harvest levels might be expected under status quo harvest policies?

The present fishery is characterized by significant underharvest of available catch OY for many species - approximately half of the available OY is being taken (Table 2). OYs for the foreseeable future are likely to remain fairly stable for most species, but constrained by overfished species (Table 3).

Subject to constraints of species under rebuilding plans, some opportunities may exist for reduced discard and fuller utilization of catch OYs. A carefully designed IQ program (and possibly other program alternatives) may provide incentives to modify gears and strategies to retain more catch and access more of the available OY.

Management Measures Remaining in Place with IFQs

Which current management measures would remain in place, and which would be replaced under an IFQ program?

Many management measures, including rockfish conservation areas, are likely to remain in place even with IFQs. The second column of Table 1 indicates the existing management measures likely to change and those likely to remain in place with adoption of an IFQ program.

Bycatch (Discard of Incidental Catch)

How much of the current bycatch problem might potentially be resolved by an IFQ program?

What are the reasons for current discards?

During 1995-1999 of the Enhanced Data Collection Program study, data on the reasons for discard were collected (Table 4). Market constraints were given as the primary reason for discard (68%), followed by regulations (24%) and finally for quality reasons (8%). The West Coast Groundfish Observer Program (WCGOP) collects similar data. This data has been requested but has not yet been made available.

What is the volume of the regulatory and nonregulatory discards currently?

Present information on discard is limited. Total catch estimates including discard mortality for 2002 and 2003 are provided in Tables 6 and 7. Estimated discards remain

high especially for highly regulated species, although there was an overall reduction in discard in commercial fisheries between 2002 and 2003 (Table 2). Considerably more data have been collected by the WCGOP and these estimates are currently being revised. Updates to total catch mortality including discard, by species, adjusted for depth and management period, and those by fishery sector are pending the receipt of data from the WCGOP.

What effect may IFQ programs have on discards, and what design elements might tend to increase or decrease discards?

The concept of a management “toolbox” was outlined in the bycatch mitigation program draft EIS (PFMC 2004c). It is likely that a combination of present tools and new IQ tools would be used to help minimize bycatch should an IQ program be implemented. Quigley (Quigley 2004) identified several methods potentially useful in reducing at-sea discards under an IFQ program (Table 11). Quigley's review concluded that multispecies fisheries managed under IFQs have had mixed success. British Columbia experienced a decrease in discard along with an underachievement of the TAC for many species. Success in the BC program was attributed to linking quota to catch (including bycatch) instead of landings, the requirement of 100% observer coverage, transferability, and disincentives for not covering catch with quota.

Area Management

Is it reasonable to expect the redistribution or concentration of catch under an IFQ program compared with status quo?

A number of factors have been identified that influence the geographic distribution of harvest. In general, the ability to divide and transfer quota shares under an IQ system, as compared to the license limitation system, would likely increase the influence of factors whose effect has been muted by the lack of exclusivity in the fishery and fishermen's lack of opportunity to benefit from a decision to reduce the scale of operation. While the degree and direction of any shift is not predictable, the system changes that are projected indicate an increased likelihood of geographic shifts in fishing activity under IFQs as compared with a license limitation system.

What kind of geographic shifts have been observed historically?

Under past and present fisheries management, distribution of fishing effort has not generally been constrained, except by the application of depth or area specific regulations. Catch and catch per unit effort demonstrated strong changes over time and some changes over latitude. Generally, the survey biomass anomalies for lingcod, sablefish and Dover sole were associated with time but with less association by latitude. Catch and catch per unit effort demonstrated strong changes over time and some changes over latitude. Two dimensional surface plots of trawl landings anomalies of the same species demonstrated temporal and some latitudinal changes over time, but did not always follow the same trend as those indicated by survey data.

What biological concerns might be associated with an increase in the concentration of harvest in some areas?

In this report, we review the Canadian government's approach to area management of its TACs, and review stock assessor's concerns over potential area impacts.

The Canadian government adopted an area allocation scheme (DFO 2004) for

conservation reasons (Figure 1 and Table 12). To the degree stock information was available, area allocation was used to prevent overfishing within these sub-areas due to possible effort concentration, and to achieve yields appropriate to the productivity of these areas. In addition, area allocation was prescribed as a precautionary measure in the absence of clear-cut stock information. The concerns for overfishing stemmed from consideration of the IVQ system and its application to a mixed stock fishery. Without area allocation, shareholders could concentrate on highly valued species in areas close to home ports. Area allocation, therefore, was designed to prevent overfishing and possible localized and/or serial depletion of resources.

Feed back from stock assessors was sought to provide the TIQ analytical team guidance on the potential impact of using an area allocation scheme for distribution of OY vs not doing so, in alternative IQ systems. There was a mixed response from stock assessment authors on the need for area management.

While the extent of potentially adverse concentrations of effort is unknown, area management may be a precautionary tool useful in preventing overfishing within sub-areas of groundfish stocks. Area allocation of OY for West Coast groundfish should be considered at least for species that have known problems of localized depletion (lingcod) or have a high potential for localized depletion.

Stock assessment scientists, fishery stakeholders, and managers should jointly evaluate the question as to whether or not area management will improve stock assessments, sustainability, and overall yield. If area management is found to be a preferred sub-alternative, then these groups should also be instrumental in defining management areas.

Magnitude of Economic Issues

Indicators of the approximate magnitude of the current activity that would be impacted by an IFQ program are shown along with some initial indicators of the size of potential impacts.

Tables illustrate the magnitude and distribution of harvesting and processing activity among West Coast port areas. Table 13 shows exvessel revenue from landings by limited entry trawl and other vessels in West Coast port areas in 2003. Table 14 shows the number of vessels, buyers and deliveries associated with these landings. The table also shows the number of vessels and total revenue associated with those vessels that retired from the limited entry trawl fleet following the buy back in December 2003.

The Fisheries Economic Assessment Model (FEAM) was used to estimate the regional income impacts generated by commercial fishing activities. Table 15 shows FEAM estimates of exprocessor value and regional income impacts resulting from deliveries by limited entry trawl and other vessels in West Coast port areas in 2003.

Effect of IQs on Asset Values

The literature on assets such as permits and quotas, in general, is based on asset theory, that is, permit and quota value is determined by the discounted stream of expected profit able to be gained from that asset. Factors such as ecological uncertainty, external economic occurrences (changes in the GDP), and uncertainty associated with management of the resource can influence this value. In addition, reported exchange prices for these assets can be skewed or inaccurate due to incentives to avoid surcharges, capital gains taxes or similar fees. It is also likely that prices reported for quota or permits will be difficult to sort out in situations where the exchanges also involved other

assets (such as vessels and gear) or services. Furthermore, it is not known how individual quota, a new asset, will influence or be influenced by other assets like permits and vessels, though there are theoretical reasons to believe that for the West Coast, the implementation of IFQs would likely result in a reduction in the value of groundfish limited entry permits.

While there is no literature pertaining to vessel value changes under IQ management, economic theory suggests that vessel values will be influenced by the level of consolidation that occurs, the ability of new entrants to gain access to the resource and to other fisheries, and the ability of current permit owners to adjust their operation in response to IFQ implementation.

The literature available referring to processor assets provides no consensus on how processor assets will be affected by implementation of IFQs, except to indicate that consolidation and other changes can result in the occurrence of stranded capital.

Potential Efficiency Gains Under IFQs

A number of economic studies have analyzed the efficiency gains created by implementing an IFQ management system. The efficiency changes discussed in these studies typically occur through one or more of four mechanisms: fleet restructuring, increased efficiency of individual vessels, shifting of harvesting to relatively more efficient vessels, and increased product value.

Empirical studies of efficiency gains from IFQ implementation vary in key factors such as species under management, features of the IFQ program, harvesting technology, and data availability. Results vary considerably across studies, with a number of studies estimating annual efficiency gains of over \$10 million.

The Northwest Fisheries Science Center (NWFSC) is undertaking a cost-earnings survey of the limited entry trawl fleet during the first quarter of 2005. With a satisfactory response rate, this survey will provide improved data for estimating potential efficiency gains from implementation of an IFQ program.

Program Setup Costs

The analysis outlines some major IFQ program costs associated with initial development and setup. The main focus is identifying factors that will influence the costs. Dollar estimates are not provided at this time. Some of the costs discussed are:

- **Quota Tracking and Matching (Software Purchase and Program Development)**
- **Initial Issuance of Quota**
- **Appeals Process**
- **At-Sea Observer Program Setup**

Other potential costs that will need to be addressed include:

- Education and Outreach
- Change in Administrative Costs associated with writing of regulations
- New Entrants Program
- Quota Market Development and Setup
- Committee and Team Meetings
- Updating and Coordination of Landings Recording Devices and Methods
- Dockside Monitoring

- Allocation Database Creation and Analysis

Enforcement Costs

With adequate tracking and monitoring elements in place (including 100% at-sea coverage and an a dockside monitoring program) very little additional enforcement effort would be required with the implementation of an IFQ program. FTE estimates have been developed by the TIQ Enforcement Group and will be forthcoming.

IFQ Allocation

Initial allocation of IFQ will be one of the most contentious issues. There are many decision points along the way.

Summary of Data Quality Issues

Landings of many of the rockfish and other groundfish species are recorded in PacFIN using generic “nominal” or “unspecified” categories. This is especially true prior to 1999. While in many cases, landings in these generic categories are assigned to individual PacFIN species codes by assuming average species composition, coverage is not uniform along the West Coast and not all generic categories are reassigned. This factor reduces the reliability of using historical landings as indicators for allocating individual species quotas. Data is provided to help illustrate the magnitude of this issue and to indicate how the data has changed over time.

Qualification by Crew

Allocations to crew members would require criteria be developed to determine which crew members qualify and how much of the initial allocation they would receive. Given the limited data available, the following are some options for allocating IFQ among crew members.

Qualification Basis	Potential Allocation Formulas
Signature on a landings receipt (fish ticket). [This data is not in the data system and would have to be submitted at the time of application]	<ul style="list-style-type: none"> • Equal allocation • One point for each year in which a groundfish fish ticket is signed • Points based on pounds landed of each species for which the individual signed tickets
Tax return with information stating that the person received income from working on a groundfish trawl vessel (regardless of whether he or she helped in the harvest of groundfish)	<ul style="list-style-type: none"> • Equal allocation • One point for each year working on a groundfish trawl vessel • Points based on the vessel's annual landings of each species for that year. (A person working on multiple vessels in a year would either: (1) choose a vessel for his or her catch history that year, or (2) receive full credit for all vessels he or she worked on. Both options entail confidentiality issues.)
Sworn affidavit from the vessel owner/skipper. [Vessel owners may not know what crew was on board. Vessel skippers may have an interest in qualifying themselves—a conflict of interest.]	

Another possible qualifying standard would be the submission of a affidavit by the applicant.

Qualification by Communities

An initial allocation of IFQ or CDQ to communities requires the identification of an amount of the OY to be set aside for the purpose, a body to represent the community and criteria for allocation. For CDQ programs there may be certain criteria the community must meet in order to qualify for participation in CDQ program.

Intersectoral Allocation

LE Vessels Using Open Access Gear

Data for 1998 and 2003 indicate that 80 and 16 LE trawl vessels landed a total of 280,000 and 154,000 pounds, respectively, of groundfish using open access gears.

**Groundfish Trawl Individual Quota
Analytical Team
October 2004 Report**

Status Quo Management Regulations

Status quo does not necessarily mean that conditions in the fishery remain stable. Status quo is what would happen if no action is taken to change the current fishery management regime. It entails continuation of existing harvest policies and continued use of the management measures by which those harvest policies are implemented. The definition of status quo will determine which costs and benefits are attributed to an IFQ program or other alternatives and which costs and benefits would be incurred even if the proposed action is not taken. Thus, status quo is not the fishery as it exists this year or the next but rather the projection into the future of current trends and commitments. Because status quo includes changing conditions in future years, the 2003 fishery (or any specific year) would not be considered status quo.

Status quo for management measures for the trawl fishery is generally characterized by cumulative landing limits and season management for Pacific whiting. A list of management measures entailed in status quo is provided in the first column of Table 1.

Defining status quo requires a determination of the status of the preferred alternative adopted under the programmatic bycatch EIS in April 2004. The preferred alternative included the following elements:

- the use of existing bycatch management measures for the protection of overfished and depleted groundfish stocks and to reduce bycatch and bycatch mortality to the extent practicable.
- baseline accounting of bycatch by sector for the purpose of establishing future bycatch program goals.
- the development and adoption of sector-specific caps for overfished and depleted groundfish species where practicable (it is expected that sector bycatch caps will be phased in and would include: monitoring standards, full retention programs, and individual vessel incentives for exemption from caps).
- the future use of IFQ programs for appropriate sectors of the fishery (the FMP would incorporate the Strategic Plan's goal of reducing overcapacity in all commercial fisheries).

The management tools associated with this preferred alternative are reflected at the bottom of the first column of Table 1.

On the one hand, the programmatic bycatch action committed the Council to full bycatch accounting and harvest mortality controls that take bycatch into account. This commitment implies that status quo entails certain follow-on actions. On the other hand, the trawl IFQ EIS will evaluate the main management alternatives adopted under the programmatic bycatch EIS (vessel cumulative catch limits, sector caps and IFQs). Additionally final action under the programmatic bycatch EIS anticipates increased observer coverage. The description of the adopted alternative (Alternative 7) states that over the longer term "the observer program will be upgraded to produce inseason catch data on overfished species." On that basis it might be assumed that there will be increased bycatch monitoring in the future regardless of the management option selected. If this is the case, it would not be appropriate to include the cost of all additional monitoring for bycatch (the change from current conditions) as part of the cost of an IFQ program but rather some increase in monitoring should be included as part of status quo, reducing the change from status quo required to implement IFQs.

There is a similar situation with respect to enforcement costs. The TIQ Enforcement group has identified significant additional resources required to bring enforcement to adequate levels under current management. Once an adequate level is achieved under current management, the

additional resources required for a move to IFQs would be substantially smaller, as compared to the move from today's enforcement levels to what would be necessary under an IFQ program.

Elements Defining Comparison Scenarios	Baseline	Status Quo
Bycatch Control	Score card accounting for overfished species including estimates of bycatch	Score card accounting for overfished species including estimates of bycatch
Enforcement	Current Levels (2003)	Approximately double
At-sea Monitoring - Observers	Approximately 15-20% (prior to implementation of the buyback program)	50% (for example)
Harvest Levels	Current (2003)	Projected (see Analytical Team Report)

Harvest Levels Under Status Quo Harvest Polices

Having some idea of potential future fishery production under status quo will help economists and stakeholders evaluate the merits of different alternatives compared to the current system. The management actions contemplated in conjunction with an IFQ program would not directly change the policies that determine the amount of annual catch available for harvest. Therefore, projections of available harvest under status quo harvest policies are relevant for evaluating the long-term net effects for IFQs and other alternatives to status quo.

Currently market limits and tight regulations on overfished species tend to constrain attainment of OYs. While an IQ program may address some of these constraints, it is likely that many will remain to some degree for the foreseeable future. These constraints should be eased to the degree that IQ participants change fishing strategies and gears to more selectively harvest non-overfished species, and develop markets for underutilized species.

Results:

The present fishery is characterized by significant underharvest of available catch OY for many species - approximately half of the available OY is being taken (Table 2).^{2/} For some overfished

2/ Methods: Estimated catch 2002 and 2003 (including discard) in metric tons were compared to target OY levels using data previously summarized in Amendment 16-3 (PFMC 2004d). (Note that for several species OY = ABC, which is usually the case when biomass is above the level where application of a rebuilding plan or the 40:10 Rule is necessary)

Future yields were estimated for groundfish using existing information to produce OY estimates for years 2010, 2015, and 2020. As a starting point, Council preferred OY numbers from Table 2-1 in the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery (PFMC 2004a) were used to project potential yields out to 2020. This was the default projection if no additional information was available. Stock assessment authors and authors of rebuilding analyses were contacted to obtain any projections they may have provided using stock synthesis or the Andre Punt rebuilding model. Outputs were examined from various documents to ensure projected values were associated with Council preferred OYs for 2005-2006. In some cases, where projections were short of the desired year, the OY for the furthest year projected by the author was used for all subsequent years (e.g., if an author estimated yield out to 2012, the same yield was used for 2015 and 2020). In other cases - non-linear interpolation techniques were used to fill in years if estimates were given

species such as lingcod and bocaccio there was overharvest of OY in both 2002 and 2003. While some of the stocks of groundfish are presently being constrained by overfished species, several others may be underutilized due to market limits.

OYs for the foreseeable future are likely to remain fairly stable for most species, but constrained by overfished species (Table 3).^{1,2} Projections were only able to be made for nine species of groundfish. Species like longspine thornyheads and yellowtail rockfish are substantially underharvested due to constraints, likely imposed by lower limits on shortspine thornyheads and canary rockfish. Most overfished species will require many years of constrained harvest levels as rebuilding occurs, due to the generally low productivity and intrinsic growth characteristics of the species. Lingcod may be one exception - OY is expected to be 2,414 mt in 2005 and beyond compared to 735 mt in 2004.

Discussion

Subject to constraints of species under rebuilding plans, some opportunities may exist for reduced discard and fuller utilization of catch OYs. A carefully designed IQ program (and possibly other program alternatives) may provide incentives to modify gears and strategies to retain more catch and access more of the available OY. It is difficult to forecast future harvests based on stock conditions with a high level of certainty. The status quo management and market forces appear not to permit full utilization of available catch. Present day stock assessments and catch OY levels suggest the potential for doubling landed catch if a suitable alternative fishery management program results in increased selectivity and efficiency in fishery practices. Inclusion of present non-marketable species may prevent an effort shift towards them (Quigley 2004). IQ holders would have to develop markets for several species in order to approach attainment of present or future OY levels.

Management Measures Remaining in Place with IFQs

Full description of the IFQ alternative involves specifying:

- the IFQ program
- existing management measures that would and change with implementation of an IFQ program

The second column of Table 1 indicates the existing management measures likely to change and those likely to remain in place with adoption of an IFQ program. This information will be incorporated with the description of the IFQ alternative.

Bycatch (Discard of Incidental Catch)

Reasons for current discards

The Magnuson-Stevens Act generally defines “bycatch” as fish that are discarded for regulatory or economic reasons.^{3/} The term applies to both incidental and target catch. Quigley (2004)

beyond 2020 but did not include desired intervening years. The source of information for the estimates is annotated in the spreadsheet.

3/ The term “fish” is defined to include nearly all types of marine life except marine mammals and seabirds. For purposes of this discussion, bycatch will be considered discarded incidental catch taken in the groundfish fishery. It is further assumed that all discarded fish die except for lingcod and sablefish which are assumed to have a 50% survival rate when

summarized several regulatory and economic reasons for discarding fish (Table 4). Two main categories of economic reasons are generally market or quality related. During 1995-1999 of the Enhanced Data Collection Program study, data on the reasons for discard were collected by these categories (Table 5). Market constraints were given as the primary reason for discard (68%), followed by regulations (24%) and finally for quality reasons (8%). It should be noted that several species that have been highly regulated with constraining cumulative trip limits over these years have had higher than average rates of discard for regulatory reasons. These data were not necessarily collected randomly or proportionately to catches by various strategies, depth, and area. It was assumed that skippers providing the reasons for discard were doing so truthfully. The West Coast Groundfish Observer Program collects similar data. This data has been requested by has not yet been made available.

Discard Estimates in the Current Fishery

Present information on discard is limited. Total catch estimates including discard mortality for 2002 and 2003 used in this report are recent updates to Tables 4-1 and 4-2 of the 2005/2006 annual specifications EIS (PFMC 2004a) (Tables 6 and 7).^{4/} Estimated discards remain high especially for highly regulated species, although there was an overall reduction in discard in commercial fisheries between 2002 and 2003 (Table 2). Discard of commercially caught lingcod was reduced between 2002 and 2003 but catch by all sectors exceeded OY by nearly 70% in 2002 and over 100% in 2003. Excess catch in both years can be attributed in part to overharvest in the recreational sector. In many cases, commercial discard rates were higher than 25% for some species but total catch still substantially less than OY.

Limited entry trawl bycatch of overfished species has been declining in recent years due in part to regulations that minimize effort in areas with high bycatch rates, and possibly due to changes in fishing strategies that tend to reduce the take of these species (PFMC 2004a).

Shoreside: Discard mortality by weight of overfished species for the shoreside limited entry trawl sector appears to have declined between 2002 and 2003 for all overfished species. Discard rates also declined for the shoreside sector except increases were seen for canary rockfish and bocaccio - two species with very restricted OY levels in 2003 (Tables 8 and 9).

At-Sea Deliveries: Large reductions in widow rockfish catches and discard mortality were seen in the at-sea sector while discard rates and discard mortality for other species remained similar (Tables 8 and 9).

discarded. Incidental catch are species taken in pursuit of target species.

4/ Discard Estimate Methods: PacFIN runs were used to develop coastwide landed catch for the 2002 and 2003 fisheries by sector. Annual landed catch by species was extracted from fishticket files by permit (limited entry) and fishing sector (shoreside trawl, at-sea trawl, fixed gear, tribal, and other). Sector discard amounts used to make estimates cited above (PFMC 2004a) were available as shoreside¹, at-sea, and fixed gear discard mortality. The proportion of commercial catch by limited entry shoreside and at-sea *trawl* sectors were estimated from PacFIN and multiplied by the total landed catch for key groundfish species listed in Tables 6 and 7. PacFIN landed catch was used directly for lingcod, canary rockfish, bocaccio, and yelloweye rockfish which have a high contribution of landed catch by the recreational fishery. Percent discard mortality was then estimated for shoreside and at-sea fisheries using the following formula:

$$\% \text{Discard Mortality} = \text{Discard Mortality} / (\text{Discard Mortality} + \text{Landed Catch}) \times 100$$

Sector discard rates were compared to overall groundfish rates and those found in a study comparing US and BC discard (Branch *et al.* 2004) (Table 10). Discard rates (expressed as percentage) in the British Columbia bottom trawl fisheries were generally lower than West Coast bottom trawl estimates from the WCGOP report (NMFS 2004) for those species declared overfished in the West Coast U.S. fishery. Annual estimates of discard rates for the shoreside based West Coast trawl sector for 2002 and 2003 include both midwater and bottom trawl groundfish catches. Thus, this sector includes vessels with directed Pacific whiting catches, and the overall discard rate for this species is low in comparison with the bottom trawl sector, which catches and lands very little Pacific whiting. The West Coast at-sea trawl sector uses midwater gear exclusively and there was very little bycatch of flatfish. At-sea trawlers had a higher discard rate for several species of overfished rockfish compared to the shore based trawlers. It should be noted that annual rate comparisons include corrections for survival of sablefish and lingcod (50% survival rate assumed) compared to West Coast and British Columbia bottom trawl comparisons for the 2001-02 and 2002-03 period.

Considerably more data have been collected by the WCGOP and these estimates are currently being revised. Updates to total catch mortality including discard, by species, adjusted for depth and management period, and those by fishery sector are not available at this time.

IFQ Design Elements and Impacts on Discards

The concept of a management “toolbox” was outlined in the bycatch mitigation program draft EIS (PFMC 2004c). IQ tools and other management tools can be used to 'mitigate' for the effects of fishing and help minimize bycatch (discards) to the degree practicable. Several tools outlined above (see above in Management Measures Remaining in Place with IFQs) and some of the IQ tools and their potential effects on groundfish can be found in Chapter 4 of the Bycatch Programmatic EIS (PFMC 2004c). It is likely that a combination of present tools and new IQ tools would be used to help minimize bycatch should an IQ program be implemented.

Much can be learned by a review of IQ systems used elsewhere that may have potential application to a West Coast trawl IQ program. In a recent review of multispecies IFQ fisheries, Quigley (2004) outlined several design elements or IQ management tools potentially useful in designing a West Coast multispecies groundfish IQ program. Depending on the application of various tools, bycatch or discard may be reduced or increased under an IQ program. Quigley (Quigley 2004) identified several methods potentially useful in reducing at-sea discards under an IFQ program (Table 11). Key aspects of an IQ program that are potentially useful in reducing bycatch include:

- Quota transferability
- Inclusion of overfished and non-marketable species in the IQ program
- Carryover provisions
- Appropriate penalties for overages
- Easy access to quota to cover catch
- Efficient quota tracking system
- Robust catch accounting (full observer coverage, VMS, and dockside monitoring)

Quigley's review concluded that multispecies fisheries managed under IFQs have had mixed success. British Columbia experienced a decrease in discard along with an underachievement of the TAC for many species. Where discard rates were higher, TACs were very low. **Success in the BC program was attributed to linking quota to catch (including bycatch) instead of landings, the requirement of 100% observer coverage, transferability, and disincentives for not covering catch with quota.** Other fisheries were found to have little change in discard levels (New Zealand), or reduced discard in the offshore sector but continued problems inshore (Australia SE Trawl). Some problems were encountered due to the complexity of New Zealand's system for acquiring quota to cover catches. Australia has had to develop a new plan for addressing bycatch issues.

Area Management

Introduction

Present management of the West Coast groundfish fishery involves very little allocation of annual OY by area. When subdivisions in OY are made for some species, they are usually done north and south of 36° N. Lat. or by INPFC area. In contrast, British Columbia's TAC is allocated by Pacific States Marine Fisheries Commission (PSMFC) areas for their groundfish fisheries, including the trawl IQ fishery. PSMFC areas are about 1/3 the size of INPFC areas. BC's area allocation of TAC was done for biological reasons as a precautionary measure to prevent excessive concentration of fishing effort and localized depletion of fishing resources near fishing ports. Stakeholders in BC were concerned that the IVQ trawl fishery entitlement and tradable IVQ shares could allow such concentration of effort.

The Trawl Individual Quota Committee (TIQC) is preparing alternatives for a limited entry trawl individual quota system for consideration by the Pacific Fishery Management Council (PFMC). The alternatives may include options that would restrict distribution of optimum yield (OY) and access privileges on an area basis. However, the TIQC has recommended area restrictions be implemented only if needed for stock conservation reasons..

Under an area allocation scheme, IQ shares could be allocated for all areas, but only a portion of the total OY would be available within an area. Area allocation of OY could be based on existing INPFC boundaries or some other area distribution scheme. There are different way to approach the allocation of IFQ by area. IFQ could be allocated based on an entities catch history within and area. However, data quality problems could lead to a complex allocation process and appeals. Another approach would be to allocate a vessel an initial allocation of, for example, 1% of the coastwide sablefish OY. Continuing with sablefish as an example, this percentage could be applied to the portions of OY north and south of 36° N Lat. which are 7,486 mt and 275 mt respectively for 2005. However, shareholders would have to trade shares to create or maintain fishing opportunities in areas they were accustomed to fish.

Socio-economic and biological concerns may motivate consideration of an area allocation scheme. Maintenance of fishing opportunities and protection of local community interests and processing infrastructure could be potential socio-economic reasons for allocating OY on an area basis. Without area allocation, there is some potential for effort to be concentrated within some areas. Allocating OY by area may prevent localized depletion of stocks - to the extent that little mixing or migration of stocks within the area is occurring.

Effects of Fisheries Management Approaches on Geographic Shifts in Fishing Effort and Fishing Practices - the Potential for Effort Concentration Under an IFQ Program

In general, the ability to divide and transfer quota shares under an IQ system, as compared to the license limitation system, is likely to increase the influence of a number of factors previously muted by the lack of exclusivity and lack of opportunity to benefit from a decision to reduce the scale of operation. While the degree and direction of any shift is not predictable, the system changes that are projected indicate an increased likelihood of geographic shifts in fishing activity under IFQs as compared with a license limitation system.

The distribution of landings along the coast is the aggregate result of individual decisions on whether or not to participate in the fishery and at what level. Different management systems present a different suite of opportunities, incentives, and barriers for those entering or expanding their activities, and for those leaving or contracting their activities.

In the following sections we identify how the influence of various factors that affect the distribution of fishing activity change with changes in the management system. The greater the change in the influence of any factor the more likely it is that the change in the management system will be accompanied by adjustment in the scale and participation of individual fishing

operations. If the individuals among whom the redistribution occurs are located in different areas, the consequence may be a geographic redistribution of activity and associated fishery benefits. Characteristics of the fishery which have little influence over the ultimate geographic distribution of effort under one management system may be more influential under another.

Initial assignment of quota shares are based on criteria developed by the fishery managers, usually linked to historical landings (volume or value of landings), current fishing capacity, or willingness to pay (as with auctioned quota shares). Under IFQs profits or rents tend to be higher since participants can match their capital and time their harvests to maximize the value of their landings.

Factors in the Decision to Fishing Practices:

The motivation to move or change fishing effort depends on the perceived benefits of making the change. Benefits may take the form of:

- Economic Factors - Increased profits (increased revenue, reduced cost);
- Social Factors - Intangibles (quality of life, cultural, familial, or community ties).

An individual fisherman's decision to change may result in the following actions:

- Expansion or contraction of fishing operations (or effort) in the existing geographical area or home port;
- Relocation of fishing operations to a different area or home port;
- Cessation of fishing operations in favor of selling, surrendering or allowing the fishing permit to lapse.

Key Economic Factors (Determinants) of Movement or Change in Fishing Activity

From a business standpoint, we assume that fishermen are motivated to maximize the profits derived from fishing activities. Economic factors, therefore, enter business decision processes, including decisions related to changing the level and location of fishing activities. Certain dynamic forces influence production related to fishing activities, and fishermen exercise varying degrees of control over them. These forces can be grouped into exogenous and endogenous forces (Box 2000).

Exogenous Forces:

Examples of exogenous forces include: seasonal weather patterns and oceanographic conditions, regulatory changes, geographic distribution of target fish species, foreign monetary exchange rates, fuel prices or other forces beyond the control of fishermen that nonetheless influence production and profitability. Management systems with open access or limited entry coupled with high latent capacity may reduce profits and decrease flexibility to make business decisions to change activities or fishing location. IQ systems, if properly designed, are thought to reduce latent capacity, concentrate fishing among fewer participants, and provide increased economic flexibility. Thus, responses to exogenous forces might be summarized as follows:

- Natural changes in weather and oceanographic conditions- increased flexibility may enable the fishermen to consider alternative areas to expand or contract fishing operations, to better meet desired scale of activity, or relocate their base of operations.
- Biological changes in abundance and or distribution patterns of target species - increased flexibility and profit offers fishermen greater latitude in decision to expand or contract fishing activities. The ability to buy or sell quota broadens the range of alternatives to better meet a desired scale of activity or relocate.
- Market conditions including financial markets and foreign exchange rates and demand - Market fluctuations would likely encourage expanding or contracting activities, as well as timing landings to maximize the value of quota landed. Again, flexibility, and a better financial posture would reduce barriers to relocation of operations if necessary.

- Infrastructure and Amenities - including harbor location and features, shipyard facilities, ice suppliers, fuel docks, etc. Increased flexibility may permit movement to locations with better infrastructure and amenities.

Movement and relation may occur from an entity relocating its fishing operations or through the transfer of IFQ to a different area.

Endogenous Forces:

Examples of endogenous forces include: fishermen's selection and level of labor inputs, choice of gear or materials used in harvest production, how much fuel to use, how and where to deploy gear, what species to target, in what condition the fish are landed, or other business decisions that are primarily under the control of the fishermen and that influence profitability. Responses to endogenous forces under a potential IQ management system also reflect increased flexibility and a better financial position:

- Production processes - choice and combination of inputs to production, where to fish, gear deployment, mix of fish and target species, where to land fish, and innovation. The ability to buy and sell quota, or to specialize in certain species provides a greater amount of control over production processes. An IQ system would likely provide the greatest latitude in business decisions to expand, contract, or relocate fishing activity compared to alternative systems.
- Investment options - prospects of exiting the fishery with a financial gain. Fishermen can consider opting out if more attractive investments are available. This type of flexibility provides a primary motive for consolidation of fishing effort among fewer remaining fishermen. Decisions of this type are likely to influence the overall geographic distribution of effort.

Key Social Factors (Determinants) of Movement or Change in Fishing Activity

Social factors play an important role in decisions to expand, constrict, or relocate fishing activities. Anticipation of these factors can also influence the design features of an IQ program to ensure preservation of core aspects of community, family, and cultural ties. As was pointed out above, IQ systems are thought to reduce latent capacity, concentrate fishing among fewer participants, and provide increased economic flexibility. The fact that effort may be consolidated creates tension to the degree consolidation affects community, family, and cultural structures. Key factors and possible responses to change are summarized below:

- Community Ties and Contribution - social connections fostered by fishing activity dependent on fishing, gear groups, those that target certain species, vessel types, groups associated with fishing. Some ties may be strengthened, especially with those remaining in the fishery, a closer interwoven community support structure may help support smaller family fishermen to keep them in the fishery. On the other hand, larger shareholders may have more flexibility and motivation to move operations.
- Familial Ties and Tradition - family lines passing down through generations, traditions (Gilden and Conway 2002). Movement to an IQ system involves changes that may have a disproportionate impact on family structures (McCay 1995). Smaller operations that stay are less likely to move, whereas, larger family based companies may move to seek consolidation of quota.
- Cultural Ties and Values - fishing a way of life, tradition. Quota may be so small as to threaten a fishing culture, and a reduction in fishing effort or a shift in geographic area may result if it preserves the culture. Shifts would depend on the size of the fishing operation and available resources.
- Social Relationships of Production - concentration of property rights or privileges relating to changes in relationships and vertical integration (McCay 1995). Crew shares may change as share owners develop economic strategies to deal with

increased cost of owning shares. Crew may shift locations to find equity. Smaller entities may relocate away from areas dominated by larger corporate entities in order to remain economically viable.

Historical Shifts in Catch, Effort and Stock Abundance

Under past and present fisheries management, distribution of fishing effort has not been constrained, except by the application of depth or area specific regulations. OY is largely set on a coastwide basis, or if partitioned, it is typically done so only for a few species north and south of lines of latitude dividing up the coast into two larger areas. Fishers have been free to move north and south of these boundaries to fish for cumulative trip limits associated with species-specific management measures designed to achieve target harvest levels for the area. PacFIN port landing and logbook data and triennial survey data were examined to look at historical shifts in catch, effort and stock abundance on an INPFC area basis. Spatial surface plots were made for representative groundfish species using catch and survey data. Catch and biomass were normalized so that latitudinal and temporal anomalies could be examined for trends. Catch and catch per unit effort demonstrated strong changes over time and some changes over latitude. Generally, the survey biomass anomalies for lingcod, sablefish and Dover sole were associated with time with less association by latitude (Figures 2, 4, and 6). Two dimensional surface plots of trawl landings anomalies of the same species demonstrated temporal and some latitudinal changes over time, but did not always follow the same trend as those indicated by survey data. Catch per unit effort trends in the INPFC Columbia area followed biomass anomaly trends for lingcod and Dover sole to some degree (Figures 3 and 7).

Survey, fishery information, and habitat suitability maps when available could be used to scale OY and allocate to more areas than those currently used (one or two). The rationale for doing so is explored below.

Biological Concerns Associated with Effort Concentration

Economic and biological forces could lead to concentration of fishing effort and areas of localized depletion. These impacts are a possibility under present management systems or a potential IQ system. Making an informed choice for an IQ program can be facilitated by evaluating several sources of information, including a review of other area management programs, review of stock assessment data, spatial analysis of fishery and survey data, and spatial analysis of habitat suitability maps soon to be available from National Marine Fisheries Service (Copp 2004). In this report, we review the Canadian government's approach to area management of its TACs, and review stock assessor's concerns over potential area impacts.

Canadian Government's Area Management Program

The Canadian government adopted an area allocation scheme (DFO 2004) for conservation reasons. Quota species have a total allowable catch (TAC) set either on a coastwide basis, sub-area, or grouping of sub areas (Figure 1 and Table 12). There are 23 Canadian ports and 3 authorized U.S. ports that receive groundfish. Most groundfish are landed into a few major ports. Major groundfish ports include Prince Rupert - northern mainland, Greater Vancouver - southern mainland, Ucluelet - West Vancouver Island, and Port Hardy - Northeast Vancouver Island. TAC was allocated by management area primarily for biological reasons. To the degree stock information was available, area allocation was used to prevent overfishing within these sub-areas due to possible effort concentration in the absence of an area management scheme, and to achieve yields appropriate to the productivity of these areas. In addition, area allocation was prescribed as a precautionary measure in the absence of clear-cut stock information. The concerns for overfishing stemmed from consideration of the IVQ system and its application to a mixed stock fishery. Without area allocation, shareholders could concentrate on highly valued species in areas close to home ports.

Area allocation, therefore, was designed to prevent overfishing and possible localized and/or serial depletion of resources. The proportion of TAC assigned by area was determined from a variety of sources including stock assessments, knowledge of stock genetics, tagging studies, physio-geography, catch and effort data, and advice from fishers with detailed knowledge of fishing grounds. In some cases, former management boundaries were adjusted as a consequence of the review and analysis process used to determine area allocations. The robust observer program Canada employs collects additional biological data on species composition, concentration, and distribution. DFO continues to review biological data and determine appropriateness of area allocations.

As described above, once Individual Vessel Quota (IVQ) shares were determined for each vessel, they were applied to management area distributions of OY such that vessels received shares for all areas. Shareholders then had the opportunity to trade species shares and acquire mixes and quantities of shares needed for desired fishing strategies and areas. Trading of shares remains a part of Canada's IVQ system.

Twenty percent of the groundfish trawl TAC was set aside for distribution based on advice from the Groundfish Development Authority (GDA). The GDA's recommendations address community development, fairness, and equity goals established by the GDA's plan.

Input from West Coast Stock Assessment Scientists

Existing fisheries management measures do not constrain fleet movements between large INPFC statistical areas. Most OYs are set on a coastwide basis. Current measures do constrain the amount of fish taken within Rockfish Conservation Areas (RCAs) causing changes in fishing patterns that have been well documented (Hannah 2003).

It is important to evaluate the potential impact of possible geographic effects that might be imposed by options being considered for the trawl IQ program. Feedback from stock assessors was sought to provide the TIQ analytical team guidance on the potential impact of using an area allocation scheme for distribution of OY vs not doing so, in alternative IQ systems.

Under an area IQ scenario, IQ shares of OY could be allocated by geographic area - sub INPFC, INPFC or larger (combinations of INPFC areas) to help ensure distribution of catch along the coast and to prevent localized depletion. Under another scenario, IQ share allocation would not be restricted to geographic area - vessels and or sales of shares could lead to movement of fishing effort and harvest between areas - impacting both stocks and assessments. The following questions/issues were discussed with several stock assessment scientists and generalized responses follow each issue.

Issue 1. Do you think an IQ program without area allocation would have the potential to adversely impact stocks (localized depletion, impacts on recruitment in other areas, or other impacts you might be aware of) if there were a concentration of effort into areas with highly valued species or into areas with higher concentrations of fish (higher CPUE)?

Responses: Generally, stock assessment scientists thought that effort under status quo has permitted concentration of effort. Fishers go to high CPUE areas, but these areas are ephemeral and thus effort will continue to shift. Effort is currently constrained by overfished species, and will likely continue to be so. A reduction in the numbers of participants might increase the potential to concentrate effort in certain geographic areas.

One scientist felt it was not a long term problem - as catch rates go down, the incentives to target in certain areas will dissipate as well. Also, the trawl fishery is a multispecies fishery and several species are sought as target species. It is likely that not all of these species are in highest concentration in the same areas. Localized depletion could be a problem, depending on the species - rockfish and lingcod are likely candidates. In fact, lingcod is thought to be overfished

in the south but not in the north. Application of spatial restrictions could complicate things unnecessarily depending on the species - Pacific whiting is a good example of a species that may not need OY allocations on an area basis.

One scientist felt it can't be any worse than it is now. MPAs, if used, create the reverse of effort concentration - areas of underfishing. Another scientist provided a distribution graph of yellowtail rockfish - indicating a possible boundary between stocks - and wondered if similar data could be looked at to find boundaries of other species. There was some uncertainty about what the real impacts would be.

Issue 2. Do you think it would be possible to detect these impacts? What kind of indicators would you look for?

Responses: Lack of spatial restrictions could lead to problems depending on species. Detection of impacts might be possible, but data collection would have to be increased and a stratified sampling scheme used. Most scientists felt that you would need to look at changes in area specific abundance trends - using survey information and / or fishery CPUE, and age composition data. It might take a big change to detect a difference between areas due to the high degree of variability in logbook data. To detect local depletion, the scale of areas would have to be the same scale as the area depleted. Declines in CPUE, and changes in age composition coupled with heavy harvest could indicate a problem. Response to changes in fishing concentration would depend on species resiliency. One scientist felt that it would be impossible to detect impacts as there is no baseline established.

Issue 3. Stock assessments are typically done for large geographic areas. What impact would potential effort concentration (in the absence of controls to restrict proportions of harvest to particular geographic areas) have on stock assessments? Would it be possible to do stock assessments for species you are familiar with for smaller geographic areas?

Responses: Smaller sample sizes in sub-areas (under an area allocations scheme) would lead to greater uncertainty. Boundaries should use existing lines - as data are gathered that way and it is hard to dissociate data sets and recombine them. Assessments are done for large areas under the assumption that broad distribution of fleet and movements of fish diffuse localized recruitments and mortality. Concentrated effort in an area for a long enough period of time may lead to paradoxical model results. Impacts could bias results. MPAs may have an opposite but equally problematical effect - older fish from an MPA may spill over into fished areas giving the impression of lower mortality than truly exists.

Effort typically concentrates in some areas. The geographic scale of assessment would be limited by the coarseness of market sampling. It would be hard to separate fishing effects from effects of fish movement or sampling in interpreting age compositions. Effort concentration may be a long term problem already - localized depletions and surpluses are averaged when doing an assessment on a large geographic area.

Spatial modeling is needed along with more data on stock structure - It could be very complex due source and sink issues and how to characterize them. There may be too many variables to answer this question. A simple spatially segregated model could be used, but they demand data of highest quality. One scientist concluded that you can't do meaningful stock assessments in small areas.

Discussion

An area distribution of TAC was chosen for British Columbia's trawl IQ system. Canadian managers and scientists assert this was done for biological reasons - to prevent concentration of fishing effort, overfishing, and localized depletion of groundfish stocks, especially those close to home ports. Walters and Bonfil (1999) felt that species TACs managed by fishing ground could

be successful in maintaining spatial and species diversity if quotas were adjusted annually based on accurate stock assessments. Even so, they favored limiting effort (through an effort quota system) and relying on spatial effort redistribution to prevent localized overfishing. While Canada has parsed out TACs for many species on an area basis, they have not relied entirely on accurate stock assessment information to do so.

Comparison of the Canadian system of TAC allocation by area with proposed alternatives under the West Coast Trawl IQ program should be done with caution. British Columbia's groundfish management area is geographically much different and occupies a much smaller spatial scale than the US Washington, Oregon, and California (WOC) management area. British Columbia has fewer ports and most are concentrated in the southern part of the management area. Considerable effort went into designing British Columbia's area allocation scheme, involving scientists, managers, and representatives of the fishing industry. At least as much effort would be required to develop such a scheme for the WOC management area.

Current stock assessments assume homogeneous distribution of the fish populations and free mixing across the region being assessed and the current suite of models do not yet have the capability to incorporate spatial structure such as mixing, moving, and dispersal rates (Punt and Methot 2004). Impacts of area management tools such as MPAs on stock assessments are only beginning to be evaluated (Punt and Methot 2004). This places limits on our ability to understand how current management, which incorporates the use of RCAs, and a possible future management alternative, which could use area allocation of OY and IQ shares, influence stock assessment results.

US scientists felt that current management has not prevented concentrations of fishing effort. They also felt it would be difficult to detect potential impacts without improvements in sampling and modeling. Some felt that designing an IQ system without area allocation of OY may not be a significant issue as effort does shift around anyway and declining CPUE would lead to compensatory fishing behavior that would result in changes in fishing location.

At the same time, factors other than stock CPUE affect distribution of harvest. For example, port costs, grounds familiarity, CPUE for a complex (as distinct from that from that of an individual stock), and fisherman social connections to a port.

There is evidence that pelagic and demersal groundfish distributions experience spatial and temporal changes in response to environmental drivers. A study of groundfish in the Gulf of Alaska found that adult and juvenile groundfish were structured primarily along depth gradients. Differences in abundance, species composition, and distributional patterns of groundfish appeared to be related to changes differences in upwelling between the eastern and western Gulf of Alaska (Mueter 1999). NMFS triennial trawl surveys off the Washington, Oregon, and California (WOC) management area have been used to characterize spatial characteristics of groundfish (Gabriel and Tyler 1980; Weinberg 1994). A study of groundfish off Oregon and Washington also found persistent groundfish assemblages along depth gradients and concluded that logbook data could be used to augment triennial trawl survey data to better characterize spatial and temporal distributions of groundfish (Lee 1997). Although persistent patterns in groundfish assemblages provide some stability and predictability - changes in abundance, diversity, and spatial distributions in response to fishing and environmental conditions can be anticipated. Use of several of sources of information may help to more fully understand spatial and temporal variability should the Council move towards management of OY on an area basis.

Summary

- There are several biological, economic, and social factors that may influence the distribution of fishing effort along the West Coast.
- Effort has shifted in the past and there is the real probability effort would continue to shift under an IQ program.

- While the extent of potentially adverse concentrations of effort is unknown, area management may be a precautionary tool useful in preventing overfishing within sub-areas of groundfish stocks.
- Area allocation of OY for West Coast groundfish should be considered at least for species that have known problems of localized depletion (lingcod) or have a high potential for localized depletion.
- The suggested boundaries for OY allocation should be based on OYs outlined in the Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery (PFMC 2004a).
- Understanding potential impacts of an IQ system within areas smaller than present management or assessment areas may be difficult as little information exists to evaluate past or present fishery impacts by sub-area. In addition, changes in fishing strategies may influence fishery-dependent data.
- The Council should continue to support research into spatial sampling and modeling approaches for stock assessments.
- Stock assessment scientists, fishery stakeholders, and managers should jointly evaluate the question as to whether or not area management will improve stock assessments, sustainability, and overall yield. If area management is found to be a preferred sub-alternative, then these groups should also be instrumental in defining management areas.
- As a precautionary measure - area allocation on a smaller than INPFC area basis could be considered using area distributions that are consistent with catch history, survey data, and habitat. If area allocation is used, fishery independent and fishery dependent data sources should be incorporated into an ongoing monitoring program to evaluate the appropriateness of area allocation of OY.

Magnitude of Economic Issues

Status Quo Gross Revenue (exvessel)

The following tables are provided to illustrate the magnitude and distribution of harvesting and processing activity among West Coast port areas.

Table 13 shows exvessel revenue from landings by limited entry trawl and other vessels in West Coast port areas in 2003. Table 14 shows the number of vessels, buyers and deliveries associated with these landings. The table also shows the number of vessels and total revenue associated with those vessels that retired from the limited entry trawl fleet following the buy back in December 2003.

Status Quo Gross Revenue (exprocessor) and Local Community Impacts

The Fisheries Economic Assessment Model (FEAM) is used by PFMC to estimate the regional income impacts generated by commercial fishing activities. Table 15 shows FEAM estimates of exprocessor value and regional income impacts resulting from deliveries by limited entry trawl and other vessels in West Coast port areas in 2003.

Effects of IQs on Asset Values

An asset is a valuable item that is owned. Fishing permits, individual fishing quotas, fishing vessels and gear, and processing equipment and facilities are all assets. It is possible that the value of some of these fish industry assets will change upon implementation of an IFQ. The following sections describe the potential changes in the value of fishing assets following implementation of an IFQ program. The following discussion provides a contextual background on the subject of fish industry asset values. It is hoped that this information is useful to those

individuals and entities that own fish industry assets associated with the groundfish trawl fishery, and to fishery managers.

Summary

The literature surrounding assets such as permits and quotas, in general, corresponds to that predicted by asset theory. That is, permit and quota value is primarily influenced by the discounted stream of perceived profit able to be gained from that asset. Factors such as ecological uncertainty, external economic occurrences (changes in the GDP) and uncertainty, and uncertainty associated with management of the resource can influence this value. In addition, the reported transfer prices can be skewed or inaccurate due to incentives to avoid surcharges, capital gains taxes and similar fees. It is also likely that reported transfer prices for quota or permits will be difficult to sort out in situations where exchanges involved other assets (such as vessels and gear) or services. Further, it is not known how individual quota, a new asset, will influence or be influenced by other assets like permits and vessels, though there are theoretical reasons to believe that for the West Coast system the implementation of IFQs would likely result in a reduction in groundfish limited entry permit values.

While there is no literature pertaining to vessel value changes under IQ management, economic theory suggests that vessel values will be influenced by level of consolidation that occurs, the ability of new entrants to gain access to the resource and to other fisheries, and the ability of current permit owners to adjust their operation in response to IFQ implementation.

The scant literature referring to processor assets provides no consensus on how processor assets will be affected by implementation of IFQs except to indicate that consolidation and other changes can result in the occurrence of stranded capital.

Permits and Quotas

Under the current groundfish regulations pertaining to the trawl sector, a permit is required to legally harvest fish. The permit value is theoretically reflected in the price the permit is bought or sold for. This value is currently likely influenced by several factors including, but not limited to:

- The number and type of gear endorsements attached to the permit;
- Permit size endorsement^{5/} (Future options to combine permits to increase vessel length is more limited than before the buyback program.);
- The market supply and demand for fishing permits^{6/};

⁵ The permit size endorsement is the vessel size range of up to five feet over the endorsed length that the permit can be used in conjunction with (depends on capacity points the permit has).

⁶ One example of how the supply and demand for permits influenced value, was illustrated after the recent buyback program. Following the buyback program, a number of "A" Trawl permits changed hands. The prices per permit capacity point increased from \$3000 per point in November 2003 to \$6000-\$10,000 per point in March 2004 (Dock Street Broker's "Permit News" Report). Some of the price increase may have been due to an increased demand for permits (even though there is a control date on IQs). Increased demand may have occurred for the following reasons:

- Processors who lost vessels (to the buyback) may want to assure supply of fish to the processing plant. (One processor lost all of his delivery vessels to the buyback.)
- Processors may be buying permits to expand their market share.
- Permit holders who were ineligible to take part in the Buyback Program are willing to sell their permits because of increased prices.

- The perceived future prices the permit user can get for species the gear endorsement on the permit enables harvest for;
- The perceived species mix and poundage of fish the gear endorsement on the permit enables them to land;
- The perceived species mix and poundage of fish the ecosystem will supply;
- The perceived future stability of potential landings; and
- The perceived costs the permit owner will be subject to.

In general, the value of a fishing permit is likely determined by the perceived future stream of profit the permit enables the owner to obtain as well as the supply and demand of permits for sale.

Economists estimate the value of an asset according to its net present value (NPV). NPV is the discounted value of the future flow of net economic benefits from that asset. Discounting reflects the rate of return that society is willing to accept or trade for sacrificing present consumption. The lower the discount rate, the more weight society places on future periods, and hence the more likely society will be to sacrifice consumption in the present time period. Conversely, the higher the discount rate, the more society 'prefers' the current time period and the less likely it is to sacrifice present consumption. The discount rate often used in calculation of the NPV of an asset is the market rate of interest.

Estimates of permit and quota sale and lease values are typically made after program implementation to see if asset prices can serve as indicators of profitability of the fishery. For example, estimation of whether permit prices reflect the discounted value of current and expected future net earnings generated by permit ownership and use is used as an indicator of the success of license limitation in preserving economic rents in Alaska's commercial salmon fisheries (Huppert et al., 1996). In another study, Newell et al. (2002) assessed the quota markets in New Zealand to determine market activity, price dispersion and quota prices to determine whether the market for quota is competitive. Milon et al. (1998) looked at the performance of the market for spiny lobster transferable trap certificates to assess whether the Trap Certificate Program achieved the goals of the initial legislation. Gauvin et al. (1994) used the difference between quota and lease prices to see if conservation objectives were being attained.

Calculating the potential change in the NPV of permits or individual quota under an IFQ system requires knowledge about all of the factors mentioned as determinants of permit value as well as how changing asset values will impact each other. Under an IFQ program, permits, vessels, and individual species-specific quota will be required to gain access to the fish resource. Currently, only permits and vessels are needed to gain access.

It is not known how permit or vessels values will change when quota is created as a fishing asset. However, in theory, there will be two dynamics affecting permit prices: first, to the degree that IFQ is created to replace cumulative limits, a permit will no longer represent fishing opportunity, it will represent only the opportunity to have a vessel on the water. Currently permits represent both the opportunity to have a vessel on the water and to take certain amounts of fish, reflected in the cumulative trip limit and whiting season openings. Theoretically, IFQ will (likely) trade in the market at a marginal price which reflects the net profits per additional

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- Some buyers may be speculating the Council will relax its rules on IQs.
 - Some buyers are buying permits to obtain potential IQ history.
 - Some buyers may calculate that it's profitable to buy a permit and fish it during the three to five years it may take to implement IQs. In 2002, the average active permit (total=223) averaged \$122,000 in groundfish revenues. If the 2002 groundfish fishery was carried out by the remaining 172 permits, the average groundfish revenue per permit would increase to about \$187,000 (NMFS, 2004).

unit of harvest. Therefore it is likely that the value of most of the opportunity to take a certain amount of fish will be reflected in the IFQ (some fishing opportunity may continue to be provided as cumulative limits associated with the permits, depending on the species coverage of the IFQ system). Given that permits will reflect a lesser part of the fishing operation (opportunity to have a platform) as compared to a pre-IFQ system, and that IFQ are likely to reflect the opportunity to harvest an amount of fish (previously reflected by the cumulative limits associated with the permit) it appears likely that permit prices will decline in value. Another reason permit prices may decline is the possible reduction of capacity. If the result of fishery rationalization is fewer groundfish trawl vessels then there will be a surplus of permits available on the market.

However, the experiences of other IFQ programs can provide guidance pertaining to the factors that may potentially impact possible determinants of quota value, the potential reasons for fluctuations in quota sale and lease price dispersion, and possible reasons for value differences between quota sale and lease prices. The following subsections discuss these.

Possible Determinants of Quota Value

It is expected that the price of an annual lease on the right to catch one ton of fish should equal the marginal flow of profit or rent from that one ton over one year. The price of holding that right in perpetuity (quota sale price) should equal the summation of the annual flow of profit from that one ton over an individual's time horizon⁷. Newell et al. (2002) attempt to describe the relationship between quota and lease price using an econometric model. They write that, in a setting with no uncertainty, quota prices would be a function of:

- Fish prices;
- Fishing costs;
- Gear types;
- Species biological characteristics; and
- Climatic conditions.

They note that finding an appropriate functional form to describe quota prices is difficult in practice due to the uncertainty surrounding fishing activities, biological populations, and the availability of information on demand in an IQ market. In their analysis, a flexible functional form is used to describe quota price as a function of contemporaneous export price, an index of fishing costs, actual annual catch, annual total allowable catch (TAC), actual quarterly catch, absolute value of the Southern Oscillation Index (a time-series measure of variability in water temperature and pressure), the real New Zealand GDP growth rate, an indicator of whether the fish stock faced significant reductions upon implementation of the ITQ, individual fish stock market fixed effects, and fixed effects for successive quarters within the fishing year.

Results confirmed that quota prices increased with:

- Increasing fish prices;
- Increased quota demand; and
- Higher GDP growth.

Quota prices decreased with:

- Increasing fishing costs; and

⁷ The quota sale price will theoretically approximate the average lease price divided by the market interest rate. If lease prices are expected to increase or decrease due to changing economic or ecological conditions, the quota sale price also increase or decrease.

- Ecological uncertainty^{8/}.

Alaska halibut and sablefish RAM staff indicate that these are all reasonable, however they have not been able to find any discernable patterns, partially due to gifting of quota shares. Other factors mentioned as probably quota share and lease price factors include;

- Availability of cheap loans; and
- Whether the exchange is part of a trade (Personal communication, Jessica Gharrett, 2004).

Price Dispersion

Newell et al. (2002) also examine the variability in quota sale and lease prices across time for the New Zealand quota markets. They describe average, deviations of about 35% around the mean in sale and lease markets one year after IFQ implementation. That variation decreased over time. By 2000, the average sale price dispersion had decreased to less than 15%. At the same time, the average lease price dispersion had decreased to around 28% (Newell et al., 2003).

They attribute price dispersion in the lease market to:

Intraseason variability in fishing conditions or other short-term consideration that would not affect the sale price;

Other factors influencing quota and lease price dispersion include:

- The fact that quota transactions take place bilaterally or through a broker, leading to differences in transaction costs, search costs, and bargaining power. In this respect, quota markets differ from more conventional assets and commodities that have existed for longer periods of time. As the market develops and fishermen and intermediaries learn

⁸ Newell et al. (2002) also reported the following findings:

- Elasticity of the quota price with respect to the fish export price is positive and statistically significant in both lease and sale price equations.
- There are indications that quota prices are much more sensitive to long-term cross-sectional differences in export prices than they are to fluctuations in export prices within species over time.
- Species with higher mortality rates had significantly lower quota prices. The elasticity was -.2 for lease prices and -.7 for sale prices. These results are consistent with the idea that species with higher mortality rates have more variability in their populations, which leads to greater profit variability and in turn lower quota prices.
- Stocks that faced initial reductions in allowable catch also experienced significant consolidation, with the median fish stock having a 38% reduction in the number of owners.
- Lease and sale prices for stocks faced with initial reductions rose faster than lease prices for the other stocks.
- Quota sale prices rose to a greater degree than quota lease prices possibly attributable to decreases in the market interest rate (11% to 3%). increases in quota sale prices could also be driven in part by the perception of increased security of quota assets, although such an effect should not be important for quota lease prices.
- Our analysis of the market arbitrage relationship between quota sale and lease prices, for example, shows that the expected rate of return for quotas follows the general historical level and trend of New Zealand's real rate of interest.
- The authors note that quota and lease prices will likely vary by species and across regions and time.

how to operate in the newly created market, variability should decrease.

- Learning in these markets. Newell et al. (2002) write, *We find that there has been substantial price dispersion within individual quota markets, but that the magnitude of this dispersion has gone down over time, particularly for quota sales, and is comparable to that found in other well-functioning markets. The trends are consistent with a period of market development where participants learn how to operate in the newly created market, and traders and brokers begin to set-up shop*⁹.
- Incomplete understanding about the value of shares because it is a new market;
- Different perceptions of the future profitability of the fishery;
- Sellers may have different discount rates; and
- Incentives to misreport the true exchange price.

Possible misreporting of transfer prices to avoid surcharges (Larkin and Milon, 2002), and capital gains taxes (Gauvin et al., 1994) have been suspected as reasons for price dispersion occurrences in other dedicated access privilege programs. In the Florida Spiny Lobster Trap Certificate Program, a tradable gear permit program with similar features to IFQ programs, it is suspected that the reported transfer prices were not reliable reflections of the actual prices used in exchange due to a 25% surcharge on transfers. In many cases, an exchange price of \$0.75, which is the annual certificate fee, was reported. When some of the possible misreported data was removed, Larkin and Milon (2002) note that average prices increase over time. To get a more accurate view of changes in transfer prices, Larkin and Milon (2002) use only prices above the annual certificate fee. Results showed that the average price rose from approximately 168% to 211% from 1994 to 1998. In addition, “the standard deviations associated with the trimmed average prices increased over time reflecting the increase in the highest reported transfer prices from less than \$20 to nearly \$70 per certificate.” Increases in the maximum prices reported may have indicated an increase in the perceived value and/or confidence in the program (Larkin and Milon, 2000)¹⁰.

Gauvin et al (1994) suggest that, “there may also be some incentives for under reporting share sales prices to avoid capital gains taxes.”

Value Differences between Quota Sale and Lease Prices

⁹ Newell et al. (2002) make the following suggestion to decrease price dispersion: *Price dispersion could potentially be reduced through the creation of a central trading exchange that posts bid and ask prices and levels of trading activity. With a clear signal from the market, the ability of quota owners and fishery managers to ascertain relevant economic and biological information would improve.*

¹⁰ Factors that have influenced the reported transfer prices include: “(a) the novelty of transferable ownership rights under the TCP; (b) uncertainty about the duration of the program; (c) uncertainty about future certificate reductions including the specification of the total number to be reduced and effects on yield per trap; (d) market imperfections such as difficulty in finding a willing buyer or seller with the desired number of certificates; (e) the surcharge applicable on the transfer (of certain classifications of certificates); (f) leasing activity that reduces the market for sales; and (g) potential under reporting of actual sale price. The combination of these factors has contributed to reports average prices that are lower than reasonable estimates of their expected market value, which are based on annual yields and current market price”. In addition, reported prices are lower than those specified in local newspaper advertisements (Milon et al., 1998).

Differences in values between quota sale and lease prices are likely to occur when quota owners see the benefits of the IFQ program extending for more than a single year. While the lease price is expected to reflect the perceived profit the lessee can obtain from a single season, the quota price is expected to reflect the perceived profitability that can be obtained the duration of time the quota is of value to the individual or entity. The degree of difference between the quota and lease price is expected to depend on several factors including:

- The discount rate fishermen use to estimate quota sale value;
- The perceived future variation in profitability the quota enables the owner to obtain; and
- The level of understanding about the value of a quota share in a new market.

The discount rate implicitly used by quota holders could possibly be influenced by:

- The perceived permanence of the IFQ program (could be influenced by sunset provisions or other regulatory structures);
- The vested interest the quota holder feels they have in the fishery; and
- The perceived stability of the stock.

In describing the Wreckfish ITQ fishery, Gauvin et al. (1994) suggest that the difference between the sale and lease prices of quota (where sale price is greater than lease price) may be a possible indicator that conservation objectives are being attained. The discount rates of fishermen would “influence the degree that conservation incentives are created from having a vested interest in the fishery.” This difference can provide insights into fishermen’s expectations for the fishery.

Market Activity

Shortly after initial allocation, IFQ programs often experience relatively larger numbers of transfers of quota compared to later years. It is likely that quota owners are in the process of accumulating or decreasing the number or mix of shares they own in order to match quota share with operational capability.

In the halibut/sablefish IFQ program, the total number of approved transfers (permanent and lease) initially increased in the first 2-3 years of the program, and then decreased substantially and remained somewhat stable over the next five years (NMFS, 2003).

Under the Spiny Lobster Trap Certificate Program in Florida (a fishery with characteristics similar to individual quota programs), the percentage of certificates transfers dropped from 12% in 1993-94 to 6% in 1998. However, this may have been influenced by the fact that the total numbers of certificates were being decreased by 10% each year (Larkin and Milon, 2000).

With regards to the number of people transferring certificates between years (which fluctuated from 73 people in 1994-95 to 53 in 1995-96 to 43 in 1996-96 to 62 in 1997-98), Larkin and Milon (2000) write, “Transacting in consecutive years may reflect one or more of the following:

- The adjustment of traps necessary to correct for imperfections in the original allocation of certificates;
- The adjustment in trap numbers necessary to attain the most profitable size fishing operation given the scale of remaining inputs (e.g., vessel size); and/or
- Speculative activity in the market for certificates.”

Vessels

There are very few references to vessel values in the IFQ literature. However, economic theory suggests that the value of fishing vessels is likely to be influenced by:

- The level of consolidation that occurs resulting in fishing vessels made available for sale (*Possible increase in vessels for sale – decrease in vessel value*);
- The ability of new entrants to enter the fishery that do not yet have vessels (*Possible increase in demand for vessels - increase in vessel value - if there are few barriers to entry, entry is affordable, fishing vessels available for sale are sufficiently versatile with respect to the other fisheries individuals can use them in, and new entrants are able to supplement groundfish activities with participation in other fisheries*); and
- The ability of vessel owners who receive initial quota allocation to increase quota share given vessel characteristics (*Possible increase in demand for vessels – increase in vessel value – if vessels are not able to increase landings without purchase of an additional vessel*);

Processing Equipment and Infrastructure

Thus far, the focus of the discussion has been on fishing permits, individual quota, and vessels due to the larger amount of literature written about these fishing assets compared to processing assets. There is very little literature written about the asset value of processing capital. There are two sources of empirical literature pertaining to the impacts of IFQs on processing entities. One report was commissioned by the State of Alaska (2002). It describes lost revenues in excess of variable costs to processors relative to pre-IFQ estimates^{11/}. A report done by the GAO (2002) reacts to this report, finds deficiencies in its methodology and with regards to impacts on processors of the implementation of the halibut and sablefish IFQ concludes that, "Some processors were adversely affected by the IFQ program, while others benefitted". The theoretical literature argues that a harvester-only allocation of quota transfers wealth from processors to harvesters.

Derby fisheries often result in supply gluts. Under such circumstances, switching to an IFQ system can result in unused fishing and processing effort and capital since effort can be distributed over a longer period of time than previously. Some processing capital and cold storage facilities will be left unused since they were built under the setting of the derby fishery where large quantities come in at once. However, some processing capital has several uses and will likely only be partially impacted by a switch from a derby to fishery to an IFQ system.

The groundfish trawl fishery is not a classic derby fishery like the crab fisheries or the halibut and sablefish fisheries were.

Consolidation in the processing sector would also likely create an excess supply of processing equipment and facilities, resulting in a decrease in the market price for equipment and infrastructure^{12/}.

¹¹ For example, Matulich and Clark (2002) estimated that "more than 82% of the halibut processing sector and 97% of the sablefish processing sector (raw fish weight) lost revenues in excess of variable costs relative to the pre-IFQ period." Matulich and Clark (2003) estimate that "the halibut processing sector lost 56% of its prior quasi rents, while sablefish processors lost 76%."

¹² One suggestion to mitigate for stranded capital has been to distribute individual processor quota. As an alternative to IPQ, some have suggested a "one-time buyback of stranded processor capital using funds from a loan from the government that will be paid back by IFQ holders". Another suggestion is to "set aside a portion of the TAC for processors or processor/fishermen teams who experience hardships because they are located in remote communities with few employment options" (Leal et al., 2003). Yet another possibility would be to allocate some portion of the IFQ to processors or provide processors the opportunity to buy IFQ.

It is possible that new processors will enter the fishery or existing processors will begin processing groundfish that hadn't previously, thus, decreasing the overall impact on the processing sector.

Further information about the type and flexibility of processing assets used to process groundfish will likely need to come from industry.

We are unclear as to how to treat the issue associated with “stranded capital” and the potential changes in processor assets. We are still exploring options for appropriate evaluation.

Future Additions

In order to explore the issue of fishing asset values further, the following efforts are being made:

- Incorporation of a discussion of the potential for the use of quota as collateral to obtain bank loans;
- Incorporation of a discussion of the potential for “stranded capital” among groundfish processing facilities resulting from conversations with processing interest representatives and NMFS economists;
- Incorporation of a discussion of how quota prices compare to revenue and how these have varied after IQ implementation;
- Incorporation of speculative activity and quota value in other fisheries;
- An expansion of the discussion of discount rates in calculation of potential quota value;
- Incorporation of a discussion of how community fishing infrastructure may be impacted by an IFQ; and
- Incorporation of a discussion of how different asset values may interact.

Potential Efficiency Gains under IFQs

A number of economic studies have analyzed the efficiency gains created by implementing an IFQ management system. The efficiency changes discussed in these studies typically occur through one or more of four mechanisms:

Fleet restructuring. An IFQ program allows transfer of quota among vessels, so some vessels may accumulate more quota and the number of vessels in the fleet may be reduced. Total fixed costs for the fleet are reduced through the reduction in the number of vessels. Quantifying this effect typically requires assumptions about vessel size and cost structure.

Increased efficiency of individual vessels. The efficiency of a given vessel may increase for a number of reasons. Vessels may be able to operate more efficiently due to more flexibility in determining when and how to harvest. By accumulating quota (subject to caps), a vessel may be able to move to a more efficient scale (output) of operation where cost per unit catch is lower. Vessels may be able to operate more efficiently by reducing their scope of operation (number of fisheries), thus avoiding the costs of changing from operating in one fishery to another.

Shifting of harvesting to relatively more efficient vessels. Even if the efficiency of any individual vessel does not change, an IFQ system allows more efficient vessels to purchase quota from less efficient vessels (subject to cap restrictions). Calculating this effect requires an estimate of the distribution of efficiency levels among vessels in the fleet. The more variation in efficiency level between vessels, the greater the potential benefit from quota transfer between vessels. .

Increased product value. In some fisheries, the value of harvested fish to consumers may rise due to improvements in product quality, such as a higher percentage of fish being landed as fresh. In order to estimate efficiency gains from improved product quality, it is necessary to separate

changes in ex vessel prices which occur due to changes in product quality from changes in ex vessel prices which are caused by other factors affecting trade between harvesters and processors.

Empirical studies of efficiency gains from IFQ implementation vary in key factors such as species under IFQ management, features of the IFQ program, harvesting technology, and data availability. Empirical studies typically measure efficiency gains ex post, comparing pre-IFQ and post-IFQ data. Results vary considerably across studies, with a number of studies estimating annual efficiency gains of over \$10 million.

Techniques have also been developed for ex ante estimation of the potential efficiency gains from an IFQ program before program implementation. These techniques require a cost-earnings data at the vessel level in the pre-IFQ fishery. While existing cost-earnings data provides excellent data on earnings from landings on the west coast (Washington, Oregon, and California), it provides very limited information on earnings from other sources (such as landings in Alaska or at sea deliveries) or costs. The Northwest Fisheries Science Center (NWFSC) is undertaking a cost-earnings survey of the limited entry trawl fleet during the first quarter of 2005. With a satisfactory response rate, this survey will provide improved data for estimating potential efficiency gains from implementation of an IFQ program.

Program Costs

The following pages outline some major IFQ program costs associated with initial development and setup. Some of the costs identified are:

- Quota Tracking and Matching (Software Purchase and Program Development)
- Initial Issuance of Quota
- Appeals Process
- At-Sea Observer Program Setup

Other IFQ program costs associated with initial development and setup that have not been evaluated are listed at the end of the document.

Quota Tracking and Matching

Quota tracking and matching activities would use data from landings destinations, sent through PacFIN or an electronic fish ticket system, to NMFS. The current system may need to be modified depending on how close to real-time reporting is required for the program to function properly. For example, an electronic fish ticket system may provide a faster transmission of data to NMFS allowing for quicker updating of individual quota holdings and therefore greater flexibility for fishermen to transfer quota when needed. The greater flexibility can decrease the possibility of going over the TAC, decrease the incentive to discard, and decrease time spent waiting for an update on quota holdings in order to go fishing. Real time updating will be particularly value if species with relatively low OYs are incorporated under the individual quota system. The longer the amount of time required for updating, the greater probability there is of exceeding the TAC. Once the data reaches NMFS, quota tracking and matching activities would likely be handled by the Permits Team of the Sustainable Fisheries Division in the Northwest Regional Office. The Permits Team would likely absorb activities associated with:

- Up-front quota tracking and matching database development;
- Maintaining tracking activities associated with the transfer of quota and annual poundage; and
- Annual maintenance for activities other than transfers (ex: billing, accounting for rollover provisions, issuance of dealer permits, etc.).

In general, the costs associated with implementation of an individual quota system for the limited entry trawl sector with regards to quota tracking and matching activities are highly dependent on the specific IQ system design and regulations. Therefore, it is not possible to quantitatively estimate cost associated with some of these activities. However, some qualitative information has been gathered regarding the factors that would influence these costs. In addition, costs associated with these activities have been gathered from the Alaska Halibut/Sablefish ITQ, the Crab Rationalization Program, and the British Columbia Groundfish IVQ programs.

Up-front Quota Tracking/Matching Database Development

Up-front database development costs would be influenced by:

- The amount of time available for database development (lead time);
- Number of species stocks needing quota tracking;
- Number of persons or entities involved in the fishery;
- Ownership caps (by species, area, etc.);
- How often quota trading is allowed and how much transfer verification the system must provide;
- Rollover provisions;
- Owner on board and similar requirements;
- Other attributes tracked for future research (ex: price at which quota was exchanged); and
- Whether all work is done in house (depends on availability of staff) or is outsourced (requires contract funds and staff oversight)

It will take an estimated two years to receive appropriate training, create the database, and conduct adequate testing if the database is developed in house from the time program features are well defined. It is believed that current hardware and software installments may be sufficient; however, hardware and software updates will be required.

Maintaining Tracking Activities Associated with the Transfer of Quota and Annual Poundage

Costs associated with using the database to track quota sales and annual poundage transfers will influence staff time requirements. Staff time will be influenced by:

- The ability fishermen have to avoid species they don't hold annual poundage for;
- The ease with which fishermen can find individuals willing to sell poundage they need to obtain the portfolio of species they catch;
- How often quota transfers are allowed to occur according to regulations;
- Roll over provisions;
- The information that needs to be gathered and entered into the database regarding an individual transfer;
- The amount of verification required to approve a transfer; and
- Other factors.

Annual Maintenance for Activities Other than Transfers

Costs associated with annual maintenance for activities other than transfers will be influenced by:

- Billing requirements due to cost recovery regulations;
- Rollover provisions allowed to occur according to regulations;
- Issuance of annual poundage based on quota ownership;
- Issuance of notices regarding catch or landings that do not match quota holdings;
- Providing data and system support to enforcement activities; and
- Reporting on permit transfers, landings, and other trends for use by constituents and for program evaluation.

Provision of data on individuals fishing in excess of their catch or landings allowance will likely be made to enforcement when necessary.

Alaska Halibut/Sablefish Quota Tracking/Matching Costs

The cost of building the initial database and program used for annual allocation, tracking quota, and conducting queries for the AK Halibut and Sablefish IFQ was \$1.2 million. Initial software program development was contracted out.

Other costs include: initial outreach to educate people about the IFQ and help people fill out applications (newspaper space, radio time, establishment of a toll free number for people to ask staff questions, and 23 workshops - included travel for staff), appeals process, and staff time toward outreach, system maintenance and paperwork. Staff time cannot be accurately estimated because start-up is much more staff-intensive and because staff allocate their time between the Halibut and Sablefish program and permitting tasks for other fisheries.

In the past, the fishery has been opened for only 8-8.5 months/year to allow time at the end of the year for IPHC and NMFS to publish annual management measures and TAC specifications, for RAM (AK Region NMFS Restricted Access Management Program) to alter the tracking software to account for new regulations, update the system to incorporate end of the year transfers and overrun allowances, and mail permits to remote locations to provide for a “fair start” for all participants who may wish to benefit from first season prices (Gharrett, 2004).

Alaska Crab Rationalization Program

Development and implementation of the electronic fish ticket reporting system and AK crab rationalization reporting software system design and implementation is estimated to cost \$400,000. The reporting system is being designed to be used for other fisheries as well (ex: BSAI and GOA groundfish). The RAM division would provide staff time and expertise for tracking. Other costs associated with the program are an initial needs assessment (\$120,000) and cost for a technology demonstrator (\$75,000). Other costs will be borne by NMFS IT and management staff and IT contracts (Gharrett, 2004).

British Columbia Groundfish Individual Vessel Quota System Tracking/Matching Costs

(To be added)

Initial Issuance of Quota

The costs associated with initial issuance of quota would be influenced by:

- The number of people (with and without permits) or entities (communities, processing facilities) to whom quota is issued;
- The number of species and area specific allocations (i.e., the complexity of the program); and
- The availability of complete and accurate historical catch records (or other basis for initial awards).

One aspect of initial issuance of quota that will likely be challenging is establishment of an individual’s historical catch due to the fact that permits have changed hands sometimes several times over the past 10 years.

Appeals Process

Development and operation of an Appeals Board as well as activities of the Permits Team are considered under this category.

Appeals Board activities have yet to be discussed and therefore, no further information about their activities or factors that would influence the costs associated with their activities is available at this time. However, it is likely that the costs would include hiring/contracting a GCF attorney.

The Permits Team would have limited involvement in the appeals process. They would possibly conduct the following types of activities:

- Providing data on individual historic catch to the group of people handling appeals, and
- Updating the quota tracking database with quota allocation information received from the appeals board.

Costs associated with the appeals process have yet to be evaluated. However, there are plans to assess these costs. The legal costs associated with individual applications for reconsideration of allocation are likely to increase with the time duration allowed for the appeals process.

At-Sea Observer Program Setup

There are several areas of uncertainty that make estimation of costs not possible at this time. The following issues need consideration and resolution before cost estimates can be made:

- Narrowing of the range of design elements that will eventually comprise the IQ program.
- Definition of full retention.
- Definition of the role of observers (biological samplers, compliance monitors, or both) - Equipment costs that adhere to NIST standards of measurement and error margins will need to be estimated if the observers have compliance duties. Without accurate onboard weighing equipment, enforcement and successful prosecution of those in violation of the rules will be difficult.
- Legal issues associated with who can provide compliance observer services if the contractor under consideration is a foreign entity.
- Issues associated with third party payment options - Implementation of a third party payment requirement may increase costs.

Other Potential Program Costs

Other potential program costs associated with IFQ initial development and setup that will likely be considered and explored in the future include:

- Education and Outreach
- Change in Administrative Costs associated with writing of regulations
- New Entrants Program
- Quota Market Development and Setup
- Committee and Team Meetings
- Updating and Coordination of Landings Recording Devices and Methods
- Dockside Monitoring
- Allocation Database Creation and Analysis

At-Sea Observer Program Costs

The following issues need consideration and resolution before accurate cost estimates for an effective IQ monitoring program can be made:

- The range of design elements that will eventually comprise the IQ program need to be narrowed so the purpose of the monitoring program can be clearly identified.

A higher number of elements included in an IQ program may increase cost. For example, in-season data management may have to include daily satellite transmissions, computer infrastructure, and daily data quality review.

- The level of retention (full retention of all species or partial retention) needs to be determined so the level and type of sampling that will be required at-sea and on shore can be identified.

For any discards at sea, a more rigorous (and hence, more costly) monitoring program would be required to collect the necessary data.

- The role of monitoring personnel (including NMFS observers, biological samplers, compliance monitors, weighmasters, or some combination of these) needs to be determined.
- Standards for observer gear are needed onboard vessels.

Equipment costs that adhere to national standards of measurement and error margins will need to be estimated if the observers have compliance duties. Without accurate onboard weighing equipment, enforcement and successful prosecution of those in violation of the rules will be difficult.

- Legal issues associated with the use of foreign and third party service providers including the use of “no cost” federal contracts need to be resolved.

The daily costs will vary depending on the types of service needed and the providers under consideration.

Enforcement Costs

With adequate tracking and monitoring elements in place (including 100% at-sea coverage and an a dockside monitoring program) very little additional enforcement effort would be required with the implementation of an IFQ program. FTE estimates have been developed by the TIQ Enforcement Group and will be forthcoming.

IFQ Allocation

Summary of Data Quality Issues

Landings of many of the rockfish and other groundfish species are recorded in PacFIN using generic “nominal” or “unspecified” categories. This is especially true prior to 1999. While in many cases, landings in these generic categories are assigned to individual PacFIN species codes by assuming average species composition, coverage is not uniform along the West Coast and not all generic categories are reassigned. This factor reduces the reliability of using historical landings as indicators for allocating individual species quotas. The tables described below are provided to help illustrate the magnitude of this issue and to indicate how the data has changed over time.

Tables 16 through 19 show annual PacFIN landings of groundfish groups on the West Coast and by state (Washington, Oregon and California) recorded before and after application of average

species composition distributions. The years shown are 1994 through 2003. These tables show a general reduction in the amount of adjustments made to the initial species group assignments over time.

Table 20 shows annual PacFIN landings recorded in "nominal" and "unspecified" groundfish species categories before and after application of average species composition distributions. The years shown are 1994 through 2003. These tables show a significant reduction in the amount of landings assigned to these generic groundfish species groups over time.

Qualification by Crew

Two issues would need to be addressed to provide an initial allocation to crew members:

- (1) The proportion of total quota shares that would be divided among the crew.
- (2) The criteria that would be used to determine which crew members qualify and how much of the initial allocation they would receive.

This section provides information pertaining to the latter of these two issues.

In the fishery data systems, the only documentation pertaining to who works on fishing vessels comes from vessel operator/crew licensing system and the signatures on fish tickets.

Linking Crew to the Groundfish Fishery

The fishery data system cannot generally link a crew member or vessel operator to a particular landing, or in some cases, to a particular vessel. Rules and circumstances determining who signs the fish ticket vary between states and vary such that different individuals may sign the fish ticket on different trips by the same vessel. Given the limited data available, the following are some options for allocating IFQ among crew members.

Qualification Basis	Potential Allocation Formulas
Signature on a landings receipt (fish ticket). [This data is not in the data system and would have to be submitted at the time of application]	<ul style="list-style-type: none"> • Equal allocation • One point for each year in which a groundfish fish ticket is signed • Points based on pounds landed of each species for which the individual signed tickets
Tax return with information stating that the person received income from working on a groundfish trawl vessel (regardless of whether he or she helped in the harvest of groundfish)	<ul style="list-style-type: none"> • Equal allocation • One point for each year working on a groundfish trawl vessel • Points based on the vessels annual landings of each species for that year (a person working on multiple vessels in a year would have to choose a vessel for his or her catch history that year, or (2) receive full credit for each vessel he or she worked on). Either option entails confidentiality issues.
Sworn affidavit from the vessel owner/skipper. [Vessel owners may not know what crew was on board. Vessel skippers may have an interest in qualifying themselves—a conflict of interest.]	

Another possible qualifying standard would be the submission of an affidavit by the applicant. Truthfulness of the affidavits would be difficult to verify, require self policing by the community and likely result in perceived inequities if it became broadly known that some individuals made substantial false claims.

Summary of Vessel Operator and Crew Licensing Rules

California

Who

- Everyone working on a vessel must hold a commercial license (except a person who does not contribute to the activities onboard or cause any fish to be brought ashore to sell and his/her presence is registered in the vessel log).
- The vessel may hold a permit for one crew member that may be assigned to any crew member working on the vessel.
- There is not a separate license for vessel operators.

There are some fisheries in which special crew member permits are required:

Crew Member Permit Categories

General Commercial Fishing
Crew member Permit

Lobster Crew member Permit * lobster operator permittee must be onboard when crew member is fishing.

Sea Urchin Crew member * crew member cannot dive for urchins

Salmon Crew member Stamp * "John Doe" crew member stamp.

Links to Vessel and Catch History

- Commercial licenses for crew members are not vessel specific.

Oregon

Who

- Crew members assisting in the fish harvest must hold licenses.
- The vessel may purchase "Commercial Crew member Fishing Licenses" (also known as "John Doe" licenses) and assign such licenses to the individuals working on the vessel. Names of individuals using these licenses are not recorded.
- There is not a separate license for vessel operators.

Links to Vessel and Catch History

- Commercial licenses for crew members are not vessel specific.

Washington

Who

- Crew members are not licensed.
- Vessel operators are licensed and there may be multiple operators licensed for a single vessel (primary and alternate operators).

Links to Vessel and Catch History

Vessel operator licenses are linked to a vessel, however, where there are multiple operators licensed for a single vessel the only information recorded documenting which operator was present for a particular landing is the signature on the fish ticket. The operator may not necessarily be the individual who signed the fish ticket. The names of who signed are not recorded in the data system but would be available off the original landing receipts.

Signatures on Fish Tickets

California

The processors sign the tickets. The name and permit numbers for the vessel operators are recorded on the fish tickets.

Oregon

The vessel owner or operators sign the tickets.

Washington

In Washington the fish tickets must be signed by the buyer and the “fisher.” The fisher signing must be the vessel operator.

Other Fisheries Experiences Making Initial Allocations to Crew

- California has had experience allocating limited entry permits to crew members.

California has had a practice--shared with other states, the Federal government, and other nations--of giving preference for issuing permits into a restricted access fishery to fishermen or vessels with past participation in that fishery. The practice has meant that those permits generally are issued to licensed California commercial fishermen rather than to non fishermen or persons not licensed in the State. The practice is a fair means to assure that those who rely on that fishery or who have invested in that fishery can remain in the fishery.

In determining priorities for the issuance of permits in a restricted access fishery, the priority for permits is given to licensed commercial fishermen/vessels with past participation in that fishery. Among fishermen or vessels with past participation in the affected fishery, preference for permits may be based on factors such as years of participation in the fishery or level of participation (landings). Second priority for permits may be based on such factors as **crew experience**, number of years in California fisheries, or participation in fisheries similar to that for which a program is being developed (An example of a similar fishery being considered for eligibility for a permit was when displaced abalone divers were added to those eligible for any new sea urchin permits). Drawings or lotteries for permits are only used when two or more applicants have identical qualifications (for example, the same number of points for eligibility for a herring permit).

Conditions/Criteria for Crew member to Apply and Upgrade to Operator Permit

Commercial Gillnet/ Trammel-net Crew member	*Applicant must have worked as a crew member for at least 12 months on vessels using gillnets or trammel-nets and shall have worked at least 180 days at sea on such vessels, or passed a CDFG proficiency examination; documented by fishing records or notarized document from a vessel owner/operator.
Herring Crew member	*Crew members receive 5 experience points for one year of service as paid crew member, 3 points for a second year, 2 points for a third year, up to a maximum of 10 points cumulative. Herring Permits are issued according to the total number of points, beginning with applicants who accrue the most points. Remaining permits (if any) are allocated by a lottery. Drawing is used to assign limited permits across applicants if there are more applicants than available permits. Documented by proof of payment for service as a crew member; tax records or cancelled check.
Sea Urchin Crew member	*Available urchin dive permits are issued to applicants who held, for each of 2 immediately preceding years, a valid sea urchin crew member permit. Documented by fishing records or notarized statement from vessel owner/operator that hired the crew member. Random number drawing for applicants seeking urchin dive permit. Eligible crew members can receive one random number for the diving permit drawing. One additional random number is assigned for each additional year they possessed a crew member permit. Not more than 5 random number shall be assigned to any one individual in a given drawing.

The California salmon limited entry program was initially based on limiting the number of individuals participating as fishermen. In 1982, the fisherman based moratorium was modified to a vessel owner based license limitation system. Permits were issued to a number of classes of owners and to individuals licensed to fish commercially for at least 20 years who had participated in the salmon fishery in at least one of those 20 years (Senate Bill 1917, 1982).^{13/}

Qualification by Communities

Community participation in individual quota programs can be accommodated through community-based control of IFQ or the identification of a certain portion of the OY for control by communities (sometimes called Community Development Quotas or CDQ). Community-based control of IFQs does not require an initial allocation if rules are established that allow communities to purchase or otherwise acquire and hold IFQ.

An initial allocation of IFQ or CDQ to communities requires the identification of an amount of the OY to be set aside for the purpose, a body to represent the community and criteria for allocation. For CDQ programs there may be certain criteria the community must meet in order to qualify for participation in CDQ program.

A method used in the British Columbia system to benefit communities is the set aside of a percent of the IFQ, to be given to fisherman-processor coops. Coops develop proposals and apply for the IFQ. Proposals are scored, in part, based on benefits that will be provided to fishing communities. A special Groundfish Development Authority was established to administer the program.

Intersector Allocation

LE Vessels Using Open Access Gear

Vessels possessing LE trawl endorsed permits also engage in other fisheries, sometimes targeting groundfish species directly or sometimes taking groundfish as incidental catch. The Council will need to determine whether or not groundfish taken by LE trawlers while engaged in

13/ If new permits were to be issued, they were first issued as interim permits. Interim permits had to be used in two consecutive seasons before a permanent permit could be issued.

other fisheries will be subject individual quotas. The tables described below help illustrate the magnitude of this issue and to indicate how the data has changed over time.

Table 21 shows groundfish landings in 2003 by vessels with limited entry trawl permits using all types of gear. Table 22 repeats this breakout for landings in 1998.

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TABLE 1. Existing management tools, management tools adopted under the programmatic bycatch EIS and management tools that would remain in place under IFQs.

Existing Management Tools (Status Quo)	IFQs
Commercial Trip Limits Commercial Cumulative Limits Commercial and Rec Closed Areas (RCA's, CCA, YRCA) Inseason Adjustments Sablefish Tier Limits Partial Observer Coverage (NMFS) Management Areas (Latitudes) Differential Gear Requirements (exclusion area for lg footrope) Differential Trip Limits (small, large, midwater) Bycatch caps in EFP Fisheries (incl whiting) Recreational Bag Limits Recreational Seasons Tribal Full Retention Programs Tribal Time/Area Closures (Bycatch Reduction) Full Retention in EFP Fisheries Voluntary Areas To Be Avoided (e.g., FG, OA, whiting) 100% Observer Coverage in EFP Fisheries "Hotspot" Closures in EFP Fisheries Mesh Size Number of Hooks Hook Size Other Commercial and Rec Gear Restrictions Fish/Fillet size limits VMS Cameras Commercial seasons (spawning lingcod) sorting requirements OY specifications	None for Trawl Fishery (depending on scope) None for Trawl Fishery (depending on scope) RCAs to protect fleet and other sectors from disaster tows of overfished spp. Habitat protection. Disaster tows or overage in other sectors could shut down trawl fishery. No change. Possibly allow fixed gear quota to be transferred to trawl (depends on provisions adopted for analysis) Observer coverage increase At least preserve existing areas Maintain for habitat and disaster tow protection. None for Trawl Fishery (depending on scope) Possible for Council to reserve some of the OY for EFP fisheries. No change, depending on IFQ transferability provisions. (depends on provisions adopted for analysis) No reason to change, allow IFQ to be purchased to allow fishing when season would otherwise be closed. (depends on provisions adopted for analysis) No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. No reason to change. VMS would continue. Might increase in use. Might have closures requiring discards but any mortality would still count against IFQ. Sorting requirements to IFQ categories. Spp comp info still required for IFQ spp groups. No change.
Preferred Alternative Tools from Bycatch EIS	
All current tools used for bycatch management overfished species caps caps would use: monitoring standards full retention programs vessel incentives for cap exemption IFQ program	

TABLE 2. (HL1.1) Estimated catch (including discard) and target OY (or ABC - in boxes) for the 2002 and 2003 West Coast groundfish fishery, and percentage over or under target harvest levels.

	2002					2003				
	Estimated Catch	Estimated Discard	%Discard	OY (ABC in boxes)	% Over or Under	Estimated Catch	Estimated Discard	%Discard	OY (ABC in boxes)	% Over or Under
Lingcod	980	159	16.2%	577	69.8%	1,367	71	5.2%	651	109.9%
Pacific Cod	798	42	5.2%	3,200	-75.0%	1,323	74	5.6%	3,200	-58.7%
Pacific Whiting	132,368	2,369	1.8%	129,600	2.1%	142,914	1423	1.0%	148,200	-3.6%
Sablefish (north)	4,330	702	16.2%	4,367	-0.8%	6,387	1126	17.6%	6,500	-1.7%
Sablefish (south)	190		0.0%	229	-17.1%	204		0.0%	294	-30.6%
Dover sole	7,584	1,265	16.7%	7,440	1.9%	8,342	957	11.5%	7,440	12.1%
English sole	1,594	415	26.0%	3,100	-48.6%	1,241	339	27.3%	3,100	-60.0%
Petrale sole	1,965	167	8.5%	2,762	-28.8%	2,161	144	6.7%	2,762	-21.8%
Arrowtooth flounder	4,979	2,889	58.0%	5,800	-14.1%	3,244	905	27.9%	5,800	-44.1%
Other flatfish	2,337	634	27.1%	7,700	-69.7%	2,094	491	23.4%	7,700	-72.8%
Pacific Ocean Perch	185	34	18.6%	350	-47.1%	160	22	13.7%	377	-57.5%
Shortbelly	12	11	97.5%	13,900	-99.9%	9	2	24.7%	13,900	-99.9%
Widow	547	193	35.4%	856	-36.1%	58	16	27.8%	832	-93.0%
Canary	110	41	37.6%	93	18.0%	47	14	30.4%	44	6.4%
Chilipepper	249	74	29.7%	2,000	-87.6%	50	15	31.1%	2,000	-97.5%
Bocaccio	140	29	20.4%	100	40.3%	29	8	29.2%	20	45.5%
Splitnose	79	23	28.6%	461	-82.8%	119	9	7.8%	461	-74.2%
Yellowtail	1,532	286	18.6%	3,146	-51.3%	504	22	4.4%	3,146	-84.0%
Shortspine Thornyheads	1,156	389	33.7%	955	21.0%	1,220	388	31.8%	955	27.8%
Longspine Thds. North	2,098	373	17.8%	2,461	-14.7%	1,835	324	17.7%	2,461	-25.4%
Longspine Thds. South	125			195	-36.1%	153			195	-21.5%
Unsp. Thornyheads	72						0			
Cowcod, Monterey	2	1	65.0%	2.4	-8.3%	0		0.0%	2	200.0%
Cowcod, Conception	0			2.4	-100.0%	0			2	-100.0%
Yelloweye	11	2	19.0%	13.5	-17.0%	8	2	19.0%	22	-63.2%
Darkblotched	202	96	47.6%	168	20.4%	140	52	37.0%	172	-18.7%
Black Rockfish (north)						174			615	-71.7%
Black Rockfish (south)						976			500	95.2%
Black Rockfish Total						1,150			1,115	3.1%
Total (including whiting)	163,647	10,194	6.2%	189,478	-13.6%	173,218	6,403	3.7%	212,466	-18.5%
Total (excluding whiting)	31,279	7,826	25.0%	59,878	-47.8%	30,304	4,981	16.4%	64,266	-52.8%

TABLE 3 (HL1.2) Projected OY for West Coast groundfish.(mt)*

Stock	2004	2005	2006	2010	2015	2020
LINGCOD - coastwide	735	2,414	2,414	2,414	2,414	2,414
Pacific Cod	3,200	1,600	1,600	1,600	1,600	1,600
Pacific Whiting (Coastwide)	250,000					
Sablefish (Coastwide)	7,786	7,761	7,634	6,760	6,362	6,362
N. of 36° (Monterey north)	7,510	7,486	7,363	7,363	7,363	7,363
S. of 36° (Conception area)	276	275	271	271	271	271
PACIFIC OCEAN PERCH	444	447	447	474	529	565
Shortbelly Rockfish	13,900	13,900	13,900	13,900	13,900	13,900
WIDOW ROCKFISH	284	285	289	442	392	409
CANARY ROCKFISH	47(42?)	43	45	52	60	69
Chilipepper Rockfish	2,000	2,000	2,000	2,500	2,500	2,500
BOCACCIO	250	307	308	400	554	769
Splitnose Rockfish	461	461	461	461	461	461
Yellowtail Rockfish	4,320	3,896	3,681	3,779	3,904	3,904
Shortspine Thornyhead - N. of 34°27'	983	999	1,018	1,018	1,018	1,018
Longspine Thornyhead - N. of 36°	2,461	2,461	2,461	2,461	2,461	2,461
Longspine Thornyhead - S. of 36°	195	195	195	195	195	195
COWCOD - S. of 36° (Conception area)	2.4	2.1	2.1	2.1	2.1	2.1
COWCOD - N. of 36° (Monterey area)	2.4	2.1	2.1	2.1	2.1	2.1
DARKBLOTCHED	240	269	294	294	294	294
YELLOWEYE	22	26	27	30	31	32
Nearshore Species						
Black WA	540	540	540	540	540	540
Black OR-CA	775	753	736	713	708	708
Minor Rockfish North	2,250	2,250	2,250	2,250	2,250	2,250
Nearshore HG	122	122	122	122	122	122
Shelf HG	968	968	968	968	968	968
Slope HG	1,160	1,160	1,160	1,160	1,160	1,160
Remaining Rockfish North	1,216	1,216	1,216	1,216	1,216	1,216
Bocaccio	238	238	238	238	238	238
Chilipepper - Eureka	32	32	32	32	32	32
Redstripe	432	432	432	432	432	432
Sharpchin	230	230	230	230	230	230
Silvergrey	28	28	28	28	28	28
Splitnose	182	182	182	182	182	182
Yellowmouth	74	74	74	74	74	74
Other Rockfish North	1,034	1,034	1,034	1,034	1,034	1,034
Minor Rockfish South	1,968	1,968	1,968	1,968	1,968	1,968
Nearshore HG	615	615	615	615	615	615
Shelf HG	714	714	714	714	714	714
Slope HG	639	639	639	639	639	639
Remaining Rockfish South	689	689	689	689	689	689
Bank	262	262	262	262	262	262
Blackgill	306	306	306	306	306	306
Sharpchin	34	34	34	34	34	34
Yellowtail	87	87	87	87	87	87
Other Rockfish South	1,279	1,279	1,279	1,279	1,279	1,279
Cabazon (off CA only)	94					
Dover Sole	7,440	7,476	7,564	8,254	9,631	10,037
English Sole	3,100	3,100	3,100	3,100	3,100	3,100
Petrals Sole	2,762	2,762	2,762	2,762	2,762	2,762
Arrowtooth Flounder	5,800	5,800	5,800	5,800	5,800	5,800
Other Flatfish	7,700					
Other Fish	14,700	7,300	7,300	7,300	7,300	7,300

*2004-2006 OYs from 2005-2006 Pacific Coast Groundfish Fishery Spex. Projections from 2005-2006 ABC document (default), or stock assessment and rebuilding plan projections (boxes).

Table 4 (BC1.1) Regulatory and economic reasons for discarding fish - adapted from Quigley

(2004).

Reason	Example	Applicability to West Coast Trawl Sector
Fish are the wrong species	Not a target species	Yes
Fish are the wrong size	Market limit on size Regulatory size	Yes, little or no value below a certain size No, current regulation on size limits.
Fish are the wrong sex	Usually processing or marketing constraint.	Not Applicable
Fish are damaged	Gear, predation in nets, abrasion by nets.	Yes, some damage can occur
Fish are incompatible with rest of catch	Slime or abrasion from other species can damage target species.	Yes, some damage can occur
Fish are poisonous or otherwise inedible		Unknown
Fish spoil rapidly	Causing problems with rest of catch	Yes, can occur with 'hot spots' - fish with caustic stomach contents and/or lack of icing.
Lack of space on board	Fishing operations successful and target species take precedence over lower valued or non--target species.	Not likely under present limits
High grading	Sorting and retention of higher valued species or sizes.	Yes, differential prices exist for different sizes of sablefish.
Quotas, TACs or catch limits reached		Yes, current management uses cumulative catch limits. Regulatory discards documented.
Prohibited species	IQ shares may be inadequate to cover catch Season closure Gear restrictions	Not applicable at present. Yes Yes, halibut and salmon may not be retained if caught by trawl gear - except salmon may be retained under EFP.
Prohibited fishing grounds	Fishing ground may be closed for capture of one species but open for others	Yes, some limited MPAs exist, RCAs constrain type of gear used.
Safety	Sometimes necessary to release some or all of catch to ensure vessel stability	Yes, sometimes in foul weather or when gear becomes hung up - catch (and gear) may need to be discarded.

Table 5 (BC1.2) Reasons given for discard during three years (1997-1999) of the Oregon Enhanced Data Collection Project (EDCP).*

Environment	Species	Number of EDCP Records	Weight of Discard in lbs	Market	Quality	Regulation	Grand Total
Northern Shelf	Canary rockfish	31	27,695	0.0%	34.8%	65.2%	100.0%
	Lingcod	309	35,938	2.2%	0.3%	97.5%	100.0%
	Yelloweye rockfish	0		--	--	--	--
	Yellowtail rockfish	66	68,020	6.2%	1.4%	92.4%	100.0%
	Arrowtooth Flounder	115	57,485	97.6%	2.4%	0.0%	100.0%
	English sole	214	15,301	83.5%	16.4%	0.2%	100.0%
	Petrable sole	29	960	100.0%	0.0%	0.0%	100.0%
Southern Shelf	Boccacio	0	0	--	--	--	--
	Cowcod	0		--	--	--	--
	Chilipepper	12	265	100.0%	0.0%	0.0%	100.0%
Slope	Darkblotched rockfish	0		--	--	--	--
	Pacific Ocean Perch	3	1,140	0.0%	8.8%	91.2%	100.0%
	Dover sole (p)	645	133,175	36.7%	7.8%	55.5%	100.0%
	Sablefish (p)	1,163	280,670	3.6%	6.3%	90.1%	100.0%
	Shortspine thornyhead (p)	514	54,810	23.7%	6.8%	69.5%	100.0%
	Longspine thornyhead	336	49,971	79.5%	11.7%	8.8%	100.0%
	Unsp. thornyhead	208	22,390	49.9%	9.5%	40.6%	100.0%
Pelagic	Widow rockfish	41	21,034	3.2%	0.0%	96.8%	100.0%
	Pacific whiting	962	622,600	93.1%	5.5%	1.5%	100.0%
Nearshore	Black rockfish	0		--	--	--	--
	Cabezon	0		--	--	--	--
Other	Small Rockfish	1,061	275,749	40.4%	4.1%	3.9%	100.0%
	Above Species (by known category)	5,709	1,667,203	53.4%	6.0%	32.1%	100.0%
Grand Total	All Species (by known category)	8,920	2,337,077	68.0%	7.8%	24.2%	100.0%
	Unknown or Unspecified Discard	7,455	2,665,545				
	Total All Discard	16,375	5,002,622				

*Percentages based on pounds discarded and recorded reasons for discard of species (market, quality, or regulation). Species discarded for an unspecified or unknown reason were not included in total pounds used to calculate percentages. Approximately 46% of the discarded species by weight had reasons associated with the discard. Environment refers to classification given for species used in EIS analysis, not necessarily the location where the reason for discard was determined by the EDCP observer.

TABLE 6 (BC1.3) Draft estimated 2002 total catch mortality of selected groundfish species from West Coast commercial, tribal and recreational fisheries (mt).^{a/}

Species	<u>LANDINGS AND MORTALITY</u>			<u>TARGETS</u>		<u>DISCARDS</u>				
	Estimated Total Catch	PRELIMINARY Estimated Commercial Fishery Discard Mortality ^{b/}	Actual Landings ^{c/}	Total Catch ABC	Total Catch OY	Shoreside Discard	Shoreside Discard Mortality	At-Sea Whiting Bycatch	Mortality from Fixed Gear Sablefish (all north)	Mid-water Widow/ Yellowtail Fishery (Period 6)
Lingcod	980.0	159.1	820.9	841	577	313.5	156.7	0.5	1.8	0.1
Pacific Cod	798.5	41.8	756.7	3,200	3,200	41.8	41.8			
Pacific Whiting ^{d/}	132,367.9	2,368.5	129,999.4	188,000	129,600	2,312.2	2,312.2			56.3
Sablefish (north)	4,330.4	701.6	3,628.8	8,209	4,367	1,285.0	642.5		59.1	
Sablefish (south)	189.8		189.8	441	229					
Dover sole	7,583.8	1,264.8	6,319.0	8,510	7,440	1,264.8	1,264.8			
English sole	1,594.5	415.2	1,179.3	3,100		415.2	415.2			
Petrале sole	1,965.4	167.3	1,798.1	2,762		167.3	167.3			
Arrowtooth flounder	4,979.3	2,888.6	2,090.7	5,800		2,888.6	2,888.6			
Other flatfish	2,336.7	633.5	1,703.2	7,700		633.5	633.5			
Pacific Ocean Perch	185.3	34.5	150.8	689	350	30.5	30.5	3.8	0.0	0.1
Shortbelly	11.7	11.4	0.3	13,900	13,900	11.4	11.4			
Widow	547.0	193.5	353.5	3,871	856	3.3	3.3	154.7	0.0	35.5
Canary	109.7	41.2	68.4	272	93	32.1	32.1	5.2	1.3	2.7
Chilipepper	249.0	74.0	175.0	2,700	2,000	74.0	74.0			
Bocaccio	140.3	28.6	111.7	198	100	28.0	28.0	0.6		
Splitnose	79.1	22.6	56.5	615	461	22.6	22.6			
Yellowtail	1,532.3	285.6	1,246.6	3,146	3,146	285.6	285.6			
Shortspine Thornyheads	1,155.7	389.4	766.3	1,004	955	389.4	389.4			
Longspine Thds. (north)	2,098.4	373.3	1,725.1	2,461	2,461	373.3	373.3			
Longspine Thds. (south)	124.7		124.7	390	195					
Unspecified Thornyheads	71.6		71.6							
Cowcod, Monterey	2.2	1.4	0.8	19	2.4	1.4	1.4			
Cowcod, Conception	0.0		0.0	5	2.4					
Yelloweye	11.2	2.1	9.1	52	13.5	0.5	0.5		1.6	
Darkblotched	202.2	96.3	105.9	205	168	93.0	93.0	3.2	0.1	

a/ Preliminary estimates of total catch mortality based on species discard assumptions used when the OYs were set. These assumptions are currently being revised using data from the West Coast Groundfish Observer Program.

b/ Preliminary estimated discard mortality in the commercial fishery. Preliminary trawl discard calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer Program data to 2002 trawl logbook data, by area and depth strata. Discard totals estimated for tows recorded in logbooks are expanded using state-specific ratios of fishticket landings to retained logbook catch. Because tows conducted under Exempted Fishing Permits could not currently be removed from logbooks and fishtickets, applying fleetwide discard rates to these tows may overstate discard for some shelf species. This column also includes at-sea discards of rebuilding species. Preliminary fixed-gear discard in the directed sablefish fisheries is calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer Program data to northern sablefish landings data. No logbooks are available for fixed-gear vessels. Because of the limited geographic coverage of available data, fixed-gear discard amounts for species caught off central California are not well estimated at this time.

c/ Includes shoreside commercial and tribal landings from PacFIN, observed total catch including estimated discards in the at-sea whiting fishery, and RecFIN recreational catch plus observed discard mortality (A+B1).

d/ Discards of whiting are estimated from observer data and counted towards the OY inseason.

TABLE 7 (BC1.4) Draft estimated 2003 total catch mortality of selected groundfish species from West Coast commercial, tribal and recreational fisheries (mt).^{a/}

Species	<u>LANDINGS AND MORTALITY</u>			<u>TARGETS</u>			<u>DISCARDS</u>		
	Estimated Total Catch	PRELIMINARY Estimated Commercial Fishery Discard	Actual Landings ^{c/}	Total Catch ABC	Total Catch OY	Shoreside Discard	Shoreside Discard Mortality	At-sea Whiting Bycatch	Mortality from Fixed-gear Sablefish (All, North of 36°)
Lingcod	1,355.6	70.7	1,284.9	841	651	137.8	68.9	0.5	1.3
Pacific Cod	1,323.1	73.5	1,249.6	3,200	3,200	73.5	73.5		
Pacific Whiting ^{d/}	142,913.8	1,422.7	141,491.1	188,000	148,200	1,422.7	1,422.7		
Sablefish (north)	6,386.6	1,126.1	5,260.5	8,209	6,500	2,067.4	1,033.7		92.4
Sablefish (south)	204.0		204.0	441	294				
Dover sole	8,342.2	956.6	7,385.7	8,510	7,440	956.6	956.6		
English sole	1,241.4	339.0	902.4	3,100		339.0	339.0		
Petrale sole	2,160.6	144.4	2,016.2	2,762		144.4	144.4		
Arrowtooth flounder	3,243.5	904.8	2,338.7	5,800		904.8	904.8		
Other flatfish	2,093.5	490.7	1,602.8	7,700		490.7	490.7		
Pacific Ocean Perch	160.1	21.9	138.2	689	377	15.5	15.5	6.3	
Shortbelly	9.3	2.3	7.0	13,900	13,900	2.3	2.3		
Widow	57.9	16.1	41.8	3,871	832	1.7	1.7	14.4	
Canary	48.5	14.2	34.3	272	44	12.7	12.7	0.9	0.6
Chilipepper	49.5	15.4	34.1	2,700	2,000	15.4	15.4		
Bocaccio	29.1	8.5	20.6	198	20	8.2	8.2	0.3	
Splitnose	118.8	9.3	109.5	615	461	9.3	9.3		
Yellowtail	504.5	22.1	482.4	3,146	3,146	22.1	22.1		
Shortspine Thornyheads ^{e/}	1,220.2	387.8	832.4	1,004	955	387.8	387.8		
Longspine Thds. North ^{e/}	1,834.8	323.9	1,510.9	2,461	2,461	323.9	323.9		
Longspine Thds. South	0.0			390	195				
Cowcod, Monterey	0.4	0.2	0.1	19	2.4	0.2	0.2		
Cowcod, Conception	0.0		0.0	5	2.4				
Yelloweye	8.1	1.5	6.6	52	22.0	0.3	0.3		1.3
Darkblotched	139.9	51.8	88.1	205	172.0	47.3	47.3	4.32986	0.2
Black Rockfish (north)	174.0		174.0	615					
Black Rockfish (south)	976.1		976.1	500					
Black Rockfish Total	1,150.1		1,150.1	1,115					

a/ Preliminary estimates of total catch mortality based on species discard assumptions used when the OYs were set. These assumptions are currently being revised using data from the West Coast Groundfish Observer Program.

b/ Preliminary estimated discard mortality in the commercial fishery. Preliminary trawl discard calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer Program data to 2002 trawl logbook data, by area and depth strata. Discard totals estimated for tows recorded in logbooks are expanded using state-specific ratios of fishticket landings to retained logbook catch. Because tows conducted under Exempted Fishing Permits could not currently be completely removed from logbooks and fishtickets, applying fleetwide discard rates to these tows may overstate discard for some shelf species. In an effort to minimize this problem, rockfish discard from target tonnage caught within the RCA off Oregon was estimated using bycatch rates from that EFP. Since the In an effort to minimize this problem, rockfish discard from target tonnage caught within the RCA off Oregon was estimated using bycatch c/Includes shoreside commercial and tribal landings from PacFIN, observed total catch including estimated discards in the at-sea whiting fishery, and RecFIN recreational catch plus observed discard mortality (A+B1).

d/ Discards of whiting are estimated from observer data and counted towards the OY inseason.

e/ Includes "unspecified thornyheads" allocated based on ratios estimated from California landings and At Sea north/south ABCs.

Table 8 (BC1.5) Draft estimated 2002 total catch mortality of selected groundfish species from West Coast commercial, tribal and recreational fisheries (mt). Shoreside and at-sea refer to the limited entry trawl fisheries. a/

Species	LANDINGS AND MORTALITY			TARGETS			Shoreside				At Sea			
	Estimated Total Catch	Estimated Commercial Fishery Discard Mortality b/	Actual Landings c/	Total Catch ABC	Total Catch OY	% shoreside landed catch	Estimated shore-side landed catch	Shore-side discard	Shore-side discard mortality	%shore-side discard mortality	% At-sea Catch	Estimated at-sea catch	At-sea whiting bycatch	% at-sea discard mortality
Lingcod	979.9	159.0	820.9	841	577	49.0%	101	313.5	156.8	60.9%	0.1%	0.3	0.5	32.6%
Pacific Cod	798.5	41.8	756.7	3,200	3,200	92.1%	697	41.8	41.8	5.7%	0.0%	0.0		
Pacific Whiting d/	132,367.9	2,368.5	129,999.	188,000	129,600	42.1%	54,757	2,368.5	2,368.5	4.1%	57.9%	75,242.4		0.0%
Sablefish (north)	4,330.4	701.6	3,628.8	8,209	4,367	40.6%	1,473	1,285.0	642.5	30.4%	0.6%	20.0		0.0%
Sablefish (south)	189.8	0.0	189.8	441	229		0					0.0		
Dover sole	7,583.8	1,264.8	6,319.0	8,510	7,440	99.4%	6,284	1,264.8	1,264.8	16.8%	0.0%	0.7		0.0%
English sole	1,594.5	415.2	1,179.3	3,100		96.1%	1,133	415.2	415.2	26.8%	0.0%	0.1		0.0%
Petrale sole	1,965.4	167.3	1,798.1	2,762		98.2%	1,766	167.3	167.3	8.7%	0.0%	0.0		
Arrowtooth flounder	4,979.3	2,888.6	2,090.7	5,800		99.4%	2,079	2,888.6	2,888.6	58.2%	0.1%	2.2		0.0%
Other flatfish	2,336.7	633.5	1,703.2	7,700		83.1%	1,416	633.5	633.5	30.9%	1.4%	24.0		0.0%
Pacific Ocean Perch	185.3	34.5	150.8	689	350	97.3%	147	30.6	30.6	17.3%	2.4%	3.6	3.8	51.2%
Shortbelly	11.7	11.4	0.3	13,900	13,900	9.8%	0	11.4	11.4	99.7%	90.2%	0.3		0.0%
Widow	547.0	193.5	353.5	3,871	856	63.9%	226	38.8	38.8	14.6%	32.7%	115.8	154.7	57.2%
Canary	109.7	41.2	68.4	272	93	82.8%	42	34.7	34.7	45.4%	4.8%	2.4	5.2	68.5%
Chilipepper	249.0	74.0	175.0	2,700	2,000	94.5%	153	74.0	74.0	32.6%	3.0%	5.3		0.0%
Bocaccio	140.3	28.6	111.7	198	100	82.9%	93	28.0	28.0	23.3%	0.9%	0.2	0.6	76.2%
Splitnose	79.1	22.6	56.5	615	461	55.7%	31	22.6	22.6	41.8%	38.4%	21.7		0.0%
Yellowtail	1,532.3	285.6	1,246.6	3,146	3,146	70.9%	884	285.6	285.6	24.4%	1.0%	12.0		0.0%
Shortspine Thornyheads	1,155.7	389.4	766.3	1,004	955	85.6%	656	389.4	389.4	37.3%	1.7%	13.1		0.0%
Longspine Thds. (north)	2,098.4	373.3	1,725.1	2,461	2,461	98.5%	1,699	373.3	373.3	18.0%	0.0%	0.0		
Longspine Thds. (south)	124.7	0.0	124.7	390	195	98.5%	123		0.0	0.0%	0.0%	0.0		
Unsp. Thornyheads	71.6	0.0	71.6				0		0.0			0.0		
Cowcod, Monterey	2.2	1.4	0.8	19	2.4	64.6%	1	1.4	1.4	74.0%		0.0		
Cowcod, Conception	0.0	0.0	0.0	5	2.4		0		0.0			0.0		
Yelloweye	11.2	2.1	9.1	52	13.5	21.2%	0.7	0.5	0.5	41.1%	0.5%	0.0		0.0%
Darkblotched	202.2	96.3	105.9	205	168	93.3%	99	93.0	93.0	48.5%	3.8%	4.0	3.2	44.2%

a/ Preliminary estimates of total catch mortality based on species discard assumptions used when the OYs were set. These assumptions are currently being revised using data from the West Coast Groundfish Observer Program.

b/ Preliminary estimated discard mortality in the commercial fishery. Preliminary trawl discard calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer data to 2002 trawl logbook data, by area and depth strata

c/ Includes shoreside commercial and tribal landings from PacFIN, observed total catch including estimated discards in the at-sea whiting fishery, and RecFIN recreational catch plus observed discard mortality (A+B1).

d/ Discards of whiting are estimated from observer data and counted towards the OY inseason.

Table 9 (BC1.6) Draft estimated 2003 total catch mortality of selected groundfish species from West Coast commercial, tribal and recreational fisheries (mt). Shoreside and at-sea refer to the limited entry trawl fisheries. a/

Species	LANDINGS AND MORTALITY			TARGETS		Shoreside					At Sea			
	Estimated Total Catch	Estimated Commercial Fishery Discard Mortality b/	Actual Landings c/	Total Catch ABC	Total Catch OY	% shoreside landed catch	Estimated shore-side landed catch	Shore-side discard	Shore-side discard mortality	%shore-side discard mortality	% At-sea Catch	Estimated at-sea catch	At-sea whiting bycatch	% at-sea discard mortality
Lingcod	1,355.6	70.7	1,284.9	841	651	37.4%	62	137.8	68.9	52.7%	0.3%	0.5	0.5	52.6%
Pacific Cod	1,323.1	73.5	1,249.6	3,200	3,200	82.6%	1,033	73.5	73.5	6.6%	0.0%	0.2		
Pacific Whiting d/	142,913.8	1,422.7	141,491.	148,200	42.1%	59,511	1,422.7	1,422.7	2.3%	54.6%	77,185.9			
Sablefish (north)	6,386.6	1,126.1	5,260.5	8,209	6,500	41.9%	2,205	2,067.4	1,033.7	31.9%	0.3%	16.4		
Sablefish (south)	204.0	0.0	204.0	441	294		0					0.0		
Dover sole	8,342.2	956.6	7,385.7	8,510	7,440	99.5%	7,346	956.6	956.6	11.5%	0.0%	0.9		
English sole	1,241.4	339.0	902.4	3,100		92.0%	830	339.0	339.0	29.0%	0.0%	0.0		
Petrale sole	2,160.6	144.4	2,016.2	2,762		95.3%	1,921	144.4	144.4	7.0%	0.0%	0.0		
Arrowtooth flounder	3,243.5	904.8	2,338.7	5,800		98.7%	2,309	904.8	904.8	28.2%	0.1%	2.8		
Other flatfish	2,093.5	490.7	1,602.8	7,700		88.5%	1,418	490.7	490.7	25.7%	0.5%	8.4		
Pacific Ocean Perch	160.1	21.9	138.2	689	377	95.8%	132	15.5	15.5	10.5%	3.8%	5.3	6.3	54.5%
Shortbelly	9.3	2.3	7.0	13,900	13,900	25.4%	2	2.3	2.3	56.5%	47.9%	3.3		
Widow	57.9	16.1	41.8	3,871	832	41.0%	17	1.7	1.7	8.8%	31.0%	13.0	14.4	52.7%
Canary	48.5	14.2	34.3	272	44	81.3%	8	12.7	12.7	61.6%	2.5%	0.2	0.9	79.3%
Chilipepper	49.5	15.4	34.1	2,700	2,000	90.8%	31	15.4	15.4	33.2%	6.3%	2.1		
Bocaccio	29.1	8.5	20.6	198	20	19.6%	4	8.2	8.2	67.0%	4.0%	0.8	0.3	25.9%
Splitnose	118.8	9.3	109.5	615	461	60.7%	66	9.3	9.3	12.2%	34.4%	37.7		
Yellowtail	504.5	22.1	482.4	3,146	3,146	32.8%	158	22.1	22.1	12.3%	0.2%	1.2		
Shortspine Thornyheads	1,220.2	387.8	832.4	1,004	955	81.2%	676	387.8	387.8	36.5%	2.1%	17.8		
Longspine Thds. (north)	1,834.8	323.9	1,510.9	2,461	2,461.0	97.5%	1,473	323.9	323.9	18.0%		0.0		
Longspine Thds. (south)	0.0	0.0	0.0	390	195.0	97.5%	0				0.0%	0.0		
Cowcod, Monterey	0.4	0.2	0.1	19	2.4	0.0%	0	0.2	0.2	100.0%	0.0%	0.0		
Cowcod, Conception	0.0	0.0	0.0	5	2.4		0					0.0		
Yelloweye	8.1	1.5	6.6	52	22	41.2%	0	0.3	0.3	39.8%	0.6%	0.0		
Darkblotched	139.9	51.8	88.1	205	172	93.8%	82.6	47.3	47.3	36.4%	5.5%	4.8	4.3	47.3%
Black RF (north)	174.0	0.0	174.0	615		49.9%	0					0.0		
Black RF (north)	976.1	0.0	976.1	500		49.9%	0					0.0		

a/ Preliminary estimates of total catch mortality based on species discard assumptions used when the OYs were set. These assumptions are currently being revised using data from the West Coast Groundfish Observer Program.

b/ Preliminary estimated discard mortality in the commercial fishery. Preliminary trawl discard calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer data to 2002 trawl logbook data, by area and depth strata

c/ Includes shoreside commercial and tribal landings from PacFIN, observed total catch including estimated discards in the at-sea whiting fishery, and RecFIN recreational catch plus observed discard mortality (A+B1).

d/ Discards of whiting are estimated from observer data and counted towards the OY inseason.

Table 10 (BC1.7) Draft estimated 2002 and 2003 percent discard mortality of selected groundfish species from selected sectors of West Coast commercial, tribal, and recreational fisheries compared to estimates from British Columbia bottom trawl trips.

Species	W.C. ^a All Sectors		W.C. ^b Shoreside Trawl		W.C. ^b At-sea Trawl		W.C. Non-Whitingg Bottom Trawl		British Columbia ^d Bottom Trawl	
	2002	2003	2002	2003	2002	2003	2001-02	2002-03	2001-02	2002-03
Lingcod	16%	6%	61%	53%	33%	53%	74%	77%	8%	11%
Pacific Cod	5%	6%	6%	7%	0%	0%				
Pacific Whiting c/	2%	1%	4%	2%	0%	0%	99%	95%	80%	96%
Sablefish (north)	16%	18%	30%	32%	0%	0%	57%	32%	54%	69%
Sablefish (south)	0%	0%								
Dover sole	17%	11%	17%	12%	0%	0%	17%	10%	9%	10%
English sole	26%	27%	27%	29%	0%	0%				
Petrale sole	9%	7%	9%	7%			8%	6%	4%	9%
Arrowtooth flounder	58%	28%	58%	28%	0%	0%	51%	40%	24%	40%
Other flatfish	27%	23%	31%	26%	0%	0%	38%	34%	27%	27%
Pacific Ocean Perch	19%	14%	17%	10%	51%	54%	12%	15%	1%	1%
Shortbelly	97%	25%	100%	56%	0%	0%				
Widow	35%	28%	15%	9%	57%	53%	4%	66%	0%	0%
Canary	38%	27%	45%	62%	69%	79%	45%	63%	1%	0%
Chilipepper	30%	31%	33%	33%	0%	0%				
Bocaccio	20%	29%	23%	67%	76%	26%	79%	100%	0%	0%
Splitnose	29%	8%	42%	12%	0%	0%				
Yellowtail	19%	4%	24%	12%	0%	0%	22%	2%	0%	0%
Shortspine	34%	32%	37%	36%	0%	0%	34%	31%	5%	4%
Longspine Thds. North	18%	18%	18%	18%			19%	20%	10%	10%
Longspine Thds. South										
Uns. Thornyheads										
Cowcod, Monterey	65%	50%	74%	100.0%						
Cowcod, Conception										
Yelloweye	19%	19%	41%	39.8%	0%	47%	74%	74%	50%	64%
Darkblotched	48%	37%	48%	36%	44%		49%	60%	11%	15%
Black Rockfish (north)		0%								
Black Rockfish (south)		0%								

a/ Preliminary estimated discard mortality rate in the West Coast groundfish commercial fishery with respect to total estimated harvest of all fisheries (commercial, recreational, and tribal), including discard. Commercial discard rates based on West Coast Groundfish Observer Program.
b/ Preliminary estimated discard mortality rate in the West Coast groundfish shoreside and at-sea limited entry trawl sectors - including P. whiting.
c/ Preliminary estimate discard rates in the West Coast groundfish shoreside limited entry bottom trawl sector. Commercial discard rates based on WCGOP observer-covered bottom trawl trips only (NMFS, 2004). Estimated discard was expanded to the entire fishery by dividing by the amount of observer coverage (13% in 2001-02 and 16% in 2002-03). Trips excluded midwater trawl shoreside fishery directed at Pacific whiting.
d/ 100% observer coverage. Estimated discard rate = discards/(discards + landings) x 100 as percentage for the bottom trawl component of the British Columbia groundfish fishery 2001-02 and 2002-03. (Branch et al., 2004).

TABLE 11 (BC1.8) Tools potentially useful in reducing bycatch (at-sea discards) under an IFQ program for the West Coast groundfish trawl fishery - adapted from Quigley (2004).

IQ Tool	How it Potentially Reduces Bycatch	Potential Downsides
<i>Quota transferability</i>	Quota transfer may lead to concentration of effort and increase in shares per vessel, potentially reducing the number of occasions a vessel comes up against a quota limit. Transferability also allows purchase of quota needed in areas of high bycatch.	High transaction costs. Concentration of shares due to transfers lead to adverse economic shifts.
<i>Incorporation of overfished species into the IQ program</i>	Reducing bycatch of overfished species can permit more access to target species; bycatch quota shares can thus be freed and used in high bycatch rate areas.	If quota shares for overfished species are small, the IQ managed fishery could be influenced by excessive catches of these species in non-IQ fisheries receiving an overall allocation.
<i>Incorporation of other gear types into the IQ program</i>	If all sectors fishing in an IQ species are in an IQ program and shares could be transferred between sectors, then sectors with an IQ deficit could purchase surplus shares and reduce bycatch by finding covering shares.	Difficulty allocating and managing shares to sectors with a large number of participants - (recreational fishery).
<i>Incorporation of non-marketable species into the IQ program</i>	Prevents excessive fishing pressure on non-IQ and formerly non-marketable species; can also create a controlled environment for development of new markets.	May be no survey or assessment data to determine appropriate OY and IQ shares. Extra cost to IQ fishermen to purchase shares for a low value species.
<i>Quota market that is convenient and easy to use.</i>	Creates a central location for sellers/buyers to locate shares and keeps transaction costs low. Allows those needed quota to 'cover' catch with purchased shares to do so - a disincentive to discarding species with little or no share remaining at time of capture.	Quota shares may not be available when needed or price may be substantially higher than market value. A government created market may be cost prohibitive - tracking costs may be prohibitive.
<i>Full observer coverage</i>	Increased accountability, eliminates incentive to discard fish that will count against quota share.	Less than 100% observer coverage and or video monitoring would leave the door open to high-grading and discarding of fish not covered by quota share.
<i>Carryover provisions</i>	Provides a means of handling catch in excess of quota share - reduces incentives to discard instead of landing fish.	Additional tracking costs.
<i>Adequate penalties for overcatches</i>	Provides incentive to incorporate selective fishing strategies that minimize bycatch of overfished or prohibited species, promotes individual accountability.	If penalties are too high, or the threshold for application of penalties is too low, incentives for discarding might increase.
<i>Education program</i>	Knowledge of impact of at-sea discards on the resource and IQ holdings and value provide incentives for minimizing waste.	

Table 12 (AE 1.1) Total allowable catches (TAC) of groundfish by British Columbia management area.

Species	Management Area	TAC (mt)
Yellowtail Rockfish	3C	995
	3D, 5A/5B, 5C/D/E	3,427
Widow Rockfish	Coastwide	4,422
Canary Rockfish	3C/D	529
	5A/B	265
	5C/D	101
	5E	151
Silvergrey Rockfish	3C/D	216
	5A/B	421
	5C/D	382
	5E	248
Pacific Ocean Perch	3C	300
	3D	230
	5A/B	2,070
	5C/D	2,818
	5E	730
Yellowmouth Rockfish	3C	219
	3D, 5A/5B	1,135
	5C/D	685
	5E	325
Rougeye Rockfish	Coastwide	530
Shorthead Rockfish	Coastwide	105
Redstripe Rockfish	3C	173
	3D,5A/B	772
	5C/D	330
	5E	246
Shortspine Thornyheads	Coastwide	736
Longspine Thornyheads	Coastwide	405
Quillback, Copper, China, and Tiger Rockfish	Coastwide	5
Pacific Cod	3C/D	500
	5A/B	390
	5C/D/E	400
Dover Sole	3C/D	1,375
	5C/D/E	1,100
Rock Sole	3C/D	102
	5A/B	875
	5C/D	673
Lemon Sole	3C/D	186
	5C/D/E	544
Petrale Sole	Coastwide	600
Lingcod	3C	800
	3D	220
	5A/B	862
	5C/D/E	580
Dogfish	4B	1,600
	Rest of Coast	3,840
Sablefish	Coastwide	384
Pollock	Gulf	1,115
	5A/B	1,790
Hake	Gulf	10,000
	Offshore	134,372
Big Skate	5C/D	567
Longnose skate	5C/D	47

Table 13 (SQ1) Onshore Ex-Vessel Value by Port Group in 2003.

Port Group	GF LE (EEZ) Trawl Ex-Vessel Value			Total	Percent GF
	Non-Whiting	Whiting	Total	Onshore Ex-Vessel Value	LE Trawl Ex-Vessel Value
Washington	3,598,255	1,283,316	4,881,571	130,848,529	4%
1.01 Northern Puget Sound	2,285,912	1,201	2,287,113	28,690,565	8%
BELLINGHAM BAY	1,606,205	1,201	1,607,406	18,735,747	9%
BLAINE	679,707		679,707	4,033,118	17%
1.02 Southern Puget Sound				19,999,898	0%
1.03 Coastal Washington North	884,797		884,797	15,470,059	6%
1.04 Coastal Washington South and Central	427,546	1,282,115	1,709,661	62,496,204	3%
ILWACO/CHINOOK	5,271	227,632	232,903	17,308,879	1%
WESTPORT	422,275	1,054,483	1,476,758	38,393,537	4%
1.05 Unidentified Washington				4,191,803	0%
Oregon	12,766,494	3,642,453	16,408,947	82,526,895	20%
2.01 Astoria	5,185,741	1,443,180	6,628,921	27,584,980	24%
2.02 Tillamook	88,397		88,397	3,510,475	3%
2.03 Newport	2,786,118	1,997,470	4,783,588	24,793,494	19%
2.04 Coos Bay	3,536,915	201,803	3,738,718	18,033,249	21%
COOS BAY	3,514,865	201,803	3,716,668	15,898,092	23%
FLORENCE	22,050		22,050	686,491	3%
2.05 Port Orford				1,972,609	0%
2.06 Brookings	1,169,323		1,169,323	6,632,088	18%
California	8,582,254	165,506	8,747,760	126,556,748	7%
3.01 Crescent City	1,092,483	2,925	1,095,408	16,841,548	7%
3.02 Eureka	2,448,485	162,581	2,611,066	15,793,366	17%
3.03 Fort Bragg	1,562,767		1,562,767	11,042,291	14%
FORT BRAGG	1,554,089		1,554,089	10,122,437	15%
OTHER MENDOCINO COUNTY PORTS	8,678		8,678	69,833	12%
3.04 Bodega Bay	252,929		252,929	5,636,957	4%
3.05 San Francisco	1,112,135		1,112,135	14,436,063	8%
OTHER S. F. BAY AND SAN MATEO COUNTY PORTS	7,482		7,482	292,732	3%
PRINCETON / HALF MOON BAY	384,914		384,914	4,832,816	8%
SAN FRANCISCO	719,739		719,739	8,431,778	9%
3.06 Monterey	1,158,864		1,158,864	13,355,440	9%
MONTEREY	252,993		252,993	3,085,877	8%
MOSS LANDING	898,033		898,033	9,657,024	9%
SANTA CRUZ	7,838		7,838	583,149	1%
3.07 Morro Bay	953,081		953,081	3,465,129	28%
AVILA	825,428		825,428	1,699,297	49%
MORRO BAY	127,653		127,653	1,756,492	7%
3.08 Santa Barbara				21,038,279	0%
3.09 Los Angeles	293		293	19,196,550	0%
3.10 San Diego	1,217		1,217	5,612,176	0%
3.11 Unidentified California				138,949	0%
Total West Coast Onshore	24,947,003	5,091,275	30,038,278	339,932,172	9%

Table 14 (SQ2) Onshore Vessel, Buyer, and Delivery Counts by Port Group in 2003.

Port Group	Bought-out Vessels					GF LE		GF LE		Large		GF LE	
	Vessels		GF LE (EEZ)	Trawl Ex-Vessel	Value	Trawl	Total	Trawl	Total	GF LE	Total	GF LE	Total
	Count	Percent	Non-Whiting	Whiting	Total	Vessels	Vessels	Buyers	Buyers	Buyers	Buyers	Deliveries	Deliveries
Washington	16	59%	2,868,683	379,297	3,247,980	27	1,168	9	397	8	47	993	75,523
1.01Northern Puget Sound BELLINGHAM BAY BLAINE	6	75%	1,695,005	1,201	1,696,206	8	370	4	111	4	17	244	25,752
1.02Southern Puget Sound							123		117		16		16,384
1.03Coastal Washington North	4	57%	473,734		473,734	7	116	2	69	1	8	496	10,968
1.04Coastal Washington South and Central ILWACO/CHINOOK WESTPORT	6	50%	699,944	378,096	1,078,040	12	558	3	122	3	17	253	16,461
1.05Unidentified Washington							1		9		1		5,982
Oregon	29	31%	4,910,066	81,112	4,991,178	94	1,034	18	269	11	20	2,503	32,603
2.01Astoria	9	28%	1,549,883	2,759	1,552,642	32	322	3	63	3	9	891	9,418
2.02Tillamook						3	110	2	44	1	4	41	3,801
2.03Newport	7	28%	1,266,270	77,921	1,344,191	25	246	4	105	3	9	843	6,148
2.04Coos Bay COOS BAY FLORENCE	7	32%	1,373,257	432	1,373,689	22	217	10	99	6	8	589	6,436
2.05Port Orford							57		12		3		3,116
2.06Brookings	6	50%	720,656		720,656	12	82	4	33	3	5	139	3,684
California	46	54%	4,832,809		4,832,809	85	2,085	53	894	23	55	2,354	75,648
3.01Crescent City	13	76%	788,600		788,600	17	122	7	51	6	16	224	3,824
3.02Eureka	16	70%	2,254,037		2,254,037	23	125	8	79	6	13	417	4,895
3.03Fort Bragg FORT BRAGG OTHER MENDOCINO COUNTY PORTS	5	50%	601,607		601,607	10	218	5	109	4	20	219	6,427
3.04Bodega Bay	1	C	120,289		120,289	C	187	5	136	3	19	C	3,794
3.05San Francisco OTHER S. F. BAY AND SAN MATEO COUNTY PRINCETON / HALF MOON BAY SAN FRANCISCO	3	21%	154,085		154,085	14	331	26	243	14	27	586	8,764
3.06Monterey MONTEREY MOSS LANDING SANTA CRUZ	3	25%	405,612		405,612	12	243	16	117	4	18	695	7,419
3.07Morro Bay AVILA MORRO BAY	5	56%	508,579		508,579	9	149	7	67	3	11	139	4,069
3.08Santa Barbara							268		211		27		15,557
3.09Los Angeles						C	293	1	172		18	C	12,874
3.10San Diego						C	140	1	88	1	10	C	7,237
3.11Unidentified California							9		18		1		788
Total West Coast Onshore	91	44%	12,611,558	460,409	13,071,967	206	4,287	80	1,560	42	122	5,850	183,739

Notes:

1. Vessel counts exclude invalid vessel ID's. Vessels are assigned to only one port group. GF LE trawl vessels are those that made a GF LE trawl landing at any of the ports in 2003.
2. Bought-out vessel's homeport port group was for last landings. Six of the 91 vessels had no landings in 2003, two of the vessels had no landings in 2002 and 2003, and one of the vessels had no landings 2001 through 2003. Bought-out vessel percent is a relative comparison against unique vessels making GF LE trawl landings.
3. Large buyers are those with purchases over \$500,000.

C = Data withheld for confidentiality reasons.

Table 15 (SQ3) Onshore Ex-processor Value and Regional Income Impacts (REI) by Port Group in 2003.

Port Group	Non-Whiting GF LE Trawl Ex- Processor Value	Non-Whiting GF Other Trawl Ex- Processor Value	Non-Whiting Groundfish Ex- Processor Value	Whiting Ex- Processor Value	Total Ex-Processor Value	Non-Whiting GF LE Trawl REI	Non- Whiting GF Other Trawl REI	Non- Whiting Groundfish REI	Whiting REI	Total REI
Washington	5,911,560	3,944,752	18,461,965	9,528,686	224,237,275	8,707,992	5,812,038	26,946,665	12,331,142	317,207,142
1.01 Northern Puget Sound Bellingham Bay Blaine	3,854,090	2,277,525	8,838,882	44,062	46,359,504	5,847,815	3,429,949	13,279,928	61,313	69,597,908
1.02 Southern Puget Sound			429,799		32,981,949			617,333		44,585,730
1.03 Coastal Washington North	1,368,156	1,473,507	5,661,641		21,380,862	2,070,452	2,252,437	8,540,077		30,700,848
1.04 Coastal Washington South and Central Ilwaco/chinook Westport	689,084	193,509	2,670,847	9,484,624	117,368,365	1,010,289	286,189	3,888,026	11,665,072	165,392,763
1.05 Unidentified Washington										
Oregon	19,280,113	71,164	25,122,550	13,517,031	156,762,270	28,446,825	133,904	36,831,648	16,170,245	214,966,187
2.01 Astoria	7,818,584	71,164	8,626,142	5,362,197	66,663,105	11,360,081	131,994	12,438,227	5,556,608	91,155,596
2.02 Tillamook	117,753		274,145		5,559,887	174,755		423,343		7,528,132
2.03 Newport	4,270,043		6,180,467	7,407,679	42,419,652	6,390,906		9,137,301	8,051,816	57,081,497
2.04 Coos Bay Coos Bay Florence	5,326,031		6,695,025	747,156	28,043,274	8,020,823		9,979,488	275,657	38,948,104
2.05 Port Orford										
2.06 Brookings	1,747,696		3,346,573		12,161,090	2,550,859		4,924,513		17,410,047
California	13,055,963	15,337	20,453,693	934,489	230,012,648	18,559,128	21,718	29,233,003	1,087,785	319,340,306
3.01 Crescent City	1,629,139		2,361,209	11,216	24,071,209	2,334,420		3,394,066	11,860	36,318,315
3.02 Eureka	3,686,011	6,697	4,179,458	919,965	23,900,178	5,272,350	9,571	5,989,338	1,002,989	32,751,593
3.03 Fort Bragg Fort Bragg Other Mendocino County Ports	2,440,522		3,463,775		15,629,060	3,487,827		4,978,158		21,913,700
3.04 Bodega Bay	374,375		446,364		8,027,267	523,606		626,597		11,150,910
3.05 San Francisco Other S. F. Bay and San Mateo County Princeton / Half Moon Bay San Francisco	1,608,227	408	2,090,075		23,592,974	2,234,829	645	2,920,854		26,444,098
3.06 Monterey Monterey Moss Landing Santa Cruz	1,842,919	4,844	3,325,897		32,650,260	2,506,978	6,674	4,553,736		40,459,723
3.07 Morro Bay Avila Morro Bay	1,472,830	967	2,534,612		5,240,139	2,213,498	1,457	3,846,301		7,516,800
3.08 Santa Barbara		1,725	465,855	191	39,759,508		2,593	633,894	107	51,799,593
3.09 Los Angeles	325		1,057,269	3,117	49,626,436	505	26	1,395,914	2,565	67,077,532
3.10 San Diego	1,387		528,718		7,301,367	2,004		629,806		10,236,289
3.11 Unidentified California										
TotalWestCoast Onshore	38,247,637	4,031,253	64,038,208	23,980,206	611,012,194	55,713,944	5,967,660	93,011,316	29,589,172	851,513,634

Notes: 1. Ex-processor value and regional income impacts (REI) are estimated using PFMC Fisheries Economic Assessment Model (FEAM)

Table 16 (DQ1a) PacFIN landings of groundfish groups on the West Coast recorded before and after application of average species composition distributions: 1994-2003 (lbs).

AGID	groundfish groups	1994			Direction	1995			Direction	1996			Direction
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
WOC	Yellowtail Rockfish	10,937,997	14,401,345	3,463,348	+	10,553,027	10,737,965	184,938	+	12,434,743	12,436,872	2,129	+
WOC	Canary Rockfish	207,276	4,070,977	3,863,701	+	1,801,544	2,104,176	302,632	+	2,461,435	2,859,588	398,153	+
WOC	Widow Rockfish	13,677,020	15,659,056	1,982,036	+	14,690,844	14,766,162	75,318	+	14,135,185	13,947,406	187,779	<
WOC	Lingcod	6,406,817	6,408,946	2,129	+	3,854,983	3,858,271	3,288	+	4,085,254	4,087,571	2,317	+
WOC	Sablefish	18,099,035	18,095,241	3,794	<	18,430,861	18,451,847	20,986	+	19,050,648	18,993,734	56,914	<
WOC	Longspine Thornyhead		9,667,553	9,667,553	+	12,554,999	12,161,667	393,332	<	10,992,753	10,684,909	307,844	<
WOC	Shortspine Thornyhead	1,251,004	8,130,308	6,879,304	+	3,557,815	4,266,837	709,022	+	3,279,126	3,655,744	376,618	+
WOC	Dover Sole	22,925,454	22,888,834	36,620	<	24,398,964	24,395,089	3,875	<	27,971,907	27,828,694	143,213	<
WOC	Pacific Cod	2,823,708	2,823,358	350	<	2,035,758	2,035,728	30	<	1,673,165	1,671,597	1,568	<
WOC	Pacific Ocean Perch	7,917,420	4,981,129	2,936,291	<	5,746,110	4,250,215	1,495,895	<	5,324,141	3,741,038	1,583,103	<
WOC	Shortbelly Rockfish	6,195	94,685	88,490	+	12,600	70,370	57,770	+	61,440	79,146	17,706	+
WOC	Chilipepper	2,697,929	4,104,352	1,406,423	+	2,821,434	4,422,784	1,601,350	+	2,749,817	3,956,665	1,206,848	+
WOC	Bocaccio	1,887,791	3,029,540	1,141,749	+	1,679,617	2,782,216	1,102,599	+	1,022,012	1,574,581	552,569	+
WOC	Splitnose Rockfish	4,029	1,019,969	1,015,940	+	18	955,820	955,802	+	370	1,064,174	1,063,804	+
WOC	Bank Rockfish	56,439	749,602	693,163	+	106,377	899,800	793,423	+	66,639	1,221,580	1,154,941	+
WOC	Other Sebastes Complex	576,233	3,570,185	2,993,952	+	520,424	5,208,954	4,688,530	+	514,100	4,838,438	4,324,338	+
WOC	Black Rockfish	456,967	683,231	226,264	+	465,134	590,960	125,826	+	582,558	569,149	13,409	<
WOC	Blackgill Rockfish	579,910	862,273	282,363	+	410,645	774,388	363,743	+	479,863	825,502	345,639	+
WOC	Cowcod Rockfish	33,718	75,597	41,879	+	52,129	144,034	91,905	+	34,054	88,452	54,398	+
WOC	Darkblotched Rockfish		1,882,413	1,882,413	+		1,668,955	1,668,955	+	178	1,769,899	1,769,721	+
WOC	Redstripe Rockfish	2,478,028	1,658,897	819,131	<	1,991,826	2,147,563	155,737	+	2,445,342	1,926,451	518,891	<
WOC	Sharpchin Rockfish		1,074,289	1,074,289	+		836,965	836,965	+		748,550	748,550	+
WOC	Yelloweye Rockfish	56,765	551,500	494,735	+	67,001	629,393	562,392	+	99,667	457,641	357,974	+
WOC	Yellowmouth Rockfish		565,402	565,402	+		261,345	261,345	+		416,617	416,617	+
WOC	Other Rockfish	40,428,166	6,311,761	34,116,405	<	18,301,842	5,564,643	12,737,199	<	17,657,225	7,018,630	10,638,595	<
WOC	English Sole	3,094,450	3,093,994	456	<	3,068,628	3,068,554	74	<	3,196,424	3,196,351	73	<
WOC	Petrale Sole	3,242,583	3,242,272	311	<	3,865,899	3,865,822	77	<	4,149,998	4,149,895	103	<
WOC	Arrowtooth Flounder	11,056,894	11,053,730	3,164	<	8,733,941	8,734,175	234	+	8,490,099	8,485,047	5,052	<
WOC	Other Groundfish	13,583,829	13,690,235	106,406	+	12,558,220	12,558,185	35	<	13,210,056	13,208,681	1,375	<
	Total	164,485,657	164,440,674	75,788,061	<	152,280,640	152,212,883	29,193,277	<	156,168,199	155,502,602	26,250,241	<
	% movement			46%				19%				17%	

Table 16 (DQ1a) PacFIN landings of groundfish groups on the West Coast recorded before and after application of average species composition distributions: 1994-2003 (lbs).

		1997			1998			1999					
AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction
WOC	Yellowtail Rockfish	5,826,917	6,208,923	382,006	+	7,459,317	7,671,158	211,841	+	6,615,446	6,643,215	27,769	+
WOC	Canary Rockfish	2,649,090	2,767,765	118,675	+	2,919,505	2,961,579	42,074	+	1,675,240	1,734,100	58,860	+
WOC	Widow Rockfish	17,149,999	17,067,608	82,391	<	10,876,295	10,770,806	105,489	<	9,976,121	9,978,952	2,831	+
WOC	Lingcod	3,848,847	3,845,529	3,318	<	1,196,824	1,196,809	15	<	1,036,277	1,018,473	17,804	<
WOC	Sablefish	18,157,992	18,143,415	14,577	<	10,097,480	10,085,958	11,522	<	15,059,150	15,046,250	12,900	<
WOC	Longspine Thornyhead	9,259,242	8,842,736	416,506	<	5,164,514	4,932,071	232,443	<	4,086,470	3,931,429	155,041	<
WOC	Shortspine Thornyhead	2,790,802	3,210,468	419,666	+	2,521,189	2,750,251	229,062	+	1,646,856	1,848,217	201,361	+
WOC	Dover Sole	23,292,675	23,189,549	103,126	<	18,652,557	18,644,877	7,680	<	20,860,393	20,828,306	32,087	<
WOC	Pacific Cod	1,739,228	1,738,036	1,192	<	1,612,592	1,609,631	2,961	<	789,782	787,025	2,757	<
WOC	Pacific Ocean Perch	5,181,273	3,645,121	1,536,152	<	4,906,761	3,545,226	1,361,535	<	3,655,338	3,043,835	611,503	<
WOC	Shortbelly Rockfish	44,888	164,870	119,982	+	15,088	52,054	36,966	+	17,634	17,813	179	+
WOC	Chilipepper	2,809,220	4,490,441	1,681,221	+	2,064,568	3,121,510	1,056,942	+	1,943,944	2,091,765	147,821	+
WOC	Bocaccio	599,993	1,563,145	963,152	+	297,317	954,855	657,538	+	150,905	382,829	231,924	+
WOC	Splitnose Rockfish	936	1,242,041	1,241,105	+	89,585	3,332,739	3,243,154	+	74,081	532,393	458,312	+
WOC	Bank Rockfish	81,466	930,022	848,556	+	451,652	1,226,260	774,608	+	27,166	84,719	57,553	+
WOC	Other Sebastes Complex	574,684	3,072,816	2,498,132	+	535,239	3,776,699	3,241,460	+	441,236	2,440,848	1,999,612	+
WOC	Black Rockfish	667,829	675,717	7,888	+	624,227	644,164	19,937	+	411,418	392,661	18,757	<
WOC	Blackgill Rockfish	414,261	825,508	411,247	+	348,464	525,112	176,648	+	77,976	161,273	83,297	+
WOC	Cowcod Rockfish	21,635	120,117	98,482	+	25,771	43,030	17,259	+	6,810	24,806	17,996	+
WOC	Darkblotched Rockfish	25,513	1,895,402	1,869,889	+	8,203	2,027,353	2,019,150	+	1,259	848,549	847,290	+
WOC	Redstripe Rockfish	2,342,716	626,298	1,716,418	<	1,947,558	600,128	1,347,430	<	531,313	165,260	366,053	<
WOC	Sharpchin Rockfish		864,696	864,696	+		268,236	268,236	+		144,838	144,838	+
WOC	Yelloweye Rockfish	92,221	437,598	345,377	+	38,216	177,339	139,123	+	20,670	250,222	229,552	+
WOC	Yellowmouth Rockfish		249,557	249,557	+		97,748	97,748	+		90,606	90,606	+
WOC	Other Rockfish	13,504,618	4,843,939	8,660,679	<	13,932,059	4,427,087	9,504,972	<	6,609,452	2,763,077	3,846,375	<
WOC	English Sole	3,729,087	3,729,005	82	<	3,260,367	3,260,020	347	<	2,584,809	2,584,743	66	<
WOC	Petrale Sole	4,387,578	4,387,541	37	<	3,363,974	3,363,905	69	<	3,428,529	3,428,465	64	<
WOC	Arrowtooth Flounder	8,026,214	8,026,137	77	<	10,749,413	10,749,370	43	<	14,227,305	14,227,270	35	<
WOC	Other Groundfish	15,839,934	15,838,590	1,344	<	10,368,169	10,367,700	469	<	10,769,144	10,766,813	2,331	<
	Total		142,642,590	24,655,530	<	113,526,904	113,183,675	24,806,721	<	106,724,724	106,258,752	9,665,574	<
	% movement			17%				22%				9%	

Table 16 (DQ1a) PacFIN landings of groundfish groups on the West Coast recorded before and after application of average species composition distributions: 1994-2003 (lbs).

AGID	groundfish groups	2000			Direc- tion	2001			Direc- tion	2002			Direc- tion
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
WOC	Yellowtail Rockfish	6,983,467	6,968,763	14,704	<	4,598,252	4,343,849	254,403	<	2,440,038	2,445,788	5,750	+
WOC	Canary Rockfish	218,288	223,503	5,215	+	197,629	196,475	1,154	<	153,888	155,348	1,460	+
WOC	Widow Rockfish	8,506,565	8,525,619	19,054	+	5,258,424	5,295,547	37,123	+	896,964	899,799	2,835	+
WOC	Lingcod	475,382	475,759	377	+	397,646	397,305	341	<	567,774	567,703	71	<
WOC	Sablefish	14,172,361	14,199,116	26,755	+	12,729,958	12,744,790	14,832	+	8,646,658	8,658,457	11,799	+
WOC	Longspine Thornyhead	3,667,490	3,340,040	327,450	<	2,720,716	2,629,909	90,807	<	4,337,625	4,170,137	167,488	<
WOC	Shortspine Thornyhead	1,392,914	1,739,267	346,353	+	1,047,218	1,149,770	102,552	+	1,511,386	1,690,752	179,366	+
WOC	Dover Sole	19,669,615	19,672,050	2,435	+	15,297,351	15,334,197	36,846	+	14,043,123	14,046,785	3,662	+
WOC	Pacific Cod	883,149	883,178	29	+	1,011,686	1,011,608	78	<	2,149,757	2,149,659	98	<
WOC	Pacific Ocean Perch	1,141,874	1,158,661	16,787	+	709,604	708,326	1,278	<	446,132	449,532	3,400	+
WOC	Shortbelly Rockfish	42,795	42,795	-	0	11,679	11,679	-	0	138	269	131	+
WOC	Chilipepper	986,692	1,012,979	26,287	+	764,281	954,261	189,980	+	346,795	367,102	20,307	+
WOC	Bocaccio	54,486	67,160	12,674	+	48,471	83,394	34,923	+	46,257	78,475	32,218	+
WOC	Splitnose Rockfish	49,962	232,378	182,416	+	30,475	171,127	140,652	+	40,304	149,345	109,041	+
WOC	Bank Rockfish	180,422	187,017	6,595	+	124,051	203,059	79,008	+	439,106	646,556	207,450	+
WOC	Other Sebastes Complex	2,107,986	1,476,345	631,641	<	1,621,564	1,217,936	403,628	<	1,360,162	962,192	397,970	<
WOC	Black Rockfish	350,682	337,240	13,442	<	555,764	542,192	13,572	<	484,113	487,064	2,951	+
WOC	Blackgill Rockfish	99,118	191,522	92,404	+	181,784	294,028	112,244	+	207,685	330,793	123,108	+
WOC	Cowcod Rockfish	1,626	2,909	1,283	+	56	1,904	1,848	+	113	311	198	+
WOC	Darkblotched Rockfish	25,148	497,257	472,109	+	206,606	357,228	150,622	+	174,543	236,009	61,466	+
WOC	Redstripe Rockfish	52,992	46,511	6,481	<	30,985	32,098	1,113	+	30,655	23,713	6,942	<
WOC	Sharpchin Rockfish		21,634	21,634	+		6,886	6,886	+		20,228	20,228	+
WOC	Yelloweye Rockfish	7,298	18,388	11,090	+	8,423	27,253	18,830	+	14,956	15,979	1,023	+
WOC	Yellowmouth Rockfish		22,652	22,652	+		8,345	8,345	+		4,575	4,575	+
WOC	Other Rockfish	2,574,229	2,347,935	226,294	<	2,010,710	1,897,029	113,681	<	9,554,401	9,333,386	221,015	<
WOC	English Sole	2,564,471	2,564,564	93	+	3,098,779	3,099,377	598	+	3,289,232	3,288,679	553	<
WOC	Petrale Sole	4,230,995	4,231,402	407	+	4,073,668	4,102,374	28,706	+	4,025,967	4,025,527	440	<
WOC	Arrowtooth Flounder	9,518,631	9,520,020	1,389	+	7,003,601	7,002,503	1,098	<	5,498,397	5,495,826	2,571	<
WOC	Other Groundfish	9,993,855	9,994,078	223	+	9,299,409	9,317,747	18,338	+	8,593,640	8,595,273	1,633	+
	Total	89,952,493	90,000,742	2,488,273	+	73,038,790	73,142,196	1,863,486	+	69,299,809	69,295,262	1,589,749	<
	% movement			3%				3%				2%	

Table 16 (DQ1a) PacFIN landings of groundfish groups on the West Coast recorded before and after application of average species composition distributions: 1994-2003 (lbs).
2003

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction
WOC	Yellowtail Rockfish	1,282,904	1,280,655	2,249	<
WOC	Canary Rockfish	169,198	169,206	8	+
WOC	Widow Rockfish	417,950	417,950	-	0
WOC	Lingcod	504,200	504,271	71	+
WOC	Sablefish	12,156,185	12,191,686	35,501	+
WOC	Longspine Thornyhead	3,559,033	3,430,688	128,345	<
WOC	Shortspine Thornyhead	1,590,470	1,745,525	155,055	+
WOC	Dover Sole	16,420,246	16,420,242	4	<
WOC	Pacific Cod	3,091,235	3,091,332	97	+
WOC	Pacific Ocean Perch	546,234	553,751	7,517	+
WOC	Shortbelly Rockfish	1,221	1,234	13	+
WOC	Chilipepper	38,799	40,002	1,203	+
WOC	Bocaccio	1,368	35,951	34,583	+
WOC	Splitnose Rockfish	49,778	349,592	299,814	+
WOC	Bank Rockfish	159,733	226,682	66,949	+
WOC	Other Sebastes Complex	949,890	878,986	70,904	<
WOC	Black Rockfish	387,705	384,079	3,626	<
WOC	Blackgill Rockfish	395,465	435,749	40,284	+
WOC	Cowcod Rockfish	11	101	90	+
WOC	Darkblotched Rockfish	164,615	177,041	12,426	+
WOC	Redstripe Rockfish	39,377	15,260	24,117	<
WOC	Sharpchin Rockfish		8,869	8,869	+
WOC	Yelloweye Rockfish	10,565	11,499	934	+
WOC	Yellowmouth Rockfish		9,069	9,069	+
WOC	Other Rockfish	2,038,197	1,625,426	412,771	<
WOC	English Sole	2,535,543	2,535,567	24	+
WOC	Petrals Sole	4,473,764	4,473,785	21	+
WOC	Arrowtooth Flounder	6,387,947	6,387,947	-	0
WOC	Other Groundfish	8,781,291	8,781,308	17	+
	Total	66,152,924	66,183,453	1,314,561	+
	% movement			2%	

Table 17 (DQ1b) PacFIN landings of groundfish groups in California recorded before and after application of average species composition distributions: 1994-2003 (lbs).
 1994 1995 1996

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction
C	Yellowtail Rockfish	545,863	708,588	162,725	+	533,709	670,088	136,379	+	465,550	595,758	130,208	+
C	Canary Rockfish	207,276	463,788	256,512	+	341,978	429,008	87,030	+	404,443	595,134	190,691	+
C	Widow Rockfish	2,035,798	2,040,826	5,028	+	3,743,250	3,846,664	103,414	+	3,107,283	3,015,217	92,066	<
C	Lingcod	1,252,419	1,255,202	2,783	+	1,187,829	1,191,206	3,377	+	1,056,940	1,059,504	2,564	+
C	Sablefish	4,818,728	4,818,844	116	+	6,215,008	6,215,012	4	+	7,045,716	7,045,716	-	0
C	Longspine Thornyhead		4,443,310	4,443,310	+	5,840,791	5,674,388	166,403	<	5,420,011	5,353,617	66,394	<
C	Shortspine Thornyhead		2,593,210	2,593,210	+	1,652,892	2,118,409	465,517	+	1,543,068	1,712,707	169,639	+
C	Dover Sole	9,893,540	9,893,540	-	0	13,445,269	13,445,269	-	0	14,119,647	14,119,647	-	0
C	Pacific Cod	28	28	-	0	4	4	-	0	10	10	-	0
C	Pacific Ocean Perch	323	14,407	14,084	+	20	19,400	19,380	+	45	40,560	40,515	+
C	Shortbelly Rockfish	6,195	10,161	3,966	+	12,600	24,938	12,338	+	61,440	70,779	9,339	+
C	Chilipepper	2,697,929	4,063,232	1,365,303	+	2,821,434	4,402,530	1,581,096	+	2,749,817	3,936,350	1,186,533	+
C	Bocaccio	1,887,791	2,152,109	264,318	+	1,679,617	1,633,895	45,722	<	1,022,012	1,042,145	20,133	+
C	Splitnose Rockfish	4,029	702,350	698,321	+	18	763,530	763,512	+	370	912,101	911,731	+
C	Bank Rockfish	56,439	718,211	661,772	+	106,377	893,495	787,118	+	66,639	1,218,098	1,151,459	+
C	Other Sebastes Complex	576,233	2,092,270	1,516,037	+	520,424	1,787,856	1,267,432	+	514,100	1,595,712	1,081,612	+
C	Black Rockfish	248,729	294,009	45,280	+	244,943	363,533	118,590	+	272,937	255,752	17,185	<
C	Blackgill Rockfish	579,910	852,637	272,727	+	410,645	732,824	322,179	+	479,863	808,680	328,817	+
C	Cowcod Rockfish	33,718	74,904	41,186	+	52,129	141,376	89,247	+	34,054	86,177	52,123	+
C	Darkblotched Rockfish		635,818	635,818	+		783,051	783,051	+	178	899,526	899,348	+
C	Redstripe Rockfish	2,478,028	663,811	1,814,217	<	1,991,826	454,340	1,537,486	<	2,445,342	484,466	1,960,876	<
C	Sharpchin Rockfish		323,501	323,501	+		190,924	190,924	+		199,545	199,545	+
C	Yelloweye Rockfish	56,765	118,518	61,753	+	67,001	105,848	38,847	+	99,667	144,495	44,828	+
C	Yellowmouth Rockfish		10,489	10,489	+				+		11,967	11,967	+
C	Other Rockfish	13,668,805	2,082,550	11,586,255	<	6,986,445	1,945,224	5,041,221	<	7,876,360	3,561,187	4,315,173	<
C	English Sole	1,020,041	1,020,041	-	0	1,103,120	1,103,120	-	0	1,281,487	1,281,487	-	0
C	Petrale Sole	1,211,554	1,211,555	1	+	1,306,892	1,306,892	-	0	1,803,987	1,803,987	-	0
C	Arrowtooth Flounder	161,685	161,685	-	0	260,059	260,059	-	0	111,287	111,287	-	0
C	Other Groundfish	3,223,110	3,223,359	249	+	3,777,889	3,777,897	8	+	5,062,462	5,062,471	9	+
	Total	46,664,936	46,642,953	26,778,961	<	54,302,169	54,280,780	13,560,275	<	57,044,715	57,024,082	12,882,755	<
	% movement			57%				25%				23%	

Table 17 (DQ1b) PacFIN landings of groundfish groups in California recorded before and after application of average species composition distributions: 1994-2003 (lbs).
 1997 1998 1999

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction
C	Yellowtail Rockfish	549,985	906,149	356,164	+	755,340	960,331	204,991	+	206,451	210,726	4,275	+
C	Canary Rockfish	477,193	500,152	22,959	+	399,366	428,714	29,348	+	233,097	259,855	26,758	+
C	Widow Rockfish	3,053,079	2,960,768	92,311	<	2,139,873	2,024,492	115,381	<	1,389,654	1,390,124	470	+
C	Lingcod	1,124,556	1,124,556	-	0	331,902	331,955	53	+	313,608	313,608	-	0
C	Sablefish	6,542,876	6,543,092	216	+	3,193,056	3,193,052	4	<	4,351,930	4,352,337	407	+
C	Longspine Thornyhead	4,607,822	4,416,280	191,542	<	2,852,235	2,668,523	183,712	<	2,382,463	2,258,033	124,430	<
C	Shortspine Thornyhead	1,315,415	1,532,340	216,925	+	1,214,818	1,398,220	183,402	+	781,918	945,631	163,713	+
C	Dover Sole	11,703,251	11,703,251	-	0	7,874,916	7,874,916	-	0	8,417,520	8,417,520	-	0
C	Pacific Cod	38	38	-	0	47	47	-	0	49	49	-	0
C	Pacific Ocean Perch		33,639	33,639	+		41,842	41,842	+	3,426	43,147	39,721	+
C	Shortbelly Rockfish	44,888	134,015	89,127	+	15,088	39,690	24,602	+	17,634	17,658	24	+
C	Chilipepper	2,809,220	4,470,875	1,661,655	+	2,064,568	3,070,955	1,006,387	+	1,943,944	2,085,144	141,200	+
C	Bocaccio	599,993	695,041	95,048	+	297,317	338,034	40,717	+	150,905	159,636	8,731	+
C	Splitnose Rockfish	936	1,034,516	1,033,580	+	89,585	3,203,714	3,114,129	+	74,081	450,277	376,196	+
C	Bank Rockfish	81,466	921,045	839,579	+	451,652	1,223,111	771,459	+	27,166	71,138	43,972	+
C	Other Sebastes Complex	574,684	1,427,808	853,124	+	535,239	1,450,037	914,798	+	441,236	953,415	512,179	+
C	Black Rockfish	269,199	277,352	8,153	+	188,741	192,076	3,335	+	130,272	117,815	12,457	<
C	Blackgill Rockfish	414,261	597,005	182,744	+	348,464	501,328	152,864	+	77,976	119,929	41,953	+
C	Cowcod Rockfish	21,635	112,571	90,936	+	25,771	35,777	10,006	+	6,810	24,229	17,419	+
C	Darkblotched Rockfish	25,513	941,468	915,955	+	8,203	1,058,227	1,050,024	+	1,259	245,785	244,526	+
C	Redstripe Rockfish	2,342,716	387,909	1,954,807	<	1,947,558	323,092	1,624,466	<	531,313	91,288	440,025	<
C	Sharpchin Rockfish		248,555	248,555	+		90,776	90,776	+		27,391	27,391	+
C	Yelloweye Rockfish	92,221	135,707	43,486	+	38,216	47,255	9,039	+	20,670	49,609	28,939	+
C	Yellowmouth Rockfish		1,400	1,400	+		320	320	+				
C	Other Rockfish	6,882,985	2,408,339	4,474,646	<	7,651,374	1,908,216	5,743,158	<	2,321,478	1,202,960	1,118,518	<
C	English Sole	1,433,932	1,433,932	-	0	941,188	941,188	-	0	849,839	849,839	-	0
C	Petrale Sole	1,832,861	1,832,861	-	0	1,042,054	1,042,054	-	0	1,249,621	1,249,621	-	0
C	Arrowtooth Flounder	104,739	104,739	-	0	82,096	82,096	-	0	94,301	94,301	-	0
C	Other Groundfish	6,501,853	6,501,856	3	+	4,382,245	4,382,254	9	+	5,036,887	5,037,770	883	+
	Total	53,407,317	53,387,259	13,406,554	<	38,870,912	38,852,292	15,314,822	<	31,055,508	31,038,835	3,374,187	<
	% movement			25%				39%				11%	

Table 17 (DQ1b) PacFIN landings of groundfish groups in California recorded before and after application of average species composition distributions: 1994-2003 (lbs).
 2000 2001 2002

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction
C	Yellowtail Rockfish	108,049	106,222	1,827	<	91,631	97,082	5,451	+	30,765	40,630	9,865	+
C	Canary Rockfish	34,963	38,206	3,243	+	32,035	30,504	1,531	<	24,051	25,396	1,345	+
C	Widow Rockfish	1,583,438	1,588,899	5,461	+	731,294	735,299	4,005	+	108,028	107,804	224	<
C	Lingcod	119,938	119,938	-	0	138,244	137,882	362	<	179,295	179,295	-	0
C	Sablefish	4,139,830	4,139,828	2	<	3,419,904	3,434,594	14,690	+	2,894,682	2,894,682	-	0
C	Longspine Thornyhead	1,940,510	1,684,462	256,048	<	1,320,716	1,246,815	73,901	<	2,484,195	2,326,924	157,271	<
C	Shortspine Thornyhead	636,635	910,163	273,528	+	451,692	537,681	85,989	+	857,478	1,026,401	168,923	+
C	Dover Sole	7,247,487	7,247,487	-	0	5,339,828	5,376,231	36,403	+	6,884,165	6,887,823	3,658	+
C	Pacific Cod	22	22	-	0	798	798	-	0	6	6	-	0
C	Pacific Ocean Perch	7,143	13,584	6,441	+	2,195	1,160	1,035	<	108	1,672	1,564	+
C	Shortbelly Rockfish	8,710	8,710	-	0	11,470	11,470	-	0	25	156	131	+
C	Chilipepper	986,692	1,011,962	25,270	+	764,281	727,935	36,346	<	346,795	366,845	20,050	+
C	Bocaccio	54,486	60,670	6,184	+	48,471	49,453	982	+	46,257	47,742	1,485	+
C	Splitnose Rockfish	49,962	180,314	130,352	+	30,475	161,578	131,103	+	40,304	132,498	92,194	+
C	Bank Rockfish	180,422	182,165	1,743	+	124,051	202,734	78,683	+	439,106	646,542	207,436	+
C	Other Sebastes Complex	835,336	588,782	246,554	<	843,595	540,126	303,469	<	774,234	472,903	301,331	<
C	Black Rockfish	110,830	103,284	7,546	<	229,671	219,826	9,845	<	203,988	208,193	4,205	+
C	Blackgill Rockfish	99,118	182,418	83,300	+	181,784	286,922	105,138	+	207,685	328,004	120,319	+
C	Cowcod Rockfish	1,626	2,882	1,256	+	56	1,694	1,638	+	113	194	81	+
C	Darkblotched Rockfish	25,148	233,870	208,722	+	38,522	190,301	151,779	+	42,613	105,616	63,003	+
C	Redstripe Rockfish	52,992	38,408	14,584	<	30,985	17,053	13,932	<	30,655	10,229	20,426	<
C	Sharpchin Rockfish		3,977	3,977	+		1,706	1,706	+		2,465	2,465	+
C	Yelloweye Rockfish	7,298	8,599	1,301	+	8,423	9,454	1,031	+	146	527	381	+
C	Yellowmouth Rockfish												
C	Other Rockfish	1,283,505	1,053,340	230,165	<	1,040,632	924,609	116,023	<	926,392	702,297	224,095	<
C	English Sole	668,165	668,165	-	0	929,144	929,779	635	+	822,078	822,078	-	0
C	Petrale Sole	1,400,703	1,400,703	-	0	1,238,371	1,267,667	29,296	+	1,057,633	1,057,633	-	0
C	Arrowtooth Flounder	57,646	57,646	-	0	20,586	21,003	417	+	64,085	64,085	-	0
C	Other Groundfish	3,738,890	3,738,895	5	+	4,151,015	4,169,945	18,930	+	2,439,728	2,441,504	1,776	+
	Total	25,379,544	25,373,601	1,507,509	<	21,219,869	21,331,301	1,224,320	+	20,904,610	20,900,144	1,402,228	<
	% movement			6%				6%				7%	

Table 17 (DQ1b) PacFIN landings of groundfish groups in California recorded before and after application of average species composition distributions: 1994-2003 (lbs).
2003

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction
C	Yellowtail Rockfish	5,045	5,045	-	0
C	Canary Rockfish	1,150	1,150	-	0
C	Widow Rockfish	10,186	10,186	-	0
C	Lingcod	115,749	115,748	1	<
C	Sablefish	3,613,876	3,613,995	119	+
C	Longspine Thornyhead	1,863,127	1,761,674	101,453	<
C	Shortspine Thornyhead	839,955	968,797	128,842	+
C	Dover Sole	7,188,066	7,188,066	-	0
C	Pacific Cod	1,316	1,316	-	0
C	Pacific Ocean Perch		278	278	+
C	Shortbelly Rockfish	1,123	1,130	7	+
C	Chilipepper	38,799	38,754	45	<
C	Bocaccio	1,368	1,368	-	0
C	Splitnose Rockfish	49,778	333,335	283,557	+
C	Bank Rockfish	159,733	226,589	66,856	+
C	Other Sebastes Complex	314,948	339,204	24,256	+
C	Black Rockfish	128,414	128,494	80	+
C	Blackgill Rockfish	395,465	420,486	25,021	+
C	Cowcod Rockfish	11	101	90	+
C	Darkblotched Rockfish	13,151	25,374	12,223	+
C	Redstripe Rockfish	39,377	12,021	27,356	<
C	Sharpchin Rockfish				
C	Yelloweye Rockfish	22	29	7	+
C	Yellowmouth Rockfish				
C	Other Rockfish	995,206	580,743	414,463	<
C	English Sole	289,836	289,836	-	0
C	Petrale Sole	838,339	838,339	-	0
C	Arrowtooth Flounder	95,711	95,711	-	0
C	Other Groundfish	2,528,988	2,529,003	15	+
	Total	19,528,739	19,526,772	1,084,669	<
	% movement			6%	

Table 18 (DQ1c) PacFIN landings of groundfish groups in Oregon recorded before and after application of average species composition distributions: 1994-2003 (lbs).

AGID	groundfish groups	1994			Direction	1995			Direction	1996			Direction
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
O	Yellowtail Rockfish	6,875,837	7,028,556	152,719	+	6,743,150	6,765,906	22,756	+	7,834,529	7,703,645	130,884	<
O	Canary Rockfish		1,629,543	1,629,543	+	1,166,171	1,230,802	64,631	+	1,676,354	1,717,791	41,437	+
O	Widow Rockfish	9,728,256	9,744,000	15,744	+	8,566,311	8,534,318	31,993	<	8,372,794	8,271,035	101,759	<
O	Lingcod	1,898,239	1,897,556	683	<	1,433,279	1,433,176	103	<	1,581,978	1,581,959	19	<
O	Sablefish	9,037,724	9,037,690	34	<	6,980,398	6,980,376	22	<	7,065,073	7,064,938	135	<
O	Longspine Thornyhead		5,224,243	5,224,243	+	5,781,259	5,637,638	143,621	<	4,835,143	4,649,535	185,608	<
O	Shortspine Thornyhead		3,121,804	3,121,804	+	1,561,082	1,716,336	155,254	+	1,337,699	1,489,509	151,810	+
O	Dover Sole	8,533,771	8,533,509	262	<	7,793,874	7,793,526	348	<	10,334,613	10,334,592	21	<
O	Pacific Cod	376,053	375,803	250	<	177,067	176,989	78	<	185,068	185,058	10	<
O	Pacific Ocean Perch	4,470,513	1,473,338	2,997,175	<	2,835,425	1,301,004	1,534,421	<	2,711,938	1,364,269	1,347,669	<
O	Shortbelly Rockfish		84,524	84,524	+		45,402	45,402	+		8,317	8,317	+
O	Chilipepper		41,120	41,120	+		20,254	20,254	+		20,315	20,315	+
O	Bocaccio		278,745	278,745	+		222,796	222,796	+		174,489	174,489	+
O	Splitnose Rockfish		284,793	284,793	+		146,617	146,617	+		99,655	99,655	+
O	Bank Rockfish		31,391	31,391	+		6,305	6,305	+		3,482	3,482	+
O	Other Sebastes Complex		1,136,754	1,136,754	+		1,001,675	1,001,675	+		1,353,892	1,353,892	+
O	Black Rockfish	208,238	384,579	176,341	+	220,191	213,200	6,991	<	309,621	313,397	3,776	+
O	Blackgill Rockfish		9,636	9,636	+		13,233	13,233	+		5,166	5,166	+
O	Cowcod Rockfish		693	693	+		2,658	2,658	+		2,275	2,275	+
O	Darkblotched Rockfish		1,207,929	1,207,929	+		741,925	741,925	+		665,092	665,092	+
O	Redstripe Rockfish		847,538	847,538	+		468,992	468,992	+		400,391	400,391	+
O	Sharpchin Rockfish		628,000	628,000	+		287,415	287,415	+		263,262	263,262	+
O	Yelloweye Rockfish		223,801	223,801	+		327,517	327,517	+		213,858	213,858	+
O	Yellowmouth Rockfish		515,358	515,358	+		194,701	194,701	+		201,717	201,717	+
O	Other Rockfish	14,820,371	2,138,589	12,681,782	<	3,610,526	1,551,826	2,058,700	<	3,414,604	1,545,461	1,869,143	<
O	English Sole	789,608	789,157	451	<	689,004	688,936	68	<	860,721	860,654	67	<
O	Petrale Sole	1,357,412	1,357,092	320	<	1,756,061	1,755,990	71	<	1,588,255	1,588,153	102	<
O	Arrowtooth Flounder	3,793,635	3,790,478	3,157	<	3,115,812	3,115,792	20	<	2,465,395	2,465,356	39	<
O	Other Groundfish	2,370,743	2,370,692	51	<	2,616,684	2,616,643	41	<	2,418,615	2,418,528	87	<
	Total	64,260,400	64,186,911	31,294,841	<	55,046,294	54,991,948	7,498,608	<	56,992,400	56,965,791	7,244,477	<
	% movement			49%				14%				13%	

Table 18 (DQ1c) PacFIN landings of groundfish groups in Oregon recorded before and after application of average species composition distributions: 1994-2003 (lbs).

AGID	groundfish groups	1997			Direc- tion	1998			Direc- tion	1999			Direc- tion
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
O	Yellowtail Rockfish	2,785,108	2,808,312	23,204	+	3,791,830	3,802,472	10,642	+	3,547,421	3,554,966	7,545	+
O	Canary Rockfish	1,541,928	1,547,990	6,062	+	1,786,477	1,778,047	8,430	<	933,655	934,886	1,231	+
O	Widow Rockfish	11,109,047	11,114,120	5,073	+	6,462,447	6,457,188	5,259	<	6,640,382	6,626,973	13,409	<
O	Lingcod	1,695,848	1,692,524	3,324	<	355,727	355,648	79	<	383,210	383,206	4	<
O	Sablefish	6,542,950	6,541,210	1,740	<	3,888,687	3,888,647	40	<	6,590,299	6,590,258	41	<
O	Longspine Thornyhead	4,011,309	3,834,351	176,958	<	2,130,156	2,096,763	33,393	<	1,633,983	1,605,821	28,162	<
O	Shortspine Thornyhead	1,118,880	1,294,713	175,833	+	1,084,964	1,118,901	33,937	+	707,157	734,821	27,664	+
O	Dover Sole	8,742,456	8,740,220	2,236	<	8,376,815	8,376,811	4	<	9,950,464	9,950,422	42	<
O	Pacific Cod	115,644	114,740	904	<	173,076	172,265	811	<	82,995	82,969	26	<
O	Pacific Ocean Perch	2,664,652	1,286,300	1,378,352	<	2,358,284	1,180,039	1,178,245	<	1,427,343	830,879	596,464	<
O	Shortbelly Rockfish		30,855	30,855	+		12,364	12,364	+		155	155	+
O	Chilipepper		19,510	19,510	+		50,425	50,425	+		4,417	4,417	+
O	Bocaccio		176,210	176,210	+		127,529	127,529	+		63,275	63,275	+
O	Splitnose Rockfish		175,573	175,573	+		104,943	104,943	+		76,543	76,543	+
O	Bank Rockfish		8,977	8,977	+		3,149	3,149	+		13,581	13,581	+
O	Other Sebastes Complex		643,494	643,494	+		954,899	954,899	+		508,089	508,089	+
O	Black Rockfish	398,630	396,255	2,375	<	435,486	411,777	23,709	<	281,146	274,846	6,300	<
O	Blackgill Rockfish		7,273	7,273	+		3,499	3,499	+		9,689	9,689	+
O	Cowcod Rockfish		7,546	7,546	+		7,253	7,253	+		577	577	+
O	Darkblotched Rockfish		654,641	654,641	+		752,399	752,399	+		522,233	522,233	+
O	Redstripe Rockfish		204,347	204,347	+		181,889	181,889	+		49,289	49,289	+
O	Sharpchin Rockfish		376,863	376,863	+		137,187	137,187	+		54,777	54,777	+
O	Yelloweye Rockfish		271,400	271,400	+		85,766	85,766	+		120,262	120,262	+
O	Yellowmouth Rockfish		122,445	122,445	+		63,083	63,083	+		48,093	48,093	+
O	Other Rockfish	2,894,991	1,554,358	1,340,633	<	2,828,304	1,663,282	1,165,022	<	1,689,025	806,078	882,947	<
O	English Sole	1,214,554	1,214,474	80	<	1,047,200	1,046,852	348	<	768,843	768,772	71	<
O	Petrale Sole	1,776,714	1,776,678	36	<	1,503,352	1,503,286	66	<	1,486,914	1,486,859	55	<
O	Arrowtooth Flounder	2,561,594	2,561,515	79	<	3,506,589	3,506,552	37	<	5,021,558	5,021,525	33	<
O	Other Groundfish	3,522,866	3,521,515	1,351	<	2,058,513	2,058,037	476	<	2,968,476	2,968,423	53	<
	Total	52,697,171	52,698,409	5,817,374	+	41,787,907	41,900,952	4,944,883	+	44,112,871	44,092,684	3,035,027	<
	% movement			11%				12%				7%	

Table 18 (DQ1c) PacFIN landings of groundfish groups in Oregon recorded before and after application of average species composition distributions: 1994-2003 (lbs).

AGID	groundfish groups	2000			Direc- tion	2001			Direc- tion	2002			Direc- tion
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
O	Yellowtail Rockfish	4,427,720	4,414,727	12,993	<	2,432,934	2,171,981	260,953	<	774,250	770,135	4,115	<
O	Canary Rockfish	71,346	71,682	336	+	42,045	42,301	256	+	38,240	37,942	298	<
O	Widow Rockfish	6,004,282	6,017,825	13,543	+	3,742,651	3,775,510	32,859	+	557,190	560,167	2,977	+
O	Lingcod	141,877	141,882	5	+	150,066	150,079	13	+	181,572	181,492	80	<
O	Sablefish	6,256,288	6,255,483	805	<	5,697,280	5,697,156	124	<	3,184,819	3,184,770	49	<
O	Longspine Thornyhead	1,685,484	1,621,359	64,125	<	1,362,549	1,349,973	12,576	<	1,835,958	1,824,832	11,126	<
O	Shortspine Thornyhead	628,308	693,336	65,028	+	495,351	507,268	11,917	+	577,238	587,822	10,584	+
O	Dover Sole	10,393,272	10,392,656	616	<	8,241,861	8,241,852	9	<	6,001,276	6,001,275	1	<
O	Pacific Cod	24,164	24,149	15	<	68,541	68,460	81	<	59,352	59,239	113	<
O	Pacific Ocean Perch	220,184	224,342	4,158	+	426,836	425,294	1,542	<	235,660	236,205	545	+
O	Shortbelly Rockfish	34,085	34,085	-	0	209	209	-	0	113	113	-	0
O	Chilipepper		422	422	+		226,326	226,326	+		91	91	+
O	Bocaccio		472	472	+		3,441	3,441	+		289	289	+
O	Splitnose Rockfish		45,408	45,408	+		7,591	7,591	+		8,083	8,083	+
O	Bank Rockfish		4,852	4,852	+		325	325	+		14	14	+
O	Other Sebastes Complex	921,024	597,104	323,920	<	420,941	370,611	50,330	<	234,228	207,852	26,376	<
O	Black Rockfish	239,852	233,956	5,896	<	326,093	322,366	3,727	<	280,125	278,260	1,865	<
O	Blackgill Rockfish		3,728	3,728	+		5,541	5,541	+		1,639	1,639	+
O	Cowcod Rockfish		27	27	+		210	210	+		117	117	+
O	Darkblotched Rockfish		244,013	244,013	+	148,875	147,391	1,484	<	116,158	114,254	1,904	<
O	Redstripe Rockfish		4,968	4,968	+		5,594	5,594	+		1,615	1,615	+
O	Sharpchin Rockfish		10,644	10,644	+		4,608	4,608	+		4,823	4,823	+
O	Yelloweye Rockfish		9,416	9,416	+		14,772	14,772	+	3,512	3,591	79	+
O	Yellowmouth Rockfish		19,187	19,187	+		8,330	8,330	+		4,552	4,552	+
O	Other Rockfish	322,399	325,558	3,159	+	382,344	384,686	2,342	+	420,632	423,712	3,080	+
O	English Sole	542,991	542,985	6	<	895,972	895,935	37	<	960,016	959,463	553	<
O	Petrale Sole	1,896,175	1,896,172	3	<	2,033,638	2,032,769	869	<	1,967,931	1,967,491	440	<
O	Arrowtooth Flounder	2,580,307	2,580,296	11	<	2,282,934	2,281,419	1,515	<	1,113,097	1,110,526	2,571	<
O	Other Groundfish	2,944,324	2,944,270	54	<	2,391,003	2,390,408	595	<	2,567,622	2,567,483	139	<
	Total	39,334,082	39,355,004	837,810	+	31,542,123	31,532,406	657,967	<	21,108,989	21,097,847	88,118	<
	% movement			2%				2%				0%	

Table 18 (DQ1c) PacFIN landings of groundfish groups in Oregon recorded before and after application of average species composition distributions: 1994-2003 (lbs).
2003

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction
O	Yellowtail Rockfish	123,547	121,283	2,264	<
O	Canary Rockfish	8,111	8,111	-	0
O	Widow Rockfish	126,710	126,710	-	0
O	Lingcod	152,751	152,752	1	+
O	Sablefish	4,786,031	4,786,037	6	+
O	Longspine Thornyhead	1,625,772	1,603,659	22,113	<
O	Shortspine Thornyhead	648,870	670,330	21,460	+
O	Dover Sole	7,983,418	7,983,418	-	0
O	Pacific Cod	634,735	634,735	-	0
O	Pacific Ocean Perch	214,408	219,842	5,434	+
O	Shortbelly Rockfish	98	104	6	+
O	Chilipepper		390	390	+
O	Bocaccio		4,146	4,146	+
O	Splitnose Rockfish		10,617	10,617	+
O	Bank Rockfish		93	93	+
O	Other Sebastes Complex	273,824	230,920	42,904	<
O	Black Rockfish	259,291	255,585	3,706	<
O	Blackgill Rockfish		7,462	7,462	+
O	Cowcod Rockfish				
O	Darkblotched Rockfish	145,686	145,741	55	+
O	Redstripe Rockfish		636	636	+
O	Sharpchin Rockfish		6,248	6,248	+
O	Yelloweye Rockfish	3,173	4,100	927	+
O	Yellowmouth Rockfish		9,048	9,048	+
O	Other Rockfish	438,817	440,509	1,692	+
O	English Sole	773,668	773,668	-	0
O	Petrale Sole	2,424,986	2,424,986	-	0
O	Arrowtooth Flounder	1,768,611	1,768,611	-	0
O	Other Groundfish	3,350,330	3,350,329	1	<
	Total	25,742,837	25,740,070	139,209	<
	% movement			1%	

Table 19 (DQ1d) PacFIN landings of groundfish groups in Washington recorded before and after application of average species composition distributions: 1994-2003 (lbs).

AGID	groundfish groups	1994			Direc- tion	1995			Direc- tion	1996			Direc- tion
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
W	Yellowtail Rockfish	3,516,297	6,664,201	3,147,904	+	3,276,168	3,301,971	25,803	+	4,134,664	4,137,469	2,805	+
W	Canary Rockfish		1,977,646	1,977,646	+	293,395	444,366	150,971	+	380,638	546,663	166,025	+
W	Widow Rockfish	1,912,966	3,874,230	1,961,264	+	2,381,283	2,385,180	3,897	+	2,655,108	2,661,154	6,046	+
W	Lingcod	3,256,159	3,256,188	29	+	1,233,875	1,233,889	14	+	1,446,336	1,446,108	228	<
W	Sablefish	4,242,583	4,238,707	3,876	<	5,235,455	5,256,459	21,004	+	4,939,859	4,883,080	56,779	<
W	Longspine Thornyhead					932,949	849,641	83,308	<	737,599	681,757	55,842	<
W	Shortspine Thornyhead	1,251,004	2,415,294	1,164,290	+	343,841	432,092	88,251	+	398,359	453,528	55,169	+
W	Dover Sole	4,498,143	4,461,785	36,358	<	3,159,821	3,156,294	3,527	<	3,517,647	3,374,455	143,192	<
W	Pacific Cod	2,447,627	2,447,527	100	<	1,858,687	1,858,735	48	+	1,488,087	1,486,529	1,558	<
W	Pacific Ocean Perch	3,446,584	3,493,384	46,800	+	2,910,665	2,929,811	19,146	+	2,612,158	2,336,209	275,949	<
W	Shortbelly Rockfish						30	30	+		50	50	+
W	Chilipepper												
W	Bocaccio		598,686	598,686	+		925,525	925,525	+		357,947	357,947	+
W	Splitnose Rockfish		32,826	32,826	+		45,673	45,673	+		52,418	52,418	+
W	Bank Rockfish												
W	Other Sebastes Complex		341,161	341,161	+		2,419,423	2,419,423	+		1,888,834	1,888,834	+
W	Black Rockfish		4,643	4,643	+		14,227	14,227	+				
W	Blackgill Rockfish						28,331	28,331	+		11,656	11,656	+
W	Cowcod Rockfish												
W	Darkblotched Rockfish		38,666	38,666	+		143,979	143,979	+		205,281	205,281	+
W	Redstripe Rockfish		147,548	147,548	+		1,224,231	1,224,231	+		1,041,594	1,041,594	+
W	Sharpchin Rockfish		122,788	122,788	+		358,626	358,626	+		285,743	285,743	+
W	Yelloweye Rockfish		209,181	209,181	+		196,028	196,028	+		99,288	99,288	+
W	Yellowmouth Rockfish		39,555	39,555	+		66,644	66,644	+		202,933	202,933	+
W	Other Rockfish	11,938,990	2,090,622	9,848,368	<	7,704,871	2,067,593	5,637,278	<	6,366,261	1,911,982	4,454,279	<
W	English Sole	1,284,801	1,284,796	5	<	1,276,504	1,276,498	6	<	1,054,216	1,054,210	6	<
W	Petrale Sole	673,617	673,625	8	+	802,946	802,940	6	<	757,756	757,755	1	<
W	Arrowtooth Flounder	7,101,574	7,101,567	7	<	5,358,070	5,358,324	254	+	5,913,417	5,908,404	5,013	<
W	Other Groundfish	7,989,976	8,096,184	106,208	+	6,163,647	6,163,645	2	<	5,728,979	5,727,682	1,297	<
W	Total	53,560,321	53,610,810	19,827,917	+	42,932,177	42,940,155	11,456,232	+	42,131,084	41,512,729	9,369,933	<
	% movement			37%				27%				22%	

Table 19 (DQ1d) PacFIN landings of groundfish groups in Washington recorded before and after application of average species composition distributions: 1994-2003 (lbs).
 1997 1998 1999

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction
W	Yellowtail Rockfish	2,491,824	2,494,462	2,638	+	2,912,147	2,908,355	3,792	<	2,861,574	2,877,523	15,949	+
W	Canary Rockfish	629,969	719,623	89,654	+	733,662	754,818	21,156	+	508,488	539,359	30,871	+
W	Widow Rockfish	2,987,873	2,992,720	4,847	+	2,273,975	2,289,126	15,151	+	1,946,085	1,961,855	15,770	+
W	Lingcod	1,028,443	1,028,449	6	+	509,195	509,206	11	+	339,459	321,659	17,800	<
W	Sablefish	5,072,166	5,059,113	13,053	<	3,015,737	3,004,259	11,478	<	4,116,921	4,103,655	13,266	<
W	Longspine Thornyhead	640,111	592,105	48,006	<	182,123	166,785	15,338	<	70,024	67,575	2,449	<
W	Shortspine Thornyhead	356,507	383,415	26,908	+	221,407	233,130	11,723	+	157,781	167,765	9,984	+
W	Dover Sole	2,846,968	2,746,078	100,890	<	2,400,826	2,393,150	7,676	<	2,492,409	2,460,364	32,045	<
W	Pacific Cod	1,623,546	1,623,258	288	<	1,439,469	1,437,319	2,150	<	706,738	704,007	2,731	<
W	Pacific Ocean Perch	2,516,621	2,325,182	191,439	<	2,548,477	2,323,345	225,132	<	2,224,569	2,169,809	54,760	<
W	Shortbelly Rockfish												
W	Chilipepper		56	56	+		130	130	+		2,204	2,204	+
W	Bocaccio		691,894	691,894	+		489,292	489,292	+		159,918	159,918	+
W	Splitnose Rockfish		31,952	31,952	+		24,082	24,082	+		5,573	5,573	+
W	Bank Rockfish												
W	Other Sebastes Complex		1,001,514	1,001,514	+		1,371,763	1,371,763	+		979,344	979,344	+
W	Black Rockfish		2,110	2,110	+		40,311	40,311	+				
W	Blackgill Rockfish		221,230	221,230	+		20,285	20,285	+		31,655	31,655	+
W	Cowcod Rockfish												
W	Darkblotched Rockfish		299,293	299,293	+		216,727	216,727	+		80,531	80,531	+
W	Redstripe Rockfish		34,042	34,042	+		95,147	95,147	+		24,683	24,683	+
W	Sharpchin Rockfish		239,278	239,278	+		40,273	40,273	+		62,670	62,670	+
W	Yelloweye Rockfish		30,491	30,491	+		44,318	44,318	+		80,351	80,351	+
W	Yellowmouth Rockfish		125,712	125,712	+		34,345	34,345	+		42,513	42,513	+
W	Other Rockfish	3,726,642	881,242	2,845,400	<	3,452,381	855,589	2,596,792	<	2,598,949	754,039	1,844,910	<
W	English Sole	1,080,601	1,080,599	2	<	1,271,979	1,271,980	1	+	966,127	966,132	5	+
W	Petrale Sole	778,003	778,002	1	<	818,568	818,565	3	<	691,994	691,985	9	<
W	Arrowtooth Flounder	5,359,881	5,359,883	2	+	7,160,728	7,160,722	6	<	9,111,446	9,111,444	2	<
W	Other Groundfish	5,815,215	5,815,219	4	+	3,927,411	3,927,409	2	<	2,763,781	2,760,620	3,161	<
W	Total	36,954,370	36,556,922	6,000,710	<	32,868,085	32,430,431	5,287,084	<	31,556,345	31,127,233	3,513,154	<
	% movement			16%				16%				11%	

Table 19 (DQ1d) PacFIN landings of groundfish groups in Washington recorded before and after application of average species composition distributions: 1994-2003 (lbs).

AGID	groundfish groups	2000			Direc- tion	2001			Direc- tion	2002			Direc- tion
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
W	Yellowtail Rockfish	2,447,698	2,447,814	116	+	2,073,687	2,074,786	1,099	+	1,635,023	1,635,023	-	0
W	Canary Rockfish	111,979	113,615	1,636	+	123,549	123,670	121	+	91,597	92,010	413	+
W	Widow Rockfish	918,845	918,895	50	+	784,479	784,738	259	+	231,746	231,828	82	+
W	Lingcod	213,567	213,939	372	+	109,336	109,344	8	+	206,907	206,916	9	+
W	Sablefish	3,776,243	3,803,805	27,562	+	3,612,774	3,613,040	266	+	2,567,157	2,579,005	11,848	+
W	Longspine Thornyhead	41,496	34,219	7,277	<	37,451	33,121	4,330	<	17,472	18,381	909	+
W	Shortspine Thornyhead	127,971	135,768	7,797	+	100,175	104,821	4,646	+	76,670	76,529	141	<
W	Dover Sole	2,028,856	2,031,907	3,051	+	1,715,662	1,716,114	452	+	1,157,682	1,157,687	5	+
W	Pacific Cod	858,963	859,007	44	+	942,347	942,350	3	+	2,090,399	2,090,414	15	+
W	Pacific Ocean Perch	914,547	920,735	6,188	+	280,573	281,872	1,299	+	210,364	211,655	1,291	+
W	Shortbelly Rockfish												
W	Chilipepper		595	595	+						166	166	+
W	Bocaccio		6,018	6,018	+		30,500	30,500	+		30,444	30,444	+
W	Splitnose Rockfish		6,656	6,656	+		1,958	1,958	+		8,764	8,764	+
W	Bank Rockfish												
W	Other Sebastes Complex	351,626	290,459	61,167	<	357,028	307,199	49,829	<	351,700	281,437	70,263	<
W	Black Rockfish										611	611	+
W	Blackgill Rockfish		5,376	5,376	+		1,565	1,565	+		1,150	1,150	+
W	Cowcod Rockfish												
W	Darkblotched Rockfish		19,374	19,374	+	19,209	19,536	327	+	15,772	16,139	367	+
W	Redstripe Rockfish		3,135	3,135	+		9,451	9,451	+		11,869	11,869	+
W	Sharpchin Rockfish		7,013	7,013	+		572	572	+		12,940	12,940	+
W	Yelloweye Rockfish		373	373	+		3,027	3,027	+	11,298	11,861	563	+
W	Yellowmouth Rockfish		3,465	3,465	+		15	15	+		23	23	+
W	Other Rockfish	968,325	969,037	712	+	587,734	587,734	-	0	8,207,377	8,207,377	-	0
W	English Sole	1,353,315	1,353,414	99	+	1,273,663	1,273,663	-	0	1,507,138	1,507,138	-	0
W	Petrale Sole	934,117	934,527	410	+	801,659	801,938	279	+	1,000,403	1,000,403	-	0
W	Arrowtooth Flounder	6,880,678	6,882,078	1,400	+	4,700,081	4,700,081	-	0	4,321,215	4,321,215	-	0
W	Other Groundfish	3,310,641	3,310,913	272	+	2,757,391	2,757,394	3	+	3,586,290	3,586,286	4	<
W	Total	25,238,867	25,272,137	170,158	+	20,276,798	20,278,489	110,009	+	27,286,210	27,297,271	151,877	+
	% movement			1%				1%				1%	

Table 19 (DQ1d) PacFIN landings of groundfish groups in Washington recorded before and after application of average species composition distributions: 1994-2003 (lbs).
2003

AGID	groundfish groups	Unadjusted	Adjusted	Movement	Direction
W	Yellowtail Rockfish	1,154,312	1,154,327	15	+
W	Canary Rockfish	159,937	159,945	8	+
W	Widow Rockfish	281,054	281,054	-	0
W	Lingcod	235,700	235,771	71	+
W	Sablefish	3,756,278	3,791,654	35,376	+
W	Longspine Thornyhead	70,134	65,355	4,779	<
W	Shortspine Thornyhead	101,645	106,398	4,753	+
W	Dover Sole	1,248,762	1,248,758	4	<
W	Pacific Cod	2,455,184	2,455,281	97	+
W	Pacific Ocean Perch	331,826	333,631	1,805	+
W	Shortbelly Rockfish				
W	Chilipepper		858	858	+
W	Bocaccio		30,437	30,437	+
W	Splitnose Rockfish		5,640	5,640	+
W	Bank Rockfish				
W	Other Sebastes Complex	361,118	308,862	52,256	<
W	Black Rockfish				
W	Blackgill Rockfish		7,801	7,801	+
W	Cowcod Rockfish				
W	Darkblotched Rockfish	5,778	5,926	148	+
W	Redstripe Rockfish		2,603	2,603	+
W	Sharpchin Rockfish		2,621	2,621	+
W	Yelloweye Rockfish	7,370	7,370	-	0
W	Yellowmouth Rockfish		21	21	+
W	Other Rockfish	604,174	604,174	-	0
W	English Sole	1,472,039	1,472,063	24	+
W	Petrale Sole	1,210,439	1,210,460	21	+
W	Arrowtooth Flounder	4,523,625	4,523,625	-	0
W	Other Groundfish	2,901,973	2,901,976	3	+
W	Total	20,881,348	20,916,611	149,341	+
	% movement			1%	

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	1994			Direc- tion	1995			Direc- tion	1996			Direc- tion
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
Nom. Yellowtail Rockfish	YTR1	10,937,997	1,330,871	9,607,126	<	10,553,027	1,128,967	9,424,060	<	12,434,743	2,197,066	10,237,677	<
Nom. Canary Rockfish	CNR1	207,276	86,752	120,524	<	1,801,544	333,538	1,468,006	<	2,461,435	510,559	1,950,876	<
Nom. Widow Rockfish	WDW1	13,677,020	1,054,910	12,622,110	<	14,690,844	901,888	13,788,956	<	14,135,185	539,353	13,595,832	<
Nom. Longspine Thornyhead	LSP1					12,554,999	1,310,568	11,244,431	<	10,992,753	1,468,621	9,524,132	<
Nom. Shortspine Thornyhead	SSP1	1,251,004	48,802	1,202,202	<	3,557,815	374,235	3,183,580	<	3,279,126	517,349	2,761,777	<
Gen. Shelf/slope rf	POP1	3,256,920	107,809	3,149,111	<	1,819,758	174,309	1,645,449	<	1,651,746	205,054	1,446,692	<
Nominal Pop	POP2	1,213,593	259,744	953,849	<	1,015,667	237,931	777,736	<	1,060,192	292,206	767,986	<
Unsp. Pop Group	UPOP	3,446,584	616	3,445,968	<	2,910,665	625	2,910,040	<	2,612,158	498	2,611,660	<
Nom. Shortbelly Rockfish	SBL1	6,195	6,195	-	0	12,600	12,600	-	0	61,440	61,440	-	0
Nom. Chilipepper	CLP1	2,697,929	579,477	2,118,452	<	2,821,434	373,324	2,448,110	<	2,749,817	274,553	2,475,264	<
Nom. Bocaccio	BCC1	1,887,791	408,076	1,479,715	<	1,679,617	189,762	1,489,855	<	1,022,012	111,351	910,661	<
Nom. Splitnose Rockfish	SNS1	4,029	4,029	-	0	18	18	-	0	370	370	-	0
Nom. Bank Rockfish	BNK1	56,439	3,076	53,363	<	106,377	83,551	22,826	<	66,639	18,262	48,377	<
Nom. Aurora Rockfish	ARR1												
Nom. Black-and-yellow Rockfish	BYL1	5	5	-	0					7	7	-	0
Nom. Blue Rockfish	BLU1	73,618	28,739	44,879	<	40,385	23,278	17,107	<	25,346	9,150	16,196	<
Nom. Bronzespotted Rockfish	BRZ1	54	54	-	0	627	627	-	0				
Nom. Brown Rockfish	BRW1	7,737	7,737	-	0	3,931	3,681	250	<	2,729	2,729	-	0
Nom. Calif. Scorpionfish	SCR1		113,215	113,215	+		90,918	90,918	+		76,677	76,677	+
Nom. Chameleon Rockfish	CML1												
Nom. China Rockfish	CHN1	67,916	31,827	36,089	<	58,193	35,994	22,199	<	38,428	16,810	21,618	<
Nom. Copper Rockfish	COP1	77,001	31,690	45,311	<	97,882	52,855	45,027	<	142,814	56,139	86,675	<
Nom. Flag Rockfish	FLG1	180	180	-	0	1,005	1,005	-	0	18	18	-	0
Nom. Gopher Rockfish	GPH1	31,158	31,191	33	+	17,448	17,448	-	0	12,110	12,110	-	0
Nom. Grass Rockfish	GRS1	72,944	68,171	4,773	<	109,136	107,221	1,915	<	93,690	92,832	858	<
Nom. Greenblotched Rockfish	GBL1												
Nom. Greenspotted Rockfish	GSP1	33,381	17,765	15,616	<	15,358	4,581	10,777	<	41,796	10,423	31,373	<
Nom. Greenstriped Rockfish	GSR1	3,140	3,140	-	0	4,235	4,235	-	0	1,529	1,384	145	<
Nom. Kelp Rockfish	KLP1	6,706	6,427	279	<	5,343	5,078	265	<	4,342	4,235	107	<
Nom. Mexican Rockfish	MXR1												
Nom. Olive Rockfish	OLV1	136	136	-	0	564	564	-	0	728	728	-	0
Nom. Pink Rockfish	PNK1												
Nom. Pinkrose Rockfish	PRR1	214	214	-	0								
Nom. Quillback Rockfish	QLB1	2,809	2,809	-	0	11,448	4,809	6,639	<	17,937	14,046	3,891	<
Nom. Redbanded Rockfish	RDB1	6,138	6,138	-	0	2,175	2,175	-	0	1,104	1,104	-	0
Nom. Rosethorn Rockfish	RST1	10,157	10,157	-	0	10,250	2,121	8,129	<	15,855	15,855	-	0
Nom. Rosy Rockfish	ROS1	1,002	1,002	-	0	202	202	-	0	39	39	-	0
Nom. Speckled Rockfish	SPK1	13	13	-	0	10	10	-	0	4,707	4,707	-	0
Nom. Squarespot	SQR1	1,413	1,413	-	0	94	94	-	0				
Nom. Starry Rockfish	STR1	18,711	18,711	-	0	4,355	4,355	-	0	455	455	-	0
Nom. Swordspine Rockfish	SWS1									1,423	1,423	-	0

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	1994				Direction	1995				Direction	1996				Direction
		Unadjusted	Adjusted	Movement			Unadjusted	Adjusted	Movement			Unadjusted	Adjusted	Movement		
Nom. Tiger Rockfish	TGR1															
Nom. Treefish	TRE1	117	113	4	<	203	203	-	0	1,540	1,505	35	<			
Nom. Vermillion Rockfish	VRM1	48,497	7,304	41,193	<	46,662	42,284	4,378	<	30,826	30,826	-	0			
Nor. Unsp. Near-shore Rockfish	NUSR															
Nor. Unsp. Shelf Rockfish	NUSF															
Nor. Unsp. Slope Rockfish	NUSP															
Unsp. Near-shore Rockfish	USHR															
Unsp. Shelf Rockfish	USLF															
Unsp. Slope Rockfish	USLP															
Nom. Black Rockfish	BLK1	456,967	225,163	231,804	<	465,134	129,504	335,630	<	582,558	215,573	366,985	<			
Nom. Blackgill Rockfish	BGL1	579,910	176,601	403,309	<	410,645	122,744	287,901	<	479,863	134,836	345,027	<			
Nom. Cowcod Rockfish	CWC1	33,718	33,269	449	<	52,129	46,657	5,472	<	34,054	23,703	10,351	<			
Nom. Darkblotched Rockfish	DBR1									178	178	-	0			
Nom. Stripetail Rockfish	STL1															
Unsp. Dpwtr Reds Rckfsh	RCK3	2,368	2,368	-	0	36,572	36,572	-	0	6,138	6,138	-	0			
Unsp. Reds Rckfsh	RCK4	1,374,722	531,600	843,122	<	1,029,658	342,311	687,347	<	1,227,624	436,047	791,577	<			
Unsp. Small Reds Rckfsh	RCK5	1,100,938	118,185	982,753	<	925,596	62,542	863,054	<	1,211,580	38,609	1,172,971	<			
Nom. Yelloweye Rockfish	YEY1	56,765	18,541	38,224	<	67,001	5,070	61,931	<	99,667	21,862	77,805	<			
Black+blue Rockfish	RCK9	10,309	1,635	8,674	<	384	384	-	0	2,226	2,226	-	0			
Bocaccio+chilipepper Rckfsh	RCK1															
Canary+vermilion Rckfsh	RCK8	147	2	145	<	227	227	-	0	33	33	-	0			
Nom. Cabezon	CBZ1	83,346	80,620	2,726	<	194,687	183,824	10,863	<	246,181	238,085	8,096	<			
Nom. Kelp Greenling	KGL1	2,949	2,949	-	0	2,674	2,674	-	0	7,293	7,293	-	0			
Other Groundfish	OGRN					164	164	-	0	1,757	1,757	-	0			
Other Rockfish	ORCK	2,516,791	537,240	1,979,551	<		35,072	35,072	+		30,610	30,610	+			
Thornyheads (Mixed)	THDS	16,223,816	847,215	15,376,601	<	527,420	225,373	302,047	<	345,721	242,109	103,612	<			
Unsp. Bolina Rckfsh	RCK2	73,667	48,666	25,001	<	56,353	35,497	20,856	<	97,519	65,272	32,247	<			
Unsp. Gopher Rckfsh	RCK7	147,625	80,159	67,466	<	168,649	108,385	60,264	<	221,777	191,676	30,101	<			
Unsp. Grenadiers	GRDR	2,046,690	2,042,741	3,949	<	2,102,442	2,102,417	25	<	3,446,926	3,446,915	11	<			
Unsp. Rockfish	URCK	18,033,737	1,914,259	16,119,478	<	13,948,934	2,195,663	11,753,271	<	12,353,706	2,405,049	9,948,657	<			
Unsp. Rosefish Rckfsh	RCK6	549,425	6,160	543,265	<	649,779	1,489	648,290	<	594,180	32,589	561,591	<			
Nom. Longfin Sanddab	LDB1															
Nom. Pacific Sanddab	PDB1	91,278	91,278	-	0	9,908	9,908	-	0	958	958	-	0			
Nom. Speckled Sanddab	SDB1															
Other Flatfish	OFLT	572	572	-	0	1,012	1,012	-	0	1,680	1,680	-	0			
Unsp. Flatfish	UFLT	62,481	62,535	54	+	108,108	108,109	1	+	87,089	87,089	-	0			
Unsp. Sanddabs	UDAB	1,428,483	1,428,483	-	0	1,492,832	1,492,832	-	0	1,741,884	1,741,884	-	0			
Unsp. Skate	USKT	478,499	478,546	47	+	1,069,398	1,069,380	18	<	3,431,713	3,431,724	11	+			
Unsp. Turbots	UTRB	10,047	10,047	-	0	14,962	14,962	-	0	16,453	16,453	-	0			
Total		84,471,074	13,017,342	71,680,430	<	77,288,539	13,857,826	63,682,695	<	79,203,797	19,370,232	60,048,161	<			
Percent Movement				85%				82%				76%				

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	1997			Direc- tion	1998			Direc- tion	1999			Direc- tion
		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement		Unadjusted	Adjusted	Movement	
Nom. Yellowtail Rockfish	YTR1	5,826,917	1,092,606	4,734,311	<	7,459,317	2,045,871	5,413,446	<	6,615,446	1,407,063	5,208,383	<
Nom. Canary Rockfish	CNR1	2,649,090	744,840	1,904,250	<	2,919,505	986,065	1,933,440	<	1,675,240	381,729	1,293,511	<
Nom. Widow Rockfish	WDW1	17,149,999	3,771,762	13,378,237	<	10,876,295	2,674,216	8,202,079	<	9,976,121	1,627,209	8,348,912	<
Nom. Longspine Thornyhead	LSP1	9,259,242	834,517	8,424,725	<	5,164,514	524,679	4,639,835	<	4,086,470	231,915	3,854,555	<
Nom. Shortspine Thornyhead	SSP1	2,790,802	423,138	2,367,664	<	2,521,189	335,142	2,186,047	<	1,646,856	139,352	1,507,504	<
Gen. Shelf/slope rf	POP1	1,782,834	344,960	1,437,874	<	1,470,855	252,851	1,218,004	<	741,304	117,013	624,291	<
Nominal Pop	POP2	881,818	307,358	574,460	<	887,429	373,553	513,876	<	686,039	204,334	481,705	<
Unsp. Pop Group	UPOP	2,516,621	4,987	2,511,634	<	2,548,477	59	2,548,418	<	2,224,569	160	2,224,409	<
Nom. Shortbelly Rockfish	SBL1	44,888	3,996	40,892	<	15,088	15,088	-	0	17,634	17,634	-	0
Nom. Chilipepper	CLP1	2,809,220	632,914	2,176,306	<	2,064,568	252,181	1,812,387	<	1,943,944	109,318	1,834,626	<
Nom. Bocaccio	BCC1	599,993	47,709	552,284	<	297,317	32,024	265,293	<	150,905	27,539	123,366	<
Nom. Splitnose Rockfish	SNS1	936	936	-	0	89,585	55,647	33,938	<	74,081	15,394	58,687	<
Nom. Bank Rockfish	BNK1	81,466	8,648	72,818	<	451,652	66,746	384,906	<	27,166	7,682	19,484	<
Nom. Aurora Rockfish	ARR1	97	97	-	0	4	4	-	0	-	-	-	0
Nom. Black-and-yellow Rockfish	BYL1	908	59	849	<	2,069	1,261	808	<	23,668	2,148	21,520	<
Nom. Blue Rockfish	BLU1	86,166	26,716	59,450	<	92,190	11,730	80,460	<	30,447	20,402	10,045	<
Nom. Bronzespotted Rockfish	BRZ1	16	16	-	0	136	136	-	0	-	-	-	0
Nom. Brown Rockfish	BRW1	29,391	29,391	-	0	13,297	13,297	-	0	24,547	19,150	5,397	<
Nom. Calif. Scorpionfish	SCR1	-	96,056	96,056	+	113,066	113,066	-	0	86,853	62,862	23,991	<
Nom. Chameleon Rockfish	CML1	-	-	-	0	18	18	-	0	-	-	-	0
Nom. China Rockfish	CHN1	47,728	11,028	36,700	<	21,949	13,767	8,182	<	14,419	3,255	11,164	<
Nom. Copper Rockfish	COP1	101,488	26,134	75,354	<	66,820	36,464	30,356	<	35,580	10,915	24,665	<
Nom. Flag Rockfish	FLG1	130	130	-	0	170	170	-	0	1	1	-	0
Nom. Gopher Rockfish	GPH1	19,450	11,478	7,972	<	23,551	18,321	5,230	<	93,749	11,663	82,086	<
Nom. Grass Rockfish	GRS1	68,242	58,517	9,725	<	92,428	25,689	66,739	<	59,427	12,248	47,179	<
Nom. Greenblotched Rockfish	GBL1	-	-	-	0	19	19	-	0	-	-	-	0
Nom. Greenspotted Rockfish	GSP1	44,779	6,677	38,102	<	27,162	14,089	13,073	<	13,526	9,358	4,168	<
Nom. Greenstriped Rockfish	GSR1	1,909	1,776	133	<	7,317	7,144	173	<	1,782	1,782	-	0
Nom. Kelp Rockfish	KLP1	2,017	1,726	291	<	1,658	1,304	354	<	2,989	397	2,592	<
Nom. Mexican Rockfish	MXR1	-	-	-	0	-	-	-	0	-	-	-	0
Nom. Olive Rockfish	OLV1	648	532	116	<	1,262	1,262	-	0	1,219	1,219	-	0
Nom. Pink Rockfish	PNK1	2	2	-	0	-	-	-	0	-	-	-	0
Nom. Pinkrose Rockfish	PRR1	296	296	-	0	3,757	3,757	-	0	-	-	-	0
Nom. Quillback Rockfish	QLB1	20,745	15,353	5,392	<	26,173	22,215	3,958	<	18,042	10,644	7,398	<
Nom. Redbanded Rockfish	RDB1	1,480	1,480	-	0	447	342	105	<	252	141	111	<
Nom. Rosethorn Rockfish	RST1	18,794	18,794	-	0	5,312	5,312	-	0	1,107	1,107	-	0
Nom. Rosy Rockfish	ROS1	-	-	-	0	8,560	8,560	-	0	592	592	-	0
Nom. Speckled Rockfish	SPK1	455	455	-	0	1,447	392	1,055	<	4,975	4,975	-	0
Nom. Squarespot	SQR1	-	-	-	0	-	-	-	0	23	23	-	0
Nom. Starry Rockfish	STR1	148	148	-	0	3,482	3,482	-	0	2,275	2,275	-	0
Nom. Swordspine Rockfish	SWS1	2	2	-	0	-	-	-	0	295	295	-	0

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	1997				1998				1999			Direction
		Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	
Nom. Tiger Rockfish	TGR1												
Nom. Treefish	TRE1	1,746	1,723	23	<	233	125	108	<	1,993	241	1,752	<
Nom. Vermillion Rockfish	VRM1	31,991	12,314	19,677	<	22,712	7,420	15,292	<	23,346	13,424	9,922	<
Nor. Unsp. Near-shore Rockfish	NUSR												
Nor. Unsp. Shelf Rockfish	NUSF												
Nor. Unsp. Slope Rockfish	NUSP												
Unsp. Near-shore Rockfish	USHR									129	129	-	0
Unsp. Shelf Rockfish	USLF												
Unsp. Slope Rockfish	USLP												
Nom. Black Rockfish	BLK1	667,829	219,775	448,054	<	624,227	143,449	480,778	<	411,418	139,014	272,404	<
Nom. Blackgill Rockfish	BGL1	414,261	126,975	287,286	<	348,464	210,427	138,037	<	77,976	27,368	50,608	<
Nom. Cowcod Rockfish	CWC1	21,635	15,825	5,810	<	25,771	8,982	16,789	<	6,810	6,810	-	0
Nom. Darkblotched Rockfish	DBR1	25,513	506	25,007	<	8,203	250	7,953	<	1,259	1,259	-	0
Nom. Stripetail Rockfish	STL1												
Unsp. Dpwtr Reds Rckfsh	RCK3	4,332	392	3,940	<	379	379	-	0				
Unsp. Reds Rckfsh	RCK4	850,863	348,624	502,239	<	710,243	264,518	445,725	<	243,203	32,962	210,241	<
Unsp. Small Reds Rckfsh	RCK5	1,487,521	26,780	1,460,741	<	1,236,936	47,061	1,189,875	<	288,110	44,480	243,630	<
Nom. Yelloweye Rockfish	YEY1	92,221	18,126	74,095	<	38,216	12,692	25,524	<	20,670	6,366	14,304	<
Black+blue Rockfish	RCK9	8,197	6,171	2,026	<	2,696	2,696	-	0	487	487	-	0
Bocaccio+chilipepper Rckfsh	RCK1	542	542	-	0	0							
Canary+vermillion Rckfsh	RCK8	58	58	-	0	0				164	164	-	0
Nom. Cabezon	CBZ1	265,594	206,891	58,703	<	374,291	87,057	287,234	<	277,668	36,849	240,819	<
Nom. Kelp Greenling	KGL1	46,532	46,532	-	0	36,460	36,460	-	0	86,863	86,863	-	0
Other Groundfish	OGRN	37	37	-	0	405	405	-	0	1,147	1,147	-	0
Other Rockfish	ORCK		12,502	12,502	+		7,339	7,339	+		6,062	6,062	+
Thornyheads (Mixed)	THDS	271,471	247,699	23,772	<	107,730	107,730	-	0	129,376	91,335	38,041	<
Unsp. Bolina Rckfsh	RCK2	126,196	86,055	40,141	<	125,959	21,412	104,547	<	112,923	8,743	104,180	<
Unsp. Gopher Rckfsh	RCK7	142,167	103,792	38,375	<	135,606	12,224	123,382	<	28,513	7,060	21,453	<
Unsp. Grenadiers	GRDR	2,076,739	2,076,696	43	<	1,723,682	1,723,678	4	<	964,134	964,130	4	<
Unsp. Rockfish	URCK	9,656,485	1,794,071	7,862,414	<	8,551,586	2,020,306	6,531,280	<	4,367,562	1,041,922	3,325,640	<
Unsp. Rosefish Rckfsh	RCK6	773,483	34,486	738,997	<	2,761,055	5,343	2,755,712	<	409,944	49,787	360,157	<
Nom. Longfin Sanddab	LDB1									3	3	-	0
Nom. Pacific Sanddab	PDB1	1,041	1,041	-	0	2,758	2,758	-	0	24,399	24,399	-	0
Nom. Speckled Sanddab	SDB1	30	30	-	0	231	231	-	0				
Other Flatfish	OFLT	229	229	-	0	1,946	1,946	-	0	707	707	-	0
Unsp. Flatfish	UFLT	67,927	67,927	-	0	123,213	123,213	-	0	87,157	83,999	3,158	<
Unsp. Sanddabs	UDAB	2,049,581	2,049,581	-	0	1,417,345	1,417,345	-	0	2,021,742	2,021,742	-	0
Unsp. Skate	USKT	5,742,625	5,742,008	617	<	2,834,379	2,834,307	72	<	3,694,488	3,694,473	15	<
Unsp. Turbots	UTRB	20,910	20,910	-	0					8,023	8,023	-	0
Total		71,686,473	21,793,532	50,110,057	<	58,492,811	17,015,676	41,491,813	<	43,571,757	12,861,742	30,722,139	<
Percent Movement				70%				71%				71%	

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	2000				Direction	2001				Direction	2002				Direction
		Unadjusted	Adjusted	Movement			Unadjusted	Adjusted	Movement			Unadjusted	Adjusted	Movement		
Nom. Yellowtail Rockfish	YTR1	6,983,467	1,579,484	5,403,983	<	4,598,252	629,938	3,968,314	<	2,440,038	216,887	2,223,151	<			
Nom. Canary Rockfish	CNR1	218,288	70,517	147,771	<	197,629	36,992	160,637	<	153,888	18,705	135,183	<			
Nom. Widow Rockfish	WDW1	8,506,565	1,629,834	6,876,731	<	5,258,424	1,839,828	3,418,596	<	896,964	239,435	657,529	<			
Nom. Longspine Thornyhead	LSP1	3,667,490	632,390	3,035,100	<	2,720,716	486,792	2,233,924	<	4,337,625	280,602	4,057,023	<			
Nom. Shortspine Thornyhead	SSP1	1,392,914	393,123	999,791	<	1,047,218	267,142	780,076	<	1,511,386	274,247	1,237,139	<			
Gen. Shelf/slope rf	POP1	16	16	-	0											
Nominal Pop	POP2	220,168	109,725	110,443	<	426,836	285,664	141,172	<	235,660	30,264	205,396	<			
Unsp. Pop Group	UPOP	914,547	1,219	913,328	<	280,573	79	280,494	<	210,364	51	210,313	<			
Nom. Shortbelly Rockfish	SBL1	42,795	42,795	-	0	11,679	843	10,836	<	138	138	-	0			
Nom. Chilipepper	CLP1	986,692	65,482	921,210	<	764,281	19,229	745,052	<	346,795	4,224	342,571	<			
Nom. Bocaccio	BCC1	54,486	18,312	36,174	<	48,471	8,736	39,735	<	46,257	5,929	40,328	<			
Nom. Splitnose Rockfish	SNS1	49,962	11,869	38,093	<	30,475	17,324	13,151	<	40,304	5,701	34,603	<			
Nom. Bank Rockfish	BNK1	180,422	15,950	164,472	<	124,051	10,675	113,376	<	439,106	2,184	436,922	<			
Nom. Aurora Rockfish	ARR1	1,527	495	1,032	<	339	339	-	0	825	825	-	0			
Nom. Black-and-yellow Rockfish	BYL1	32,214	2,645	29,569	<	19,807	3,796	16,011	<	18,992	8,513	10,479	<			
Nom. Blue Rockfish	BLU1	26,529	19,135	7,394	<	35,278	7,957	27,321	<	45,049	11,199	33,850	<			
Nom. Bronzespotted Rockfish	BRZ1	61	61	-	0	55	55	-	0	109	109	-	0			
Nom. Brown Rockfish	BRW1	29,228	4,251	24,977	<	59,314	7,197	52,117	<	47,432	6,567	40,865	<			
Nom. Calif. Scorpionfish	SCR1	41,359	41,359	-	0	44,202	44,204	2	+	29,811	29,811	-	0			
Nom. Chameleon Rockfish	CML1					29	33	4	+							
Nom. China Rockfish	CHN1	12,374	3,666	8,708	<	10,537	5,168	5,369	<	11,362	3,059	8,303	<			
Nom. Copper Rockfish	COP1	21,855	14,012	7,843	<	32,953	11,690	21,263	<	28,267	9,227	19,040	<			
Nom. Flag Rockfish	FLG1	281	281	-	0	83	83	-	0	181	111	70	<			
Nom. Gopher Rockfish	GPH1	78,204	10,385	67,819	<	97,420	9,092	88,328	<	74,761	17,702	57,059	<			
Nom. Grass Rockfish	GRS1	63,071	7,319	55,752	<	51,431	8,105	43,326	<	37,523	7,658	29,865	<			
Nom. Greenblotched Rockfish	GBL1	477	477	-	0	1,113	1,113	-	0	147	147	-	0			
Nom. Greenspotted Rockfish	GSP1	6,495	5,814	681	<	1,446	1,092	354	<	1,556	1,319	237	<			
Nom. Greenstriped Rockfish	GSR1	986	986	-	0	635	581	54	<	274	185	89	<			
Nom. Kelp Rockfish	KLP1	2,243	1,350	893	<	2,172	1,802	370	<	2,532	1,215	1,317	<			
Nom. Mexican Rockfish	MXR1									141	141	-	0			
Nom. Olive Rockfish	OLV1	2,188	2,188	-	0	2,367	2,267	100	<	1,884	1,830	54	<			
Nom. Pink Rockfish	PNK1									48	48	-	0			
Nom. Pinkrose Rockfish	PRR1					5	5	-	0							
Nom. Quillback Rockfish	QLB1	13,859	8,252	5,607	<	26,165	8,211	17,954	<	9,952	2,431	7,521	<			
Nom. Redbanded Rockfish	RDB1	10,174	10,174	-	0	742	742	-	0	1,585	1,367	218	<			
Nom. Rosethorn Rockfish	RST1	285	285	-	0	513	513	-	0	200	200	-	0			
Nom. Rosy Rockfish	ROS1	297	297	-	0	2,568	2,568	-	0	6,493	6,493	-	0			
Nom. Speckled Rockfish	SPK1	223	223	-	0	46	46	-	0	41	41	-	0			
Nom. Squarespot	SQR1															
Nom. Starry Rockfish	STR1	335	335	-	0	237	237	-	0	198	198	-	0			
Nom. Swordspine Rockfish	SWS1	1,778	1,778	-	0	46	46	-	0							

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	2000				2001				2002				Direction
		Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	Unadjusted	Adjusted	Movement	Direction	
Nom. Tiger Rockfish	TGR1									506	506			+
Nom. Treefish	TRE1	3,763	2,128	1,635	<	3,491	675	2,816	<	2,771	790	1,981		<
Nom. Vermillion Rockfish	VRM1	22,945	9,409	13,536	<	26,067	17,550	8,517	<	18,668	12,760	5,908		<
Nor. Unsp. Near-shore Rockfish	NUSR	58,406	13,638	44,768	<	59,779	5,505	54,274	<	55,531	4,430	51,101		<
Nor. Unsp. Shelf Rockfish	NUSF	206,554	79,482	127,072	<	241,244	109,644	131,600	<	145,803	34,609	111,194		<
Nor. Unsp. Slope Rockfish	NUSP	999,066	395,379	603,687	<	468,333	226,605	241,728	<	377,697	146,755	230,942		<
Unsp. Near-shore Rockfish	USHR	6,558	4,461	2,097	<	6,255	4,539	1,716	<	2,547	1,449	1,098		<
Unsp. Shelf Rockfish	USLF	42,883	11,537	31,346	<	26,972	8,193	18,779	<	26,502	6,032	20,470		<
Unsp. Slope Rockfish	USLP	421,768	45,103	376,665	<	399,920	11,665	388,255	<	411,280	5,637	405,643		<
Nom. Black Rockfish	BLK1	350,682	143,457	207,225	<	555,764	96,497	459,267	<	484,113	102,471	381,642		<
Nom. Blackgill Rockfish	BGL1	99,118	43,809	55,309	<	181,784	85,135	96,649	<	207,685	51,309	156,376		<
Nom. Cowcod Rockfish	CWC1	1,626	1,344	282	<	56	56	-	0	113	59	54		<
Nom. Darkblotched Rockfish	DBR1	25,148	7,018	18,130	<	206,606	59,859	146,747	<	174,543	24,291	150,252		<
Nom. Stripetail Rockfish	STL1	14	14	-	0									
Unsp. Dpwtr Reds Rckfsh	RCK3	271	271	-	0					21	21	-		0
Unsp. Reds Rckfsh	RCK4	40,349	25,431	14,918	<	23,220	9,272	13,948	<	17,999	7,248	10,751		<
Unsp. Small Reds Rckfsh	RCK5	12,358	12,358	-	0	7,765	7,769	4	+	12,635	2,960	9,675		<
Nom. Yelloweye Rockfish	YEY1	7,298	3,596	3,702	<	8,423	3,646	4,777	<	14,956	15,014	58		+
Black+blue Rockfish	RCK9	48	48	-	0	1,021	1,021	-	0					
Bocaccio+chilipepper Rckfsh	RCK1					26	26	-	0					
Canary+vermillion Rckfsh	RCK8	23	23	-	0	5	5	-	0					
Nom. Cabezon	CBZ1	256,587	59,492	197,095	<	159,930	38,357	121,573	<	111,175	111,175	-		0
Nom. Kelp Greenling	KGL1	94,093	45,380	48,713	<	87,667	67,887	19,780	<	135,827	135,827	-		0
Other Groundfish	OGRN	309	309	-	0									
Other Rockfish	ORCK		3,226	3,226	+		33,877	33,877	+		3,078	3,078		+
Thornyheads (Mixed)	THDS	165,734	149,486	16,248	<	105,100	105,100	-	0	148,982	130,647	18,335		<
Unsp. Bolina Rckfsh	RCK2	67,498	22,664	44,834	<	36,089	36,089	-	0	17,866	12,773	5,093		<
Unsp. Gopher Rckfsh	RCK7	12,065	2,551	9,514	<	4,559	4,065	494	<	2,812	2,812	-		0
Unsp. Grenadiers	GRDR	693,853	693,859	6	+	676,750	677,196	446	+	608,107	608,109	2		+
Unsp. Rockfish	URCK	1,009,375	987,575	21,800	<	45,220	41,789	3,431	<	61,647	25,411	36,236		<
Unsp. Rosefish Rckfsh	RCK6	192,311	54,497	137,814	<	206,317	62,109	144,208	<	165,620	1,189	164,431		<
Nom. Longfin Sanddab	LDB1					107	107	-	0					
Nom. Pacific Sanddab	PDB1	10,447	10,447	-	0	16,999	16,999	-	0	64	64	-		0
Nom. Speckled Sanddab	SDB1									64	64	-		0
Other Flatfish	OFLT	796	796	-	0	275	275	-	0	2,710	2,710	-		0
Unsp. Flatfish	UFLT	85,276	85,275	1	<	104,070	104,196	126	+	54,981	54,979	2		<
Unsp. Sanddabs	UDAB	1,638,269	1,638,269	-	0	1,740,231	1,739,785	446	<	1,328,580	1,328,580	-		0
Unsp. Skate	USKT	3,778,678	3,778,624	54	<	3,073,500	3,084,692	11,192	+	1,869,562	1,869,538	24		<
Unsp. Turbots	UTRB	4,369	4,369	-	0	12,944	12,944	-	0	6,633	6,633	-		0
Total		33,872,393	13,041,809	20,837,048	<	24,384,597	10,393,313	14,082,586	<	17,445,382	5,898,584	11,554,086		<
Percent Movement				62%				58%				66%		

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	2003			Direction
		Unadjusted	Adjusted	Movement	
Nom. Yellowtail Rockfish	YTR1	1,282,904	91,862	1,191,042	<
Nom. Canary Rockfish	CNR1	169,198	6,849	162,349	<
Nom. Widow Rockfish	WDW1	417,950	129,313	288,637	<
Nom. Longspine Thornyhead	LSP1	3,559,033	245,180	3,313,853	<
Nom. Shortspine Thornyhead	SSP1	1,590,470	241,444	1,349,026	<
Gen. Shelf/slope rf	POP1				
Nominal Pop	POP2	214,408	20,967	193,441	<
Unsp. Pop Group	UPOP	331,826	22	331,804	<
Nom. Shortbelly Rockfish	SBL1	1,221	1,220	1	<
Nom. Chilipepper	CLP1	38,799	2,732	36,067	<
Nom. Bocaccio	BCC1	1,368	1,362	6	<
Nom. Splitnose Rockfish	SNS1	49,778	43,887	5,891	<
Nom. Bank Rockfish	BNK1	159,733	7,774	151,959	<
Nom. Aurora Rockfish	ARR1	3,399	884	2,515	<
Nom. Black-and-yellow Rockfish	BYL1	16,706	6,993	9,713	<
Nom. Blue Rockfish	BLU1	26,767	6,700	20,067	<
Nom. Bronzespotted Rockfish	BRZ1				
Nom. Brown Rockfish	BRW1	44,255	7,060	37,195	<
Nom. Calif. Scorpionfish	SCR1	11,608	11,608	-	0
Nom. Chameleon Rockfish	CML1				
Nom. China Rockfish	CHN1	3,480	2,377	1,103	<
Nom. Copper Rockfish	COP1	6,622	5,135	1,487	<
Nom. Flag Rockfish	FLG1	54	54	-	0
Nom. Gopher Rockfish	GPH1	29,657	4,795	24,862	<
Nom. Grass Rockfish	GRS1	29,880	4,654	25,226	<
Nom. Greenblotched Rockfish	GBL1	27	3	24	<
Nom. Greenspotted Rockfish	GSP1	703	64	639	<
Nom. Greenstriped Rockfish	GSR1	827	821	6	<
Nom. Kelp Rockfish	KLP1	2,507	1,739	768	<
Nom. Mexican Rockfish	MXR1	4	4	-	0
Nom. Olive Rockfish	OLV1	1,591	1,591	-	0
Nom. Pink Rockfish	PNK1	6	6	-	0
Nom. Pinkrose Rockfish	PRR1				
Nom. Quillback Rockfish	QLB1	4,324	4,324	-	0
Nom. Redbanded Rockfish	RDB1	403	403	-	0
Nom. Rosethorn Rockfish	RST1	81	81	-	0
Nom. Rosy Rockfish	ROS1	536	536	-	0
Nom. Speckled Rockfish	SPK1	64	64	-	0
Nom. Squarespot	SQR1	424	424	-	0
Nom. Starry Rockfish	STR1	49	49	-	0
Nom. Swordspine Rockfish	SWS1	10	10	-	0

Table 20 (DQ2) West Coast PacFIN landings recorded in "nominal" and "unspecified" groundfish categories before and after application of average species composition distributions: 1994-2003 (lbs)

Common Name	SPID	2003		Movement	Direction
		Unadjusted	Adjusted		
Nom. Tiger Rockfish	TGR1	123	123	-	0
Nom. Treefish	TRE1	1,776	485	1,291	<
Nom. Vermillion Rockfish	VRM1	18,323	12,097	6,226	<
Nor. Unsp. Near-shore Rockfish	NUSR	42,444	15,916	26,528	<
Nor. Unsp. Shelf Rockfish	NUSF	168,090	28,051	140,039	<
Nor. Unsp. Slope Rockfish	NUSP	409,877	118,034	291,843	<
Unsp. Near-shore Rockfish	USHR	458	378	80	<
Unsp. Shelf Rockfish	USLF	1,629	1,574	55	<
Unsp. Slope Rockfish	USLP	123,186	10,908	112,278	<
Nom. Black Rockfish	BLK1	387,705	79,763	307,942	<
Nom. Blackgill Rockfish	BGL1	395,465	84,110	311,355	<
Nom. Cowcod Rockfish	CWC1	11		11	<
Nom. Darkblotched Rockfish	DBR1	164,615	31,900	132,715	<
Nom. Stripetail Rockfish	STL1				
Unsp. Dpwtr Reds Rckfsh	RCK3	59	59	-	0
Unsp. Reds Rckfsh	RCK4	34,981	7,625	27,356	<
Unsp. Small Reds Rckfsh	RCK5	4,337	4,337	-	0
Nom. Yelloweye Rockfish	YEY1	10,565	11,191	626	+
Black+blue Rockfish	RCK9	93	93	-	0
Bocaccio+chilipepper Rckfsh	RCK1				
Canary+vermillion Rckfsh	RCK8				
Nom. Cabezon	CBZ1	87,617	87,617	-	0
Nom. Kelp Greenling	KGL1	55,472	55,471	1	<
Other Groundfish	OGRN				
Other Rockfish	ORCK		1,692	1,692	+
Thornyheads (Mixed)	THDS	130,237	103,026	27,211	<
Unsp. Bolina Rckfsh	RCK2	4,903	4,903	-	0
Unsp. Gopher Rckfsh	RCK7	3,644	3,644	-	0
Unsp. Grenadiers	GRDR	697,581	697,581	-	0
Unsp. Rockfish	URCK	82,220	65,413	16,807	<
Unsp. Rosefish Rckfsh	RCK6	373,299	2,855	370,444	<
Nom. Longfin Sanddab	LDB1				
Nom. Pacific Sanddab	PDB1	187	187	-	0
Nom. Speckled Sanddab	SDB1				
Other Flatfish	OFLT	90	90	-	0
Unsp. Flatfish	UFLT	73,646	73,645	1	<
Unsp. Sanddabs	UDAB	1,376,493	1,376,493	-	0
Unsp. Skate	USKT	2,972,196	2,972,201	5	+
Unsp. Turbots	UTRB	5,705	5,705	-	0
Total		15,627,699	6,710,158	8,922,187	<
Percent Movement				57%	

Table 21 (IA1) PacFIN Groundfish landings in 2003 by vessels with Limited Entry (LE) trawl permits using all types of gear (lbs).

Groundfish species groups	Landings with Non-Trawl Gear			Landings Totals		
	With LE Trawl Gear	With LE Fixed Gear	With OA Fixed Gear	With Other OA Gears	NonTrawl Gear (LE+OA)	All Gears
YELLOWTAIL ROCKFISH	301,676			156	156	301,832
CANARY ROCKFISH	17,434					17,434
WIDOW ROCKFISH	35,683	667		930	1,597	37,280
LINGCOD	136,533	1,420		859	2,279	138,812
SABLEFISH	5,032,320	309,637		2,185	311,822	5,344,142
LONGSPINE THORNYHEAD	3,470,123			474	474	3,470,597
SHORTSPINE THORNYHEAD	1,310,362	379		355	734	1,311,096
DOVER SOLE	16,116,356	338		300	638	16,116,994
PACIFIC COD	2,276,766					2,276,766
PACIFIC OCEAN PERCH	279,251	4			4	279,255
SHORTBELLY ROCKFISH	592					592
CHILIPEPPER	37,567			283	283	37,850
BOCACCIO	279					279
SPLITNOSE ROCKFISH	46,109			2,517	2,517	48,626
BANK ROCKFISH	124,690					124,690
OTHER SEBASTES COMPLEX	380,822	3,190	4	1,892	5,086	385,908
BLACK ROCKFISH	2,110	75			75	2,185
BLACKGILL ROCKFISH	98,399					98,399
COWCOD ROCKFISH	11					11
DARKBLOTCHED ROCKFISH	162,684					162,684
REDSTRIPE ROCKFISH	31,452					31,452
YELLOWEYE ROCKFISH	807					807
OTHER ROCKFISH	1,251,184	4	69	1,215	1,288	1,252,472
ENGLISH SOLE	1,775,789	14		4,375	4,389	1,780,178
PETRALE SOLE	4,207,827			17,840	17,840	4,225,667
ARROWTOOTH FLOUNDER	5,054,522	42			42	5,054,564
OTHER GROUND FISH	6,604,435	368		20,148	20,516	6,624,951
Subtotal PFMC Groundfish (lbs)	48,755,783	316,138	73	53,529	369,740	49,125,523
Number of Unique vessels	206	11	1	15	27	233
No. of Deliveries (fish ticket counts)	5,501	50	1	40	91	5,592
PACIFIC WHITING	112,898,253			100,100	100,100	112,998,353
Total (lbs)	161,654,036	316,138	73	153,629	469,840	162,123,876

Table 22 (IA2) PacFIN Groundfish landings in 1998 by vessels with Limited Entry (LE) trawl permits using all types of gear (lbs).

Groundfish species groups	Landings with Non-Trawl Gear				Landings Totals	
	With LE Trawl Gear	With LE Fixed Gear	With OA Fixed Gear	With Other OA Gears	NonTrawl Gear (LE+OA)	All Gears
YELLOWTAIL ROCKFISH	4,743,871	8,988	10	59,965	68,963	4,812,834
CANARY ROCKFISH	1,951,763	3,015	11	8,151	11,177	1,962,940
WIDOW ROCKFISH	8,185,816	15		11,540	11,555	8,197,371
LINGCOD	476,158	160		7,316	7,476	483,634
SABLEFISH	4,724,579	199,548	87	10,185	209,820	4,934,399
LONGSPINE THORNYHEAD	5,106,757			6,134	6,134	5,112,891
SHORTSPINE THORNYHEAD	2,345,916	30		3,065	3,095	2,349,011
DOVER SOLE	17,545,514	439		37,906	38,345	17,583,859
PACIFIC COD	897,249			375	375	897,624
PACIFIC OCEAN PERCH	2,697,539	76		9,354	9,430	2,706,969
SHORTBELLY ROCKFISH	15,088					15,088
CHILIPEPPER	1,403,327			4,627	4,627	1,407,954
BOCACCIO	134,469			787	787	135,256
SPLITNOSE ROCKFISH	78,425					78,425
BANK ROCKFISH	335,974					335,974
OTHER SEBASTES COMPLEX	8,130	43	48	44	135	8,265
BLACK ROCKFISH	136,982	15		7	22	137,004
BLACKGILL ROCKFISH	114,508					114,508
COWCOD ROCKFISH	2,620	50		286	336	2,956
DARKBLOTCHED ROCKFISH	8,002					8,002
REDSTRIPE ROCKFISH	1,470,913			10,630	10,630	1,481,543
YELLOWEYE ROCKFISH	4,181					4,181
OTHER ROCKFISH	8,904,448	2,128	376	67,114	69,618	8,974,066
ENGLISH SOLE	2,498,455			3,766	3,766	2,502,221
PETRALE SOLE	3,183,859	5		10,254	10,259	3,194,118
ARROWTOOTH FLOUNDER	6,976,826	7	23	2,710	2,740	6,979,566
OTHER GROUND FISH	7,118,619	31		25,681	25,712	7,144,331
Subtotal PFMC Groundfish (lbs)	81,069,988	214,550	555	279,897	495,002	81,564,990
Number of Unique vessels	235	13	2	78	93	328
No. of Deliveries (fish ticket counts)	5,501	50	1	40	91	5,592
PACIFIC WHITING	193,623,076	60,367		4,134	64,501	193,687,577
Total (lbs)	274,693,064	274,917	555	284,031	559,503	275,252,567

Figure 1 (AE1.1) British Columbia groundfish trawl species management areas.

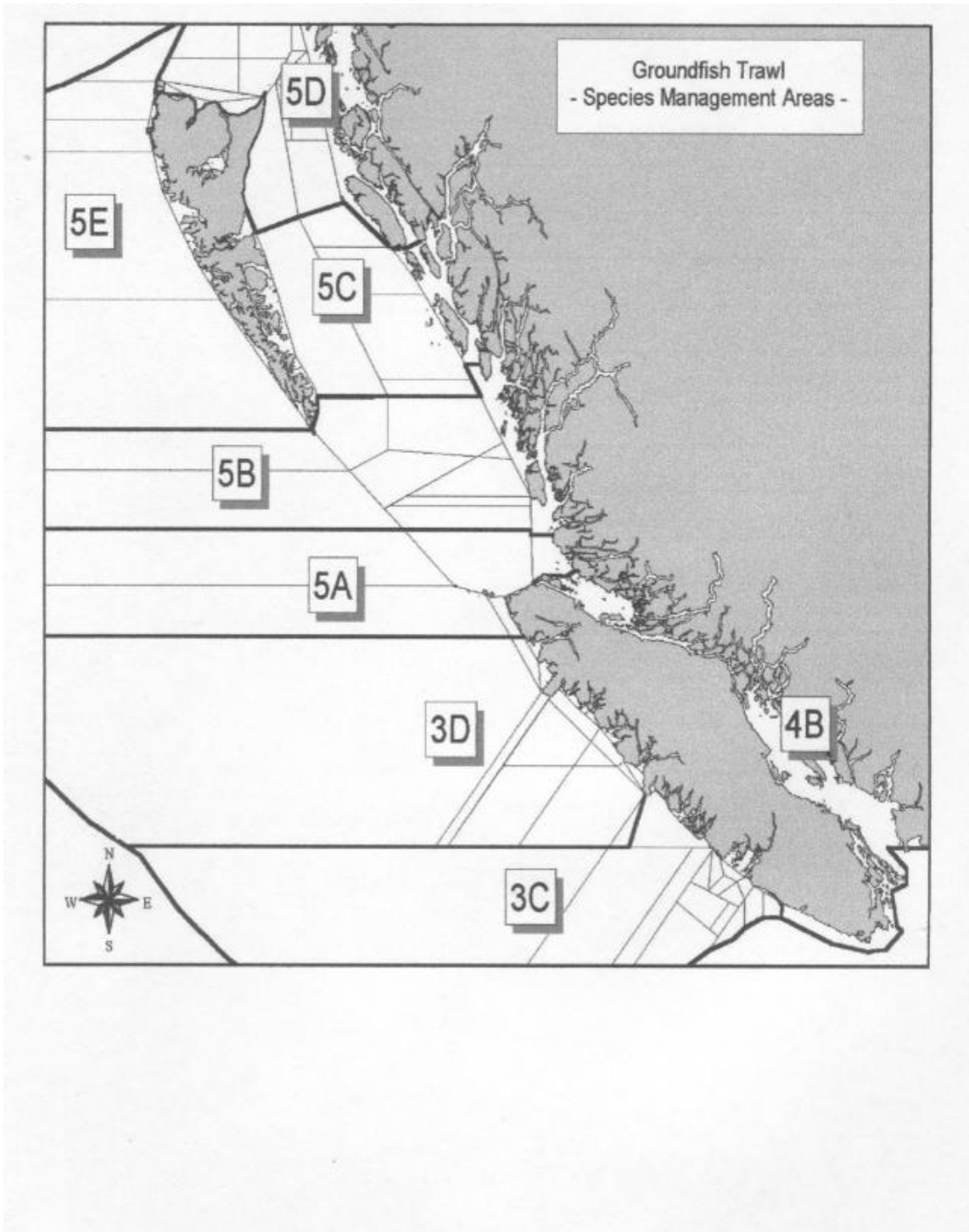
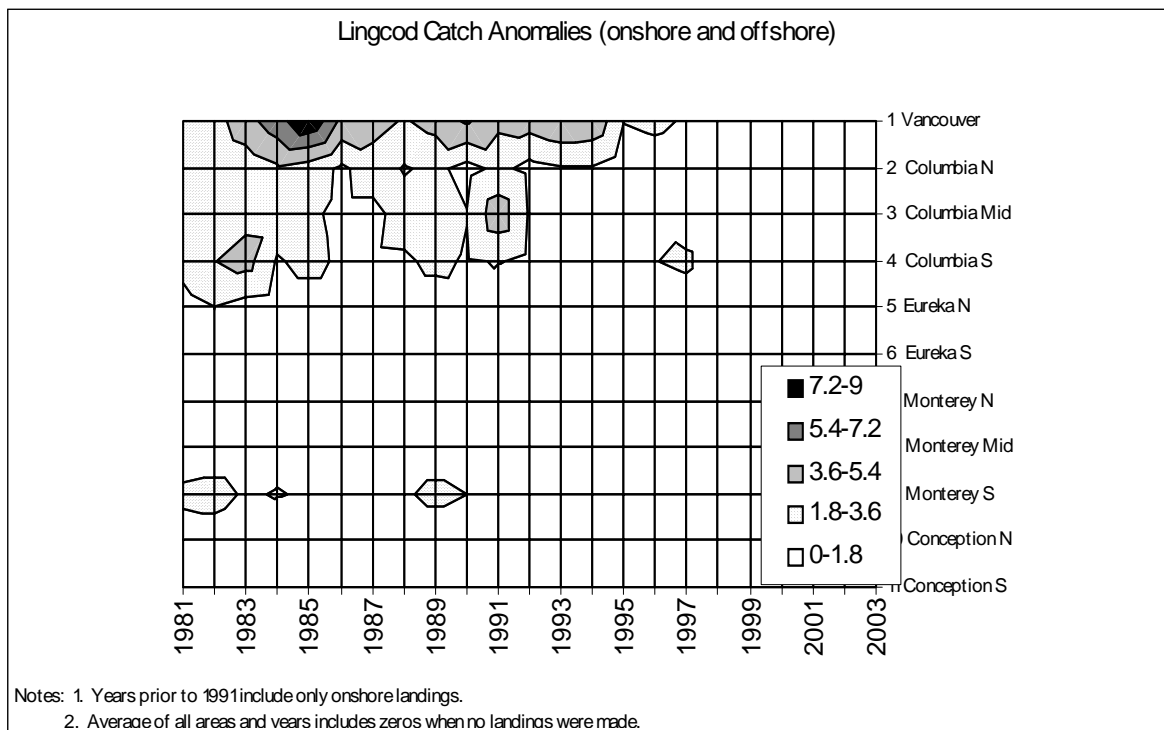
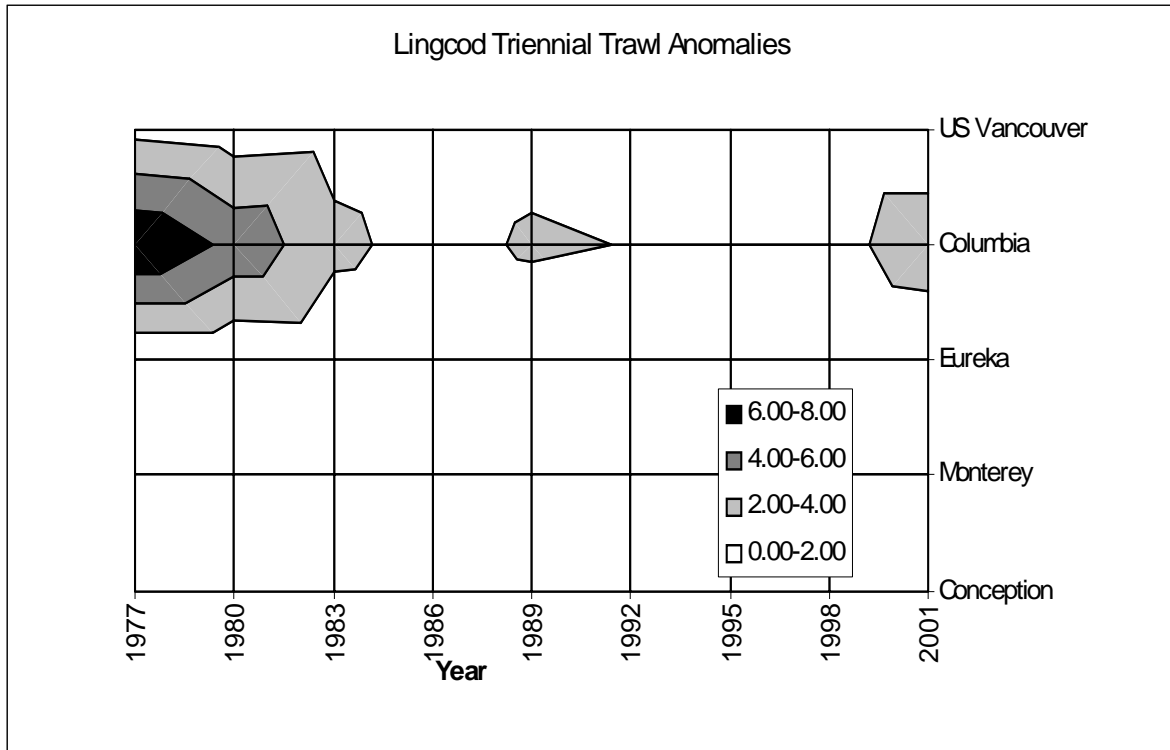


Figure 2 (A1.1a) Lingcod triennial trawl anomalies by INPFC area (1977-2001) and commercial catch anomalies by INPFC area (1981-2003).



Notes: 1. Years prior to 1991 include only onshore landings.
 2. Average of all areas and years includes zeros when no landings were made.

Figure 3 (A1.1b) Lingcod onshore landed catch and CPUE for INPFC Columbia area (1994-2003).

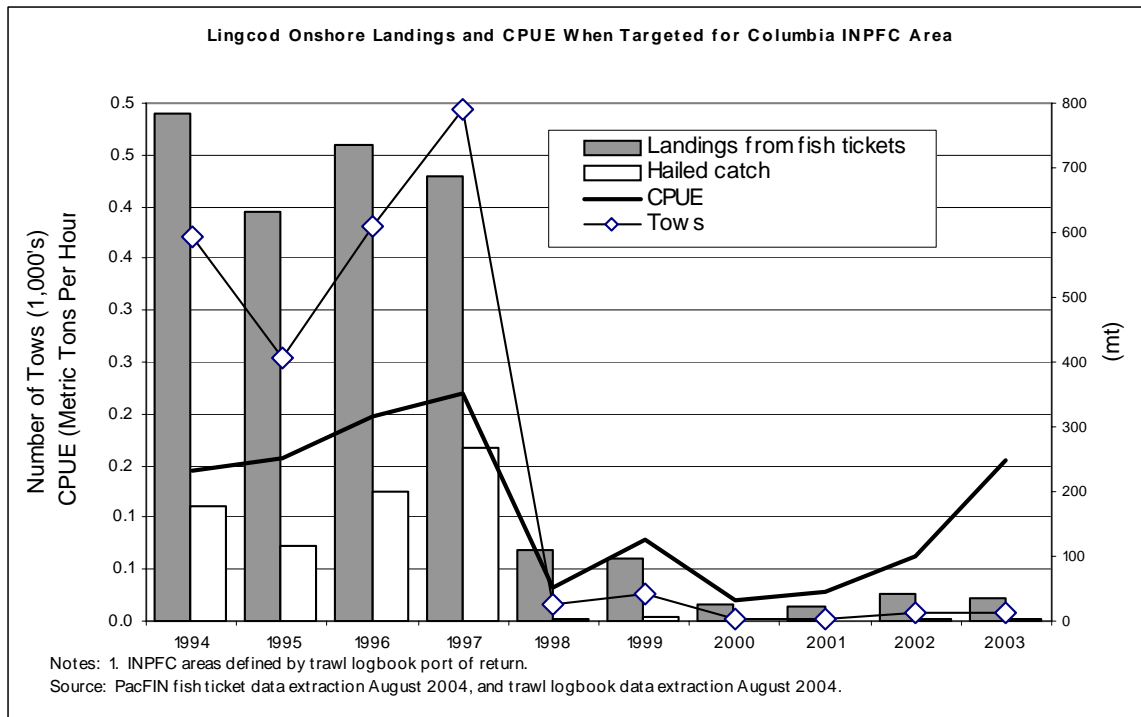


Figure 4 (A1.2a) Sablefish triennial trawl anomalies by INPFC area (1977-2001) and commercial catch anomalies by INPFC area (1981-2003).

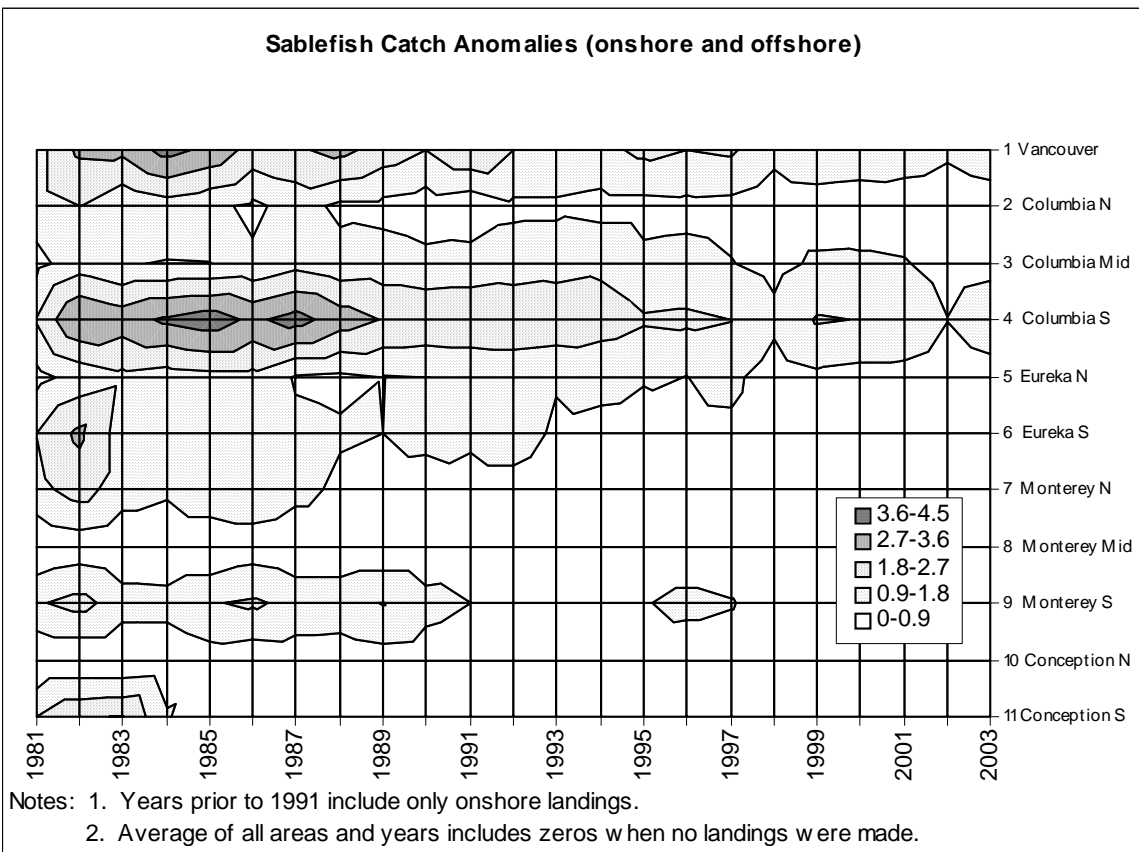
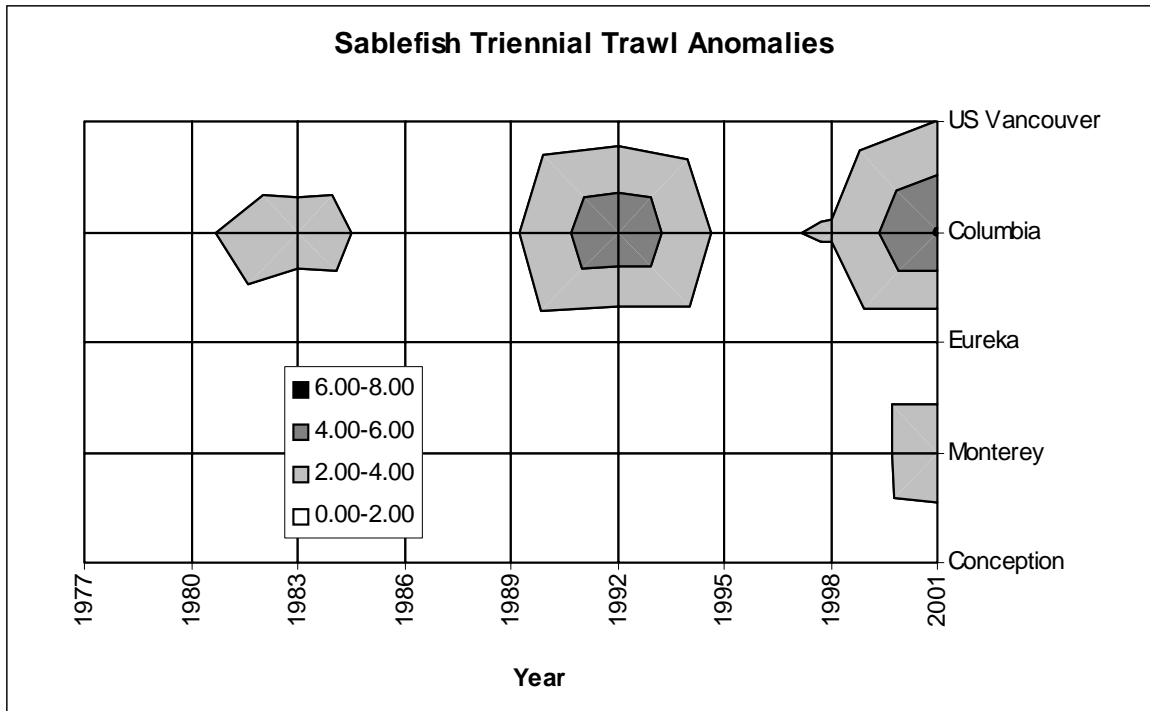


Figure 5 (A1.2b) Sablefish onshore landed catch and CPUE for INPFC Columbia area (1994-2003).

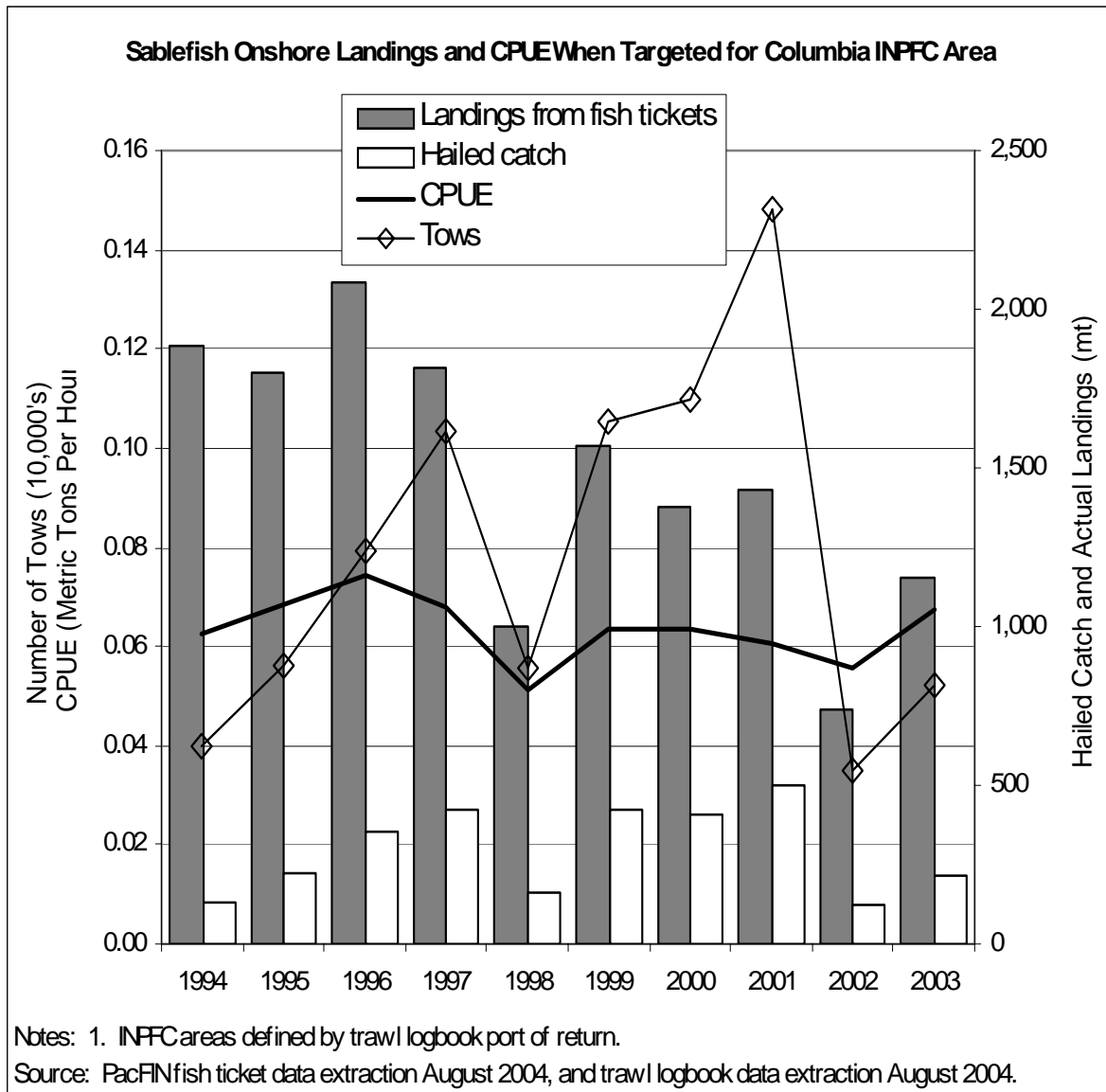


Figure 6 (A1.3a) Dover sole triennial trawl anomalies by INPFC area (1977-2001) and commercial catch anomalies by INPFC area (1981-2003).

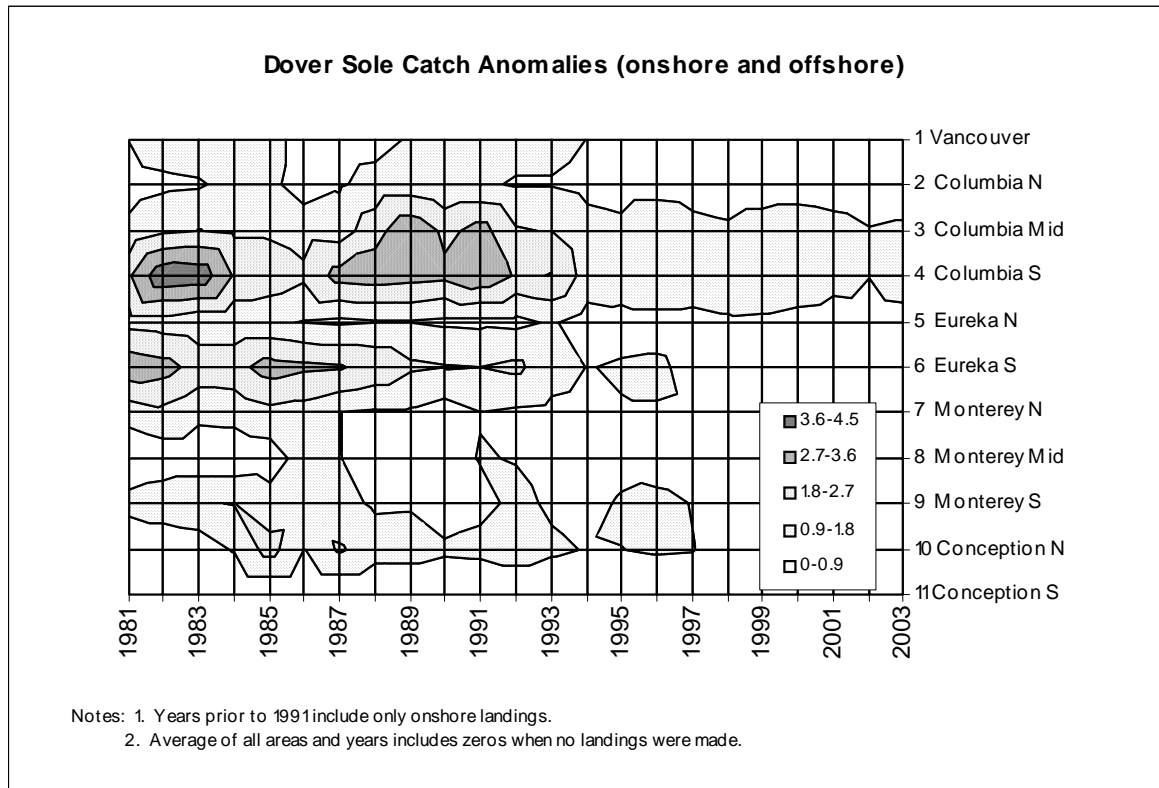
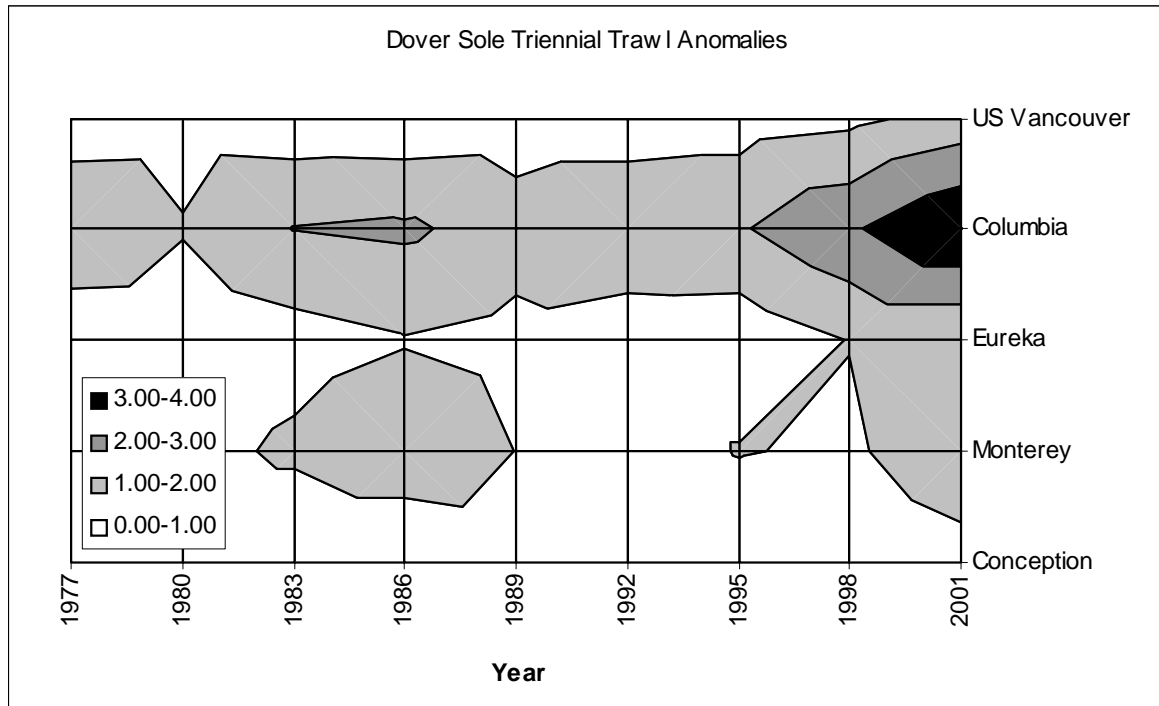
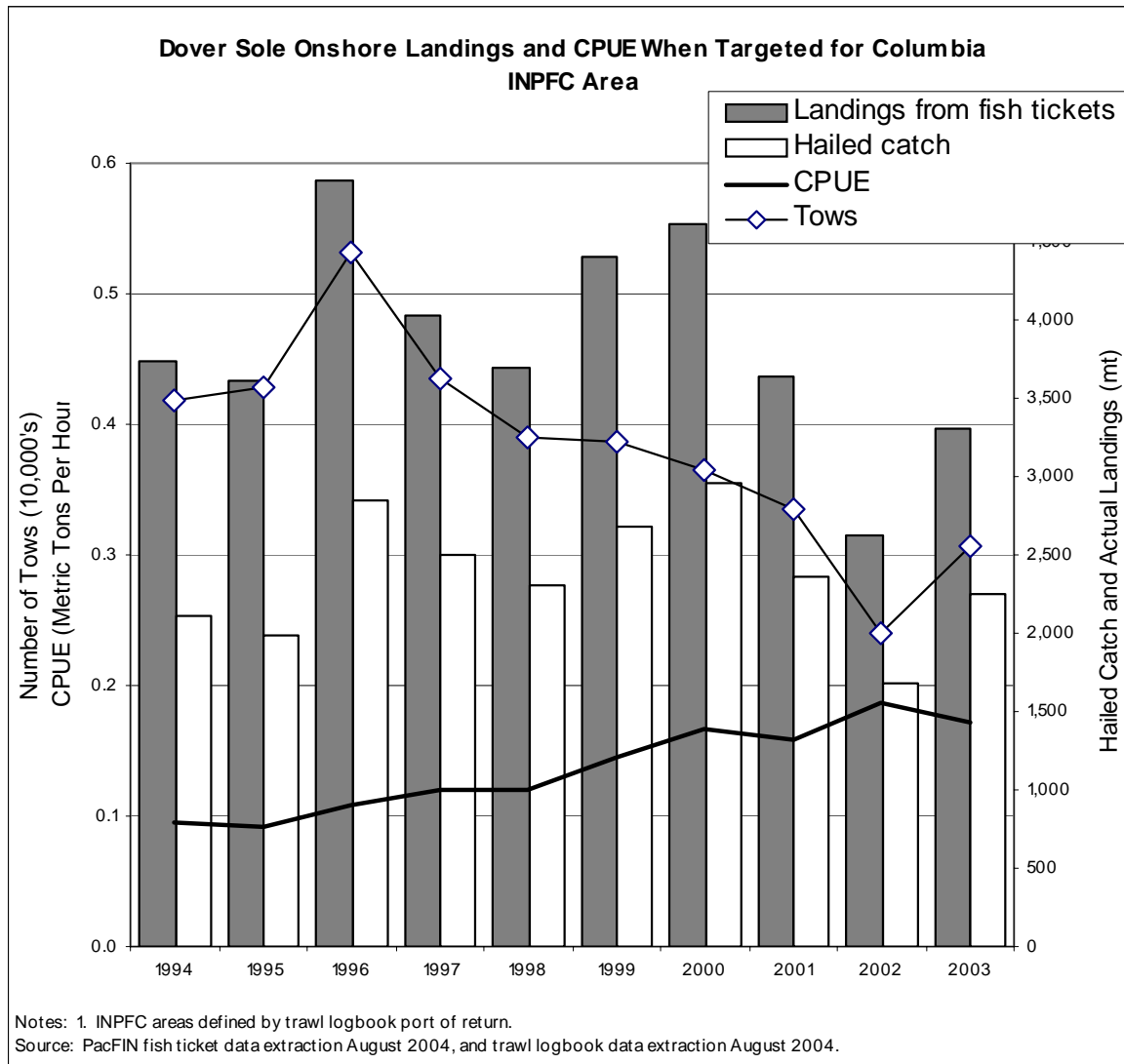


Figure 7 (A1.3b) Dover sole onshore landed catch and CPUE for INPFC Columbia area (1994-2003).



APPENDIX A - Socio-Economic Factors Affecting Geographic Distribution of Landings

Geographic Redistribution of Fishing Activity

The distribution of landings along the coast is the aggregate result of individual decisions. Different management systems present a different suite of opportunities, incentives, and barriers for those entering or expanding their activities and those leaving or contracting their activities.

In the following sections we identify how the influence of various factors that affect the distribution of fishing activity change with changes in the management system. The greater the change in the influence of any factor the more likely it is that the change in the management system will be accompanied by adjustment in the scale and participation of individual fishing operations. If the individuals among whom the redistribution occurs are located in different areas, the consequence is a geographic redistribution of activity and associated fishery benefits. Characteristics of the fishery which have little influence over the ultimate geographic distribution of effort under one management system may be more influential under another.

In general, the transferability and divisibility of harvest opportunity as compared to the license limitation system is likely to increase the influence of a number of factors previously muted by low profits, open access competition, and the lack of exclusivity and opportunity to benefit from decision to reduce the scale of operation. While the degree and direction of any shift is not predictable, the system changes that are projected indicate an increased likelihood of geographic shifts in fishing activity under IFQs as compared to a license limitation system.

Effects of Fisheries Management Approaches on Geographic Shifts in Fishing Effort and Fishing Practices

Different approaches to fisheries management may likely yield dissimilar effects on geographic movement of fishing effort, for example under Open Access management, Limited Entry management, and Quota Based Limited Entry management. Descriptions of the more qualitative aspects of these effects and differences are discussed below under two general groupings: Social Factors, and Economic Factors.

Characteristics of each Fisheries Management System :

Open Access. The fishery can be exploited by any and all entrants, and is divisible such that the harvest by anyone subtracts from the harvest available to others. Because of new entry, there is usually too much competition in the fishery and persistent latent capacity in the fishing fleet. Stewardship or conservation incentives are stifled under the “free-rider” atmosphere of open access. This is because the benefits of individual conservation practices end up being divided among all permittees, and the gains from conservation cheating are captured entirely by the cheater. Overall rents or profits approach zero, since new entry into the fishery continues as long as profits are to be made. Traditional management measures for Open Access fisheries tend to take the form of input controls: vessel or gear restrictions, restricted seasons, area restrictions, etc.

Limited Entry. Entry into the fishery is limited to the number of permittees considered appropriate for sustainable harvest of the resource. Target levels of sustainable effort are based on estimates of overall fishing capacity, balanced against the strength and resiliency of the fish populations (stock size and recruitment potential). While the number of permittees is limited, latent capacity persists in the fishery either because the number of vessels has not yet been sufficiently reduced or potentially more efficient configurations of fishing activity cannot be achieved due to the lack of flexibility in the regulatory regime. As a result of the latent capacity rents or profits are reduced as compared with a rationalized fleet. In the West Coast groundfish trawl fishery, the primary management measures are an output control (two-month cumulative trip limits) and an input control (the license limitation system). This combination of

an input control with an output control, while not achieving full rationalization, effectively stifles any incentive for expanding capitalization within the groundfish trawl fishery. There are also numerous input controls such as gear and area restrictions.

Quota Based Limited Entry. Entry into the fishery is limited to enough permittees considered appropriate for sustainable harvests. Overall fleet fishing effort, and individual effort, is regulated through quota shares held by each permittee. Quota shares are quasi-property rights entitling the permittee to harvest some portion of the allowable catch, usually expressed as a percentage of the allowable catch (NRC 1999). Shares are infinitely divisible and transferable, with transfers between permittees allowed throughout the fishing season (subject to some restrictions and fees on transfers). Initial assignment of quota shares are based on criteria developed by the fishery management authority, usually linked to historical landings (volume or value of landings), current fishing capacity, or willingness to pay (as with auctioned quota shares). Profits or rents tend to be higher since participants can match their capital, and time their harvests, in order to maximize the value of their landings. The primary management measures are output controls: individual harvest amounts (subject to an overall allowable catch for the fleet for the season). Additionally, input controls such as gear restrictions and area closures will remain in place.

Factors in an Individual's Choice Whether to Alter Fishing Practices: Assuming that fishermen will behave as rational individuals and profit-maximizing businesses, the motivation to move or change fishing effort depends on the perceived benefits making the change under each fishing scenario: Open Access, Limited Entry, and Quota Based Limited Entry. Benefits may be in the form of increased profits or intangibles that increase individual satisfaction. Profit impetus may take the form of either increased revenues potential or cost minimization opportunities. Intangibles may be nonmarket components of individual welfare such as individual quality of life, or ties to cultural, familial, or community welfare. Thus, many reasons may factor into a fisherman's decision to change fishing practices under a given fishing scenario.

Manifesting the Decision to Change or Move Fishing Practices in the Fishery:

In general the individual's resulting decision whether to change their fishing effort or fishing practices under each fishing scenario, will take the form of one or more of the following three actions:

- To expand or contract fishing operations (or effort) in the existing geographical area or home port,
- To relocate fishing operations to a different geographical area or home port, and,
- To cease fishing operations in favor of selling, surrendering, or allowing the fishing permit to lapse.

Determinants of Movement or Change:

A. Economic Factors:

As a rational business person, fishermen are motivated to maximize the profits derived from fishing activities. Accordingly, economic factors would enter business decision processes, including decisions whether to move or change the level of fishing activities. These economic factors include the realm of all the inputs to production, and how the inputs are combined, that affect each fisherman's profitability. Fishermen strive to employ inputs to maximize gross revenues or minimize production costs, either of which figure into profitability or profit maximization. Certain dynamic forces and their influence on production may be more, or less, under the control of the individual fisherman; Endogenous forces, and Exogenous forces (Box 2000). Examples of exogenous forces include: seasonal weather patterns and oceanographic conditions, regulatory changes, geographic distribution of target fish species, foreign monetary exchange rates, price per gallon of fuel, or other forces beyond the control of the fishermen that nonetheless influence production and profitability. Examples of endogenous forces would include: fishermen's selection and level of labor inputs, choice in gear or materials used in

harvest production, how much fuel to use, how and where to deploy gear, how raw inputs are combined together, what species to target, in what condition the fish are landed, or other business decisions that are primarily under the control of the fishermen and influence profitability.

Exogenous Forces

Natural Features and Patterns

This entails factors beyond the control of the fishermen that nonetheless can impact individual decisions on how or where to expend fishing effort. Examples include oceanographic features; prevailing currents, bottom topography, shoreline features; weather conditions and seasonal patterns.

Open Access

The stifled profit potential under open access conditions may present a barrier to adapting fishing activities, in light of limited financial resources. To the extent that natural features restrict the alternatives available to the fishermen; alternative ports or fisheries, this may present a disincentive to expanding or relocating fishing activities. The decision to cease fishing may or may not be influenced by natural features since, in the highly competitive open access fishery, all participants are presented with the same challenges.

Limited Entry

The benefits of reduced competition are dissipated to the extent that latent capacity persists under limited entry. Profit potential under limited entry, improves when it entails significant reduction in fleet size, but may still be subject to the conditions in open access; latent capacity and overcapitalization. Natural features may restrict the alternatives available to the fishermen like alternative ports or fisheries, and may present a disincentive to expanding or relocating fishing activities. The decision to cease fishing may not be influenced by natural features since, under limited entry fishery, fishermen are presented with comparatively better prospects for earning profits.

Quota Based Limited Entry

Increased profit potential and flexibility in timing of landings offers the fishermen greater latitude in business decisions to expand or contract fishing activities or relocate fishing effort. Under transferable individual quotas, some fishermen may elect to constrict their scale of operations, and opt to sell all or part of their quota. Balancing this choice to sell quota and constrict operations, is the buyer counterpart, the fisherman who desires to purchase quota and expand operations. In the face of natural features, this increased flexibility may enable the fishermen to consider alternative areas to expand or constrict fishing operations, to better meet their desired scale of activity, or relocate their base of operations.

Biological Features

This represents biological features over which the fishermen may have little or no control. An example is the geographical distribution (or movement patterns) of target fish species.

Open Access

Conditions under open access, which stifle profit potential, may present barriers to adapting fishing activities, in light of limited financial resources. To the extent that biological features dictate what alternative fishing areas are available to the fishermen, this may present a disincentive to expanding or relocating fishing activities. The decision to cease fishing may or may not be influenced by biological features since, in the highly competitive open access fishery, all participants are presented with the same challenges. However, at or near some threshold of minimum fishing activity, fishermen may decide to cease fishing when biological resources are insufficient to sustain business operations.

Limited Entry

Persistent latent capacity tends to dissipate profit potential and offsets some benefits of reduced competition under limited entry. To the extent that biological features dictate what alternative fishing areas are available to the fishermen, this may or may not present a disincentive to expanding or relocating fishing activities. The decision to cease fishing may not be influenced by biological features since reduced competition between fishermen should improve prospects for sustained or higher profits in the future. However, at or near some threshold of minimum fishing activity, fishermen may decide to cease fishing if biological resources prove insufficient to sustain business operations.

Quota Based Limited Entry

Increased flexibility and profit potential offers the fishermen greater latitude in business decisions to expand or contract fishing activities or relocate fishing effort. Given the biological distribution of target species, some fishermen may elect to alter their scale of operations, and opt to sell all or part of their quota. Balancing the sale of quota and constricting operations would be those fishermen who desire to purchase quota and expand or relocate their operations. In the face of biological features, this increased flexibility for business activities broadens the range of alternative areas to expand or constrict fishing operations, to better meet their desired scale of activity or relocate their base of operations.

Market Conditions

This encompasses financial markets, foreign exchange markets, geographical centers of demand (for fish products), demand for variety of deliverable products, availability of substitutes, and regional cost of living.

Open Access

Fishermen operating under a highly competitive open access fishery exercise little individual market power over price paid and quantity of product purchased. This, coupled with the comparatively low profits, makes fishermen vulnerable to outside influences like competition from substitute products, processor inventories/supply-on-hand, or costs for production inputs. Consequently, market influence may establish limits for fishermen, and represent a disincentive to expand or relocate activities. Likewise, market conditions may or may not influence a fisherman's decision to cease fishing under an open access circumstance.

Limited Entry

Fishermen operating under the less competitive limited entry environment, may be able to exercise more individual market power over price paid and quantity of product purchased. To the extent that persistent latent capacity allows some profit potential, fishermen may be better equipped to weather localized market conditions and expand or relocate activities to improve profit potential. Consequently, market conditions may or may not present forces that encourage expanding or relocating fishing activities. Under limited entry, market fluctuations may not greatly influence a fisherman's decision to cease fishing, given prospects for sustained or higher profits in the future and some individual market power.

Quota Based Limited Entry

Fishermen with individual quotas would have the greatest individual market power over price paid and quantity of product purchased, relative to open access and limited entry. These circumstances would likely lead to higher profit potential for quota holders. Consequently, market fluctuations would likely encourage expanding or constricting activities as well as timing of landings, to maximize the value of the quota landed. The fishermen would have more flexibility, and a better financial posture, to relocate operations as a rational business decision. Market fluctuations would probably not influence a fisherman's decision to cease fishing, unless coupled with some other influence; e.g., influence of financial gain by exiting the fishery.

Infrastructure and Amenities

Benefits, services, and provisions available to the fisherman at their business location, which are necessary to the continued production process, can affect the flexibility the fisherman has in how or where they locate their fishing business and efforts. Examples of infrastructure and amenities include harbor location and features, shipyard facilities, ice suppliers, fuel docks, processors, chandlers, offloading facilities, supplemental income sources, and attainable housing.

Open Access

Conditions under open access, which stifle profit potential, may present barriers to adapting fishing activities, in light of limited financial resources. To the extent that the fisherman's business operations depend on local infrastructure and amenities, they may represent a limiting factor and disincentive to expanding or relocating fishing activities. However, the decision to cease fishing may or may not be influenced by infrastructure and amenities since, in the highly competitive open access fishery, all local participants would be presented with the same conditions. However, the loss of certain critical infrastructure or amenities could result in a decision to cease fishing; e.g., loss of distribution channels or local processor.

Limited Entry

The location of acceptable infrastructure and amenities, suitable for the fisherman's desired scale of operations, may limit the options for a fisherman to expand or relocate fishing operations. To the extent that the local offers established markets for product, there would be disincentives to relocate or cease fishing operations under limited entry. Particularly given comparatively better prospects for earning future profits, and reduced competition under limited entry.

Quota Based Limited Entry

Increased profit potential and flexibility in timing of landings offers the fishermen greater latitude in business decisions to expand or contract fishing activities or relocate fishing effort. Under transferable individual quotas, some fishermen may elect to constrict their scale of operations, and opt to sell all or part of their quota. Balancing this choice to sell quota and constrict operations, are the fishermen desiring more quota to expand operations. In the face of limited infrastructure and amenities, this increased flexibility and profitability may enable the fishermen to consider alternative areas to expand or constrict fishing operations, to better meet their desired scale of activity, or relocate their base of operations. Infrastructure and amenities would probably not influence a fisherman's decision to cease fishing, unless coupled with some other influence; e.g., influence of financial gain by exiting the fishery. This is due to the increased flexibility under the quota based system, affording the fisherman more liberty to move or adapt operations to a new location or adapt to better suit the current location.

Endogenous Forces

Production Processes

Production processes primarily under the influence of the fisherman and may include: choice and combination of inputs to production, where to focus fishing effort, how to deploy gear, level of diversification, choice of product mix or condition of fish landed, where to land the fish, and individual innovation.

Open Access

The highly competitive open access fishery and stifled profit potential would likely present a barrier to altering fishing activities; expanding or relocation operations. Much of the decisions on capital investment and choice of production inputs are geared more toward harvest capture potential and not harvest value potential. In an overcapitalized fleet this could mean much of the fishing profits go toward sustaining unnecessary capital and burdensome financial liabilities. In some cases financial obligations may represent a primary motive to continue fishing, though the activity may not be profitable or an optimal business decision.

Limited Entry

Fishermen operating under the less competitive limited entry environment, may exercise more individual control over the kind and quantity of product delivered to market. While persistent latent capacity may erode overall profit potential, fishermen may be better situated to vary their use of production inputs or pursue innovations in order to enhance their harvest potential. As a result fishermen may or may not choose to expand or relocate fishing operations under limited entry. Under limited entry, production processes may not influence a fisherman's decision to cease fishing, given prospects for lower competition and for sustained or higher profits in the future.

Quota Based Limited Entry

Increased flexibility and profit potential under an individual quota system would offer the fishermen the greatest latitude in business decisions to expand or contract fishing activities or relocate fishing effort. Given the biological distribution of target species, some fishermen may elect to alter their scale of operations, opt to sell or buy quota, or specialize in certain species or product quality. Under a quota based limited entry system, we would expect fishermen to exercise the greatest control over production processes, and that these conditions would facilitate expanding or relocating operations as a rational business decision. The increased flexibility for business activities broadens the range of alternative areas to expand or constrict fishing operations, to better meet their desired scale of activity or relocate their base of operations. Furthermore, given the greater flexibility in making business decisions under individual quotas, there would be little incentive to cease fishing activities unless coupled with some other influence; e.g., financial gain by exiting the fishery.

Investment Options

Aside from the production decisions in day to day fishing operations, other non-fishing investing consideration may affect a fisherman's decision on how or where to conduct fishing activities, if at all. An example of investment options would be the prospects available to the fisherman for exiting the fishery with a financial gain. Financial gain may provide the fisherman the flexibility either to remove themselves entirely from the fishery (divest) or to reinvest in alternative fisheries.

B. Social Factors:

Community Ties and Contribution

This category represents the inter-relatedness of fishermen in a community. The social connections fostered by fishing activity and in a sense dependent on fishing. Examples include social ties within and between different gear groups, those that target specific species, or those that have specific vessels. Businesses related to fishing such as ice manufacturer's, net suppliers, or fuel suppliers are some examples as well. Fishermen's associations or fishermen's wives groups also contribute and support community ties.

Open Access

- Stability and strong community ties support fishing activity, unlikely to break community ties and move to a different location.
- Difficult to rebuild trust and business relationships in a new community.
- Community ties may be structured around fishing success and accomplishments (Gilden and Conway 2002) that are knowledgeable in an existing community and therefore would need to be recreated in a new community.

Limited Entry

- Limited entry may result in a slight consolidation of fishing resources and therefore a stronger community support network and structure.
- Business relationships may become more unique and specialized.
- Geographic shift may depend upon area restrictions, the seeking of additional permits, otherwise strong community ties are likely to be maintained and counter any movement.

Quota Based Limited Entry

- Community ties are strengthened in a limited entry program, so they are only likely to become stronger with more limitations.
- Consolidation of resources impacts entire community from family members to business partners. As a result a closer interwoven community support structure may support smaller family fishermen to keep them in the fishery.
- Larger entities that seek to acquire additional quota would be more likely to choose a geographic location shift in order to obtain higher quota limits.

Familial Ties and Tradition

This category represents family lines passing down fishing through generations, traditions. Linkages may form the fishing community's identity. Fishing becomes a family business, where members of the family may participate in fishing activities as well as in the management of business and family finances (Gilden and Conway 2002). The practice of fishing is ingrained in the everyday lives of the fishing families.

Open Access

- Movement unlikely for an overcapitalized fishery when familial ties are strong and the support structure is solid.

Limited Entry

- Familial ties may strengthen under a limited system.
- Family and tradition interlinked with community and community members, web of society, not likely to move to different community and different traditions

Quota Based Limited Entry

- Dependent on design of IFQ negative impacts and consolidation of quota may have a disproportionate negative effect on family based structures (McCay 1995) resulting in some removal from the fishery.
- Higher values of IFQ's often result in higher costs and taxes and difficulties passing quotas as inheritance (McCay 1995).
- A smaller number of fishermen may cling to significance of fishing to family and traditions and hold onto the quota as long as possible even if they are out competed by larger entities.
- Smaller family fishing operations are less likely to move, whereas, larger family based companies may move to seek consolidation of quota.

Cultural Ties and Values

Fishing as a way of life inherent in every day life, values, beliefs, and norms surround how fishing is conducted. In families of strong fishing backgrounds, fishing is seen as the optimal job, the thing to do that is significant in life.

Open Access

- Cultural ties may be linked to a specific geographic region and community and therefore movement may be unlikely.

Limited Entry

- Under a system where access is limited the importance of fishing may be more realized and therefore more culturally significant.
- Efforts to retain culture may be a disincentive to move.

Quota Based Limited Entry

- If quota allocation is so small where a fishing culture may be threatened, it may be possible to see a geographical shift for the purpose of maintaining the culture.
- Any geographic shift would be dependent on the size of the fishing operation and the available resources.
- In the case of smaller entities whose identity is tied to fishing, if resources are not available to move, fishing may be continued at a lower level until a time where the ability to fish is lost or they are forced out of the fishery by a larger entity.

Job Satisfaction

McCay (1995) describes job satisfaction as a “confluence of personal, situational, and socio-cultural community values.”

Open Access

- Depending on connection to fishing, cultural, familial, etc., job satisfaction may be more difficult to achieve for someone just interested in fishing without have a community and cultural background. If this is the case entrance and exit from the fishery may be common.

Limited Entry

Not much information available, feasible to suggest an incentive to cease as job satisfaction is reduced with permitting costs.

- Not much information on this, but it is feasible to consider any ability to fish, even limited, yields some job satisfaction

Quota Based Limited Entry

- Satisfaction may vary dependent on the specific role of an individual in the fishing industry under IFQ's.
- Those that are able to meet the costs and compete in an arena where IFQs may increase in value, may yield a higher job satisfaction and continue in the fishery, and if resources are available may move around to increase IFQ ownership
- Those who are unable to withstand the costs, bear the brunt of the costs, may represent a negative effect in job satisfaction and depending on the community may stay in the fishery or may exit.

Social Relationships of Production

McCay (1995) describes this dynamic as a change in the “concentration of property rights” or privileges relating in changes in relationships and vertical integrations. As values change, costs change, and social structures change. Specifically this may impact the relationships between larger entities, owners of both boats and quotas, crew and other employees.

Open Access

- No real change to effect geographic movement.

Limited Entry

- Good business structures that are successful may only see some consolidation from effort limits, but the social relationships of production may not change, resulting in no real change in geographic efforts.

Quota Based Limited Entry

- McCay (1995) indicates a contraction as consolidation occurs and participants fight to establish a favorable position to maintain economic value. As a result, relationships of dependency and exploitation between larger firms who hold large amounts of IFQs change. Increased costs are placed on owners, who then change wage structure of crew so they can shift burden of increased costs. As a result crew may shift locations trying to find reasonable place within the system that respects
- Incentive to relocate to an area with fewer large corporations. Smaller entities may be forced to sell permits and exit as smaller entities are squeezed by larger corporations who have resources to drive values of IFQ's, small entities cannot keep up and are unwillingly forced to exit .

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Communities and Individual Quota Programs

Discussion on Community Definitions, Community Eligibility Criteria and Allocation Process in Quota Systems

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Understanding communities in the context of fisheries management is important as the term can be interpreted in several different ways. It is critical to define how the term is being referred to for any particular management measure. The definition may be supplemented by designing specific eligibility criteria which would help distinguish communities. As Individual transferable quota (ITQ) systems throughout the world are focused on individuals, a few have learned the importance of acknowledging communities and have adjusted their quota systems to reflect community quota eligibility. This brief section will consider the various ways communities can be defined, how the Magnuson-Stevens Act defines the term, and how different systems selected communities for quota through eligibility criteria.

Defining Communities

When referring to community is it common to consider it to be a place based definition regarding a specific geographic area and the people that occupy the area. For example one definition of the term states "...a social group of any size whose members reside in a specific locality, interact with one another on an ongoing basis, and who have a shared sense of identity, interests, values, governmental institutions, and cultural and historic heritage (McGoodwin 2001)." Examples of place based communities may be Bellingham WA., Brookings OR., or Crescent City, CA.

Other types of communities may be 'communities of interest,' 'virtual communities', and 'occupational communities' to name a few. "Communities of interest" are based on 'common interests' or common activities of the participants or community members (Gilden1999)(NRC 1999). Examples of a community of interest may be clubs, commodity groups, or business organizations. In an ITQ system, a community of interest is created encompassing those who hold quota shares.

"Virtual communities" are likened to a place based community except the members may not live in the same geographic communities (NRC 1999a). Examples of these communities may be fishers that are interested in a specific fishery and its correlating habitat, or individuals that are interested management measures such as closed areas, which affects various communities over a large geographic area. These communities may represent associations of different occupations such as fishers, fish processors, biologists, and conservationists. The differentiation of fishermen by a specific gear group, for example trawlers or urchin divers, also represents a virtual community, they are linked by the commonality of a gear group but are geographically dispersed (Gilden 1999).

"Occupational communities" are those linked by similar occupations, such as crabbing or trolling (Gilden 1999). Fishermen may be considered an occupational community which may be further identified by specific fishing gear groups such as trawlers or pot fishers.

The Magnuson-Stevens Act defines a fishing community as "a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such a community (§3[16])." National Standard 8 (50CFR600.345(b)(3)) further defines a community as "a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent services and industries."

A point noted by the GAO (2004), when defining a community based on geographic criteria, is to take into consideration the requirements of National Standard 4 (NS4). NS4 states "conservation and management measures shall not discriminate between residents of different states (§301[4])." A community definition which may be too narrowly defined may conflict

with NS4. As a result, a clear definition of a community or community eligibility criteria is required.

When categorizing a community, it is plausible that a single community can be defined by several different definitions. A community of interest, may also be an occupational community. It is also important to note that communities are ever changing, dynamic, and responsive to change (McCay & Jentoft 1998). Management measures cause change in communities. As a result, it is important to carefully define the term or clearly identify eligibility criteria.

Community Development Quota of Western Alaska

The CDQ program of western Alaska was developed by the North Pacific Fishery Management Council in 1992 to assist in the social and economic development of coastal villages in rural western Alaska. The program encompasses the Bering Sea and Aleutian Island (BSAI) region and their associated fisheries. Upon the initiation of the plan, allocations were provided for Bering Sea pollock, however, over time other fisheries were added such as halibut, sablefish, crab, and multispecies groundfish. Community eligibility criteria were developed, CDQ groups were established to represent communities, and allocation is managed through the Council process based on recommendations from the State of Alaska.

Eligibility Criteria

Communities within western Alaska are small rural communities which are often very isolated. As a result, the purpose of the CDQ program and the eligibility criteria appropriately target these small communities. The major eligibility criteria are as follows:

- Location within 50 nautical miles of the Bering Sea.
- Native village as defined by the Alaska Native Land Claims Settlement Act.
- Residents conduct over 50% of their current commercial or subsistence fishing effort in the waters of the Bering Sea.
- No previously developed harvesting or processing capacity sufficient to support substantial groundfish fisheries participation.

Initially 56 communities were determined to be eligible, with additional communities qualifying to a current date total of 65 eligible communities. Most of the qualified communities had high rates of poverty and unemployment (NRC 1999b). Community members held planning meetings during which six separate CDQ coalitions or groups were established.

Community Development Groups

CDQ groups were 'self-determined' during community planning meetings and were designed based on cultural boundaries and regional similarities (Alaska 2003). Each of the CDQs is a nonprofit organization. Groups determined the need to find an industry partner with Bering Sea harvesting ability. As a result, each CDQ group received proposals from harvesters and processors and chose the proposals that reflected the goals of their specific group. Royalty agreements or contracts were signed between industry and the CDQ groups. Royalty payments received for access to the communities share of quota are then used to meet development goals (NRC 1999b).

All CDQ groups share the common objective of developing fisheries related economies in western Alaska. Each group determines the best use of its allocation and outline what activities are best suited for their region. While not all groups approached how to achieve this

objective in the same manner, and have varying levels of success, all have incorporated efforts to create jobs and some type of education and training component (NRC 1999). Examples of goals include: promote and participate in business opportunities with capital investment fund, facilitate fisheries management through research; construct vessel repair, maintenance and storage facility, small boat harbor projects; and to improve the social conditions through creating human resource programs that will be self-sustaining over time (Alaska 2003).

Community Development Quota Allocation

CDQ groups are required to complete extensive annual Community Development Plan (CDP) applications to be eligible for quota. The plans are reviewed by a CDQ team comprised of designees of Alaska's governor. The applications include the group's goals and objectives, employment information, fishing related infrastructure, a budget, documented support from each participating community, appropriate management and technical experience, and a plan to prevent exceeding quota.

Once completed, the plans are submitted to the State of Alaska for review. The state checks the plans for federal and state regulatory compliance and then recommends allocation to the governor. Upon approval, the state must consult with the North Pacific Fisheries Management Council and the National Marine Fisheries Service (NMFS). After any questions are resolved and findings approved, allocations are finalized through the Council process.

Initial allocation in the Bering Sea pollock fishery was derived from the 15% harvest "reserve" held to assist in-season management. The allocation was not outside the total allowable catch (TAC) for that season. It was determined that an amount equal to half of the of the "reserve", 7.5%, would be allocated to community quotas. This amount held until the passing of the American Fisheries Act, which increased the pollock quota to the CDQ program to 10% in 1999.

Initial allocation of BSAI sablefish was 20%. Halibut allocations were varied and are distributed across management areas. Expansion added Pacific cod, Atka mackarel, turbot, yellowfin sole, and other flatfish species, Tanner crab, and snow crab under the multispecies program at a total of 7.5% of the quota. Bering Sea opilio, bairdi, and king crab was phased in at 3.5% in 1998, 5% in 1999, and 7.5% in 2000. The maximum award to any single CDQ group is 33% of the overall 7.5% allocation (NRC 1999b).

The process to determine how to distribute these quota across each CDQ group is handled by the State of Alaska and their CDQ teams. Through standards and criteria established in Alaska state regulations, the CDQ teams evaluate the information provided by the CDQ groups in their CDP against the standards and criteria and from the overall evaluations determine a quota allocation.

Gulf of Alaska Halibut and Sablefish IFQ Program

Overcapitalized halibut and sablefish fisheries resulted in the development of the IFQ program for the Gulf of Alaska (GOA). Program implementation occurred in 1995 with the issuance of quota shares (QS) to individuals. By the late 1990's quota had been consolidated, primarily transferred to large communities leaving fewer shares for small coastal communities. The impacts of reduced access to IFQ shares compounded by poor salmon prices led to declining fishery economies in small communities (Smith 2004). Community leaders created the Gulf of Alaska Coastal Community Coalition (GOACCC) which sought a solution to gain access to quota for small communities. In April 2002, the NPFMC took action providing the opportunity for communities to "buy in" to the IFQ program. Quota shares would be held by non-profit corporations who would represent communities.

Eligibility Criteria

Eligibility criteria and program requirements for the GOA communities was included in the Final Rule published in the Federal Register on April 30, 2004 [69FR No. 84; 23681]. Communities must meet all of the following criteria to be eligible to participate in the IFQ program:

- Have a population of less than 1,500 persons based on the 2000 United States Census.
- Have direct saltwater access.
- Lack direct road access to communities with a population greater than 1,500 persons.
- Have historic participation in the halibut and sablefish fisheries.
- Be specifically designated on a list adopted by the Council and included in this rule.

Initially 42 communities qualified under this criteria. If a community does not qualify under criteria, but appears to meet the criteria, they may apply directly to the Council for inclusion. Once qualified as an eligible community, they are then able to designate a nonprofit organization to hold QS on behalf of the community.

Community Quota Entity

The Final Rule designates the ability of nonprofit organizations to apply for the status of a Community Quota Entity (CQE) to act on the behalf of eligible communities. Each CQE may represent more than one community, but each community can only have one CQE. Nonprofit entities apply directly to NMFS for their CQE status. Applications included articles of incorporation and by-laws, an organizational chart and management structure, procedures for distribution of annual IFQ to represented communities, and the formal statement of support (resolution) from the governing bodies of eligible communities. Upon receipt of the application, the NMFS will review and once determined to be complete, will forward the application to the State of Alaska for a review period. Upon reviewing comments from the state, NMFS may approve, partially approve, or deny the application. Upon approval, a CQE will be designated to act on behalf of a specific community. The CQE will be issued a “transfer eligibility certificate” (TEC) and will be able to enter the QS market and hold QS for the community.

The CQE then “leases” annual IFQ permit amounts to individual permanent community residents to fish. The CQE continues to purchase more quota for fishermen in the community to fish. There are caps on the amount of QS a single community can hold, caps on the amount of QS held by all participating communities, and “block” limits of quota. Community use caps are the same as found in the current ITQ program. They are: 1% of 2c halibut QS, 0.5% of all GOA halibut QS, 1% of SE sablefish QS, and 1% of all sablefish QS (Smith 2004). Cumulative use caps on all CQE holdings vary by year and commence with 3% the first year, 6% the second year, 9% the third year, 12% the fourth year, 15% the fifth year, 18% the sixth year, and 21% the seventh year. The program will be reviewed in five year increments, during which time these use caps will be reviewed.

Other limitations prohibit the purchase or transfer of ITQs from specific designated management areas in the GOA. CQE block rules apply prohibiting the purchase/use of more than 10 blocks of halibut or 5 blocks of sablefish QS in any one management area. Rules also prohibit the combination of small “sweep up” blocks to form a larger block. “Sweep up” amounts are smaller QS blocks intended to facilitate the purchase of QS by new entrants. The

intent of this prohibition is to avoid a “potentially unfair competition in the QS market between CQE’s and individuals for these small blocks [69FR No. 84; 23684].”

The Final Rule also states that CQE’s can not sell QS unless the sale will generate revenues to improve, sustain, or expand the opportunities for the communities residents to participate in the halibut and sablefish fisheries. NMFS will not authorize the transfer of the QS held by a CQE unless the community for which the QS was held authorized the transfer. This authorization must come as an Approval of Transfer form signed by an authorized representative of the governing body of the specific community. If it is determined that the transfer was issue conducted for any reason other than for the benefit of the community, the CQE will face restrictions on holding and administering QS for the specific community for up to a period of three calendar years.

Quota pounds are issued on an annual basis and are leased by CQE’s on an annual basis. Once the annual allocation is received by the CQE, it may then be transferred or ‘leased’ in full or part of the applicable pounds to one or more permanent residents of the represented community.

Criteria for an Individual to Lease QS from a CQE

Eligibility of an individual to qualify to lease quota from a representative CQE requires the individual to be a permanent resident of the represented community. Residents must affirm that he or she has maintained a residence in the community from which the IFQ is leased for a period of at least 12 consecutive months immediately preceding the time when the residence is being claimed. The individual can not have claimed residence in any other community, state, territory, or country during the same period of time. Individuals who receive quota are considered to be equal to IFQ permit holders and the same regulations are applicable. An individual can also qualify for CQE shares if they are a “IFQ crew member” and can demonstrate 150 days of fishing experience. One can also qualify if they received QS by the initial issuance.

QS holders are required to be present on the vessel while fishing and delivering, the hiring of skippers is prohibited. IFQ holdings by a lessee may not exceed 50,000 pounds of halibut or sablefish. The amount of IFQ fished from any vessel may not exceed 50,000 pounds of halibut or sablefish in any season, inclusive of all IFQ fished aboard the vessel.

Canadian Groundfish Scotia-Fundy Fisheries Community-Based Management

The Scotia-Fundy groundfish fisheries functioned under quasi-property rights for a period of time in the early 1980's. By the mid to late 1980's initial allocation of non-transferable quotas to fishing companies, termed Enterprise Allocations, were extended to the entire fleet. Catching capacity of the inshore fleet continued to increase under a competitive quota system until a rapid decline of groundfish resulted in a closure of fishing grounds and the need to reduce harvest capacity which was met through license buyouts. In 1996, an experimental community quota system was introduced for the inshore fleet. The system divided the fleet into seven community based groups. The experimental program was extended annually through 1998 at which time it was again extended for a five year period (DO 2000).

Eligibility Criteria

Initially the Canadian Department of Fisheries and Oceans (DO) supported a concept to determine communities based on “like-minded individuals” but this concept was set aside in an effort to avoid “corporate concentration” (Peacock and Hansen 1999). Instead communities were selected solely based on geography. Seven community groups were established and are

clearly outlined in the fisheries management plan. The program is specifically for the inshore fleet fixed gear vessels less than 45ft.

All license holders were assigned to a specific community based on the area of registry of the license holder in the year the program was developed. Opting out provisions were available.

Community Management Boards & Allocation

Community Management Boards (CMBs) are private boards comprised of elected representatives, whom are usually fishers (Peacock and Hansen 1999). The CMBs were established to represent communities and are responsible for distributing catch allocation, and the development, implementation, control, and monitoring of in-season management plans. Each of the seven communities has a CMB with the exception of one, which has two. In this case, the community had varying philosophies and performance due to different vessel groups, and as a result the community has two CMBs, one for each group (DO 2000). The CMBs are considered a social/economic driver for their designated community and as a result, are responsible for all activities related to these functions including the implementation of co-management approaches (Peacock and Hansen 1999).

Allocations of quota were provided to each CMB based on the catch history of each individual between 1986-1993 period, which was then standardized to 1996 levels. Calculations were based on landings linked to individual license-holders plus unidentified landings from processors within the community. Mediators were used to resolve any issues that arose. CMBs determine allocation to individual fishers and are able to conduct temporary quota trades between communities. Each management board may manage multiple species quota based on species allocations for specific fishery management areas.

New Zealand ITQ System and Traditional Fishing

After the implementation of the New Zealand ITQ program, the indigenous Maori people identified that their fishing rights were not being honored as guaranteed under the 1840 Treaty of Waitangi (Batstone and Sharp 1998). After years of negotiations and legal proceedings, the Maori people were allocated almost 40% of the New Zealand ITQ through the Treaty of Waitangi (Fisheries Claims) Settlement Act of 1992 (NRC 1999). The settlement resulted in a waiver of any additional Maori claims in exchange for a 50% Maori shareholding in Sealord Products limited and 20% of all new commercial fisheries entered into the quota management system (Te Ohu 2005). Through this act the Waitangi Fisheries Commission was created to hold the assets on behalf of the iwi (tribes) and to determine a fair allocation scheme.

After more than a decade of working with the iwi, Maori, and lobby groups, accompanied by successive legal challenges, the Maori Fisheries Act 2004 was passed through Parliament. This Act specifies allocation among the Maori, establishes trusts to hold allocations, and addresses all administrative roles and qualification criteria for individual iwi and their affiliated organizations.

Eligibility and allocation criteria are largely based on tribal qualification parameters, residence, coastline entitlements, and population considerations. Allocations are very complex and are outlined in the Act, but appear to allow equal amounts to be allocated to each iwi within each allocation sector. This program is unique due to the allocation through a legal rights process surrounding native rights.

Icelandic ITQ System and Community Protection

While the Icelandic ITQ system is based on quota allocated to vessels, and doesn't have direct community quota allocation, they do incorporate what may be considered 'community protection' measures within the ITQ program (GAO 2004). The Icelandic ITQ system applies to

all fisheries, quotas are representative of shares of the TAC, quotas are permanent, divisible, and transferable with a few exceptions. Portions of any share are transferable, but a full annual vessel quota is only transferable between vessels within the same geographic region. These transfers within the geographic regions are reviewed by the appropriate fisher's unions and local authorities. The intent of geographic restrictions is to stabilize local employment (Runolfsson and Arnason 1997). Transfers outside of the region are subject what is referred to as a "community right of first refusal" rule which provides the community an opportunity to purchase vessels with their designated quota from within the community before the vessels are sold outside of the community (GAO 2004). Through these measures the community has a more direct voice in the utilization of the vessel quota.

Conclusion

Various programs that have incorporated community aspects into their quota program have various levels of detail and regulatory control over the quota. Each program is unique to the types of communities they are representing, for example, tribal, inshore fleets, gear types etc.. An understanding of the types of communities that will be affected by a quota implementation and the characteristics of those communities will undoubtedly assist in the process to define the term 'community' as it will apply to the specific program, help develop applicable community eligibility criteria, and assist in quota allocation decisions.

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Coastal Fishing Community Considerations in the Context of Trawl IFQ's

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The 1996 revision of the Magnuson-Stevens Fishery Conservation and Management Act recognizes the importance of human communities and their relationship to fisheries. Among other things, National Standard 8 declares that fishery conservation must take into account the importance of fishery resources to coastal fishing communities, with the goals of providing for the "sustained participation" of those communities in fisheries and minimizing "adverse economic impacts" as much as possible. This focus on communities represents a shift taking place in many areas of natural resource management. ⁽¹⁾ As we consider the proper place of communities in the IFQ debate, we are using the MSA and NMFS definition that a fishing community exists in a specific **place** – such as Astoria.

An analysis of a system which includes the ability of coastal fishing communities or groups representing particular coastal fishing communities to participate in the quota marketplace must be included in any proposals or recommendations forwarded to the Council for analysis. The facilitation of ownership by communities of quota that could then be leased should be a minimum design element of any IFQ Program design. Consideration of a mechanism that allows communities opportunities to retain quota should also be considered as a design element.

Coastal Fishing Communities and the IFQ Program Design:

Community interests and needs must be adequately represented in this process. This can be done by providing the opportunity for communities to be involved in the program and by providing flexibility to change with changing conditions.

To that end, an analysis of a system which includes the ability of coastal fishing communities or groups representing particular coastal fishing communities to participate in the quota marketplace is imperative.

- ✓ The facilitation of ownership by communities of quota that could then be leased should be a minimum design element of any IFQ Program design.

It is recognized that initial direct quota allocation to communities may not be the most desirable or operationally feasible option.

- ✓ Include a mechanism to ensure that quota usage benefits and involves communities. This includes options such as the ability of communities or groups representing communities to purchase quota, first right of refusal agreements, and annual allocations to proposals containing community-specific commitments.

For those communities which desire to support and strengthen their local fishing industry, an option needs to be in place for communities to obtain quota to be used for the benefit of that community - especially if that community is investing in its fisheries via infrastructure development and the adoption of policies to support and enhance the local fishing industry (such as protecting the use of valuable waterfront for fisheries related needs). Such a system could have design elements which would ensure that the interests of other sectors like fishermen and processors are also protected. For example, if a community had "quota" it could only be fished by permitted trawl vessels and this quota could be over and above the allocation an individual fisherman received. Further, if the quota was required to be landed in a particular

port, this could help ensure benefits to community-based fish processors. There are several ways this could be designed. The community quota would have to be delivered in the community holding the quota, or could be delivered elsewhere by a community quota holder (fisherman/vessel) whose earnings would come back to benefit the community in which the vessel is homeported. Groups entitled to hold community quota could be any place-based community group – including fishermen and processors. Use of this quota could also be designed to help new entrants who have a groundfish trawl permit to get started by having the ability to lease quota if they cannot afford to buy it in their early years.

Community quota accumulation would be based on a particular community's desire to obtain the quota for the purpose of strengthening or maintaining its fleet, processors and support services. Not all communities are equal in this desire – some are actively planning for and supporting the local fleet and some are not. However, those communities which are planning for an industry in their future, and which want the opportunity to participate in the IFQ process should be granted the ability protect their local interests and investments by the accumulation of quota at some level.

Other mechanisms to address community concerns that should be included for further analysis include:

- ✓ Provide incentive for voluntary coops. This incentive might be important if there are tight caps on ownership that may not allow harvesters and processors to accumulate enough quota to operate at economies of scale. For example, if ownership was capped at 1 or 2%, harvesters and processors could form a coop or joint venture that would allow them to increase their collective and jointly managed quota share by some additional amount. This could be tied to a community of place.
- ✓ Community having the right of first refusal before any quota based in the community is sold outside of the community (voluntary coop held quota, processor held quota, or whatever). If communities are allowed to have ownership they can acquire first refusal rights from other owners – this could all be voluntary without communities having direct ownership.
- ✓ Hold back some percent of the quota share and allocate annually based on proposals brought forth jointly by processors and harvesters who have committed their quota to be delivered to a given port community.
- ✓ Geographic limits on quota use, whether used to designate landing or harvesting locations, can ensure dispersion of fishing effort, continued industry distribution along the coast and even engagement in specific ports.

Information needs for analysis:

List of coastal fishing communities and level of participation in West Coast fisheries including trawl fisheries.

Economic information

Social information

Community planning goals regarding fisheries (trawl).

A well structured IFQ program which incorporates community interests can meet the Pacific Fishery Management's Council's (PFMC) goals of providing for a well-managed system to protect and conserve groundfish resources; providing for a stable and efficient groundfish industry; increasing net benefits that arise from the fishery; providing for a fair and equitable

distribution of fishery benefits; providing for a safe fishery; and rationalizing capacity through market forces

Background Information

In a letter (6/18/04) to selected participants, Senators Gordon Smith (OR) and Patty Murray (WA) expressed their desire that the process for developing an IQ program for the West Coast groundfish trawl fishery include a policy framework that provides for a stable and healthy coastal economy. They said “We encourage efforts to bring lasting value back to our groundfish fishery. However, we believe that we must proceed judiciously to ensure that all options are carefully considered and the interests of all- commercial fishermen, sport fishermen, seafood processors, marine suppliers, broader coastal communities and most importantly, the fishery resource itself-are taken into account as options are developed.” At a meeting with the Senators’ staff – Casey Sixkiller (Murray), Betsy McDonnell and Martin Doern (Smith), it was made clear that it was important to the Senators that consideration of how management decisions affect coastal fishing communities and all segments of communities (ports, cities, banks, etc.) have an interest in the outcome of this process. Fishery regulations should include the maximization of benefits to coastal communities. (3)

What is a Fishing Community?

The Magnuson-Stevens Act (MSA) defines a fishing community as:

“a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.” (1)

In interpreting this definition, the National Marine Fisheries Service has stated that “A fishing community is a social or economic group whose members reside in a specific location...” This “official” interpretation means that a fishing community exists in a specific place like Astoria, San Pedro, or Seattle. However, other types of communities exist. For example, an “occupational community” is a group of people involved in the same occupation, like the coast wide community of trawlers who engage in similar activities. A “community of interest” is made up of people who share similar interests – for example, people who are concerned about making the fishing industry safer. One town or city might include many different occupational communities and communities of interest. (1)

However you define fishing communities, it can be said that they are composed of diverse, independent people who do not fit easily into neat categories and who rarely, if ever, present themselves as a homogeneous group. (5)

Coastal Fishing Community Needs

Communities desiring to plan their future with fisheries need to have involvement in the system and some control over their destiny. Basic needs include:

- Healthy fisheries
- Family wage jobs
- Infrastructure – ports, fish plants, support services, etc.
- Leadership – a community governing body which understands the fishing industry and issues (local and global) affecting local communities.

- Economic and social information regarding fisheries at the local, regional and national level. This is crucial for community planning and decision-making.
- Interactive communication and involvement with the fisheries management system.
- Interactive communication and involvement with the local fleet and support services.
- A system which incorporates cross community needs and impacts (regulations in one community which affects neighboring communities).
- Pro-active planning at the local level (planning for a future in fisheries, planning for working waterfronts, incorporating a diverse economy including fishing.)

Coastal Fishing Community Concerns Related to IFQ's:

The following is a compilation of community *concerns* articulated by a survey group of nearly 100 individuals and organizations including fishermen, processors, crewmembers, port representatives, city, county, state, and federal government representatives, non governmental organizations and other interested parties during the summer of 2004. (4)

- The Council and IFQ committee will not address community concerns in the IFQ program.
- The Council must be forthcoming in acknowledging and addressing the community impact of management decisions in order to build trust
- The full scope of potential impacts, including impacts on other parts of the trawl fishery, other fisheries, and on communities are not being considered.
- Lack of specific program elements to address community concerns (they are too general).
- Not engaged in the process because of the potential high costs.
- Legitimate concerns would be dismissed because addressing them would be overly complex.
- Management policy should not unduly harm or help specific communities, neither should it stand in the way of letting markets inspire appropriate community change.
- The line between addressing community concerns and protectionism is subtle but very important, and the council should consider it in weighing program design issues.
- Fear of excessive consolidation of IFQs in both harvesting and processing sectors; job loss and abandoned ports.
- Any transition in the industry should be controlled so that effects on communities, even if unavoidable or on some level desirable develop at a measured pace and to a reasonable extent so as to avoid real social disruption.
- Clearly describe and address anticipated impacts, though more difficult, would better serve the public than ignoring the side effects of rationalization.

References:

1 – www.pcouncil.org/communities

2 – *Information for Public Scoping of Dedicated Access Privileges for the Pacific Coast Limited Entry Trawl Groundfish Fishery*. PFMC, Portland, OR 2004.

3 – Letter dated June 18, 2004 to TIQC Committee from Gordon Smith and Patty Murray

4 – *Addressing Community Concerns in the Development of Individual Fishing Quota Program Alternatives for the Pacific Groundfish Trawl Sector. A Survey of Community Stakeholders*. Environmental Defense, Sept 6, 2004

5 – *Oregon's Changing Coastal Fishing Communities*, Jennifer Gilden, Editor. ORESU-0-99-001, OSU, Corvallis. 1999.

Others:

New England's Coastal Fishing Communities, Madeleine Hall-Arber et al, MIT Sea Grant, Cambridge, MA 2001.

Personal Communication: Flaxen Conway, OSU Sea Grant; Gil Sylvia, COMES;
Dorothy Lowman, Environmental Defense

Brief Description of the Eligibility Criteria and Initial Allocation Information for Community Quota Programs

Program	Community Eligibility Criteria	Initial Allocation
Community Development Quota of western Alaska	<ul style="list-style-type: none"> • Location within 50 nautical miles of the Bering Sea. • Native village as defined by the Alaska Native Land Claims Settlement Act. • Residents conduct over 50% of their current commercial or subsistence fishing effort in the waters of the Bering Sea. • No previously developed harvesting or processing capacity sufficient to support substantial groundfish fisheries participation. 	<p>Pollock Fishery - 7.5% from “reserve” TAC - Increased to 10% with American Fisheries Act in 1999</p> <p>BSAI Sablefish - 20% of TAC</p> <p>Multispecies Fishery - 7.5% TAC - Pacific cod, Atka mackarel, turbot, yellofin sole, other flatfish species, Tanner crab, snow crab - 7.5%</p> <p>-Bering Sea opilio, bairdi, and king crab were phased in 1998 - 3.5%, 1999 - 5%, 2000 - 7.5%</p> <p>- Maximum amount of quota award to any single CDQ group is 33% of the total 7.5% allocation</p> <p>State of Alaska recommends breakdown of allocation to CDQ groups based on community development plans submitted by each representative community group</p>
Gulf of Alaska halibut and sablefish Community Quota Program	<ul style="list-style-type: none"> • Have a population of less than 1,500 persons based on the 2000 United States Census. • Have direct saltwater access. • Lack direct road access to communities with a population greater than 1,500 persons. • Have historic participation in the halibut and sablefish fisheries. • Be specifically designated on a list adopted by the Council and included in this rule. 	<p>Community Quota Entities (CQE) purchase Quota Shares (QS) on behalf of designated communities</p> <p>Individuals lease QS from CQE's - Not to exceed 50,000lbs halibut or sablefish - IFQ fished from any vessel not to exceed 50,000 of halibut or sablefish in any season, from all IFQ's</p>
Canadian Scotia-Fundy Groundfish ITQ	<ul style="list-style-type: none"> • Participating communities were specifically named based on geographic location 	<p>Allocation to the program on a whole was based on the collective catch history of the holders in a group + the unidentified processor landings within the specific community</p> <p>Community Management Boards representing each community distribute allocations among licensed fishermen in the community.</p>

Analytical Team Tasks Assigned at November Meeting

Kate Quigley

Note: Information was provided by DFO staff in British Columbia (Barry Ackerman), industry reps (Bruce Turriss), DFO staff in Nova Scotia (Andrew McMaster, Jorge Hansen, Michael Campbell), Jim Sanchirico (Resources for the Future), Dan Holland (New Zealand Seafood Industry Council), and AK RAM staff.

5c) Data request on how often fishers go fishing without enough IFQ to cover what they landed.

Nova Scotia - One ton is needed to go out fishing. However, people have gone out with no tons before and the DFO has not gone after those people. Dockside monitors would record when a fisherman does not have enough pounds to cover landings. However, this information was not readily available since fishermen are allowed a certain amount of time and overage before penalties are assessed. In most cases, managers indicated that fishermen made phone calls at sea to cover what was caught. Managers I spoke with also indicated that fishermen have become very good at targeting. Also, companies often pool their quota to avoid going over.

BC - No pounds are required to go out fishing. At-sea monitors note when fish is caught that a vessel does not hold pounds for. I was not able to get this data. Turriss and Ackerman indicated that fishermen have become very good at targeting. Also, quota and pounds are often bought and sold "uncut" (combinations of quota or pounds sold together because they are typically caught together).

Note: If this becomes a really important issue, I can make a formal data request. However, it looks like it might take some work for people to pull together. It is not something they are concerned about unless landings or catch cannot be covered through the mechanisms (transferability, overages) available.

Data comparing TAC to catch from 1997-2002 by species can be found under "Summary of Historic catch vs. Available Weight" at:
<http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/Groundfish/GFTrawl/GfTrawlInfo.htm>

7) a) Outline examples of various caps. Start with a simple system, provide example. Increase complexity, identify benefits and drawbacks. (Developed through consultation with the NMFS Permits Team.)

Example 1 (Simplest system administratively given certain assumptions):

Assumptions – a) The term “vessel” implies a U.S. coastguard craft^{14/}; b) Quota share or pounds and pounds must be directly associated with a groundfish trawl permit^{15/}. That is, an entity cannot own quota share or pounds without owning or holding a permit; c) Permit leases continue to be tracked by NMFS; d) Latent permits allowed; e) Permits can still only be allowed to be assigned to two vessels each year; f) Still required renew permit each year^{16/}; g) Area and species-specific caps are necessary to prevent localized depletion; and h) Individuals who are allocated more than is allowed under the caps are restricted from purchasing more quota than they already own (“grandfathering-in”).

Under these assumptions an example was provided for ownership, vessel and control caps:

Ownership cap - 1% on ownership of each area-specific species **pounds as a percentage TAC or quota share**. That is, no entity can be purchase or own more than 1% of the TAC of a species in a given area (coastwide or region specific) in a given year (pounds or quota of the TAC). Those entities allocated more than 1% are grandfathered-in but restricted from purchasing more quota than they already own.

Vessel cap^{17/} - **2% cap on the total amount of groundfish that can be caught** each year by an entity. This would be tracked in an entirely separate software program from the ownership cap since it requires different data sources. If based on catch, the data that goes into the calculation would have to come from at-sea monitors (if 100%). If based on landings, the data that goes into the calculation would have to come from dockside monitoring reports. The calculation could be as simple as adding all poundage of all species under the IFQ caught by a vessel and dividing it by the total poundage of all TAC of all species under the IFQ.

Control cap – None. Left to the Department of Justice.

Statistics – Permits (170 active and inactive), Vessels (between 50 and 340)

Benefits: 1) Restricts tracking responsibilities for NMFS to a manageable level; and
2) Allows for/enables individual accountability to occur.

¹⁴ Requiring this allows for easier identification of an individual to a vessel than allowing a “vessel” to be any seafaring craft since some states do not require registration.

¹⁵ In this way, the number of people owning pounds each year is able to be tracked because: a) they are associated with an individual than NMFS has an address for; b) limited to a set amount of individuals, and; c) is consistent with management (tracking participation by permit ownership or holding) in other sectors of the groundfish fishery that may eventually be incorporated into the IFQ. If individual accountability is important to designers of the IFQ, then the quota share and pounds must be associated with a permit or vessel. Otherwise, individuals become extremely difficult to track. Associating quota share or pounds with a *permit* is preferable to associating quota share or pounds with a *vessel* because that is how the current software tracking system is set up and because vessel information is linked to an individual through Coast Guard data. Accessing and requiring updates to that data would require data requests and may not be immediately accessible.

¹⁶ This ensures that NMFS has a record of the current permit owner’s name and contact information.

¹⁷ The maximum number of vessels is already capped at 340 since the number of permits is 170 and each permit can only assign a permit to two vessels each year. However, designers of the IFQ may want to limit the minimum number of vessels since there is no cap on the number of permits a vessel can lease; theoretically, a small number of vessels could lease all of the permits in the fishery and harvest all the pounds while permit holders still adhered to the “two vessels per permit each year requirement”.

Drawbacks: 1) No control cap. The program would likely be criticized for this; and
2) Requires entities that would like to purchase quota share or pounds to purchase or lease a permit.

Example 2 (More complex system that satisfies additional desired design elements):

Assumptions – Same as that stated for Example 1.

Under these assumptions an example was provided for ownership, vessel and control caps (changes to a category indicated with an asterix):

Ownership cap – Same as that stated for Example 1.

Vessel cap - Same as that stated for Example 1.

***Control cap (I don't really know much about this and need to do more research but it appears that very few, if any, fisheries have a control cap – still looking around) – Control** over ownership of quota share and pounds each year limited to 1% for each individual. A requirement can be made for IFQ fishery participants to reveal individual ownership names, contact information and portion of ownership of quota share and pounds. However, assessing control can be difficult since individuals could put ownership under another individual's name in the same family or entity. The system would likely be suboptimal and need to evolve as problems are recognized. Entities exceeding the control cap right now would likely have to be grandfathered-in.

Statistics – Same as those stated for Example 1 with the addition of control of ownership of pounds (between 100 individuals and an infinite number of individuals, given no limit on number of individuals sharing in quota share ownership).

Benefits: 1) Develops a system to attempt to track control of quota share and/or pounds which may build confidence in the system; 2) Somewhat restricts tracking responsibilities for NMFS to a manageable level; and 3) Allows for/enables individual accountability to occur.

Drawbacks: 1) Tracking control may require a major programming and administrative effort that will likely not capture all information on control wanted;
2) Requires entities that would like to purchase quota share or pounds to purchase or lease a permit.

Example 3 (Even more complex system that satisfies additional desired design elements including the ability to separate ownership of quota share and pounds from a permit):

Changes to a category indicated with an asterix:

***Assumptions** – Same as that stated for Example 1 **except that Assumption b would be eliminated** thereby allowing any entity to own quota share or pounds without owning a groundfish trawl permit.

Under these assumptions an example was provided for ownership, vessel and control caps:

Ownership cap – Same as that stated for Example 1.

Vessel cap - Same as that stated for Example 1.

Control cap – Same as those stated for Example 2.

Statistics – Same as those stated for Example 2.

Benefits: 1) Develops a system to attempt to track control of quota share and/or pounds which may build confidence in the system; and 2) Allows for relatively inexpensive entry into the fishery since no permit is required to purchase quota share or pounds.

Drawbacks: 1) Tracking control may require a major programming and administrative effort that will likely not capture all information on control wanted;
 2) May not result in an adequate amount of individual accountability due to the lack of data on individuals without permits;
 3) Creates very burdensome and perhaps inadequate tracking situation for NMFS in that the number of entities that need to be tracked for quota share or pounds ownership becomes infinite.

b) Provide a table of ownership caps in other IFQ programs.

Fishery	Quota ownership cap
BC Groundfish ITQ	4-10% for most species/area, 15% (hake); about 2% vessel caps ^{18/}
Nova Scotia Groundfish ITQ	About 2% depending on species/area
AK Halibut & Sablefish	Area specific ^{19/}
AU SE Trawl ITQ	None
Iceland Groundfish ITQ	10% for cod and haddock; 20% for other species; 12% of value of all TACs in all areas.
NZ ITQ	35% of total IFQ in all areas <u>or</u> 20% of total IFQ in any one area for a species (will vary for some species)
U.S. Surf Clam/Ocean Quahog	Min: 5 cages (160 bushels); Max: None
U.S. Wreckfish	None

9c) Summarize reasons used for building in rollover provisions in other IFQ programs.

¹⁸ IVQ holdings caps were calculated for each groundfish trawl license, during the first year of the IVQ program. The total IVQ holdings cap for each groundfish trawl license is measured in groundfish equivalents (described in FMP) as a percentage of total groundfish equivalents. These holdings caps, determined in 1997, continue to remain in effect.

¹⁹ “Rules on the accumulation and transfers of halibut and sablefish IFQ are constantly evolving. In general, there are limits on accumulation and transferability. No person (individual, company, corporation) may own more than 0.5% of the total halibut QS in combined Areas 2C, 3A, and 3B; more than 0.5% of the total halibut QS in Areas 4A-E; or more than 1% of the total QS for Area 2C. No person may control more than 1% of the total Bering Sea-Aleutian Islands and Gulf of Alaska sablefish QS or more than 1% of the total sablefish QS east of 140 degrees west...Individuals whose initial allocation exceeded the ownership limits were grandfathered-in, but prohibited from acquiring additional QS” (NRC’s *Sharing the Fish*, 1999).

Def. - A rollover (also called a carryover, carryunder, overage, underage, overrun) is typically a species-specific (and sometimes area specific) allowance of pounds that may be deducted (in the case of an overage) or added (in the case of an underage) from or to the following year's quota allocation. Typically, rollovers only "roll over" for one year due to administrative burdens of extending rollovers for more than one year. Also, typically, a monetary fee is charged for an overage equivalent to the revenue the overage amount is worth. In addition, usually the individual that has an overage is restricted from fishing again (sometimes in that area and/or for that species he has an overage for) until the overage is covered by pounds.

Purpose of rollover provisions - 1) Allows fishermen flexibility by providing another method for covering catch. This can be particularly useful in fisheries with species that have low TACs and in fisheries where avoiding catch of unwanted species is not entirely possible; 2) Decreases the incentive to discard when an individual does not have the quota pounds required to cover catch; 3) As a means to enforce individual accountability; 4) One possible purpose of rollovers would be to avoid pursuing penalties against fishermen that exceed their quota or pounds holdings.

BC - A 30% underage or overage is allowed for most species. Species with low TACs have low or no overage provisions. The BC experience has been that penalties for violations of rollover provisions have only been assessed twice in the past 7 years.

Nova Scotia - In the past, a 20% overage has been allowed for most species. This past year, there were twenty instances of overages. Most of these overages will be matched to purchased quota before next season. If someone goes over their holding of pounds, they are restricted from fishing. They also give up the revenue earned from the pounds they exceeded their quota. No underages have ever been allowed to roll over. Starting April 1st, overages will no longer be allowed due to the administrative burdens it requires. If someone exceeds their pounds holdings next year, they will have the pounds taken off of next year's allocation, will need to forfeit they revenue from those pounds and are restricted from fishing until the pounds are covered.

Note: In CA, in order to have an overage, one has to own a groundfish license. A license holder has to be a full time fisherman. This is defined as a person with two years experience fishing for seven months each year.

AK - The Crab Rationalization Program does not include rollover provisions and this is viewed as a big benefit administratively. I am waiting to receive more info on this and the halibut and sablefish rollover allowances.

NZ - waiting for reply to info request

Iceland - waiting for reply to info request

AU - waiting for reply to info request

10b) Are there other IFQ programs with use-or-lose provisions or other mechanisms that prevent IFQ from being acquired and held by those with an interest in not harvesting?

BC - There have not been any use-or-lose provisions or other design elements implemented to prevent entities from not harvesting pounds. However, there are design elements that become active in April to help prevent speculative activity and "armchair fishermen". In April, quota owners will be required to harvest 25% of groundfish equivalent (GFE) or they lose that 25% minus the rollover allowance. This will increase to 40% after three years and last for four years. In addition, the number of permanent reallocations (quota transfers) will be restricted to two over each of those periods of time. Purchase of quota by environmental groups that would not harvest what they owned was never a big concern.

Nova Scotia - There are no use-or-lose provisions or other design elements implemented to prevent entities from not harvesting pounds. Currently, there are "armchair fishermen". Approximately one-third of the fleet (100 of 350 quota owners) leases out all of their pounds each year to other fishermen.

Note: In order for an entity to hold pounds and not harvest them, the entity would have to either purchase quota or purchase pounds each year. In order to purchase quota or pounds, the entity would have to own a groundfish license for the IVQ fishery. To own a groundfish license, a license holder has to be a full-time fisherman. This is defined as a person with two years experience fishing for seven months each year. The Nova Scotia fishery reps I spoke to felt the expense to hire a fisherman not to fish would be significant.

Therefore, one of the reasons this is not a concern for either the BC or Nova Scotia fishery is because of the requirements for quota purchases which make speculative activity or ownership without harvesting more expensive and difficult.

12f) Stranded capital meeting notes - sent. I didn't mention it earlier, but feel free to share what I sent with the Analytical Team.

12g) What happened to BC processors (number of companies and custom processors before and after IVQ, turnover)?

Question asked: How have processors been impacted by the IQ system? Did the number of companies change after implementation of the IVQ? Did ex-vessel prices go up? Was this due to changes in product quality, product form, a shift in power, or some other occurrence? Are there more custom processors now than before the IVQ? Do you have any pre or post IVQ analysis of the impact of the IVQ on processors (stranded capital, changes in bargaining power, predictions of consolidation or geographical relocation)?

BC - In the short run, there were some changes. In the long run there were no concerns. In the beginning there was lots of harvester rationalization (130 to 70 vessels). Initially, landings decreased due to the adherence to the TAC.

A lot the lack of concerns with processors was due to 25-35% of the processors having vertical integration of some sort (owned, co-owned, agreements). Another reason why things didn't change much was due to the GDA of which the goal was to prevent geographic relocation and to prevent impacts on processors. The outcome was not the same as it was in the halibut fishery where there was a big change in product quality and in impacts on processors. The number of processors actually increased slightly. Of the top 10 processors, two dropped out and two more entered the fishery. Consolidation did not occur. This was partially due to the fact that fishermen started landing catch here instead of in the U.S. due to decreases in trip limits in the U.S. As a result of the GDA, more fishermen fish closer to home. There were large increases in ex-vessel prices to fishermen but this was due to reasons other than changes in bargaining power. There was a quality increase though. Also, the US \$ dropped compared to the CA \$ and that was another reason to land in CA instead of the U.S. Fishermen feel they have lost power due to the GDA. Small processors also feel they have lost power to the GDA because they are at a disadvantage when it comes to writing a proposal. The bigger you are the more you get rewarded from the GDA. There has been some growth in custom processing but that may be due to the trend for custom processing in seafood and other products in general. GDA kept landings, processing, offloading and processing in coastal ports and away from Vancouver.

Nova Scotia - A company cannot own a groundfish license. Instead, they have developed forced contracts. In the beginning, processors would blockade DFO offices because they wanted 50% of

the IFQ. In 1990 a task force was developed, they made recommendations after consulting for one year and these recommendations were adopted.

Other information I thought might be useful for distribution to the Analytical Team and perhaps to incorporate into the report being prepared for the TIQC meeting in Jan/Feb:

1) Greg Cassad had noted that he had heard that it does not take fishermen in the AK halibut and sablefish fisheries 30 days to cover landings when landings exceed pounds held. He thought 24 hours may be sufficient time to allow for transfers to take place.

I asked this question of Barry Ackerman in BC. He said that 30 days was initially a necessary design element to have to make all necessary transfers. Now, harvesters and processors are better prepared and can plan and target better. The 30 day period is no longer necessary.

2) Does the comparison between catch and TAC include rollovers (underages and overages) in the BC fishery?

Underages are included in the TAC (and catch). Overage allowances are not included in the TAC but are included in catch.

3) Is there hoarding of certain species quota in the BC and Nova Scotia fisheries?

Fisheries managers I spoke to said this does not occur to their knowledge. In BC, much of the quota is bought and sold "uncut" (in species and area combination resembling catch). In Nova Scotia, companies often pool their quota to decrease risk and paperwork burdens (transactions costs).

4) Do leases in other fisheries extend for more than one year?

In BC and Nova Scotia, leases last for one year only. If you do not fish all that you leased in the Nova Scotia fishery, you lose those pounds since there is no underage allowed as part of the rollover provision. If you do not fish all that you leased in the BC fishery, those pounds are rolled over to the next year and they can be fished by the individual who bought the pounds the previous year. It is not too burdensome to track these individuals since they must own a groundfish license to lease and since the BC Groundfish IVQ is a limited entry fishery there are a limited number of people who own and lease quota and pounds.

5) What exactly is tracked by IFQ management entities?

BC - Quota and pounds are tracked. Anyone owning quota share or pounds has to own a groundfish license. Leases are not tracked. Only sales of pounds are tracked. Tracking is not burdensome and updating occurs every 24 hours.

Nova Scotia - It used to be that a DFO officer observed the offloading. Then the slips were picked up and entered into a database. This was sometimes a slow process. Now, the system is computerized and dockside monitors (there are five companies doing waymastering for the Groundfish fishery) enter this information and it is sent to DFO. Enforcement has access to this information. For an ITQ system, it is very important to have an electronic system. Updating occurs every 48 hours from dockside monitoring to DFO. We are also working on implementation of VMS and electronic logbooks.

Tracking transfers requires two or three staff and one or two data quality persons. These people also have other duties. Sometimes the two months at the end of the season allowed for matching

quota to catch is not long enough to enter all the data and make all the changes required due to the fact that the staff have other work obligations.

6) Are there fees on transfers?

BC - no

Nova Scotia – no

7) Do other fisheries have control caps (caps on what can be owned and leased and tracked by individual, even though they may be part of a company)?

BC - We don't have "control caps". We have lease/ownership caps. That is, an individual can own or lease a certain percentage of pounds each year by area/species. It doesn't matter if they are allocated through ownership of quota or leased from a quota owner. The same cap applies and one cannot be stacked on the other. Control caps were considered at one time due to concern over Japanese ownership. But, due to the complexity of tracking ownership, it was decided that this would be too onerous and extremely difficult to do.

Nova Scotia - No control caps.

8) What mechanisms are used in other fisheries for aiding new entrants?

BC - Groundfish development Authority (GDA)

Nova Scotia - There is no special program specifically designed for this purpose. One problem in the fishery right now is if a father wants to pass his quota to his son or another individual, he has to give up his license and the Minister of Fisheries re-issues another license. This is entirely at the discretion of the MOF though. If the fisherman sells his son the license, he has to pay capital gains taxes and people would like to see an exemption for this particular circumstance of bequeathing licenses.

9) What has happened to quota value over time? What has happened to license prices since implementation of the IVQ/ vessel values? Processor capital?

BC - License prices have increased due to several factors. At first, license prices increased due to speculation. Quota value has increased two to three times its initial value. Sablefish quota has increased four to five times its initial value. Groundfish quota is less valuable than sablefish quota value due to species caps and holding caps as well as limitations imposed by other species caught that are not under IVQ. Vessel values did not change much. The larger vessels were sold outside the country to countries in South America. The small vessels are still around and still have value because they still have a license associated with them. This is an inexpensive way for new entrants to access the fishery.

Nova Scotia - As TAC has gone up, ex-vessel price and quota price have gone down due to increased supply and therefore decrease in ex-vessel price. The cost of diesel and the exchange rates between the US and Canada influence quota value.

10) A link to the BC Groundfish management plan with all details of its 2004-05 management can be found at: <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/Groundfish/GFTrawl/default.htm>? To access the management plan, you have to register on the website (involves providing an email address and password).

Comments and Suggestions from "Stranded Capital" Conference Call

(November 29, 2004 conference call of NMFS economists)

Comments:

" It will be important to define what stranded capital is. Possible definition: stranded capital - capital that has no alternative productive use as a result of a change in regulations. The term "stranded" appears to have been introduced in analyses associated with Alaska processing plants where the issue was focused on the processing of one or two species over short season and often being located in a remote area such as several of the large Pollock processing plants. It is not clear, if processors have the potential to purchase IFQs after their initial allocation, whether any capital can be considered "stranded."

" What matters to industry and what is needed for analysis? For analytical reasons, we may want to indicate the potential initial financial impact on various capital assets. For policy reasons and for the basis of potential requests for economic mitigation/compensation, asset owners may want to have such an analysis undertaken. Economic mitigation/compensation could take various forms. For example, in the case of processors, processors may want some form of "processor buyback," some guarantee that a certain minimum percentage of the groundfish will be delivered to their dock, an initial allocation of the IFQ, or some form of IPQ.

" On one hand IFQs may increase the potential for "stranded" capital but on the other hand IFQs would also lead to "augmented" capital. "Augmented" capital is capital that is now more fully employed and thus more valuable. The value of capital for some processors will likely go up while the value for others will go down as a result of IFQs. In addition, companies with several plants will likely be affected differently than singly owned plants. Effects will depend on location and supply.

" In determining whether capital is "stranded" or "augmented" as a result of IFQs, what needs to be assessed are the alternative uses of the capital before and after implementation of IFQs. The chief technique for measuring the value of alternative uses is the employment of net present value techniques on what ever is defined as a capital asset. In short, what matters is the net present value of equipment and infrastructure (what is infrastructure?).

" Often issues concerning capital are associated with ownership, which in turn leads to issues concerning vertical integration. Because of concerns about market control and foreign ownership, in AK, there have been attempts to identify ownership and how much vertical integration existed in the Pollock and crab fisheries between processors and harvesters. Getting any of this information for West coast groundfish fisheries will be very difficult. Vertical integration can decrease the impacts of implementation of an IFQ on processors.

Suggestions for Analysis and Research:

" Under standard benefit-cost analysis, "stranded" capital reflects inefficient capital as a result of implementation of an IFQ system. Therefore, protecting or minimizing the amount of "stranded capital" becomes a public policy problem where efficiency goals are traded off against other social goals. For analytical reasons and for public policy reasons, it may be helpful to analyze such tradeoffs by comparing the effects of IFQs on different plant structures and on the industry as a whole.

" If economic mitigation or compensation is the issue, we may want to compare alternative compensation techniques including allocation of IFQs to processors against the long run effects of IFQs being initially allocated to fishermen.

" It is not clear if IFQs will lead to more or less vertical integration. For example, if processors hold IFQ, there may be no incentive for processors to make efforts toward increasing vertical integration. They may contract out with vessels instead. Therefore, it may be difficult to answer the question: "Will economic benefits associated with vertical integration change?" Initially, we may want to describe what little we know about the existing level of vertical integration in the fishery and review IFQ situations such as the B.C., Icelandic, and New Zealand Fisheries where processors either received initial IFQ allocations or were able to purchase such allocations after they were assigned.

" We also need to research the use of fish ticket data and NMFS Processed Product data to determine levels of capacity in existing groundfish processing plants and the alternative uses of such plants for other species. We may also want to take the processing sector up on its offer to provide the analysts with needed data which could include information on plant assets.

" We need to talk with Mark Fina about his ownership/vertical integration research concerning the Alaska Crab fishery and Chris Anderson of URI to get information about his experimental approach to finding out how processors may react to an IFQ system. (For our monitoring analysis we may also want to contact Martin Loefflad of the NMFS Alaska Observer Program about using video cameras for monitoring as well as the NWFSC on the use of cameras in the Pacific whiting fleet.)

Draft Discussion paper outline - Impacts to processor assets from a harvester-only IFQ implementation alternative.

For now, I have decided to focus the discussion paper on addressing the problems processors have brought up.

I. In what ways do processors think they may potentially be impacted by an alternative where IFQs are allocated and/or owned by harvesters only?

A. Kent Craford's (representing the Coastal Jobs Coalition) statement at the Analytical Team meeting:

1. Geographical relocation of harvesters similar to buyback
2. Stranded capital (overinvestment by processors)
3. Ex-vessel price increases due to increased harvester bargaining power with no way to increase final product prices

B. Conversations with whiting fishery representatives - Do they feel differently from Coastal Jobs Network statement?

II. What factors would influence geographical relocation? What are the benefits and drawbacks associated with geographical relocation to processor assets?

- A. Initial allocation of area specific quota
- B.

III. What is "stranded capital"? Does it exist? What factors influence its prevalence? How could processors be compensated for "stranded capital"? (This section would include a discussion of compensation versus long run allocation as well as strategies to achieve each.)

- A. Origination of the phrase and its applicability to West Coast Groundfish situation
- B. Compensation mechanisms

- IV. Is there likely to be a shift in bargaining power? Conceptually, why would this occur? What contracts and vertical integration already exists? Might vertical integration prevent this from occurring? What other design elements could affect a shift in bargaining power?
 - A. Current methods of bargaining
 - B.
- V. Methodologies for assessing potential geographic relocation, potential stranded capital, shift in bargaining power.
- VI. Vertical integration and its effect on processor impacts. Ways to assess the level of vertical integration that currently exists.
- VII. Other factors likely to impact processor assets
 - A. Management uncertainty
 - B. Opportunities for participation in changes made to the IFQ that could affect processors
- VIII. Summary

Notes on Efficiency and Initial Quota Allocations

The initial allocation of quota can affect efficiency not only through transaction costs, but also through strategic behavior by quota buyers and sellers who believe they have some degree of market power in the quota market. As the difference between the pre-exchange initial allocation of quota and the post-exchange final quota holdings increases, transaction costs will increase due to the greater amount of exchange in the quota market. The magnitude of transaction costs will depend on factors which include the rules for quota exchange.

Strategic behavior by buyers and sellers in the quota market may also affect efficiency. This line of thought began in a non-fisheries paper by Hahn in 1984, and was extended to fisheries and ITQs by Anderson in 1991. If buyers and sellers believe that they have some degree of market power, they may alter the amount of quota they buy or sell so as to influence the price of quota. Consider the case of a harvester allocated less quota than needed for the desired level of landings. The harvester will be a net buyer of quota. If the harvester believes his demand for quota raises the market price, he may buy less than the "efficient" level of quota so as to keep the market price of quota down. Similarly, a harvester allocated more quota than needed for his desired level of landings will be a net seller of quota. If the harvester believes his supply of quota lowers the market price, he may sell less than the "efficient" level of quota so as to keep the market price of quota up. This potential effect of the initial quota allocation on efficiency through strategic behavior by buyers or sellers depends upon the presence of market power in the quota market.

Hahn, R. "Market Power and Transferable Property Rights." *Quarterly Journal of Economics*, 1984, pp. 735-65.

Anderson, L., "A Note On Market Power in ITQ Fisheries" *Journal of Environmental Economics and Management*, 1991, pp. 291-296.

On the Need for Spatial Management in West Coast Groundfish Fisheries

Executive Summary

The Trawl Individual Quota Committee (TIQC) is preparing alternatives for a limited entry trawl individual quota system for consideration by the Pacific Fishery Management Council (PFMC). The alternatives may include options that would restrict distribution of optimum yield (OY) and access privileges on an area basis. Time and area controls that specifying fishing rate and area fished are considered input controls (Walters and Pearse 1996), whereas allocation of catch to IQ holders by area would be considered an output control.

Under an area allocation scheme, IQ shares could be allocated for all areas, but only a portion of the total OY would be available within an area. Area allocation of OY could be based on existing International North Pacific Fisheries Commission (INPFC) boundaries or some other area distribution scheme. For example, a vessel might receive an initial allocation of 1% of the coastwide sablefish OY. This percentage would be applied to the portions of OY north and south of 36° N which are 7,486 mt and 275 mt respectively for 2005. Shareholders would have to trade shares to create or maintain fishing opportunities in areas they were accustomed to fish.

Socio-economic and biological arguments can be made for using an area allocation scheme. Maintenance of fishing opportunities, protection of local community interests and processing infrastructure could be potential socio-economic reasons for allocating OY on an area basis. Without area allocation, there is some potential for effort to be concentrated within some areas. Allocating OY by area may prevent localized depletion of stocks - to the extent that little mixing or migration of stocks within the area is occurring. During the TIQC Committee and Council review of the TIQC analytical team's work products on area effects, questions were raised about the biological need for area allocation and evidence for localized depletion. The following literature review and analysis attempts to address these questions.

In summary, evidence presented supports consideration of both initial allocation of select species to a trawl IQ program, and area allocation as a precaution against localized depletion, depending on the species.

Introduction

Fishing mortality can be expected to produce measurable changes in distribution, abundance, and age structure of marine fish populations. The degree of change fisheries managers can detect depends on the intensity of fishing effort with respect to catchability (fraction of population removed per unit of effort) and productivity of the stock as well as the degree of movement of the species being fished. Catch per unit effort may decline in heavily fished areas and the number of productive fishing locations may be reduced. With an increase in overall mortality, a reduction in age classes can be anticipated (Gulland 1977). Studies done within the last two decades have documented ecological effects associated with intense fishing pressure such as the removal of top predators, reduced biodiversity, and habitat impacts (Francis 2003). More recent work on recruitment dynamics and population structure also have implications for both temporal and spatial management of groundfish.

Localized depletion is viewed as a relative term for purposes of this paper. That is, a local area may be as large as a group of INPFC areas (typically >100 nm of coastline) for some species, or as small as a Pacific States Marine Fisheries Commission (PSMFC) area for other species (<100 nm). With a few exceptions the latter is considered to be the smallest practical management unit. Development of nearshore management plans or marine reserves by state and federal agencies may result in local management areas of even smaller size.

This paper provides some examples of localized depletion in fisheries and describes attempts by fisheries managers to spatially manage to prevent localized depletion. More importantly, biological features of groundfish are discussed which provide evidence that some species should be managed through temporal input and spatial input and output controls.

Examples of Localized Depletion

On a large spatial scale, the collapse of the Atlantic cod (*Gadus morhua*) stocks reflected some characteristics of localized depletion. Temporal and spatial changes in abundance were noted in this fishery as stocks declined to overfished levels steadily beginning in 1962 (Hutchings and Myers 1994). The cod stocks were thought to have been significantly reduced by trawling in the 1970's. Subsequently, harvest of cod offshore of Newfoundland and Labrador by gill nets began after the sharp decline in inshore gillnet landings between 1982 and 1985. Increases in gill net catches were coupled with declining catch rates. Catch rates declined both inshore and offshore, thus indicating a sequence of serial depletion. During the stock decline, technological advances permitted the fleet to continue to locate and exploit remaining stocks at ever increasing rates of fishing mortality.

On a much smaller spatial scale, Mason (1995) analyzed species trends in sport fisheries occurring within the Monterey Bay area between 1959-86. Most of the fish were taken by more mobile commercial passenger fishing vessels (CPFV) and smaller more local skiff fleet. Earlier in Monterey Bay's fishing history, abundant species closer to port were targeted by both fleets. Mason found that as effort increased, the catch of certain nearshore rockfish species (genus *Sebastes*) taken primarily by the skiff fishery declined and species composition changed to reflect declines in populations of the most abundant species. Commercial passenger fishing vessels moved further offshore to target on more abundant deepwater species as target species. Fishing pressure and variable recruitment were cited as reasons for a decline in blue rockfish (*Sebastes mystinus*) formerly sought inshore by the skiff fleet, and in more distant (from home port) shallow reefs targeted by CPFVs. With a reduction in blue rockfish abundance, CPFVs began targeting semi-pelagic yellowtail rockfish (*Sebastes flavidus*) over deeper water reefs, then shifted to a still deeper water red complex of *Sebastes* species further offshore. Mason cited rockfish life history characteristics such as residential behavior, variable recruitment, and natural longevity as sources of vulnerability to localized overfishing for several species. Further, Mason concluded that the high site fidelity exhibited by nearshore species in particular, made them particularly vulnerable. Other studies cited by Mason in this paper indicated that many nearshore species (blue rockfish and olive rockfish (*Sebastes serranoides*)) move less than a kilometer or two from reefs, while more pelagic species such as yellowtail rockfish may move more than 25 km.

Spatial Management of Groundfish Fisheries

In Gulf of Alaska and Bering Sea and Aleutian Islands, total allowable catches (TACs) are established for individual species and species complexes based on biomass distribution to prevent localized depletion (Witherell 1995). Flatfish TACs are typically set lower than ABC levels to protect the available bycatch for valuable trawl fisheries for pollock, Pacific cod, and rockfish. TACs may be set for specific smaller regulatory areas, particularly in the GOA, in proportion to biomass distribution, to distribute catch and effort. These sub-areas are comparable in size to INPFC areas used to manage the West Coast groundfish fishery.

The Canadian government uses such an area allocation scheme (DFO 2004). Quota species have a total allowable catch (TAC) set either on a coastwide basis, sub-area, or grouping of sub-areas (Figure 1 and Table 1). Major groundfish ports include Prince Rupert - northern mainland, Vancouver and Richmond - southern mainland, Ucluelet - West Vancouver Island, and Port Hardy - Northeast Vancouver Island. TAC was allocated by management area primarily for biological reasons. To the degree stock information was available, area allocation was used to

prevent overfishing within these sub-areas due to possible effort concentration in the absence of an area management scheme, and to achieve yields appropriate to the productivity of these areas. In addition, area allocation was proscribed as a precautionary measure in the absence of clear-cut stock information. The concerns for overfishing stemmed from consideration of the IVQ system and its application to a mixed stock fishery. Without area allocation, shareholders could concentrate on highly valued species in areas close to home ports. Weaker stocks might also be present in the catch with target species. Concentration of shares to enable access within these areas may lead to depletion and or serial depletion of target and incidentally caught species.

Area allocation, therefore, was designed to prevent concentration of IVQ shares and fishing effort (within an area) with commensurate overfishing and possible localized and/or serial depletion of resources. The proportion of TAC assigned by area was determined from a variety of sources including stock assessments, knowledge of stock genetics, tagging studies, physio-geography, catch and effort data, and advice from fishers with detailed knowledge of fishing grounds. In some cases, former management boundaries were adjusted as a consequence of the review and analysis process used to determine area allocations. The robust observer program Canada employs collects additional biological data on species composition, concentration, and distribution. DFO continues to review biological data and determine appropriateness of area allocations.

As described above, once Individual Vessel Quota (IVQ) shares were determined for each vessel, they were applied to management area distributions of OY. Shareholders then had the opportunity to trade species shares and acquire mixes and quantities of shares needed for desired fishing strategies and areas.

Biological Factors Indicating a Need to Spatially Manage West Coast Groundfish

Berkeley et al.(2004) reviewed stock status, population age and genetic structure, and management implications, citing examples from the West coast groundfish fishery. The authors presented evidence of stock structure on a finer scale than is typically assumed in stock assessments. Further more, they argue that truncation of age structure within rockfish populations in particular may lead to reduced larval viability and survival - older black rockfish appear to spawn earlier (Bobko and Berkeley 2004) and produce more viable larvae (Berkeley 2004). While not a West Coast groundfish, older female Atlantic cod (*Gadus morhua*) also appear to be more reproductively successful than younger females (Murawski et al. 2002). Berkeley et al.(2004) conclude that both spatial structure and age structure are important for long term viability of a stock, and that a network of marine reserves could be used as an alternative management measure to ensure protection of these important population components.

Most groundfish stock assessments assume that the genetic structure of the assessed species is panmictic - that is the stock is fully mixed and members from all geographic regions regularly interbreed and that populations are homogenous, or if there is evidence of separate stock structure these differences are ignored as input data are typically not fine enough to conduct stock assessments on separate sub-stock components. Larval dispersal mechanisms theorized based on ocean currents tended to support this view in that passive dispersal occurs over fairly large distances. There is however, a growing body of evidence that suggests many species of groundfish have a complex and subtle stock structure that varies by geographic region within the WOC management area. Miller and Shanks(2004) examined otolith microstructure and microchemistry of black rockfish and found evidence that larvae from different locations did not mix during ontogeny and possibly did not disperse long distances latitudinally. The authors estimated larval dispersal distances to be much shorter (<120km) than previous estimates based on models of passive dispersal. Smaller mean dispersal distances imply the need for spatial conservation of adults producing the larvae - especially if the species is overfished.

Genetic evidence also suggests finer and more complex population structure for rockfish in particular. Withler et al.(2001) through microsatellite DNA studies affirmed earlier work by Gunderson(1972) which identified two populations of Pacific ocean perch (*Sebastes alutus*) within Queen Charlotte Sound, British Columbia. Withler et al. (2001) separated Eastern and Western Queen Charlotte Island stocks and a Vancouver Island stock. An interesting feature of this finding was that the QCI stocks overlapped latitudinally - distance did not appear to be a factor in the degree of genetic isolation. The study supports other findings that many marine populations, in spite of their potential to reach large population sizes, are fragile due a high degree of genetic variability, longevity, slow growth rates, and to episodic recruitments influenced by environmental changes (Grant and Bowen 1998) and (Fitch 1969). The authors concluded that separate management would be advisable to conserve the spatial integrity of Pacific ocean perch.

Copper rockfish (*Sebastes caurinus*), a benthic, nearshore species with a high degree of site fidelity, was found to be genetically divergent between Puget Sound and coastal stocks (Buonaccorsi et al. 2002). Furthermore, genetic divergence along the coastline was also significant suggesting isolation between regions even though larvae drift for up to 3 months prior to settlement. The authors suggest a pattern of recolonization since the last glacial period (14,000 years ago) and more limited realized larval dispersal due to oceanographic barriers such as recirculating oceanographic currents and mesoscale eddies along with potential unique larval behaviors that may tend to counteract passive drifting.

Genetic patchiness in marine populations may be explained to a “sweepstakes-chance” model proposed by Hedgecock (1994). Hedgecock argues that observed genetic heterogeneity on a microgeographic scale may result from temporal variation in the genetic composition of recruits. Furthermore, he argues that this variability could be due to selection on larval populations or large variations in the reproductive success of individuals whereby successful parents match reproductive activity with favorable windows of oceanographic conditions that promote fertilization, larval development and retention, and recruitment. Larson and Julian (1999) argue that fisheries management should account for spatial unpredictability in spawning success by “spatial bet-hedging”. If fish populations are composed of groups of spawners whose success in producing recruits is variable and spatially distributed, representative areas would need to be protected throughout their range to ensure some parents in any given year (the “sweepstakes winners”) would make a contribution to future recruitments. The authors suggest more information is needed to determine the spatial scale of genetic patchiness, and that this information would help design marine no-take areas to protect population structures geographically

Current Management Measures that May Influence the Spatial Distribution in the West Coast Groundfish Fishery

West Coast groundfish management uses a variety of input and output controls to regulate the fishery (PFMC 2004e). Although the areas are large, these management tools imply some measure of temporal and spatial control. Relaxation of some of these controls may be considered under a trawl IQ program.

- Some allocation of OY by area.
- Differential Trip Limits - Differences exist in cumulative trawl trip limits north and south of 40°10' N. Latitude. Cumulative limits reflect differences in opportunities due to distribution of OY north and south and their potential to be realized. In addition, the need to protect overfished species constrains the take of co-occurring species and these constraints vary north and south.
- Current participation has been reduced due the vessel buy-back program. In addition to fleet consolidation, processor consolidation has occurred. Thus, with fewer boats and processors, the ability catch and process fish has been

concentrated among remaining fleet and ports. Under an IQ program, the potential to see further concentration is anticipated.

- RCAs - Tight restriction occur in large areas within bathymetric ranges established to protect overfished rockfish. These provide marine reserve like protection to the population and age structure.
- Selective trawl designs - Recent development of less efficient gear (with respect to bycatch of overfished rockfish) has allowed the use of this input control to take flatfish in the northern area while minimizing the take of overfished species.

Discussion

The Trawl IQ Committee does not support allocation of OY by area, unless it is necessary for biological reasons. Past and current management of West Coast groundfish on a spatial basis has only been done on a coarse scale. Alaska and British Columbia groundfish fisheries use some form of allocation by area to ensure catches are distributed in proportion to available biomass. In a few examples West Coast groundfish and fisheries elsewhere indicate evidence of localized depletion and support the need for spatial management. Current stock assessments generally assume a large degree of homogeneity in stocks of groundfish - due in part to the problem of distribution of catch and biological data and the inability to conduct stock assessments on a finer spatial scale than coastwide. Currently, there is little documented evidence of localized depletion for most species of groundfish, however, there does not appear to be sufficient analytical capacity or effort to determine if localized depletion is taking place. Some anecdotal information from fishermen who have been long time participants indicate a historically broader distribution of species such as Pacific ocean perch, canary rockfish, and black rockfish, to name a few.

There is a significant amount of evidence that population structure of many species of groundfish (rockfish in particular) is complex and genetically fragile. Furthermore, preservation of age class structure appears to be important as recent studies indicate older fish may produce more viable larvae. There is evidence in the literature and from stock assessments that the age structure of groundfish species has been truncated and that growth and maturity of some species has been affected (Francis 2003). Rebuilding plans for known overfished species have been developed to rebuild populations. Some of the measures taken should have the effect of restoring population and age structure in the short-short term.

Both population genetic structure, patterns of larval distribution, and age structure indicate a need to manage in a way that significantly reduces fishing mortality throughout the geographic range of the species. Allocation of catch by area would help protect the genetic components of rockfish - which appear to have a complex structure. A closure during spawning might ensure all potential successful parents have the opportunity to spawn during a given year. However, they would remain vulnerable during open periods, and unless areas were restricted, risk of excess fishing mortality on potentially successful parents would remain to the degree fishing effort was concentrated in a particular area. A reduction in risk might be accomplished if spawners were significantly more vulnerable during the spawning period - a closure would tend to reduce overall vulnerability if this were the case. Reduced fishing mortality overall would help protect the age class structure. Both population and age structure could be conserved through a network of marine reserves. More information is needed for various species to determine effective population size, larval contribution, and recruitment patterns in order to be able to design an effective network of marine reserves. Current RCAs provide some protection for both population and age structure. If these are removed, along with other controls that could be used to reduce the possibility of concentrating fishing effort, some groundfish stocks may continue to be at risk.

One of the benefits of the trawl IQ program may be an increase in efficiency in taking quota shares, un-encumbered by many of the present regulations. Time and area restrictions could be

used as input controls on harvest in combination with an IQ program (Walters and Pearse 1996). Temporal and spatial restrictions (input controls) alone would tend to undermine this efficiency and may continue to do so under an IQ program if shareholders are forced to compete for local concentrations of fish within restricted windows of opportunity (Walters and Pearse 1996). Reduction of uncertainty in stock assessments is key to ensuring reduced risk of assessment errors and thus long-term viability of fisheries. This might be accomplished through co-operative arrangements between industry and government to finance and better utilize and extend (spatially) fishery and research data used in stock assessments(Walters and Pearse 1996).

Recommendations

- § 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 and fish distribution patterns.
- § Recent studies of population and age structure and recruitment dynamics raise serious biological concerns with present and proposed management. Present management measures (RCAs, selective gears, etc.) and new tools (finer area allocation, MPAs, etc.) should be employed to ensure proper spatial management to 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 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 WOC.

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Figure 1. Groundfish management areas off the West Coast of Canada.

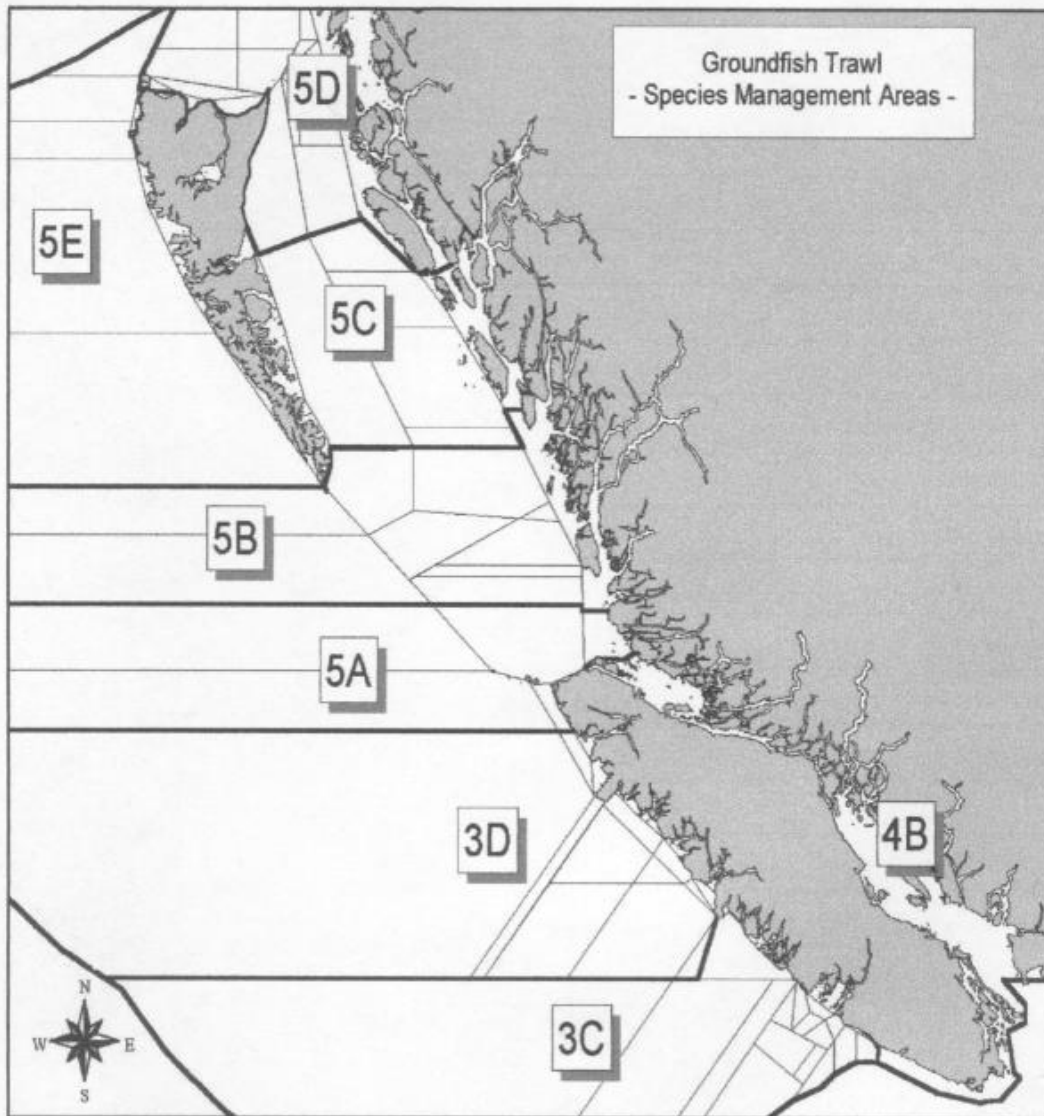


Table 1. Total allowable catches (TAC) of groundfish by management area of British Columbia.

Species	Management Area	TAC (mt)
Yellowtail Rockfish	3C	995
	3D, 5A/5B, 5C/D/E	3,427
Widow Rockfish	Coastwide	4,422
Canary Rockfish	3C/D	529
	5A/B	265
	5C/D	101
	5E	151
Silvergrey Rockfish	3C/D	216
	5A/B	421
	5C/D	382
	5E	248
Pacific Ocean Perch	3C	300
	3D	230
	5A/B	2,070
	5C/D	2,818
	5E	730
Yellowmouth Rockfish	3C	219
	3D, 5A/5B	1,135
	5C/D	685
	5E	325
Rougheye Rockfish	Coastwide	530
Shorthead Rockfish	Coastwide	105
Redstripe Rockfish	3C	173
	3D,5A/B	772
	5C/D	330
	5E	246
Shortspine Thornyheads	Coastwide	736
Longspine Thornyheads	Coastwide	405
Qullback, Copper, China, and Tiger Rockfish	Coastwide	5
Pacific Cod	3C/D	500
	5A/B	390
	5C/D/E	400
Dover Sole	3C/D	1,375
	5C/D/E	1,100
Rock Sole	3C/D	102
	5A/B	875
	5C/D	673
Lemon Sole	3C/D	186
	5C/D/E	544
Petrals Sole	Coastwide	600
Lincod	3C	800
	3D	220
	5A/B	862
	5C/D/E	580
Dogfish	4B	1,600
	Rest of Coast	3,840
Sablefish	Coastwide	384
Pollock	Gulf	1,115
	5A/B	1,790
Hake	Gulf	10,000
	Offshore	134,372
Big Skate	5C/D	567
Longnose skate	5C/D	47

Commercial Fish Business Licenses in Washington, Oregon, and California

Each state program has a different licensing structure for fish business activities that deal with sale of commercially caught fish, including fishermen's retail sales, buying of fish for a wholesale fish dealer, wholesale fish dealing where fish are sold to retail dealers, and fish processing, and canning. Definitions of fish processing or fish processor include:

Washington (RCW 77.08.010 (42)) "To process" and its derivatives mean preparing fish, wildlife, or shellfish.

(WAC 220-69-210 (11)) "Processed" means preparing and preserving, and requires a wholesale dealer's license. Preserving includes treated with heat, including smoking and kippering. Cooked crab are processed. Preserving also includes freezing fish and shellfish.

(WAC 220-56-100 (20)) "Processed" means fish or shellfish which have been processed by heat for human consumption as kippered, smoked, boiled, or canned.

Oregon (OAR 635-006-0001 (15)) "Processing" means smoking, reducing, loining, steaking, pickling, filleting, or fresh packaging requiring freezing of food fish, or any part thereof (Does not include cooking crab).

(16) "Processor" means a person who buys fresh food fish from a licensed commercial fisher or a wholesale fish dealer and processes food fish for sale through retail outlets or for sale to the ultimate consumer.

California "Fish Processor" is any person who processes fish for profit and who sells to other than the ultimate consumer.

California Fish and Game Code 8031 (a) (1) "Process fish" means any activity for profit of preserving or preparing fish for sale or delivery to other than the ultimate consumer, including, but not limited to, cleaning, cutting, gutting, scaling, shucking, peeling, cooking, curing, salting, canning, breading, packaging, or packing fish. "Process fish" also means the activity for profit of manufacturing fish scraps, fish meal, fish oil, or fertilizer made from fish. "Process fish" does not include the cleaning, beheading, gutting, or chilling of fish by a licensed commercial fisherman which is required to preserve the fish while aboard a fishing vessel and which is to prevent deterioration, spoilage, or waste of the fish before they are landed and delivered to a person licensed to purchase or receive fish from a commercial fisherman.

Federal Pacific Coast Groundfish Fisheries Management Plan "Processing or to process" means the preparation or packaging of groundfish to render it suitable for human consumption, retail sale, industrial uses, or long-term storage, including, but not limited to, cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, but does not mean heading or gutting unless additional preparation is done.

"Processor" means a person, vessel or facility that (1) engages in processing, or (2) receives live groundfish directly from a fishing vessel for sale without further processing.

See attached tables for other business license definitions and the relationship between them and licensed processors (Regulations are not attached but sent as separate files).

Discussion

If the Trawl IQ Committee considers options for including fish processors in the initial allocation of IQ shares, questions may be raised as to which businesses dependent on groundfish would be eligible for shares. Some businesses are licensed to purchase fish for resale while others process fish then resale. Oregon identifies dealers as reporting and non-reporting. The Committee may want to consider those eligible for a “processor” allocation as those businesses who have a reporting requirement as wholesale fish dealers (whether they process fish or not). This would not include fish buyers who work for wholesale fish dealers. One issue that would need to be resolved would be how to treat those holding commercial fishing licenses who are licensed or endorsed to sell fish directly to the ultimate consumer. Another issue would be those “processors” meeting the federal FMP definition, who purchase live groundfish for sale without additional processing. Much of the infrastructure and investment with these types of wholesale fish dealers is associated with holding and transportation facilities needed to keep fish alive and in good condition until they can reach the market. One suggestion is to look at the landing records of various processing business types and develop a processor IQ share based on certain species or amounts of fish landed. Thus, even small businesses that could be considered “primary processors” could be ensured a share of fish based on species and/or catch history without impacting larger processing firms. Alternatively, a reserve may need to be set aside to allocate a portion of the groundfish OY for other purposes than assigning an IQ share to large processing firms.

WASHINGTON COMMERCIAL BUSINESS FISHING LICENSE MATRIX

Food Fish Harvester	Bait Harvester
Commercial Fishing License - Gear and Species Specific, ranges from R-\$110-\$630, N-\$115-\$1085, per species/per license	Same as food fish harvester
<p>A person may <i>NOT</i> engage in any of the following activities without a license or permit issued by the director:</p> <ul style="list-style-type: none"> • commercially fish for or take food fish or shellfish; • deliver food fish or shellfish taken in offshore waters; • operate a charter boat or commercial fishing vessel engaged in a fishery; • engage in processing or wholesaling food fish or shellfish 	
Direct Retail Endorsement	
<p>Endorsement is added to the portfolio of commercial licenses - \$50</p> <ul style="list-style-type: none"> • Permits the holder of a commercial license to commercially harvest retail-eligible species and to clean, dress. And sell his or her catch directly to consumers at retail, including over the internet. • Endorsement can only be held by a single individual. • Currently endorsement is only applicable to crab and salmon 	
Wholesale Fish Dealer	Fish Buyer
\$250 plus bond	\$95 plus bond
<p>License required for:</p> <ul style="list-style-type: none"> • Processor • Food fish Canner • Shellfish Canner 	
<ul style="list-style-type: none"> • A business in the state to engage in the commercial processing of food fish or shell fish, including custom canning or processing of personal use food fish or shellfish. • A business in the state to engage in the wholesale selling, buying, or brokering of food fish or shellfish. • A wholesale fish dealer's license <i>is not</i> required of businesses which buy exclusively from Washington licensed wholesale dealers and sell solely at retail. • Fishermen who land and sell their catch or harvest in the state to anyone other than a licensed wholesale dealer or outside the state. • A business to engage in the commercial manufacture or preparation of fertilizer, oil, meat, caviar, fish bait, or other by-products from food fish or shellfish. • A business employing a fish buyer. 	<p>An individual who purchases food fish or shellfish on behalf of a licensed wholesale dealer.</p> <p>May represent only one wholesale fish dealer</p>

OREGON COMMERCIAL BUSINESS FISHING LICENSE MATRIX

Food Fish Harvester			Bait Harvester (\$60)
<p>Tuna Landing License \$20 For tuna only</p>	<p>Or...</p>	<p>Commercial Boat License R-\$200, N-\$400 <i>and</i> Commercial Fishing License R-\$50, N-\$100 <i>and</i> Limited Entry Permit \$75 (may be multiple permits depending on species harvested)</p>	
<p>Takes, Operates Boat and/or Lands Food Fish For sale only to wholesale fish dealer, food fish canner, shellfish canner or wholesale bait dealer, except limited fish seller.</p>			<p>- In lieu of commercial fishing and boat license for sale only to wholesale bait dealers for bait. - Cannot sell to wholesale fish dealer</p>

OREGON COMMERCIAL BUSINESS FISHING LICENSE MATRIX (continued)

Wholesale Fish Dealer (\$350)		Food Fish Canner		Shellfish Canner		Limited Fish Seller (\$20)	Wholesale Bait Dealer (\$60) plus bond
Reporting (\$350 plus bond)	Non-reporting (\$350)	Reporting (\$350 plus bond)	Non-reporting (\$350)	Reporting (\$350 plus bond)	Non-reporting (\$350)	Reporting	Only for use as bait, for scientific or educational purposes or for live public display
Buys, processes and/or sells food fish	- Processes and/or sells food fish - Buys only from other fish dealers	Buys, cans, processes, and/or sells food fish or shellfish	- Cans, processes and/or sells food fish or shellfish - Buys only from other fish dealers	Buys, cans, processes, and/or sells shellfish	- Cans, processes and/or sells shellfish - Buys only from other fish dealers	- Sells only own catch from own boat - Sells only to ultimate consumer - Sale of salmon limited to 40 vessels	
Fish Buyer individual, site, vehicle, boat, or barge (\$150)		Fish Buyer individual, site, vehicle, boat, or barge (\$150)		Fish Buyer individual, site, vehicle, boat, or barge (\$150)			
Employed by Wholesale Fish Dealer Buys or receives away from licensed location		Employed by Wholesale Fish Dealer Buys or receives away from licensed location		Employed by Wholesale Fish Dealer Buys or receives away from licensed location			

OREGON COMMERCIAL BUSINESS FISHING LICENSE MATRIX (continued)

Retail Fish Dealer	Retail Fish Bait Dealer
<p>No License Required</p> <p>Buys from Wholesale Fish Dealer, Foodfish Canner or Shellfish Canner</p> <p>Sells <i>only</i> to ultimate consumer</p> <p>May process (fillet, smoke, steak, pickle), provided sales are only to ultimate consumer</p>	<p>No License Required</p> <p>Buys from Wholesale Fish Dealer or Wholesale Bait Dealer</p> <p>Sells only for bait</p> <p>No processing</p> <p>Sells to Ultimate Consumer</p>

06/01/05

K.Brown, updated by Jim Golden

CALIFORNIA COMMERCIAL FISHING BUSINESS LICENSE MATRIX

Fishermen's Retail	Marine Aquarium Receiver
\$70	\$1,393.75
Commercial fishermen who sells all or a portion of his/her catch to the ultimate consumer.	Person engaged in the business of receiving live marine species native to California waters for the purpose of wholesaling or retailing those species for the pet industry or for hobby purposes.

Multifunction Commercial Fish Business	Fish Importer	Fish Processor	Fish Wholesaler	Fish Receiver
\$1,393.75	\$557.25	\$557.25	\$376.50	\$557.25
Fish importer, fish processor, fish wholesaler, fish receiver. If the licensee is a commercial fisherman, fisherman can act as a fish retailer.	Person who, for the purpose of resale to persons <u>other than ultimate consumers</u> , receives or purchases fish taken outside of State and not landed by State licensed commercial fisherman.	Person who processes fish for profit and who sells to other than the ultimate consumer.	Person who obtains fish from another person for purpose of resale to persons other than the ultimate consumer, and is required to purchase from a person licensed as a fish processor, fish receiver, or fish wholesaler.	Any person who purchases or receives fish for commercial purposes from a commercial fisherman not licensed as a fish receiver.

06/01/05 J.Golden, reviewed by T. Tillman

APPENDIX I
SUMMARY OF PUBLIC COMMENT

Formal Scoping Period Comments on
Dedicated Access Privileges (Individual Quotas)
For the
Pacific Coast Limited Entry Trawl Groundfish Fishery

Summaries of the hearings and summaries of written comments are provided in this document, and transcripts of public testimony from the hearings and written comments are attached as an appendix.

Hearing Summaries

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HEARING SUMMARY

*Scoping Hearing on
Individual Quotas (Dedicated Access Privileges) for
the Pacific Coast Groundfish Trawl Fishery*

Pacific Fishery Management Council

Crowne Plaza Hotel

Alexandria I Room

1221 Chess Drive

Foster City, CA 94404

June 13, 2004

Public Attendance: 12

Council Staff: Dr. Kit Dahl, Mr. Jim Seger

Testifying: Seven people testified representing five organizations.

Mr. Bob Osborne	United Anglers of Southern California
Mr. Kent Crawford	Coastal Jobs Coalition
Mr. Peter Huhtala	Pacific Marine Conservation Council
Mr. Tom Raftican	United Anglers of Southern California
Ms. April Wakeman	United Anglers of Southern California
Mr. Pete Leipzig	Fishermen’s Marketing Association
Mr. Steve Bodnar	Bandon Submarine Cable Committee

Summary of Comments:

Mr. Bob Osborne, United Anglers of Southern California

- We have asked to have a recreational angler represented in the process.
- Seems like an individual fishing quota (IFQ) program would be granting rights.
- Seems the Council is trying to avoid difficult questions, such as cross-sector transfer of quotas and call for National Standards.
- Concerned about bycatch and habitat damage caused by trawling.

Mr. Kent Craford, Director, Coastal Jobs Coalition

- Support balanced fisheries rationalization.
- Strongly support IQ system.
- Believe any IQ system must provide equally for harvesters and processors.
- Support establishment of community development quota (CDQ) or community quota to operate parallel to IFQs.
- Council should analyze the use of an auction-based system.
- Council should analyze different combinations of allocation, including 50-50 initial allocation of IFQ to trawl permit owners and primary processors, and combinations of initial allocation to trawl permit owners, primary processors, and community entities.

- Urge study of the recently rationalized Bering Sea crab fishery.
- Concerned that this environmental impact statement (EIS) process is premature; allocation should be dealt with first.

Mr. Peter Huhtala, Pacific Marine Conservation Council

- Concerned about bycatch.
- Concerned that move into IFQs might be distracting the Council from bycatch issues; should spend time completing the bycatch EIS.
- A programmatic EIS should be completed before a trawl IFQ EIS.
- The fact that allocation isn't being dealt with now is a problem; can't conduct cumulative impact analysis without considering allocation.
- Support U.S. Ocean Commission recommendations regarding National Standards.

Mr. Tom Raftican, United Anglers of Southern California

- The groundfish fishery needs a programmatic review before an IFQ can be considered.
- The recreational sector must be included in the initial program and in the design of intersector allocation.
- The Ad Hoc Groundfish Trawl Individual Quota Committee (TIQC) should include recreational representatives.
- Funding for the TIQ program must be discrete and secure.
- Support National Standards for IQ programs.

Ms. April Wakeman, attorney (United Anglers of Southern California)

- Include recreational sector in planning, etc. for trawl IQ program.

Mr. Pete Leipzig, Fishermen's Marketing Association

- Support moving forward with IQ program.

Mr. Steve Bodnar, Coos Bay Trawlers Association

- Trawl fleet supports the program, but now that it's about trawlers, there's much attention being paid.

HEARING SUMMARY

*Scoping Hearing on
Individual Quotas (Dedicated Access Privileges) for
the Pacific Coast Groundfish Trawl Fishery*
Pacific Fishery Management Council
National Marine Fisheries Service
7600 Sand Point Way NE
Seattle, WA 98115
July 20, 2004

Public Attendance: 22 (12 representatives of government/academia, three environmental representatives, one fisherman, three processors, and three unknown).

Council Staff: Mr. Jim Seger

Testifying: Five people testified:

Mr. Ray Hartwell	Environmental Defense
Mr. Tom Casey	Bering Sea crab vessel owners' representative
Mr. Dave Fraser	Fishing vessel skipper
Mr. Peter Huhtala	Pacific Marine Conservation Council
Mr. Joe Bersh	Supreme Alaska Seafoods (mothership)

Summary of Comments:

Mr. Ray Hartwell, Environmental Defense

- Supports development of IQ alternatives.
- Supports addition of coastal community representative on the TIQC.
- Process should be open to stakeholders' input.

Mr. Tom Casey, Bering Sea crab fishing vessel owners

- In the Alaska crab ITQ program, ownership caps favor processors leading to vertically integrated operations. Impose the same ownership caps on processors as apply to fishermen.

Mr. Dave Fraser, fishing vessel skipper

- The Council should move ahead quickly with ITQs.
- Doesn't support fourth option on page 2.9.
- Doesn't support individual processor quota (IPQ) programs.
- It is important to maintain a competitive marketplace.
- Communities may or may not support processor shares. Communities contain both harvesters and processors.
- Allocation of harvester shares to skippers or permit owners should be considered as one of the options.

Mr. Peter Huhtala, Pacific Marine Conservation Council

- The IFQ development process is premature because a programmatic EIS needs to be completed for the groundfish fishery and National Standards developed for IFQs before the TIQ program goes forward.
- A program of sector-specific bycatch caps for overfished species should be considered as an alternative to IFQs. Such a program could be implemented more quickly.
- Bycatch caps, if implemented, should not be tradable.

Mr. Joe Bersh, Supreme Alaska Seafoods (whiting mothership)

- Some rationalization has occurred during the window period established to qualify for initial allocation in a TIQ program. As a result, individuals who have permanently left the fishery could qualify for quota shares. Therefore, there should be an ongoing participation requirement.
- A control date should be established for processors, in the event that the program includes processor shares.
- Consider allocating shares to processors who are not vertically integrated, since the issue of preserving non-mobile capital is not as important for vertically integrated operations.
- Consider an accumulation limit for processors that takes into account harvester ITQs they receive through fishing vessel ownership.
- There are significant differences between conditions on the U.S. West Coast and British Columbia—overfished species in particular—which makes it hard to readily transfer the British Columbia model to West Coast fisheries.

HEARING SUMMARY

*Scoping Hearing on
Individual Quotas (Dedicated Access Privileges) for
the Pacific Coast Groundfish Trawl Fishery*
Pacific Fishery Management Council
Mark O. Hatfield Marine Science Center
2040 SE Marine Science Drive
Newport, OR 97365
July 27, 2004

Public Attendance: 22 (eight representatives of the fishing industry; three representatives of non-governmental organizations; three representatives of state or federal agencies; three members of academia; three representatives of coastal community organizations; and two unknown).

Council Staff: Mr. Jim Seger

Testifying: Five people testified:

Mr. Leesa Cobb	Port Orford Ocean Resource Team
Mr. Peter Huhtala	Pacific Marine Conservation Council
Mr. David Jincks	Midwater Trawlers Cooperative
Ms. Dorothy Lowman	Environmental Defense
Mr. Denny Burke	F/V Timmy Boy

Summary of Comments:

Ms. Leesa Cobb, Port Orford Ocean Resource Team

- Identify Port Orford as an individual port; do not lump with Brookings, etc.
- Consider CDQs.
- Analyze impacts on Port Orford, especially inter-sector allocation.
- Identify how fishing opportunities are allocated, so communities know whether effort will be shifting into their areas.

Mr. Peter Huhtala, Pacific Marine Conservation Council

- This is an extremely controversial topic.
- Support development of National Standards by Congress to ensure that shares are allocated equitably and to prevent domination of industry by a few large businesses.
- Advocate a programmatic EIS to review the groundfish fishery management plan (FMP), paying attention to effects of management changes on communities.
- Advocate hard bycatch caps by sector (total mortality caps) for overfished species.
- Difficult to consider cumulative impacts without knowing how fisheries will be allocated.
- Cumulative impacts section should look at all recent management changes (area closures, buyback, etc.).

Mr. David Jincks, Midwater Trawlers Cooperative

- Support TIQs.
- Need to rationalize the fishery.
- IQs will bring stability.

Ms. Dorothy Lowman, Consultant, Environmental Defense

- Support dedicated access privileges from groundfish trawl fleet.
- Include alternative that looks at bycatch caps for overfished species; allocate them as tradeable quotas.
- Consider CDQs or other methods to address concerns of coastal communities.
- To maintain fishing and processing opportunities in coastal communities, consider holding back a percentage of the IQ each year to be allocated annually based on joint proposals with fishermen and processors.
- Analyze initial allocation to skippers who can demonstrate history of dependence on the fishery.
- Consider area-specific IQs based on socioeconomic and biological considerations.
- Consider a mechanism to allow communities to form nonprofits that can hold and lease quota to community members and allow the nonprofits to apply for loans.
- Don't wait too long to start inter-sector allocation discussion.
- Modify the Ad Hoc Allocation Committee, so all sectors and stakeholders are represented.

Mr. Denny Burke, fisherman

- Support quota program.
- Don't make shares smaller than they are now. It's very hard to make a living.

SUMMARY OF WRITTEN COMMENTS

*Scoping on
Individual Quotas (Dedicated Access Privileges) for
the Pacific Coast Groundfish Trawl Fishery
Pacific Fishery Management Council*

Number of Written Comments: Nine submissions from seven parties

Comments were received from the following parties:

Captain Gordon Murray (F/V Blue Horizon)
Coastal Jobs Coalition (Mr. Kent Craford)
Morro Bay Commercial Fishermen's Org./Crab Boat Owners Assn. of San Francisco
Environmental Defense (Dr. Rod Fujita)
International Pacific Halibut Commission (Dr. Bruce Leaman)
Pacific Coast Federation of Fishermen's Associations (Mr. Zeke Grader, Jr.)
Pacific Marine Conservation Council (Mr. Peter Huhtala: two letters and one e-mail)
B. Sachau
United Anglers of California
United Anglers of Southern California
West Coast Seafood Processors Association (Mr. Rod Moore)

Summary of Comments:

Captain Gordon Murray, Past Captain of the F/V Blue Horizon

- Captains and crew who were responsible for significant past catch records, but who did not own the vessels they fished, should not be overlooked, but should be granted IFQ access shares.

Coastal Jobs Coalition (Mr. Kent Craford)

[Coastal Jobs Coalition written comments from Kent Craford are identical to oral testimony taken at June 13, 2004 scoping hearing and are summarized as part of that hearing.]

Environmental Defense (Dr. Rod Fujita)

- Consider sectoral bycatch caps allocated as transferable bycatch quota.
- Initial allocation alternatives should address the potential impacts on coastal communities.
- Mechanisms should be explored that would help maintain fishing and processing opportunities in coastal communities.
- Analyze an initial allocation to skippers who can demonstrate specific history and dependence on the fishery.
- Explore using an auction mechanism, but recommend that it be tiered to provide opportunities for diverse operations to effectively compete.
- Consider area-specific IFQs based primarily on biological considerations to address concerns about local depletion.

- Urge effective monitoring of any IFQ system. Support 100% at-sea observer coverage, 100% dockside monitoring and mandatory vessel monitoring systems.
- Explicitly ban highgrading.
- Develop measurable environmental performance objectives to which the IFQ program will be held accountable.
- Support cost recovery for the monitoring activities described, as well as industry financial contributions to research and management. Urge considering a “sliding scale” or initial loan opportunities for members of the fleet who might be disadvantaged in paying these costs.
- Allow coastal communities to form nonprofits whose purpose would be to hold and lease quotas to community members, and these nonprofits qualify for any loan program opportunities.
- Include unambiguous language that is thoroughly vetted with stakeholders who have expressed concerns about IFQs constituting or evolving to become a de facto property right.

International Pacific Halibut Commission (Dr. Bruce Leaman, Executive Director)

- Any provision allowing retention of trawl-caught halibut would require IPHC approval.
- The Halibut Catch Sharing Plan would need to be amended to account for retention by this additional user group.
- Requiring retention of halibut would double the amount of legal-sized halibut mortality by the trawl fishery and would exceed the current catch limit for the directed commercial halibut fishery.

Morro Bay Commercial Fishermen’s Org./Crab Boat Owners Assn. of San Francisco (Barbbara Stickel on behalf of Thomas J. Stickel, Craig Barbre, Larry Collins)

- Manner of notice and timing of the scoping sessions did not give open access fishermen that target salmon adequate opportunity to participate and comment.
- Prefer status quo and oppose all IFQ systems.

Pacific Coast Federation of Fishermen’s Associations (PCFFA) (Mr. Zeke Grader, Jr., Executive Director)

- Consideration of the trawl IFQ program is premature; an analysis of the effect of the buyback on trawl effort, reallocation of quota back to other groundfish sectors, and establishment of National Standards for IFQ programs should take place first.
- The justifications for an IFQ system are not strong enough. The proposal fails to say how an IFQ program will lessen bycatch, and the rationale for groundfish management seems to have changed from supporting a year-round fishery to allowing fishermen to fish when they want. An explanation for this change in rationale is needed.
- No mention is made of the increased cost of IFQ systems. The cost issue needs to be carefully considered.
- PCFFA urges the Council not to proceed at this time with the preparation of an IFQ system.

Pacific Marine Conservation Council (Mr. Peter Huhtala, Senior Policy Director) letter of May 25, 2004

- Concerned that this process is moving forward too quickly.

- The Pacific Council should decline to approve a public scoping document for a trawl ITQ EIS, and should instead recommend that NOAA Fisheries proceed with the issuance of a Notice of Intent (NOI) to prepare a comprehensive programmatic EIS that will facilitate an open public process for planning for the future of the groundfish fishery as a whole.
- A comprehensive programmatic EIS must be completed for the West Coast groundfish fishery prior to consideration of options for new forms of dedicated access privileges specific to the trawl sector of this fishery.
- The NOI to prepare an EIS regarding implementation of dedicated access privileges in the groundfish trawl fishery is deficient, and some premises set forth in the NOI can be considered misleading.
- The process leading to the public scoping document has been severely flawed, inherently tainting the material offered to the Council.
- Under objective criteria developed by the National Research Council, the West Coast groundfish trawl fishery is unlikely to be considered an appropriate fishery for implementation of an IFQ system.
- The way in which exploration of a possible IFQ system has transformed into a rush to implement a trawl IFQ program, demonstrates the need for Congress to enact National Standards. If Congress cannot act swiftly to pass National Standards, then a moratorium on new IFQ systems should be established until they are adopted.

Pacific Marine Conservation Council (Mr. Peter Huhtala, Senior Policy Director) includes letter of July 29, 2004, and comments in separate August 2, 2004 email

- Believe time and resources are being inappropriately diverted to design the dedicated access privileges (DAP) system, while a comprehensive programmatic EIS for the groundfish FMP is overdue.
- Urge completion of the bycatch program EIS, its associated FMP amendment, and implementation of associated regulations.
- Propose a new alternative based on sector caps on the total catch of each overfished species. (Detailed proposal included).
- Consider longer cumulative landing limit periods under status quo management (three, four, or six months).
- Elements of the attached proposal could be implemented swiftly, while not precluding additional solutions.
- Consider how any DAP system will respond to or discourage future changes in area-based management, both for biological and economic reasons.
- Recommend analyzing a range of sunset provisions from one to ten years. Also, consider reviewing the performance of the IFQ system prior to the sunset date. Short-term sunsets (such as two years) would increase flexibility.
- Sunsets would help ensure the IFQ program achieves its goals.
- Recommend the program be required to achieve measurable conservation goals.
- Offer a range of referendum scenarios, including a double referendum where two-thirds of those involved in the fishery would be allowed to vote first on whether to develop an IFQ system, then whether to implement the system.
- Analyze the current fishing situation spatially and model scenarios to help understand the biological and economic changes that various IFQ systems might cause.

- Concerned that IFQs could encourage local depletion of some populations. A spatial analysis could help address this concern.
- Constitutional problems may arise with community quotas. Please describe the range of legally possible solutions for community quotas and requiring landings in certain ports.

B. Sachau

- Raises questions about how the public is protected from self interest of fishermen and supports protecting the public from the self interested actions of fishermen.
- The resource belongs to the general public and the Council should make that clear.
- Reduce the number of fishermen so that seasons will be longer and fishermen will not rotate between fisheries.
- Establish marine reserves, and reduce quotas by 50% and 10% every year thereafter.
- Capacity rationalization through market forces is not appropriate.
- Community quotas are not appropriate as the fish are a public resource.
- Incorporates by reference Pew Foundation reports on overfishing and the Councils.

United Anglers of California (Bob Strickland, President)

- Recreational sector has been excluded
- If the IFQ program will lock in an allocation then the inter-sector allocation needs to be done first.
- Economic and biological implications of locking in bottom trawling need to be considered.
- Wait on developing IFQs until national standards for IFQ programs are developed.

United Anglers of Southern California (Bob Osborn, Fishery Consultant for Tom Raftican, President)

- Wait on developing IFQs until a programmatic EIS is completed.
- Wait on developing trawl IFQs until impacts on benthic habitats are understood.
- Provide for transferability of IFQ between a full range of approved gears and future gears.
- A hard allocation of IFQ for an indefinite time frame is unfair to the open access fisheries.
- Benefits granted to a sector are a cost to the public sector.
- IFQ programs should have reasonable expectations of providing conservation and habitat benefits for the resources.
- Evaluate the likelihood of investment of capital for conservation of a slow growing and low productivity resource such as those found in the groundfish fishery.
- Take into account disaster tows and increases in participation that exhaust the allocated quota and the resultant necessary adjustments to allocations both within and outside the trawl IFQ fishery.
- Wait on developing IFQs until national standards for IFQ programs are developed.

West Coast Seafood Processors Association (Mr. Rod Moore, Executive Director)

- Have concerns about the process chosen to develop the EIS; allocation should come first.
- Cannot analyze the social and economic effects of a DAP without first knowing whether fishing will be allowed and how it will be allocated.
- The DAP should include all species of Pacific groundfish covered under the FMP and legally available for harvest; or separate DAPs should be developed for Pacific whiting and for non-Pacific whiting groundfish fisheries.
- Providing privileges to some but not all harvested species will negate the economic benefits of a DAP and reduce impacts on bycatch reduction.
- The Council should consider three groups for initial allocation of privileges: owners of limited entry (LE) trawl permits, processing companies that purchase LE trawl-caught groundfish (with a sub-option of processing facilities, rather than companies); and communities where at least 1% of the annual landings of LE trawl-caught groundfish are made.
- The Council should consider allocating directly to recipients through a regulatory process and distributing privileges through an auction system.
- The Council should consider having no caps on quota ownership in order to allow maximum economic flexibility. The Council should also consider having different caps for different privilege holders.
- For ease of enforcement, the Council should analyze an option that limits the number of ports where trawl-caught groundfish may be landed.

APPENDIX

TRANSCRIPT OF PUBLIC COMMENTS

Trawl IQ Scoping Hearing

Pacific Fishery Management Council

Crowne Plaza Hotel

1221 Chess Drive

Foster City, CA 94404

June 13, 2004

Mr. Bob Osborne, recreational angler and fishery consultant for United Anglers of Southern California

It's been over a year since we started talking about this. We've been asking for an opportunity to get a recreational angler into the process to discuss putting some potential alternates into the process, looking at other stuff that would affect recreational angling that might be covered in the process with the team currently in place.

I've heard where it's at that the Council doesn't consider this IFQ program to be granting rights, but the last time I was aware of a process where it made that determination that didn't involve the full public was King George, with the colonials. It's complicated. ... The complications are covered in the NOAA publication "Sharing the Fish." I don't think it's simply cut and dried to have an IFQ program without answering some of these more difficult questions that the Council seems to be trying to avoid.

For example, cross-sector transfer of quotas; in addition, the call for national standards for IFQs, from a broad sector, very clearly states that this is not an easy process and that there needs to be a wide public process in establishing the goals and objectives for this process and in designing (it well?). Bycatch still is a problem. There are number of fish species subject to bycatch, such as northern bocaccio, which there is no stock assessments on. Another issue is habitat considerations. The damage to bottom habitat, over which the drag gear passes; and also offsite damage from the dragger gear, from clouds of sediments that increase water turbidity and may have smothering effects on filter feeders well away from the trawl passage. Thank you.

Mr. Kent Craford, Director, Coastal Jobs Coalition

We're a group recently formed by the WCSPA to evidence the broad base of support for *balanced* fisheries rationalization that recognizes and provides for all stakeholders in the west coast groundfish fishery, including seafood dependent communities. I'm here today representing dozens of companies and organizations employing thousands of people in primary processing and its supporting industries, including transportation, cold storage, and packaging, for example, in addition to seafood industry customer groups, like restaurants... Thank you for the opportunity to comment today... first I'd like to express our coalition's strong support for dedicated access privileges or IQ systems. There are significant economic and management benefits that can be derived from IQ systems for these 2 groundfish fisheries, but the key to obtaining those benefits, especially economic benefits, is in the proper design of an IQ system. We've heard it said many times by both processors

and fishermen that neither can exist, much less succeed, without the other; therefore it is imperative that any IQ program...recognize this fact, and work to foster the vitality of both for their mutual benefit and the benefit of the communities that depend on them. So the primary message we'd like to send today is that any IQ system must provide equally for harvesters and processors. A balanced approach will bring needed stability to both sectors, for supporting industries as well as coastal communities. With this in mind we formally proposed the inclusion of the following alternatives... And some of these may already be partially covered in the scoping documents. We feel that the socioeconomic impacts of each of these alternatives should be analyzed fully and independently of each other. The alternatives we propose are:

1. Establishment of community quota or CDQ to operate parallel to an IFQ. Despite use in other fisheries, this option was rejected by the ad hoc trawl IQ committee without sufficient justification. CDQ is a reasonable alternative and should be analyzed in the EIS.
2. Second, an auction-based system should be analyzed as a reasonable alternative to status quo or an IFQ system, so we'd like to see an auction-based system put alongside a more traditional IFQ system. Such was the recommendation of NRC to include an auction-based system in the scoping process, as referred to in the scoping document. ...

As stated in the EIS, initial allocation of quota is the most controversial aspect of quota systems, recognizing the tremendous economic and social impacts and shifts that will occur through the initial allocation. ... We support analysis of various combinations of IFQ initial allocation. Each of these deserves equal consideration as a reasonable alternative to status quo in the EIS.

3. A 50-50 initial allocation of IFQ to trawl permit owners and primary processors.
4. Combinations of initial allocation of IFQ to trawl permit owners, primary processors, and community entities.

Additionally, the Coastal Jobs Coalition supports analysis of existing dedicated access privilege or quota systems related to the above-mentioned alternatives, as well as others considered in the EIS. As part of the analysis, we feel it imperative to study our nation's most recently rationalized fishery, Bering Sea crab. We recognize and understand that Congress has temporarily prohibited the consideration of such a system as a reasonable alternative to status quo for west coast groundfish, but analysis of that system is appropriate for learning purposes. As seafood industry business, we feel strongly that the short experience we've had with crab rationalization will speak well for the socioeconomic benefit that such a balanced approach can have for processors, harvesters, community, and all stakeholders on the seafood industry. Ignoring the most recent and relevant American fishery quota system while we try to develop our own from scratch would be foolish.

Finally we must express our concerns that this EIS process is premature. It's been recognized that allocations between groundfish harvest sectors need to be negotiated before any trawl IQ system can move forward. Why is this not being done first? To march down the path towards an IQ system without even knowing where the trawl fishery stands vis a vis fixed gear, open access, and recreational fisheries is putting the cart before the horse. ... [We will participate actively in the coming months. Thanks.]

Mr. Peter Huhtala, Pacific Marine Conservation Council

I would like to introduce a letter submitted under C9, would like the substance considered in this process. Thanks for opportunity to speak. Although I have a lot of concerns about process (I'll limit those to the C9 discussion on Thursday), I have relevant comments on the notice of intent. I'll primarily talk about the cumulative impact analysis required. The NOI came jointly from the NOAA Fisheries and PFMC, and at every Council I'm racking my brain to find that moment where the Council explicitly voted to instruct staff and NOAA Fisheries to move forward with a trawl ITQ EIS. I haven't figured that out yet. But I know we're working on a bycatch program EIS... and there is some sort of linkage. It's very important to PMCC to get a good handle on bycatch – both in monitoring and reducing bycatch, and coming into legal compliance with the FMP amendment for bycatch – and not just legal compliance, but getting down to producing regulations that improve this fishery, and that move us in the future, that increase the economic viability of the fishery and the health of the resource in both the short and long term.

I get the impression though, [that we are] moving quickly and heavily resource oriented into trawl ITQ development, that we may be losing sight of the bycatch EIS itself, referred to in the NOI. The resources, to my mind, really could be better spent in completing, as best we can, that bycatch program EIS, and developing a really useful FMP amendment that can be the basis of regulations for improving the fishery. The resources diverted into this trawl ITQ development could also be better spent on the programmatic EIS, and actually, are requisite to developing a trawl ITQ EIS, because the type of analysis that would be required to take place within the programmatic EIS is the type of information you need to complete the cumulative impacts analysis for these dedicated access privileges. The comprehensive programmatic EIS would not only link our bycatch monitoring and reduction efforts, our efforts to protect EFH, our approach to rebuilding overfished fish populations and preventing overfishing, but it would also provide a forum for analysis of major changes that have occurred in the fishery over the past several years, including our response to overfished species, but also the major closed area management decisions, which have had tremendous impacts on recreational and commercial fishing and fishing communities. And completing the analysis of the open access situation. Should we move the open access fishery into LE? We haven't completed that debate yet.

These are some of the ways that a programmatic [EIS] can start bringing us up to at least a baseline understanding of the what the past effects, the present actions, and possible future actions, could be, in a process in which the public can have a voice in the future of this fishery. And if the public, with eyes wide open, says a trawl ITQ is the way to go to really improve this fishery, then that's the way we go. [But we should go there through an open and inclusive process.]

The NOI and scoping document and the process that's been laid out here today has a fatal flaw which the previous speaker pointed out, in that the idea is to design the trawl ITQ program and then figure out allocation. Well, the cumulative impact analysis can't even be reasonably complete unless you consider the development of the program as well as the allocation. The allocation has considerable impact on fishing community, processors, the recreational fishing fleet, adjacent fisheries, fixed gear, OA, etc., and there is no way that we can separate these, whether the allocation should go first – maybe it should; in some ways, in completing and implementing the bycatch program EIS perhaps there needs to be some allocation issue worked out. But certainly in the context of a trawl ITQ, the program cannot be separated from the allocation, because it's far too complex

and we end up with a program design that is a foregone conclusion before we get the allocation, and that is no way to be fair in the social and economic analysis necessary to protect our fisheries and our fishing communities.

Finally the fact that DAP is the new buzzword is interesting to me. It became popularized with the US Commission on Ocean Policy report. The US Commission was supportive of considering DAPs at various times, but they very specifically, in their draft report, recommended a series of national standards that these programs should adhere to, or lacking standards, that ... and they're remarkably similar to the standards proposed by the MFCN, a group that the PMCC is part of...there are over 170 groups involved (said who is involved in MFCN.) But the US Commission—I have to read their recommendations into the record here:

At a minimum, the national guidelines should require DAPs to specify the biological, social, and economic goals of the plan; recipient groups designated for the initial quota shares and data collection protocols; provide for periodic reviews of the plan to determine progress in meeting goals; assign quota shares for a limited period of time to reduce confusion concerning public ownership of living marine resources; allow managers flexibility to manage fisheries adaptively, and provide stability to fishermen for investment decisions; mandate fees for exclusive access based on a percentage of quota shares held; these user fees should be used to support ecosystem-based management. Fee waivers, reductions or phase-in schedule should be allowed until a fishery is declared recovered, or a fishermen's profits increase. Include measures such as community-based quota shares or quota share ownership caps to lessen the potential harm to fishing communities during the transition to DAPs; and something we haven't heard about yet today, hold a referendum of all permitted commercial fishermen after adequate public discussion and close consultation with all effected stakeholders to ensure acceptance of the dedicated access plan prior to final RFMC approval. Worth reflecting on.

Mr. Tom Raftican, United Anglers of Southern California, and speaking on behalf of United Anglers of California, who couldn't be here today

The groundfish fishery needs a programmatic review before an IFQ program can be considered. According to NEPA, federal managers are required to analyze the impacts of recent changes to the groundfish fishery. The fishery is in tremendous flux, and needs this type of analysis before moving into a major reconfiguration of the fishery. Implementation of the trawl IFQ could lock us into sector allocations and gear configurations that may not be appropriate.

2. The recreational sector must be included in the initial program and design of intersector allocation. Trawl IQ committee membership has excluded representatives of the recreational sector. We have requested membership from the Council, and our exclusion has created uncertainty in the recreational community about the impacts of trawl IFQ on the recreational sector, especially w/regard to bycatch. Participation in the inter-sector allocation portion of the process is impaired by not having (been) part of the initial program design.
3. Funding for the trawl IFQ must be discrete and secure. The rush to complete an IFQ for the trawl sector has led to a virtual scramble for funds. The scramble indicates that the cart has been placed before the horse, and that a well thought out, integrated approach for design and funding should take place.

4. National standards for Congress have not been enacted. While it's certainly in the Council's right to pursue an IFQ program given that the moratorium has expired, it is the position of the UA of SC and the UA of CA that national standards such as those described in HR 2621 be enacted before new IFQ program are approved by NOAA Fisheries. NOAA Fisheries has made it clear that they want to see criteria from Congress before approving any new IFQ programs.

Ms. April Wakeman, attorney representing United Anglers of Southern California

Want to reiterate the fact that recreational fishermen will be affected, and do need to be represented, and would appreciate the chance to participate. From a personal point of view, buy-in is much better if everybody has participated in the solution, so it's just good common sense.

Mr. Pete Leipzig, Fisherman's Marketing Association

... This process is going to be a long one. It's a complicated issue, and a lot of work will go into putting this together. For many of us it will be a very frustrating process. Much of what is going to occur is very bureaucratic. But it's a requirement; you have to adhere to the requirements to complete all the necessary analysis. But for someone like myself, I feel much like a father bringing an injured child to the emergency room, and before he can be attended to there's the requirement to complete all the insurance paperwork. He needs attention, but we're gonna spend the time dealing w/the paperwork. And as I hear some of the other speakers, it's almost as though that analogy has expanded, that they're suggesting that perhaps we need to have a review of the admission procedures before we can begin the paperwork before we can have the child see a physician. This is frustrating. I hope that we can continue to move forward. Some of these issues that people raise can occur concurrently, in parallel with the work that the committee is doing, with the work that the analysis group is doing. The council has been requesting for years to get along with sector allocations. We've limped along; we have some things in place because of the declaration of overfished species; they're not adequate; we need to get past these things. But they don't have to occur sequentially. Those who suggest that they occur sequentially, I have to be very skeptical; in view of what you're saying, I believe you're not interested in having an ITQ program go forward, and that the perfect way to delay it, to kill it, is to have it go sequentially. Thank you.

Mr. Steve Bodnar, Coos Bay Trawlers Association and Bandon Submarine Cable Council

The trawl fleet wants the IQ program; everybody comes to the door and is knocking there; it is amazing to me that there wasn't this kind of attention done when the fixed gear, the LE fixed gear, pulled the same thing and got their IQs basically by permit stacking. It's just amazing to me that the gear makes the difference in who's at the door and who wants in. Welcome aboard everybody!

TRANSCRIPT OF PUBLIC COMMENTS

Trawl IQ Scoping Hearing
Pacific Fishery Management Council
National Marine Fisheries Service
7600 Sand Point Way NE
Seattle, WA 98115
July 20, 2004

Mr. Hartwell, Environmental Defense

Environmental Defense fully supports the Council's decision to move forward to develop IQ alternatives for the West Coast groundfish fishery. We look forward to working with Council in developing a program to improve management and resource sustainability and bring economic sustainability to fishermen, processors, and coastal communities. We are interested that there be a range of alternatives to address coastal community concerns. Over the summer we are working with coastal community leaders to better understand their concerns and needs and will be presenting a report to the Council at their September meeting describing our findings and their implications for IQ alternatives. We are pleased that the Council recently added a coastal community representative to the Trawl IQ Committee. We believe that it is of utmost importance that the process continues to be open to all stakeholders' input throughout the EIS process. Finally, ED will be hosting an open forum on the British Columbia ITQ program in Newport, Oregon, next week from 9 am to 1 pm on July 27th. The public will have an opportunity to hear firsthand about the environmental and economic benefits of IFQs from participants in the BC groundfish fishery and will be able to discuss the implications for our own ITQ development process. We will be submitting a summary of this meeting as part of our formal written scoping process after July 27th. I encourage interested parties to seem me after about the Newport forum. Thank you.

Mr. Casey, Bering Sea crab vessel owners representative, Woodinville, Washington

My clients are Bering Sea crab vessel owners, and if I lie to you today Bob Alverson and Dave Fraser can tell you that they saw everything that I saw. I simply came to warn you. I read this article on the web about what you are doing and all my remarks refer to page A9, accumulation limits. I simply wanted to tell you what happened in Alaska and warn you about a socioeconomic virus that I think we let loose up there and could very easily come down here all along the Pacific coast. In my opinion with the next rewrite of the Magnuson Act it spread all over the country. I believe it is against a hundred-year historical tradition in this country of antitrust containment. Here is what it is in a nutshell. I ask you to write down two numbers: eight, which is the percent of the IFQs in crab that processors own in the Bering sea. That's what they qualify for under the qualifying year scenarios decided on by the [North Pacific] Council. Number two, please write forty, question mark. I believe this is right; I get that number by multiplying eight processors times a five percent ownership cap. As you know, every fisherman, Dave Fraser for example, may only accumulate one percent of the IFQ in crab, according to the Secretary of Commence. Glenn's people may each acquire five percent. This is all legal, all above board, all on the public record. But when I tell you who decided that I think you will be surprised. Gary Locke decided that. Governor Kulongowski decided that. Governor Kitzhaber decided. Governor Knowles decided that. And Governor Murkowski decided that. And do they even know it? Of course not. However, the

Magnuson law says that they have a seat, a voting seat ex-officio, on those councils. All of their representatives voted to give Dave Fraser one percent max and give Glenn's people each five percent max. And when I read your article I thought maybe we can contain this to crab in the Bering sea. You remember who decisively won the Civil war by overrunning Atlanta? He had a brother who wrote a law called the Sherman—not William Tecumseh Sherman, his brother—the Sherman Antitrust law. You know that we've come to that in Alaska. The way the decision was made all of Glenn's guys are subject to the antitrust laws today and into the future. There is no escape from that. But what is the golden ingredient that gets all the way around that? It's the five-to-one ratio. If 240 Dave Frasers can only own one percent and eight processors can own five percent each, who cares about the Sherman or Clayton Antitrust Acts? Within 10 years, most likely the harvesting privilege will be owned and controlled by the vertically integrated operations. And you know what? Some of them are fishermen owned. Let's not point fingers. Not only international corporations, they are partnerships with the fishermen. We tend to think that's the wrong way to go, and I hope that when you guys make this decision.... I think I was looking at page A9, it says one percent or nine percent, and that's where we started too. I hope you make it the same. My message is purely that. Whatever you decide, give the fishermen the same as the processor. Otherwise I believe you are creating a system—remember in the *New Industrial State* John Kenneth Galbraith talked about countervailing power between labor and capital? This is a little different. But to maintain a competitive market it seems to me you don't want to accumulate large blocks of fishing privilege in the hands of a small group. Eight, and 240 can only have one percent. Thank you.

Mr. Dave Fraser, F/V Muir Milach

I haven't taken much time to go through this and I hope there's an opportunity to submit email comments on this. I just wanted to say real quickly that I support the comments of EDF. I think that the experience we had early on in the presentation from the B.C. fishermen and processors presents a real good model. I think the Council should move ahead quickly—2009 didn't sound real quickly—but as quickly as possible to move toward a rationalized environment. On page 2.9, socioeconomic environment, I think its real important, this is in the context of the allocation options on page 8-21, and I'm assuming the ones under the TIQ recommendations are the ones that will be further developed. [Inaudible response from Jim Seger.] Right. And I have no objections to the first three on the list. I think option number four isn't currently legal and I wouldn't encourage moving in that direction. One that isn't on the list that I've seen supported elsewhere is individual processing quotas in addition to the the allocation of quota to processors, which is a horse of a different color. I don't support IPQ systems. But I do think that the NRC set some good guidelines in *Sharing the Fish*. Looking at processor concerns is relevant, and in that context and coming back to what's on page 2.9, it's important to look at the relevant amounts of non-malleable capital invested in the harvesting and processing sectors and how relevant that capital is to the particular fishery. You can have a non-malleable processing plant, but it may be doing crab and salmon and sardines and this and that. So those sort of comparisons are relevant if you go down the road of alternative three of allocating harvest share to processors and trying to put that in perspective. I think an important element that needs to be woven into the socioeconomic environment is maintaining a competitive marketplace. The one IPQ system that is recently popularized, the Department of Justice pointed out very serious competition issues with that. I heard the comments about communities, and EDF comments, and its interesting to note what's important to communities can go two different ways. In Alaska, the Pribilof Islands are totally isolated from road access and kind of different situation from communities down here. They sort of jumped on board with the

processors. On the other hand, Kodiak Island felt that they would be best served by a single pie system that encouraged competition in the marketplace, which would be good for the community as a whole. I'm just thinking about our situation on whiting, we deliver in Ilwaco. But some of our fish is processed in Ilwaco and some of it ends up in a truck going up to Bellingham or Stanwood, going up the road. The community issue doesn't necessarily resolve in one specific direction. Our crews are scattered from Bellingham to Port Townsend. Anyway, I'll try to submit more coherent comments by email. [Inaudible comment from Jim Seger.] I think it is a relevant option in terms of that. I mean the connection between the communities is both harvesters and the processors. One thing I did mean to mention, I found it rather odd that the TIQC included the allocation of harvest shares to processors but excluded the option of allocation to harvesters or skippers or permit owners. And that seem contrary to the general tone of advice from the NRC. It always baffles me why skippers would end up lower on the totem pole. [Inaudible comment from Jim Seger.] Yea, thank you.

Mr. Peter Huhtala, Pacific Marine Conservation Council

Some interesting additions to the discussion today. PMCC has commented on this before and we will in the future. We are real concerned about some of the issues that have been brought up today, around consolidation, also about potential loss of fleet diversity. We look forward to the detailed analysis in that regard. And certainly the issues of vertical integration and the real potential for this to spread to processor quotas, if not explicitly in this initial process, inevitably perhaps. PMCC's position remains that this process is premature to adoption of national standards for IFQ programs by Congress and premature to completion of a programmatic EIS for the groundfish fisheries, the whole programmatic to review the current state of the groundfish FMP and in an open process to establish the values, goals, and direction of the groundfish fishery. Today I'm going to just briefly offer an alternative to the primary issue as it's stated in the problem statement of the notice of intent to prepare an EIS, which basically comes down to we have a serious problem in the fishery that is constrained by the incidental catch of overfished—certain overfished groundfish species—and in association with healthy stocks. Our suggestion is to analyze something that is a little different from what was stated in the NOI. We'd like to look at a system of hard caps on the total mortality of each overfished species by sector. And in this case you may consider, for example, the nonwhiting groundfish trawl fishery to be a sector. The sector cap would be established through some sort of allocation process. Perhaps not a permanent allocation, but at least an allocation adequate to the season involved or two year period involved. The sector would receive a cap on each overfished species, and upon attainment of the total mortality cap for any of those overfished species the sector would cease fishing. Other sectors that may encounter the same species, as long the sector that was shut down didn't blow past the OY, could continue to fish. Within the sector, individuals would have the opportunity to choose to opt out of the sector cap, taking with them an individual bycatch cap for their operation. In order to do that, the individual vessel or permit owner would need to agree to carry an observer to verify their compliance with the hard individual bycatch cap. They would, in exchange, also receive access to additional higher trip limits of the healthy target stocks. These individuals that have opted out may also choose to form groups or clubs to pool their hard individual bycatch caps and share the risk. In the case of a sector being shut down, the individuals that opted out would not be shut down; they would get to continue fishing regardless. In addition, the current system of two-month cumulative caps for each of these species could be analyzed in different ways. The hard total mortality caps could be for two months, they could be for four months, they could be for six months, they could be for a year, or they could even be for a two-year

period. We're not going to get too far down into the weeds of that, but we'd like analysis looking at getting away from the two-month cumulative limits. But also maintaining some potential for somebody to get back into the fishery and not get shut out for a full two-year period, perhaps. It makes more sense to start that cap over again. We'd like to see this type of hard cap system analyzed in relationship to the complexity and time necessary to develop the other systems that have been suggested to deal with the problems that were stated in the NOI. In the end, we suspect this could be implemented in shorter order, or at least aspects of it, pilot programs, similar to this could be implemented. In fact, the arrowtooth flounder EFP moving to regulations next year is an example of a fishery that is managed very similar to what we are talking about. This allows additional time to go through a programmatic process to review the possibilities for different sorts of dedicated access privilege systems that may be a longer term solution to rationalizing the fishery. But in the meantime we are impatient and we'd like to get on with getting a better hand on the total mortality of groundfish that are in an overfished state, rebuilding those with some degree of assurance and providing access to healthy stocks through the use of incentives in reward. My little offering for today. [Inaudible comment from Jim Seger.] Well yea, if you run into a total mortality cap for one of the other species and you may have to quit fishing. But as far as hard sector caps, going through this, which is a bit of an allocation problem initially, focus on the overfished species rather than going through the full allocation battle. There is sure to be a battle on all the other species as well. Does that clarify what I mean? [Inaudible response from Jim Seger.] Probably. [Inaudible comment from Jim Seger.] Yea. Ultimately, but right now having the kind of monitoring necessary to set hard caps on the recreational sector sounds to me like a nightmare. You know, eventually we're going to have to have them, but since the subject of this problem statement is the trawl fishery, and the subject of this discussion is developing dedicated access privileges for the trawl fishery, I limited it to the trawl fishery. It is easier to define sectors; you can define it as the entire trawl fishery; you can divide up the whiting fishery out; you can divide up the sectors of the whiting fishery; and its relatively easy compared to some of the other sectors, open access for example. [Inaudible comment.] Yea it is; yea, I think that's correct Jim. I just see it in a different way than was presented in the ICA [Inaudible comment from Jim Seger.] And we're clearly not interested in tradable total mortality caps for the overfished species. But that doesn't mean you can't analyze them, which I'm sure you will. Thank you.

Mr. Joe Bersh, Supreme Alaska Seafoods

We operate the Excellence, a mothership in the tribal and nontribal whiting fisheries. My first point has to do with provision A13.2 and its interaction with provision A6, the use-it-or-lose-it and the recency provisions. Unfortunately, this program is apparently going to take some time to implement; yet we fixed in time the recency cap limits, which I believe are 2000 to 2003. At the present time there is a set or fixed allocation period for history years, which I don't see necessarily any reason to change. But one of the goals of this is rationalization through market forces, and I think an analysis of participation in this fishery would show that there has been rationalization that's occurred during the allocation years. Which if the recency requirements don't continue to call for an ongoing participation requirement, if they don't move forward when it comes time to allocate some of this in an IFQ, it's going to give fish to people who have long since retired from the fishery and currently have no intent to return to the fishery. I would say that an ongoing participation requirement would be consistent with the A6 use-it-or-lose-it requirement. If my memory serves me, use it every three out of five years is the requirement there. My next item would be provision A13.5. I suspect I'm not the first person in any of these scoping meetings to raise the issue

regarding returning to putting a control date in these and that there is an allocation to the processing sector or to non-harvest sectors. So I would ask that that would be reconsidered. Comments from members of the TIQC suggested that the reason that it was not appropriate to put in the control date was because it somehow validated the concept of giving IFQ to processors. Certainly that is not a reasonable position as to why it should not be considered. If there are reasons for a harvesters' control date to prevent speculative harvesting, I would argue there is a reason to do it to prevent speculative processing. Another non-popular issue relative to allocation to processors would be to—or maybe this would be a popular one, I don't know—would be to consider alternatives which would only provide ITQ to processors who are not vertically integrated. The concept of preserving non-mobile capital really isn't such an overriding concern if the processor has its own harvest fleet which is already receiving ITQs. So I would suggest that there might be an analysis of placing some type of accumulation limit in the event that shares are given to processors, which would take into account what they are receiving as a harvester ITQ as owners of harvesting vessels. My final comment is I think that the panel has put together a group of people to put in input. We have strong input regarding the Canadian program. Yet I think there's—I fear a tendency to follow too much of the B.C. program without peeling back the layers of the onion in their program to see how it works for them and why it works for them. I would say why some of these provisions would not work for us is because we are faced with a very serious problem regarding overfished species. Peter makes some valid points as to how to treat overfished species. I don't think that there's anything within the B.C. model that can be readily transferred to our system. So I just hope we won't become too focused on looking at their system, thinking that it is working for them and that it will work in all areas for us. I think it's a good starting point, but we need to address our unique issues ourselves. Thank you.

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TRANSCRIPT OF PUBLIC COMMENTS

Trawl IQ Scoping Hearing
Pacific Fishery Management Council
Hatfield Marine Science Center
2040 SE Marine Science Drive
Newport, OR 97365
July 27, 2004

Ms. Leesa Cobb, Port Orford Ocean Resource Team

Firstly, when you do measure any impacts, if you get to that type of work with this program, and we hope you will...identify Port Orford as an individual port and don't lump us in with Brookings or Coos Bay, which has consistently been the practice in the past. It's going to be very important to us during this work that that doesn't happen because of our long history with the groundfish fishery. So we'd like to get that on the record.

I also want to speak in favor of CDQs as an alternative as you're developing these scoping issues. Our community has a community based management project in place that's been up and running for 3 years, so we have the infrastructure to manage a quota, and there's work being done in central California also with another group that could manage a quota. So we're interested in you scoping that.

And [we] request that as at this work proceeds, and as you identify alternatives, that you analyze the impacts on our community all through the process, and one that comes to mind is that when you talk about inter-sector allocation, we're interested in—I guess that means who gets the fish, right?—We're particularly interested in that type of analysis, because of our long history in groundfish fisheries in Port Orford, and essentially not fishing now on groundfish because of the closures on the prohibited species and also the area closure that we have. So we need that type of analysis done. That would help our community understand what this trawl IQ plan is going to mean to us.

In addition, as you do break up the fish and the trawl fleet and develop a process for that, we'd be very interested to identify where that fish is going, so we'll know if there's going to be a shift of effort into our area, accumulation into our area, that might impact our fishing grounds. Thanks.

Mr. Peter Huhtala, Pacific Marine Conservation Council

I've been talking to folks up and down the coast about this issue, had some meetings, public forums in Astoria, Port Townsend, and – gosh. There's a wide range of opinion and you know just for the record, the general idea of this proposal is outrageously controversial. There's some who really think that full-blown tradable IFQs for every species is the cat's pajamas. And there's the more extreme side, saying this is a gifting of a public resource and many of the people who are getting the gift are those who just took the buyback money from the public coffers, which need to be paid by a lot of folks in both the trawl fishery and other fisheries like pink shrimp and crab. There's some—in Astoria—that were [concerned] that IFQs would reward those responsible for creating the problems that they intend to solve. Others are saying it's a grand economic experiment whose time has come.

I've talked to you a bit about the anxiety that many in PMCC have about the potential IFQs [have] to squeeze out small businesses, cause the loss of jobs and communities—potentially result in big boat domination of the fishery and alternately contribute to the processing sector being monopolized by a few major processors that end up coming in on the coattails of this. I don't know that all of that would happen, because there's a lot of ways that this could go. So we've consistently advocated that national standards be adopted by Congress as recommended by the US Commission on Ocean Policy, and I'm not going to go into the standards exactly right now, certainly we have before; but this would be a development of some basic national standards in a democratic process in Congress, and it would give us a whole lot more comfort if some of these sideboards on accumulation, vertical integration, time periods for these programs to be expired or be reviewed... because I know you keep mentioning the Council's a public process and all these meetings are open to the public, but frankly the Council may be a public process, but it's not necessarily a real accessible institution, and the actual decision making authority is made by folks that—there's no requirement for the non-fishing public to have any representation on the Councils whatsoever.

So ... not only are we interested in national standards to be developed through a democratic process, but we've also advocated for a programmatic EIS to review the FMP. We consider a programmatic EIS review outrageously overdue, and potentially very useful. This would be a way, a public process, in which the public can look at the goals and objectives and future policy directions of the FMP, and consider the major changes that have occurred in this fishery over the past several years. The overfished species that need to go into rebuilding plans—what's that doing to our communities? What's that doing to our fisheries? The spatial management, the closed area management, wide areas of the coast—how is that affecting individual communities? The buyback itself—how did that play out? What really turned out, what capacity was reduced, and what's that doing to our towns?

That said, in Seattle, Jim, I talked with you a bit about looking at another alternative within this process—assuming this process does move forward, with or without a programmatic EIS—and that was looking at what we call hard bycatch caps by sector, or total mortality caps—very similar to the cumulative catch limits that are described in the scoping document. ... Basically we advocate for a cumulative catch limit, total mortality catch limits by sector, first off; (?) defining the trawl sector—you can surely subdivide that if you like—and giving individuals the option of opting out of their sector, taking with them the personal vessel total mortality cap—we're talking only on overfished species. And in exchange for accepting personal accountability, you get more fish, and if your sector gets closed down, you don't get closed down if you stay within your cap. You can also share the risk with your friends if you trust them, and pool those caps. Which is not unreasonable, because people may want to use gear, techniques, shorter tow times, simply communication to keep away from hot spots of the overfished species, that sort of thing. And we think this makes good sense, especially if we combine this with longer, potentially analyzing longer cumulative periods, so you end up with higher trip limits, higher cumulative period limits, and more flexibility within that period. And we believe this can be accomplished in far less time than 2008-2009; ... we're only talking about the overfished species, and this can be accomplished with what I call soft allocation or [the] annual process of making sense of what ... to offer each sector, and we don't have to go through the whole complete allocation battle, but we can actually start getting a handle on reducing bycatch of overfished species, gaining access to the healthy stocks that we're foregoing at this point, and making things better for the fishery, even as the longer-term potential for other types of dedicated access privileges for the trawl fishery or for the whole west coast groundfish fishery are explored over a longer period of time.

Finally, today I have to touch on a part of this—NEPA documents have a section called the cumulative impacts (or effects) analysis—and what that means is you’ve got to look at the combined effects of decisions that have been made, or are being made, or are likely to be made sometime in the near future on the decision at hand. And when you’re looking at the cumulative impacts of this hard bycatch proposal or any of the other dedicated access schemes on the table, you’re gonna have to look at cumulative impacts. And it’s really hard for me to get my mind around how you look at the cumulative impacts of the designed phase of a trawl IFQ without looking at the allocation issues—who gets the fish... the communities, the fisheries, the trawl fishery itself—unless you know how many fish are gonna be roughly available between the sectors as well as within the sector. It’s really hard to complete that cumulative impacts analysis.

In addition, the cumulative impacts analysis should take a look at the cumulative impacts [for] communities of the major changes in the fishery recently—the rebuilding plans, the shelf closure, the buyback, and look at those impacts carefully, and look them most specifically in how they affect the smaller boat fishermen, the smaller communities, the lower income and minority workers, local processing businesses of all sorts, and certainly adjacent fisheries.

Mr. David Jincks, President, Midwater Trawler’s Cooperative, and owner of trawl vessels that fish in Alaska waters and off the West Coast

I’m speaking in favor of trawl ITQs; in favor of ways that I think will benefit not just the trawlers that are fishing, and the vessel owners, but also the communities that the vessels fish out of; the ports; I think it’ll be a good thing for all. As far as rationalizing the fishery and moving through ITQs, there are several different ways besides ITQs; there are IFQs, there are several names to put on it; but one of the things that’s needed in this fishery is some incentive for the fishermen to continue fishing, and to help with conservation and sustainability of the fisheries that they’re fishing for. It gives us the opportunity to go to sea knowing what we can catch, how much we can catch, without throwing the fish away that we caught that we didn’t intend to catch. Allocation issues—yes, there will be allocation issues; as I believe Jeff mentioned that between hook, longline, pot, shrimp, open access, we do have some issues there, but right now we are fishing under these scorecards that are ratcheted up and down on us, so not knowing fully each year what that scorecard’s going to be set at makes it a little harder to fish. Some of the fisheries that try and fish clean, their scorecard might be dumped down lower to help another fishery. So yes, there should be allocations; we will need allocations. But as far as a set-aside to a certain group of fishermen, yes, I think this is needed; I think it’s a long time coming. We’ve had buyback; I supported buyback only with the thought of moving into ITQs. My vessel personally just fishes for whiting down here; my part of the buyback, which will go for probably the incidental catch that I bring in, but I am more than willing to still support it; I think it was a good thing, but only if we move into ITQs. Without ITQs, I think buyback wasn’t necessary. We need to rationalize the fishery. I’m fully in support of it. The National Standards are in place today. As they change, possibly we’ll have to change with them. I think that ITQ Committee, which I am also a member of, in some of our statements we did mention that if new national standards come into place they also will be looked at and incorporated if possible. Right now it’s open to look at everything. But it is worth moving ahead with. It will bring stability to these fisheries. Thank you.

Ms. Dorothy Lowman, Environmental Defense

I'm going to give a few comments on behalf of Environmental Defense. E.D. does believe that designing a groundfish trawl dedicated access privilege that utilizes individual quotas may be one of the most important management initiatives ever undertaken by the Pacific Council. We've studied a lot of IFQ programs from around the world and we believe that IQs combined with other management measures can greatly improve the sustainability and economic viability of fisheries. E.D. is very committed to working in partnership with the Council and with all of the stakeholders to ensure that the West Coast trawl IQ process considers a full range of alternatives and their impacts. We really believe that if we work together we can design a program that meets the needs of the resource, industry, and our coastal communities. So we're going to provide you with some written comments, but I wanted today just to highlight, just concentrate on things that I don't think are in the scoping document at this time, that we ought to include to expand the scope at the beginning of this process before we start narrowing the scope.

And first of all, over on the general ideas of alternatives to be analyzed, given Council action on the programmatic bycatch EIS and some of the bycatch objectives that are identified during this process so far, that we should include another alternative for analysis which would be to look at having bycatch caps or incidental catch caps—I don't think I have my terminology quite right—for the overfished species, for all sectors, and then, where possible, allocate them as individual tradable quotas that could be traded between sectors as well as between individual vessels.

We also are concerned that when we design IFQ programs that it is critical that we understand and address the concerns of coastal communities. We're actually going to present a report to the Council in September that will describe the concerns of coastal communities that may not otherwise be engaged in the planning process, and some means of mitigating potential problems based on a summer-long outreach effort that we're currently undertaking. At that time we might have some additional design proposals, but at a minimum we think that it's too soon to take off the table initial allocation to coastal communities. And so we should include CDQs or some other mechanism to allocate to coastal communities.

In addition we ought to look at some other alternative that might be able to be explored to help maintain fishing and processing opportunities within coastal communities. One option that we recommend is to hold back some percentage of the IQ each year to be allocated annually based on joint proposals with processors and fishermen. Fishermen and processors could present their proposals to the Council or some other body that would rank proposals based on a set of criteria that could include things such as contribution to coastal jobs, maintenance of processing opportunities, sustainable fishing practices, among other ideas. This is based on the British Columbia GDA mechanism, but of course we would modify it to meet the needs of our fishery.

We also think that we should analyze some initial allocation to skippers that could demonstrate some specific history of dependence on the fishery.

Also, in terms of the issues of area-specific IFQs, there may be localized depletion concerns that could warrant area-specific IQs. Therefore we recommend the consideration of area-specific IQs based on socioeconomic as well as biological considerations.

I'm not going to talk about things that are already in the document, although there are certainly some very important monitoring options and others that we think are going to be critical to design of a good program. Finally, one other area that I think we'd like to see a little extension is there's a section on trying to look at maybe a loan program or other options for new entry. We suggest [including] a mechanism [that allows] coastal communities to form nonprofits whose purpose would be to hold and lease quota to community members, that would allow these nonprofits to then qualify for loan program opportunities.

We have not addressed issues related to inter-sector allocations, not because they're not important, but because we know this is a separate EIS. But it's clearly going to be a very important and difficult set of decisions, and we believe that the impact analysis and the controversy of these decisions that we shouldn't wait too long to start that process. I urge the Council to being that soon, and modify the allocation committee to ensure that all sectors and stakeholders have representation and are actively involved.

Mr. Denny Burke – Fisherman with 55-foot crab, blackcod, shrimp boat

I support quota. The trip limit system that we have now isn't really an effective tool with the amount of fish available. When we get our 60-day limit, we really have 15, maybe 20 days and we're done. So if a guy doesn't have something else to do, he parks his boat a lot. So I'm for something other than what we have now, but having said that, I want to express that I have fear for the future. I've had my boat close to 20 years, and in that 20 years every year I've seen less and less access to the ocean and to fish. I mean, I used to catch a lot more pounds than I do now, and it's not because the fish aren't there; the fishing's actually good. I just don't have any access. So I'm for quota, but I'm hoping that as this thing comes down the road, when allocation comes, a guy's share isn't less than he already has now. I mean, what I consider we have now is a real weak pot of soup. It's been watered down, and what's left hardly keeps you alive. Dragging really is maybe 25-30% of my income, and I hope that when this thing's done, it doesn't give a guy less share than he has already, 'cause what he has now isn't enough to stay in business. And along those lines, something I want to ask the Council is, you're gonna get a lot of pressure to change that cutoff date. People are going to want to extend that, and I hope that they stick to their guns and keep it at the November 2003. That's one thing that can help. Another thing, I hope they don't do to make the pot of stew even weaker than it is already is spread the allocation any further, in other words, right now we don't have access to the ocean. We don't have pounds today, and all we're talking about is the catchers. I mean, the fish is divided among people that are on the boat fishing, the trawlers, it's open access, fixed gear, but it's the actual catchers. There's other groups now looking for allocation—processors, I've heard suppliers, you know; I'm not selfish, but if I have 20 days out of 60 days that I can work now, and somebody else wants some of that, am I gonna get 10 days? So I'm for it. I just hope that when it's over, we don't all look each other in the eye and go "whoa, that was another mistake" because a lot of things that we've done, I didn't see any relief, really, from limited entry; so far I haven't gotten an increase from buyback—the only good thing is so far, there's no payback. And I hope that stays that way. Cause I mean, you know, my cannery has more boats than it used to, and my limits are no better. So I can wander on forever. I'm for this; obviously status quo isn't going to get it. But we can't water this down any more than it is. Everybody wants a piece of the pie. It's an awfully small pie already. I hope it stays where it started, which is with the fishers. Thank you.

WRITTEN COMMENTS

Following are the actual written comments received.

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July 29, 2004

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Pacific Fishery Management Scoping Council

PFMC

Concern: Access Privileges
Individual Fishing Quotas

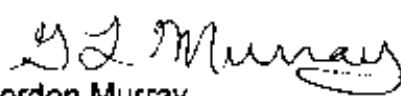
I started working on West Coast Trawlers in Eureka, CA in 1970. I worked on deck for 8 years. In 1978 I started operating a multitude of West Coast Trawlers. As a Captain I saw the fishery as prolific and sustainable.

I have devoted over 20 years of my life to catching groundfish as Captain/Manager. I have saved money towards purchase of a Trawler in the Capital Construction Fund. I may lose over half of this fund as my ability to buy a boat has changed with the buyback.

Captain/Crew who were responsible for significant past catch records but did not own the vessels they fished should not be overlooked and instead be granted IFQ Access Share in groundfish. As I state my situation I speak for many others.

I received nothing from the buyback. I am unemployed in less than a viable job market in my preferred and chosen profession.

Access to groundfish after many years of past catch history seems just. More just than Processors acquiring IFQ.

Sincerely, 

Captain Gordon Murray
Past Captain of the FV Blue Horizon
PO Box 948

Astoria, OR 97103

Email Address: Gordon & Murray @ EarthLink.NET

Cell: (503) 551-4846

Coastal Jobs Coalition

Working for Sustainable Fisheries and Communities

Testimony of Kent Craford
Pacific Fisheries Management Council IQ Public Scoping Hearing
Foster City, CA
June 13, 2004

My name is Kent Craford and I am the director of the Coastal Jobs Coalition. We are a group recently formed by the West Coast Seafood Processors Association to evidence the broad base of support for balanced fisheries rationalization that recognizes and provides for all stakeholders in the West Coast groundfish fishery including seafood-dependent communities.

I am here today representing dozens of companies and organizations employing thousands of people in primary processing and its supporting industries including transportation, cold storage and packaging for example, in addition to seafood industry customer groups like restaurants. Together, these many specialized sectors make up the seafood industry.

Thank you for the opportunity to comment today on reasonable alternatives for the development of dedicated access privileges for the West Coast groundfish trawl fishery, and potential impacts of those alternatives.

First, I would like to express our coalition's strong support for dedicated access privileges or individual quota systems. There are significant, economic and management benefits that can be derived from IQ systems for these two groundfish fisheries. But the key to attaining those benefits, especially economic benefits, is in the proper design of an IQ system.

We've heard it said many times by both processors and fishermen that neither can exist, much less succeed, without the other. Therefore it is imperative that any IQ plan developed for West Coast groundfish recognize this fact, and work in such a way as to foster the vitality of both for their mutual benefit, and the benefit of the communities which depend on them. And so, the primary message we would like to send today is that any IQ system must provide equally for harvesters and processors. A balanced approach will bring needed stability to both sectors, their supporting industries as well as coastal communities.

With this in mind, we formally propose the inclusion of the following alternatives, to be given full and equal consideration in the EIS process in addition to those already outlined by the Ad Hoc Trawl IQ committee. We feel that the socio-economic impacts of each of these alternatives should be analyzed fully and independently of each other. The alternatives we propose are:

1. The establishment of Community Quota or CDQ, to operate parallel to an IFQ. Despite use in other fisheries, this option was rejected by the Ad Hoc Trawl IQ Committee without sufficient justification. CDQ is a reasonable alternative and should be analyzed in the EIS.
2. An auction-based system should be analyzed as a reasonable alternative to status quo or an IFQ system. Such was the recommendation of NRC as referred to in the scoping document. Such a system has merits and should be analyzed.

As stated in the EIS scoping document, initial allocation of quota is the most controversial aspect of quota systems. Recognizing the tremendous economic and social impacts and shifts that will occur through the initial allocation of fishing quota if an IFQ system is adopted, we support analysis of various combinations of IFQ initial allocation. We feel that each of these deserves equal consideration as a reasonable alternative to status quo within the EIS. They are:

3. 50/50% initial allocation of individual fishing quota to trawl permit owners and primary processors
4. Combinations of initial allocation of individual fishing quota to trawl permit owners, primary processors, and community entities.

Additionally, the Coastal Jobs Coalition supports analysis of existing dedicated access privilege or quota systems related to the above mentioned alternatives as well as others considered in the EIS. As part of this analysis, we feel it imperative to study our nation's most recently rationalized fishery, Bering Sea Crab.

We recognize and understand that Congress has temporarily prohibited the consideration of such a system as a reasonable alternative to status quo for West Coast groundfish. But, analysis of that system is appropriate for learning purposes.

As seafood industry businesses, we feel strongly that the short experience we have had with Bering Sea Crab rationalization will speak well for the socio-economic benefits that such a balanced approach can have for processors, harvesters, communities, and all stakeholders in the seafood industry. Ignoring the most recent and relevant American fishery quota system as we try to develop our own from scratch would be foolish.

Finally, we must express our concerns that this EIS process is premature. It has been recognized that allocations between groundfish harvest sectors will need to be negotiated before any trawl IQ system can move forward. Why is this not being done first? To march down the path towards an IQ system without even knowing where the trawl fishery stands vis-à-vis fixed gear, open access and recreational fisheries is putting the cart before the horse.

Over the coming months as the Council and its appointed committees analyze options for groundfish and whiting IQs, the Coastal Jobs Coalition plans to participate actively to ensure that the full range of reasonable options are investigated. We look forward to working with you and thank you again for the opportunity to comment.

August 2, 2004

Mr. Don Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

IFQ Scoping Comments

Dear Chairman Hansen:

Designing a groundfish trawl dedicated access privilege system, which uses individual quotas may be one of the most important management initiatives ever undertaken by the Pacific Council. Experiences from around the world show that properly designed IFQ programs, when combined with other management measures, can greatly improve the ecological sustainability and economic viability of fisheries.

Environmental Defense is committed to working in partnership with the Council and all of its stakeholders to assure that the west coast trawl IQ process considers a full range of alternatives and their impacts. By working together, we are hopeful that we can design a program that meets the needs of the resource, the industry and our coastal communities.

To this end, we have reviewed the June 2004 scoping document, and offer the following recommendations regarding the range of alternatives, IFQ design elements, and impact considerations. These are preliminary recommendations intended to meet the NEPA deadline, and we intend to provide ongoing comments through the Council process to encourage that the concerns of all stakeholders be adequately considered.

Additional Alternatives to Be Considered

Sectoral Bycatch Caps Allocated as Transferable Bycatch Quota

An additional alternative that should be considered is to develop hard bycatch caps for overfished species for all sectors of the groundfish fishery as a whole. Then, for the sectors where feasible, allocate the sectoral bycatch allowance as tradable Individual Bycatch Quota, which could be tradable between sectors as well as between individual vessels.

IFQ Design Elements

In designing an IFQ program, it is critical that we understand and address the concerns of coastal communities for which fisheries are an important part of their economy and culture. Environmental Defense intends to present a report to the Council in September that will describe both the concerns of coastal communities who may not be otherwise engaged in the planning process, and means of mitigating potential problems. The report

will reflect summer-long outreach efforts by our staff, and will describe strategies for ensuring that any IFQ system works for communities as well as industry and the environment. The results may provide some additional design options at that time. However, at a minimum the design options to be considered should include the following:

Initial Allocation

Out-migration of quota from a community has been a concern in other IFQ programs. Initial allocation alternatives should address the potential impacts on coastal communities. Mechanisms should be explored that would help maintain fishing and processing opportunities in coastal communities. One option that should be included is to hold back some percentage of the IFQ each year to be allocated annually based on joint proposals from fishermen and processors. Fishermen and processors would present their proposals to a committee that would include community representation and would rank the proposals based on a set of criteria that could include contribution to coastal jobs, maintenance of processing opportunity, sustainable fishery practices, among others. This option is based on the British Columbia Groundfish Development Authority but would be modified to meet the specific needs of our fishery.

We also recommend that initial allocation to skippers who can demonstrate some specific history and dependence on the fishery be analyzed.

With respect to Initial Allocation options that have already been identified, we support exploring using an auction mechanism, but recommend that it be tiered to provide opportunities for diverse operations to effectively compete for quota.

Area-Specific IFQs

There may be localized depletion concerns that could warrant area-specific IFQs. Therefore, we recommend consideration of area-specific IFQs based primarily on biological considerations. We suggest that agency and academic biologists recommend how best to determine area- and stock-specific management. Area-specific IFQs should also be considered as an option for protecting community interests, balanced with the need for flexibility and transferability to meet the primary objectives of the IFQ program.

Other Design Elements

Monitoring

Through our examination of other IFQ programs, we have been convinced that a key component of programs successful at achieving environmental goals have been individual accountability. Fishermen, managers, and processors in British Columbia alike testify to the importance of effective monitoring to support accountability. We support the 100% at-sea observer alternative as well as 100% dockside monitoring and mandatory VMS options that are included in the scoping document as critical design elements. We would also suggest that an explicit ban on highgrading be included.

Environmental Performance Objectives

The Council should develop measurable environmental performance objectives to which the IFQ program should be held accountable. Environmental performance objectives should be designed to protect habitat, conserve forage species, and sustain target and bycatch species/populations. Such objectives can result in innovative, practical, and cost-effective gear designs and fishing practices.

Cost Recovery

Environmental Defense supports cost recovery for the monitoring activities described above as well as industry financial contributions to research and management phased in over time. In order to preserve options for small boat participants, we also urge the consideration of some form of "sliding scale" or initial loan opportunities for members of the fleet that might otherwise be put at a disadvantage in paying for the costs of monitoring, management and research. Phasing of cost recovery should also be considered, to allow for a transition to a more profitable fishery that is more capable of cost recovery.

Level- Entry Opportunities

The scoping documents describes options for establishing a loan program to assist new entrants, small boat operators and crew who meet qualifying criteria in acquiring quota shares. We recommend that coastal communities be allowed to form non-profits whose purpose would be to hold and lease quota to community members; and that these non-profits also qualify for any loan program opportunities.

Definition of Individual Quotas as Privileges and Ensuring Against Defacto "Rights"

Congress was careful not to create a vested property right under Magnuson-Stevens, which states that an IFQ "shall not create, or be construed to create any right, title, or interest in or to any fish before the fish is harvested." (1996 Cong. US S 39 s 108(d)(3)(D)). Similarly, the National Marine Fisheries Service defines IFQs as a harvest privilege only and not as property for purposes of a takings claim.¹ The federal rule establishing an IFQ program in the Atlantic also emphasizes this point: "The system is not irreversible. It does not convey property rights in the resource...the right to sell an allocation exists only until the Council or the Secretary amend the FMP to modify or withdraw the allocation scheme." (55 Fed. Reg. 24187 (1990)).

¹ NFMS stipulates that the privilege "may be revoked or amended subject to the requirements of the Magnuson Fishery Conservation and Management Act and other applicable law." (50 C.F.R. s. 676.20(g) (1995)).

The government creates IFQs, and therefore has the ability to define them to ensure that they will not be considered legal property rights.² We encourage the Council and NMFS to include unambiguous language that is thoroughly vetted with those stakeholders who have expressed public concerns about IFQs constituting or evolving to become a defacto property right.

Conclusion

These scoping comments are focused on broad alternative and trawl IQ program design issues which were either not identified or had been initially rejected by the Trawl IQ Committee. We have not addressed issues related to inter-sectoral allocation. Clearly, this is going to be an important and difficult set of decisions and impact analyses that must occur before any trawl IQ program is implemented. We urge the Council to begin the inter-sectoral allocation EIS process as soon as possible and to modify the allocation committee to ensure that all sectors and stakeholders have representation and are actively involved.

We will be presenting additional information and comments based on ongoing outreach efforts in September and look forward to working closely with the Council, NMFS, and stakeholders on all aspects of this important management initiative throughout the design and implementation process.

Sincerely,

Rod Fujita

² The government can thus avoid takings claims under the Fifth Amendment. See Robert H. Nelson, 1986 U. Ill. L. Rev 363, 374 (1986).

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INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA

AND THE UNITED STATES OF AMERICA

June 30, 2004

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PFMC

Dr. Donald O. McIsaac, Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

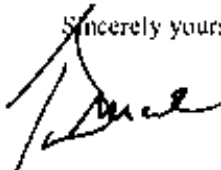
Dear Don,

The staff of the International Pacific Halibut Commission (IPHC) has reviewed the materials available at the June meeting of the Pacific Fishery Management Council regarding the proposal for an Trawl Individual Quota (TIQ) program. An IQ program for this fishery clearly has the potential to address some of the problems currently facing this sector on the Pacific coast. However, the Council briefing document on the TIQ program suggests that prohibited species bycatch, which would include Pacific halibut, would be allowed to be retained by trawl vessels, presumably for sale. We have several comments on this issue for the Council as it develops the elements of the program.

1. Any provision allowing retention of trawl-caught halibut would require IPHC approval. Permissible gear for the retention of Pacific halibut is governed by the Halibut Convention between the U.S. and Canada and must be approved by the IPHC. Current IPHC regulations do not allow trawl-caught halibut to be retained, so allowing this type of retention would require approval by the IPHC and a change in IPHC regulations. In addition, the IPHC would need to address other management measures, e.g., fishing season and minimum size limit. Recent proposals to the Commission requesting trawl retention of halibut have not been approved, so it is unlikely that the Commission would adopt this proposal.
2. The Halibut Catch Sharing Plan (CSP) would need to be amended to account for retention by this additional user group. The CSP currently allocates the annual available halibut yield among recreational, directed and incidental commercial, and treaty tribal fishers. Allowing retention by trawls would effectively create another user group for the halibut resource off the west coast, which the Council would need to include in the CSP.
3. Effect on bycatch reduction. In 1991, Canada and the U.S. agreed to reduce halibut bycatch mortality in non-target fisheries by 50 percent. Requiring retention would, in effect, double the amount of legal-sized halibut mortality by the trawl fishery, as the current discard requirement allows for survival of those in the best condition, or 50 percent of the total caught. In turn, this 100% mortality associated with trawl retention would decrease the yield available to the other current harvesters of the halibut resource. The amount of additional mortality exceeds the current catch limit for the directed commercial halibut fishery.

A member of our staff will be attending the meeting scheduled for July 20, and can answer any questions the technical group may have.

Sincerely yours,



Bruce M. Leaman
Executive Director

cc: Commissioners

Chuck Wise
President
David Birt
Vice-President
Lynn Mylonakis
Secretary
Mariyse Tattistella
Treasurer
In Memoriam:
Nahumel S. Bonglans
Harold C. Christensen

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W.E. Zeker-Gander, Jr.
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Glen H. Spain
Northwest Regional Director
Michele Farris
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30 July 2004

BY FAX AND BY MAIL

Dr. Donald McIsaac, Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220

RE: Comments on Notice of Intent to Prepare an Environmental Impact Statement (EIS) for Consideration of Establishing an Individual Fishing Quota (IFQ) System for the Pacific Coast Groundfish Trawl Fishery.

Dear Dr. McIsaac:

The Pacific Coast Federation of Fishermen's Associations (PCFFA), representing working men and women in the west coast commercial fishing fleet, has reviewed the document noticed in the 24 May 2004 *Federal Register* (Vol. 69, No. 100, pp.29482-29485) noticing the intent of the Pacific Fishery Management Council to prepare an Environmental Impact Statement (EIS) and take scoping comments for the purpose of considering an Individual Fishing Quota (IFQ) system for the Pacific Coast groundfish trawl fishery. PCFFA, which represents some trawl fishermen along the central and southern California coast and various limited access and open access longline and hook-and-line fishermen in the groundfish fishery, has the following comments:

Consideration of Trawl IFQ Program is Premature

PCFFA believes that prior to proceeding with the preparation of an EIS to consider an IFQ system for the Pacific groundfish trawl fishery a number of steps must first be taken. It is premature at this time to be considering an IFQ system for trawling or any other sector of the groundfish fishery until the following occur:

1. **Analysis of Affect of Buyback on Trawl Effort.** Prior to moving ahead with an IFQ system, basing the reasons on many of the factors preceding the buy-back, that just took place this year, an analysis should be done to describe what the affect has been. Has the buyback appreciably reduced effort in the trawl fishery? Have vessels with "latent" trawl

permits moved in to fill the void left by the departure of the buy-back vessels? How does the new trawl fleet catch capacity/economic needs stack up against projected groundfish stock abundance? An analysis of the existing system as affected by the buy-back is needed prior to moving to a new system that may not be warranted by such an analysis.

2. ***Reallocation of Quota Back to Other Groundfish Sectors.*** Prior to moving ahead with consideration of an IFQ system for the trawl fleet, the Pacific Council has an obligation to consider the needs of the non-trawl limited entry fishery and the open access fishery. Both of these fisheries have watched their share of the groundfish resource be whittled away since 1982 in order to provide for the bycatch of the trawl fleet and the somewhat specious claims by some processors that they had to have access to trawl-caught groundfish throughout the year, disregarding either biological considerations (e.g., spawning periods) or economic considerations (the higher value of some of the hook-and-line or longline caught fish). Now that it is evident trawl groundfish may not be available throughout the year and the need to maximize the value of the fish that can be taken, the Pacific Council should consider first reallocating some of the total catch back to the non-trawl sector prior to issuing quota shares in the trawl fishery.
3. ***Establishment of National Standards for IFQ Systems.*** Neither the Pacific Council, nor the National Marine Fisheries Service should proceed with any IFQ system until Congress establishes national standards for the creation of such systems. Since 1996, Congress had a moratorium on IFQ systems, which was to allow time for NMFS to prepare a set of standards for IFQ systems. NMFS failed to do what Congress asked and the moratorium elapsed in September 2003. There is legislation currently in the House and language has been introduced in the Senate to establish standards. The Pacific Council and NMFS should wait, out of deference to the Congress and out of respect for those in the groundfish trawl fishery (in the event Congress enacts standards forcing changes in any groundfish IFQ system), until national standards for IFQ systems are established to assure any program created by the Pacific Council is consistent with the national standards.

Justification of an IFQ System

PCFFA recognizes that for some fisheries an IFQ system may be preferable, providing a number of conditions are met, including assurances that all the active participants in the fishery have access to quota, the quota is apportioned fairly, and ownership of quota is restricted to fishermen. However, in addition to the concern raised above that consideration of an IFQ system for the groundfish trawl fishery is premature at this time, PCFFA believes the rationale given in the notice, fails to make a compelling case for consideration.

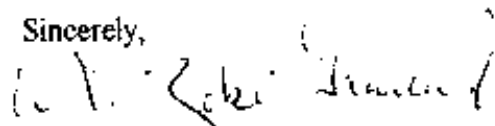
1. ***Bycatch Reduction.*** The proposal for consideration of an IFQ system discusses the bycatch issue in the trawl fishery but fails to say how an IFQ system will improve lessen bycatch over the current trip limit system. Are bycatch quotas being considered as well? Not only is no basis given for how bycatch will be reduced under an IFQ system, the issue of "highgrading" (i.e., sorting through fish to take only the largest or most valuable fish pursuant to a quota) is totally ignored. The notice discusses the problem the groundfish fleet has with being constrained, not be allowed to fish abundant stocks because of the incidental take of less abundant species. That issue is hardly unique to groundfish, but is something the salmon fishery has had to deal with since the Pacific Council instituted "weak stock" management for that fishery.

2. ***Change in Rationale for Groundfish Fishery?*** In the notice it is mentioned one of the advantages for fishermen under an IFQ system is the ability to fish when they want, when the weather and markets are best as well as to access other fisheries. This rationale is contrary to that given by the Pacific Council for nearly two decades to assure there was groundfish fishing year around to supply shoreside plants and processing lines. Indeed, as mentioned above, the rationale for wanting a year around trawl fishery was used to take catch from the non-trawl fishery. How does the Pacific Council and the IFQ proponents explain this change in rationale for groundfish management?
3. ***Cost of an IFQ Program.*** No mention is made of the increased cost of IFQ systems, or even the cost of preparing the EIS, at a time when the councils and NMFS are under pressure to contain costs given the magnitude of the federal budget deficit. PCFFA questions proceeding with an EIS at this time given the costs and the issues raised above, or the ability to pay for such a system if it were adopted. The cost issue has to be carefully considered.

PCFFA, for the reasons state above, urges the Pacific Council not to proceed at this time with the preparation of an IFQ system. The only reason PCFFA can see for rushing ahead with an IFQ system at this time is to grant as much of the fishery as possible to the trawl vessel owners with large catch histories. This is not a proper basis for moving ahead at this time.

If you have any questions regarding these comments, please do not hesitate to contact us.

Sincerely,



W.F. "Zeke" Grader, Jr.
Executive Director



Pacific Marine Conservation Council

May 25, 2004

Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

Re: Trawl Individual Fishing Quota public scoping document

Dear Chairman Hansen,

The Pacific Marine Conservation Council (PMCC) is a public-benefit, non-profit corporation that works with fishermen, marine scientists, conservationists, and the general public. PMCC seeks to ensure that needed steps are taken to rebuild and sustain depleted groundfisheries along the West Coast, as well as to balance healthy marine ecosystems with viable fishing community economies.

PMCC is very concerned that the development of an individual transferable quota (ITQ) system for the trawl sector of the groundfish fishery is moving forward with inadequate forethought. The haste in which the Pacific Fishery Management Council (Pacific Council) is being asked to approve a public scoping document to support this development is objectionable, and commencing scoping for a trawl ITQ environmental impact statement (EIS) is, in itself, inappropriate and premature.

The Pacific Council should decline to approve a public scoping document for a trawl ITQ-EIS, and should instead recommend that NOAA Fisheries proceed with the issuance of a Notice of Intent (NOI) to prepare a comprehensive programmatic EIS that will facilitate an open public process for planning for the future of the groundfish fishery as a whole. Within this programmatic EIS process, scientific investigation should occur which examines the biological, social, and economic implications of instituting various forms of dedicated access privileges within the West Coast groundfish fishery – including the possibility of ITQs in the trawl sector. The Pacific Council could, through the programmatic EIS process, also draw on the expertise of their Science and Statistical Committee (SSC) to attempt to reconcile divergent scientific points of view on this controversial subject. This process would assist the Council in deciding whether or not to move forward with an EIS regarding a specific IFQ program – based on a credible scientific foundation.

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A comprehensive programmatic EIS must be completed for the West Coast groundfish fishery prior to consideration of options for new forms of dedicated access privileges specific to the trawl sector of this fishery.

PMCC has consistently cautioned against moving forward with a major management change such as a trawl ITQ program, and its associated allocations, before taking stock of the major changes that have already occurred in the groundfish fishery in recent years. These include several overfished species with rebuilding plans under development, large areas of the continental shelf closed to certain types of fishing effort, the buyback of 91 trawl permits and the subsequent transfer of at least 17 latent permits, and environmental impact statements under development for both bycatch and essential fish habitat. PMCC has called for analysis of these major changes and linkage between the various National Environmental Policy Act (NEPA) initiatives. This would require an open, public process, where informed decisions can be made about a vision for the future of the groundfish fishery – a comprehensive programmatic EIS.

Prior to taking the radical step of seriously considering ITQ-based management, it is essential to review and analyze the impacts of recent changes to the groundfish fishery, and important new information that is now available. NEPA (at 40 C.F.R. § 1502.9(c)) requires preparation of supplemental [programmatic] EIS when “the agency makes substantial changes in the proposed action that are relevant to environmental concerns;” or when “there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” The groundfish fishery certainly qualifies on both accounts, and it would be entirely appropriate for the Pacific Fishery Management Council to urge NOAA Fisheries to begin work on a programmatic EIS as soon as possible, both for the utility of the process and to comply with the law.

The willingness of NOAA Fisheries to fund the trawl ITQ-EIS process should raise concern in light of a statement made by Bill Robinson of the Northwest Region at the June 2003 Council meeting, when development of a comprehensive programmatic EIS was abandoned in order to focus more narrowly on bycatch. From page 34 under B.12.b of the NMFS report: *“Mr. Robinson wanted to point out to the Council that the concept of a broader programmatic EIS is still alive as far as NMFS is concerned. But the resources available didn't allow preparing three major EIS's simultaneously. The EFH EIS and bycatch reduction are mandated by the Court so they take precedence. Hopefully, NMFS can prepare a programmatic EIS in the future once resources were made available.”* Yet, resources were apparently found for developing a trawl ITQ, instead.

The Notice of Intent (NOI) to prepare an EIS regarding implementation of dedicated access privileges in the groundfish trawl fishery is deficient, and some premises set forth in this NOI can be considered misleading.

Providing exactly 21 days of notice of the only Pacific Council meeting-associated scoping session, as is here the case, for an EIS which would herald a major departure for Council-system management is outrageous. When taken along with a promise to provide a draft public scoping document *at the time* of the session, outrage must turn to grief for the insult to public process that

this represents. This is an issue that affects people's lives, their livelihood, our ocean environment, and is integral to the future management of West Coast marine fisheries. This is not an isolated instance where the timing of notice limited the ability for the public to be involved with this process. The October 2003 meeting of the Ad Hoc Trawl Individual Quota committee was held after providing just 14 days advance notice in the Federal Register, the exact minimum notice required under the Magnuson-Stevens Act. Only 15 days Federal Register notice was provided for this committee's second meeting in March 2004.

Frankly, I'm surprised that this NOI was pushed to publication in the Federal Register, since I'm still not sure where the funding for this EIS might come from. Mr. Chairman, we have all heard about the attempt to access for this purpose the remaining \$550,000 or so in California's share of the groundfish disaster relief funds. The irony is clear: take funds that were intended to help the fishing community cope with the economic hardship of a fisheries disaster, then use that money to set up a system from which a few people will profit while putting many times more out of a job.

The authors of the NOI seized upon a phrase used by the U.S. Commission on Ocean Policy: "dedicated access privileges," perhaps as a euphemism for the vilified "individual fishing quotas." In fairness, the new term broadens the concept somewhat. However, there is a big problem here in that the NOI authors selectively take the work of the U.S. Commission out of context, completely omitting the commission's recommendation to enact national standards for implementation of dedicated access privileges – to guide processes like that being placed before the Pacific Council. (Please see page nine of these comments for a list of the U.S. Commission on Ocean Policy recommendations for minimum standards.)

It would seem that those developing this trawl ITQ would either rather not wait for Congress to enact standards such as those proposed by the U.S. Commission on Ocean Policy, or perhaps they just don't like those particular standards. Judging from the ITQ proponents' opposition to setting quota shares for limited durations, or even allowing participants in a fishery to vote in a referendum as to whether an ITQ system should be established, to name two standards, I the latter is likely the case.

The authors of the NOI also engage in an unfortunate misappropriation of the Bycatch Program EIS and the Pacific Council's choice of a preferred alternative. The Bycatch EIS is an important document designed to help guide the Pacific Council's program for bycatch monitoring and reduction over the next few years. The Pacific Council's preferred alternative moves toward sector-based bycatch caps, while making explicate the status quo efforts to quantify and minimize bycatch. Support for potential "future IFQ programs in appropriate sectors of the fishery" was mentioned, but not explained. The Pacific Council specifically *did not* choose an alternative in the Bycatch EIS that would have centered around "rights-based" management, even though this option was presented to the Council as an alternative. To use the Bycatch EIS in any way to form a programmatic nest for a trawl ITQ is worse than a stretch, it would be utterly misleading and disingenuous.

This is not to say that IFQ systems could not have a beneficial impact on bycatch reduction. Apparently most have not, though, and many IFQ systems have exasperated bycatch problems. Since the NOI highlights bycatch and the constraints imposed by encounters with overfished species

as major problems in the West Coast groundfish fishery, it will be interesting to see how the offered public scoping document proposes to reduce bycatch over the status quo, if in fact this is attempted. If peer-reviewed science is offered that is contrary to much of the current literature, this could be useful within the scientific review process discussed earlier, in the context of a comprehensive programmatic EIS, including consideration by the SSC.

In any event, the Bycatch Program EIS needs to lead in short order to a Fishery Management Plan Amendment that fully addresses bycatch monitoring and reduction, in a legally-compliant fashion. A hypothetical trawl ITQ years in the future is not going to fulfill this requirement, any more than the Bycatch EIS lays the foundation for a trawl ITQ.

Again, it comes back to a reasonable mandate: the Pacific Council and NOAA Fisheries should fully engage in developing a comprehensive programmatic EIS, linking disparate efforts in a thoughtful, measured way, and fully engaging the public. This step could go a long way toward improving a management system that has too often been crisis-driven.

The process leading to the public scoping document has been severely flawed, inherently tainting the material offered to the Council.

When the Pacific Council's Trawl Individual Quota Committee (TIQC) met in March 2004, the TIQC continued to develop recommendations for *how* a trawl ITQ would function, working to create a public scoping document to "focus" public comment during scoping for an EIS that would support development of a trawl ITQ system. The committee report to the April Council meeting states: "Public scoping sessions are not a required part of the scoping process, however, because of the controversial nature of individual quotas and the scoping effort that has already occurred through the Trawl IQ Committee meetings, such sessions may be warranted. An open process that 'invites broad participation by stakeholders' is one of the recommendations contained in the National Research Council report produced pursuant to the Sustainable Fisheries Act."

PMCC continues to maintain that an open process is needed *before* considering moving forward with developing a specific IFQ program. Systematically attempting to narrow the scope of alternatives for the groundfish fishery by presuming that a trawl ITQ system (or even trawl "dedicated access privileges) is the public's preferred general direction is premature. Spending federal resources to support the TIQC's development of specific recommendations which may further prejudice public scoping (because recommendations have been agreed to by a Pacific Council-appointed committee, and now potentially approved by the members of the Pacific Council) raises eyebrows – especially when interested stakeholders from recreational, fixed gear, open access, and other potentially impacted fisheries have been deliberately excluded – along with conservation groups that support the agenda of the Marine Fish Conservation Network (a coalition of over 170 conservation groups, commercial and recreational fishing organizations, and marine science groups), that new IFQ programs should not be established until after Congress enacts national standards that protect fishermen, coastal communities, and the environment from the many potentially harmful effects of this type of management.

The preliminary motion creating the TIQC, made by trawl fisherman and Pacific Council member Ralph Brown, specifically named eight trawl fishery and three processor representatives as the primary representation. Although the official motion was modified to describe representation rather than individuals, the same people ended up appointed (along with a tribal representative, a representative from enforcement, and, later, another processor). The named individuals also included a contractor with Environmental Defense (ED) as a "conservation" seat. It is well known that ED is very unusual in the conservation community as proponents of rights-based management; the staff of ED had been strongly advocating in support of IFQs, and the organization has since contributed money to support the Pacific Council's development of a trawl ITQ system.

Mr. Brown as well as several individuals who were appointed to this committee, which is primarily supported by public dollars, stand to see substantial financial benefit if a trawl ITQ is enacted, while other commercial and recreational fishermen excluded from the development process may lose market share, or even their businesses, depending on how the ITQ might be implemented. This situation argues strongly for legislation that would require council members to recuse themselves from votes which would have a direct financial implication upon their business. As it now stands, Mr. Brown did not violate any law by acting to support his personal financial self-interest.

But even conflict-of-interest reforms at the council level would not ameliorate the inherent flaws in setting up a committee designed to avoid dissenting opinions, other than the tensions of negotiating power between trawlers and processors. This is an insider, backrooms game that excludes adjacent commercial fisheries, the less-efficient trawl businesses, the entire recreational fishery, and the American public. There is no wonder that this process has inspired the widespread perception that what is going on here is a privatization of this country's ocean resources, a "theft of the commons."

For the Pacific Council to take the dramatic step of approving a scoping document for a trawl ITQ-EIS would be extraordinarily unwise, because this would quickly be interpreted as Council support for the basic idea that a trawl ITQ is desirable, and all that's left is to debate the precise structure and allocation of species. This would also be a rejection of the right of the public to have a voice in the future of West Coast groundfish.

Under objective criteria developed by the National Research Council, the West Coast groundfish trawl fishery is unlikely to be considered an appropriate fishery for implementation of an individual fishing quota system.

According to the National Research Council's Sharing the Fish: Toward a National Policy on Individual Fishing Quotas, "IFQ programs will be more successful when the following conditions are met:

- 1) *The total allowable catch can be specified with reasonable certainty.*
- 2) *The goals of economic efficiency and reducing the number of firms, vessels, and people in the fishery have a high priority.*
- 3) *Broad stakeholder support and participation is present.*
- 4) *The fishery is amenable to cost-effective monitoring and enforcement.*

- 5) *Adequate data exist. Because of the long-term impacts and potential irreversibility of IFQ programs, it is important that sufficient data are available to assess and allow the mitigation of, insofar as possible, the potential social and economic impacts of IFQs on individuals and communities.*
- 6) *The likelihood for spillover of fishing activities into other fisheries is recognized and provision is made to minimize its negative effects.*

Certainly a situation exists (1) in groundfish where the allowable catch for each managed species or group of species is *specified* each year, although most of these species have not undergone a complete stock assessment. I think the intent here is to point out the difficulty inherent in setting up IFQs for populations of exceptionally variable biomass, such as Dungeness crab or pink shrimp. However, implementation of IFQs can also be problematic in multi-species fisheries that include depleted populations with a low biomass. The need to rebuild the populations of these species demands a higher priority than quota-holder access to their percentage of healthy stocks. Data reporting limitations in other fisheries (including recreational) that encounter the overfished species, and potential overages in these fisheries, can also contribute to considerable uncertainty regarding access to quota.

The capacity reduction feature of (2) seemed to have importance in the trawl fishery during advocacy for the buyback, even though the trawl industry and NOAA Fisheries preferred to leave a substantial number of latent and underused permits available for those who took the buyback money to re-enter the fishery or expand their businesses, or for processors to purchase in an attempt to replace lost delivery capacity.

So, I'm not sure that capacity reduction is really a high value. The buyback reduced some capacity, and a large number of skippers and deckhands were put out of work, and the business plans of some processing plants were challenged. Whether additional consolidation, efficiency, and unemployment are desirable would depend upon one's point of view. Less than optimally efficient businesses that support coastal families can provide a substantial benefit to our communities, and IFQ systems have been observed to destroy such businesses from British Columbia to Iceland.

As far as (3) goes, we don't really know whether there might be "broad stakeholder support and participation," because the Ad Hoc Trawl Individual Quota committee was set up specifically to limit participation. In addition, the public has been resoundingly excluded by the continuing resistance to a comprehensive programmatic EIS process. Additionally, in September 2003, the Pacific Council heard testimony *against* inclusion of a referendum where participants in the fishery might vote on whether they wanted to develop and implement IFQs. On all accounts the Pacific trawl ITQ process fails this condition; this is clearly an insider play by those who would gain the most.

To suggest that airing these issues within the council process accommodates sufficient public involvement is inaccurate. Even the voting body of the Pacific Council itself does not include a fair and balanced cross-section of all sectors of the fishery and the public interest. This is not the fault of the Council, but rather a subject requiring national reforms. But the point is that the Pacific Council is an inadequate forum to ensure broad public participation.

On the other hand, there are many stakeholders who participate in the Council process – and discuss issues among themselves – who would be limited in their involvement in this scoping process, as the comment period, after an adopted scoping document is provided, does not include a Council meeting.

Number (4) is interesting, considering the long-time resistance of many in the trawl fleet to at-sea observers. Will industry now be willing to pay for 100% observer coverage, even with catch levels constrained by encounters with overfished species? Or will the public be expected to foot the bill, even as public resources are “gifted” to the private sector? Meanwhile, enforcement personnel are already strained with current tasks, as well as with national security.

We have huge problems with (5) because of lack of data in the biological, economic, and social realms. As mentioned earlier, most of the managed groundfish populations have not been fully assessed – there are not enough data available to assess many of them. The status of non-managed marine life is, in many cases, even more difficult to evaluate. As we move toward a more ecosystem-based management approach, the concept of operating a system of single species-based IFQs seems incompatible, if not outright bizarre. It gets worse if we consider the adaptive management consequences of in-season adjustments which attempt to ensure that total catch by species in the groundfish fishery as a whole stays within allowable levels, particularly those involving overfished species or bycatch species on a reduction plan; the IFQ setup might actually create a race-for-fish, driven by the fear that the accelerated mortality of constraining species might shut the fishery.

The social and economic impacts of (5) are also challenging. Useful new tools, such as the Groundfish Fleet Restructuring Information and Analysis (GFR) project, undertaken as a proof-of-concept by Ecotrust and PMCC, demonstrate that there are the means to look at the likely effects of IFQ-driven consolidation, unemployment, loss of infrastructure, reduction in diversity, concentration of fishing effort, deleterious impacts to the recreational fleet, and the adverse consequences suffered by communities. This argues for careful evaluation of these types of effects, their possible mitigation, and any offsetting benefits of IFQ programs, within the larger context of a comprehensive programmatic EIS.

This is a complex subject that needs to be informed by both biological and social scientists. The information to be provided by the analytical team is a start, but it would be prudent to have a substantial amount of data, which *could* be made available, provided to the SSC, the Pacific Council, and the public, *before* a decision is made to proceed with a trawl ITQ-EIS. The situation here involves approving a scoping document to go forward with this EIS without scientific foundation, based instead on self-interest and politics. This would, of course, bolster the case often made by critics of the council process, that scientific decisions – biological, sociological, and economic – should be insulated from the political realm, leaving only advice on allocation matters to the regional fishery management councils.

Finally, there should be no problem in recognizing the spillover probabilities (6) of a trawl ITQ, both due to increased capitalization and more flexible business planning. The Dungeness crab fishery in

Oregon, for example, saw a tremendous influx of pots this year, in part due to the capital infusion from the groundfish buyback. Many of the same individuals who took the profits of the buyback and expanded operations in other fisheries stand to also gain financial advantage through ITQs, and would likely continue expansion. We could run some sociological and economic analysis and make reasonable projections of expected behavior – and we should – *before* we decide whether to commit to the development of a trawl ITQ-EIS.

These are just a few criteria for evaluating whether a fishery might be a candidate for IFQ management, as posed by the National Research Council. There are a number of other biological, social and economic factors that can be examined in evaluating whether a fishery is appropriate for IFQs. NOAA Fisheries has begun some of this work by looking at IFQs in multi-species fisheries internationally. A draft of these findings was made available to the NRC, but apparently went no farther within the council system. It is only reasonable to expect the fisheries service to present these findings as completely as possible, along with the other material discussed earlier, through a comprehensive programmatic EIS, with vetting before the SSC, before encouraging the Pacific Council to move blindly on a path from which return would be difficult at best.

The Pacific Council deserves full information and adequate opportunity for deliberation, rather than a rush for approval of a scoping document. Certainly at the present it appears that the West Coast groundfish trawl fishery is not an appropriate candidate for IFQ management.

The way in which exploration of possible use of individual fishing quota systems in the Pacific Region has transformed into a headlong rush to implement a trawl ITQ, demonstrates clearly the vital need for Congress to enact strong national standards to protect marine ecosystems, commercial and recreational fishermen, our coastal communities, and the public trust from potentially substantial deleterious impacts of individual fishing quota systems. If Congress cannot act swiftly to pass standards legislation, such as HR 2621, then a moratorium on new IFQ systems should be established until national standards are adopted.

PMCC supports the national agenda of the Marine Fish Conservation Network (MFCN) regarding IFQs, including the following:

The Magnuson-Stevens Act should be amended to:

- *Acknowledge that marine fish are publicly owned and that IFQs are not property rights;*
- *Ensure that IFQ programs enhance fish conservation;*
- *Protect fishing communities from excess consolidation;*
- *Limit IFQs to no more than five years, after which they may be renewed if conservation is enhanced; and*
- *Recover all administrative costs*

The PMCC board of directors adds these additional requisite standards:

- *Any IFQ must have a community component that results in appropriate harvest in the full fishing ranges of traditional coastal communities.*
- *Any IFQ allocation should provide incentives for use of gear which has the least bycatch and the least adverse impacts on habitat.*
- *No provisions that allow for the transfer of bycatch quota (including non-target marine life and overfished or Endangered Species Act-listed species) will be allowed.*

More details about the need for national standards, and about the impacts of IFQ systems worldwide, can be found at <http://www.pacificmcc.org>.

The U.S. Commission on Ocean Policy also understands the compelling need to establish national standards, if dedicated access privilege systems are to be considered. The Commission recommended on page 235 of their Preliminary Report:

At a minimum, the national guidelines should require dedicated access programs to:

- *specify the biological, social, and economic goals of the plan; recipient groups designated for the initial quota shares; and data collection protocols.*
- *provide for periodic reviews of the plan to determine progress in meeting goals.*
- *assign quota shares for a limited period of time to reduce confusion concerning public ownership of living marine resources,*
- *allow managers flexibility to manage fisheries adaptively, and provide stability to fishermen for investment decisions.*
- *mandate fees for exclusive access based on a percentage of quota shares held. These user fees should be used to support ecosystem-based management. Fee waivers, reductions or phase-in schedules should be allowed until a fishery is declared recovered or fishermen's profits increase.*
- *include measures, such as community-based quota shares or quota share ownership caps, to lessen the potential harm to fishing communities during the transition to dedicated access privileges.*
- *hold a referendum among all permitted commercial fishermen after adequate public discussion and close consultation with all affected stakeholders, to ensure acceptance of a dedicated access plan prior to final Regional Fishery Management Council approval.*

Conclusions:

It is clear from the information presented in this letter that it would be decidedly inappropriate to approve a public scoping document for trawl dedicated access privileges at this time, or in any way to encourage NOAA Fisheries to develop an EIS solely for a trawl ITQ system. Nor should Pacific Council staff time continue to be diverted to this effort.

The appropriate, valuable, and legally-required course of action is for the Pacific Council and NOAA Fisheries to forthrightly begin scoping for, and development of a comprehensive programmatic EIS for the commercial and recreational groundfish fishery. This is the proper vehicle to fully assess the efficacy and impacts of the Rockfish Conservation Areas; decipher the actual impacts of the buyback program; create linkages between rebuilding overfished populations, assessing and reducing bycatch, and protecting essential fish habitat; investigate how to better implement ecosystem-based management; and...evaluate whether types of dedicated access privileges might be appropriate tools for some sectors of this fishery.

Seeking the best work in the biological and social sciences, including worldwide experiences with forms of dedicated access privileges, to incorporate into the analysis within a comprehensive programmatic EIS is a wise way to proceed. After this science is reviewed by the SSC, and general policy alternatives are selected for the future directions of the West Coast groundfish fishery, only then might it be appropriate to begin development of an EIS to support dedicated access privileges in a particular sector.

Respectfully,

Peter Huhtala
Senior Policy Director



Pacific Marine Conservation Council

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July 29, 2004

Donald O McIsaac, Ph.D.
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220

Re: Trawl IFQ-EIS scoping comments

Dear Dr. McIsaac,

These comments are intended to supplement oral testimony that Pacific Marine Conservation Council (PMCC) has made at scoping hearings for this environmental impact statement (Trawl IFQ-EIS) at Foster City, Seattle and Newport. Specifically, I'll take this opportunity to elaborate on PMCC's recommendation for the council and NOAA Fisheries to analyze an additional alternative, should a decision be made to proceed with this EIS.

To be clear, PMCC remains resolved that we believe that time and resources are being inappropriately diverted to designing a trawl dedicated access privilege system while a comprehensive programmatic EIS for the groundfish fishery management plan (FMP) is overdue. In addition, we believe that focus and resolve needs to be committed to completing the Bycatch Program EIS, its associated FMP amendment, and implementing regulations that make for effective monitoring and reduction of bycatch. There remains, nonetheless, the current Notice of Intent (NOI) and scoping process, and if the council decides to continue down this path then an additional alternative should be considered.

The problem statement in the NOI highlights the bycatch problems in the groundfish fishery, particularly the unintended encounters with overfished species. This statement summarizes some of these concerns as "uncertainties about the appropriate bycatch estimation factors, few incentives for the individual to reduce bycatch rates, and an associated loss of economic opportunity related to the harvest of target species." PMCC agrees that these are significant problems that should be addressed as quickly as possible.

The NOI makes reference to the council's preferred alternative for the draft Bycatch Program EIS. I'm attaching for the record your letter of April 27, 2004, to Regional Administrator Robert Lohn, describing this alternative. This alternative has many elements in common with the "Draft Proposal

for Counting and Minimizing Bycatch in the West Coast Groundfish Fishery” submitted by PMCC and other groups for analysis within the Bycatch Program EIS process. I’m also attaching this document. I will draw upon ideas expressed in these two documents in describing a new alternative for the Trawl IFQ-EIS.

This alternative is based on sector caps on the total catch of each overfished species. While this concept is discussed in the scoping document (2.0 Alternatives and Impacts) under “Cumulative Catch Limits” and “ICAs (Pooled Species Caps),” it would be useful to include some additional flexibility with these tools.

We would like to accommodate an approach that begins with sector-based catch caps (in this case the limited entry trawl sector, although there might be ways to further subdivide this sector to, say, delineate the whiting fleet). All vessels within the sector would be required to stop fishing once the cap for any species was attained. Adequate, but not necessarily 100% monitoring would be required. This is not a huge departure from status quo, although the allocation to the trawl sector of catch of the overfished species would be explicit, at least for the time period involved.

Permit holders would have the opportunity to opt out of their sector for the fishing season. If they make this choice, they take with them a proportionate share of the catch caps on each overfished species, which now become individual catch caps. The vessels that have opted out of the sector must carry an observer or a compliance monitor (if operating in a full-retention arrangement) or otherwise assure 100% accounting of catch. Incentives for opting out of the sector will be provided to offset the cost of monitoring, such as higher cumulative landing limits for non-overfished species. The other implicit incentive is that vessels that have opted out of a sector would get to continue fishing if their sector was shut down, as long as they stayed within their individual caps.

Those have chosen to accept individual catch caps would additionally have the opportunity to pool their caps with others who have opted out of the sector. However, the entire group that has pooled their caps would have to stop fishing upon attainment of the aggregate catch cap of any species. PMCC does not advocate making the individual catch caps for overfished species transferable.

Additional performance standards and incentives could be built into this system, as suggested in the “Draft Proposal for Counting and Minimizing Bycatch in the West Coast Groundfish Fishery.” We expect that some analysis of similar constructs for the groundfish fishery as a whole will be included in the final Bycatch Program EIS, as the authors complete work to incorporate public comments and the council’s preferred alternative.

Turning to Table 2.1-1 in the scoping document, this alternative could be described as “Alternative 5” and simply include this hybrid of ICAs and Cumulative Catch Limits as the means to manage the overfished species within the trawl fleet. All other species would be subject to status quo management. (I should acknowledge that, although this proposal is pretty specific it might be wise look more generically at CL/ICA management for the overfished species, as the council could then request to see a range of options analyzed within this alternative.)

I’m not sure how this will fit in your scoping report, but I’d like there to be a mechanism for looking at longer cumulative landing limit periods under status quo management – perhaps 3, 4, or 6 months – and how that might play out with the new Alternative 5.

One important area to consider when looking at Alternative 5 is the timeline for possible implementation. Elements of this proposal could be implemented more swiftly than other dedicated access privilege systems under consideration, while not precluding consideration of additional solutions. The benefits of superior accounting of bycatch to reduce uncertainty about the total catch of overfished species, and instituting incentive systems to reduce bycatch can lead to increased economic opportunity even as conservation mandates are fulfilled. Even though we are asking that Alternative 5 be considered and compared with other dedicated access privilege systems within the Trawl IFQ-EIS, the council could choose to move in this proposal into regulation without going through the lengthy process expected under other options. We believe this could be in place by the beginning of 2007, if not sooner.

Appendix A of the scoping document includes a discussion on area restrictions (A.2.0). We suggest anticipating that some groundfish stocks that are managed on a coast-wide basis may be determined in future years to include genetically distinct populations, and that we don't have the biological basis now to determine these future geographical ranges. Therefore, it's important to consider how any dedicated access privilege system will respond to or discourage future changes in area-based management, both for such biological reasons or for enhancing economic equity. Alternative 5 could provide the flexibility needed for making adaptive management decisions, particularly in that the catch caps are set by season and are non-transferable.

Thank you for considering this alternative and the other suggestions PMCC has made during this scoping period.

Respectfully,

Peter Huhtala
Senior Policy Director

Draft Proposal for Counting and Minimizing Bycatch in the West Coast Groundfish Fishery

March 31, 2004

This proposal to count and minimize bycatch relies on enhanced bycatch observation in the groundfish fishery, the use of bycatch caps for sectors of the groundfish fishery, and the continued use of spatial management to reduce bycatch. The sectors referred to in this document match those currently used in the Council's "bycatch scorecard" and can be further subdivided by area. We propose that a statistically adequate reporting methodology to assess the amount and type of bycatch occurring in each fishery be established using the criteria contained in "Evaluating Bycatch: A National Approach to Standardized Bycatch Monitoring Programs" (Powers Report) and "How Much Observer Coverage is Enough to Adequately Estimate Bycatch" (Pikitch report). Implementation will be phased in over time based on a ranking of need and feasibility consistent with these reports.

Proposed Alternative to Minimize Bycatch in the Groundfish Fishery

The proposed alternative is a modification of Alternative 4 in the Bycatch EIS. This proposed alternative would combine sector caps with continued use of spatial management to minimize bycatch. The groundfish fishery will initially be subdivided into the sectors defined by gear type (limited entry trawl, fixed gear, etc), as used in the bycatch scorecard (attached). These sectors may be further subdivided by the Cape Mendocino line (40-10) into North and South components and by the RCA, into fishing zones seaward and landward of the RCA. Vessel operators who want to fish both seaward and landward of the RCA must provide proof of past fishing in both of these areas using catch history for that vessel over the past three years. Upon further analysis, these sectors may be further subdivided into geographical areas to fit area-based management initiatives.

Caps on total mortality of each overfished species will be established for each sector, and a sector will be closed to fishing upon attainment of any of these caps. Additional management measures will be employed to ensure that the total mortality of every managed species stays within its OY.

Boats from within a sector can opt out of the sector cap, thereby preserving the opportunity to continue fishing if their sector is shut down, by meeting some established criteria such as funding 100% observer coverage for one's vessel. Upon opting out, a commercial vessel would get individual bycatch caps and incentives such as higher trip limits from a reserved portion of target species OY. This cap would be deducted from that of the vessel's sector. Vessels that opt out of sector allocations can form collectives to pool bycatch quotas amongst collective members. The entire collective is prohibited from further fishing once a collective bycatch cap is met.

Furthermore, vessels are permitted to switch to another sector by changing gear type. Similar to those vessels that opt for individual bycatch caps, bycatch cap amounts will transfer with the vessel to the new sector.

The initial bycatch caps will be for those species identified on the bycatch scorecard (bocaccio, canary rockfish, etc.), and the most current bycatch scorecard will be used to apportion the OY of each species among the sectors. The Council will review bycatch rates for other managed species not contained on the bycatch scorecard. If bycatch rates for these species are higher than an established threshold, a bycatch cap will be set for those species, and gradually reduced over time. As OY levels increase for the capped species, the increase beyond what may be needed as a buffer will be allocated to operators with the lowest bycatch rates among those with individual caps, and through other means that provide incentives for bycatch reduction individually, by sector and within collectives.

For species without set OYs (for example, unassessed species), information will be collected through a standardized reporting methodology for bycatch. After a to-be-determined time period of data collection, a bycatch cap will be established for individual species or species groups if bycatch of any unmanaged species is found to increase or decrease by 10% or more relative to the previous year. After a set number of years (e.g. five) after establishment of a bycatch cap, bycatch would be reduced by some set percentage (10%, for example) per time period through reductions in the caps, while providing incentives for those most successful at avoiding bycatch. In the interim, bycatch of unassessed and other species will be minimized by use of the RCA and additional spatial management measures as needed (for example, on the slope).

Establishing a Standardized Reporting Methodology for Bycatch

A bycatch reporting methodology will be established consistent with the criteria in the Powers and Pikitch reports. Groundfish fishing sectors will be analyzed consistent with these reports within the following categories: status of current reporting methodologies and bycatch interaction (fish, endangered animals and marine mammals). The sectors will then be ranked within the two categories. After consultation with appropriate NMFS and PSMFC staff, decisions will be made as to which sectors should be considered priorities for an enhanced reporting methodology. A timeline will be developed for establishment of this reporting methodology for each sector.

Reference Documents:

Powers report: http://www.nmfs.noaa.gov/by_catch/EvalBycatch.pdf

Bycatch EIS: <http://www.pcouncil.org/groundfish/gfbdpeis.html>

Pikitch report: <http://www.oceana.org/uploads/BabcockPikitchGray2003FinalReport.pdf>

PACIFIC FISHERY MANAGEMENT COUNCIL

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Donald O. McIsaac

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April 27, 2004

Mr. Robert Lohn, Regional Administrator
National Marine Fisheries Service, Northwest Region
Building 1, BIN C15700
7600 Sand Point Way NE
Seattle, WA 98115-0070

RE: The Pacific Coast Fishery Management Plan Bycatch Mitigation Draft Programmatic
Environmental Impact Statement

Dear Mr. Lohn:

At its April 5-9, 2004, meeting in Sacramento, California, the Pacific Fishery Management Council (Council) reviewed the Pacific Coast Fishery Management Plan (FMP) Bycatch Mitigation Draft Programmatic Environmental Impact Statement (DPEIS) released on February 20, 2004, and identified its preferred alternative for NMFS to incorporate into the EIS. This would be identified as Alternative 7 in the Final Programmatic EIS (FPEIS) and would contain elements of several alternatives described in the DPEIS. The Council approved the following motion describing the recommended preferred alternative:

Create a new Alternative 7 that includes elements of Alternatives 1, 4, and 5. Elements from Alternative 1 that would be included in Alternative 7 would be all current programs for bycatch minimization and management, including but not limited to: setting optimum yield specifications, gear restrictions, area closures, variable trip and bag limits, season closures, establishing landings limits for target species based on co-occurrence ratios with overfished stocks, etc. The FMP would be amended to more fully describe our standardized reporting methodology program and to require the use of bycatch management measures indicated under Alternative 1 for the protection of overfished and depleted groundfish stocks and to reduce bycatch and bycatch mortality to the extent practicable. These would be used until replaced by better tools as they are developed.

Elements from Alternative 4 that would be included in Alternative 7 would be the development and adoption of sector-specific caps for overfished and depleted groundfish species where practicable. We anticipate phasing in sector bycatch caps that would include: monitoring standards, full retention programs, and individual vessel incentives for exemption from caps.

Mr. Robert Lohn
April 27, 2004
Page 2

Elements of Alternative 5 that would be included in Alternative 7 would be the support of future use of Individual Fishing Quota programs for appropriate sectors of the fishery. The FMP would incorporate the Strategic Plan's goal of reducing overcapacity in all commercial fisheries.

Additionally, baseline accounting of bycatch by sector shall be established for the purpose of establishing future bycatch program goals.

Consistent with our recommendation, we ask the EIS project team to further describe Alternative 7 as necessary for the purpose of making it consonant with the descriptions of the other alternatives and to support sufficient analysis of its impacts on the human environment, but to not change matters of intent substance.

After this action is finalized, the Council will consider undertaking preparation of a new groundfish FMP amendment consistent with the findings in the FPEIS. We look forward to working with NMFS after the release of the FPEIS to implement the policies and program direction described by the preferred alternative.

Sincerely,



D. O. McIsaac, Ph.D.
Executive Director

KRD:rdd

Subject: Scoping Comments - I.D. 051004B
From: "Peter Huhtala" <peter@pmcc.org>
Date: Mon, 2 Aug 2004 14:21:28 -0700
To: <TrawlAccessEIS.nwr@noaa.gov>
CC: <Jim.Seger@noaa.gov>, <steve.freese@noaa.gov>

Comments on Notice of Intent to Prepare an Environmental Impact Statement, ID # 051004B

August 2, 2004

Pacific Marine Conservation Council (PMCC) offers a few additional comments.

Sunsets: In the scoping document under A.11.0, the TIQC rejects the inclusion of automatic sunsets. We recommend analyzing a range of sunset provisions from one to ten years. In addition, the concept of conducting a review of the performance of an IFQ system prior to the sunset date should be examined (For example, setting a review at five years and a sunset at seven years, so that continuation or expiration of the IFQ system could be anticipated as a result of the review.)

Short-term sunsets, say two years, might make for flexibility, especially in a system focused exclusively on the overfished species.

Sunsets put teeth in performance standards designed to ensure that IFQ programs achieve the goal for which they are designed. We recommend that any program be required to achieve measurable conservation gains, such as reduction of bycatch or significant habitat protection, or they not be allowed to continue. This helps to return some value to the public, the owner of the resource, for granting a valuable privilege.

Setting the duration of quota shares for a fixed period not only can clarify any confusion about property rights, as recommended by the US Commission on Ocean Policy, but can obviate possible equity and biological problems. Short-term arrangements allow management to avoid long-term proportional allocations between gear groups. As overfished populations rebuild, the structure of the available resource will change, as will the basis for inter-sector allocations. Sunsets avoid a possible conundrum.

Referendums: A range of referendum scenarios should be offered, including a double referendum where two-thirds of those involved in the fishery would be allowed to vote first whether to develop an IFQ system, and finally whether to implement the system. Consideration should be given to allowing anyone earning more than three-quarters of their income (permit holders, skippers, deckhands) from groundfish harvest to participate in the referendum.

Spatial analysis: In order to project some of the biological and economic changes that various IFQ management systems may bring, it would be useful to describe the current situations spatially, and model some scenarios. First, we could look at catch by fishing block and landings by port in as fine a scale as possible. In addition, we could look at estimates of biomass by area (NMFS survey & ?).

Then we could look at how catch and landings might occur if all stocks were at MSY (a goal of the council). Again, we could draw on the historical data-set from the NMFS surveys. Another run might forecast the state of the ecosystem in, say, 2020 based on the rebuilding plans now in place.

These sort of projections might inform decisions about whether and how proportional allocation between sectors might be set. But this is not just an allocation issue; it speaks directly to the design of any dedicated access system, and, I believe will make obvious the need to limit share distribution to short periods.

One concern that we've raised about possible IFQ plans is that they might encourage localized depletions of some populations. This would be especially problematic if it turns out that a stock managed on a coastwide basis is actually genetically-distinct in certain areas. The spatial analysis described here could be used to consider whether any localized depletions due to fishing have already occurred.

Community quota: You've received requests to consider forms of community quota, CDQs and the like. This is certainly reasonable, as the GAO recently suggested that such arrangements might be one of the best means to mitigate the adverse impacts of IFQ systems. However, in a multi-state fishery certain constitutional problems might arise in relation to the Port Preference Clause. Would you please describe the range of legally possible solutions for community quota and/or requiring landings in a particular port. What does it take to get around the constitutional and inter-state commerce issues; what are the realistic possibilities in regard to community quota systems? Even if harvest quota is assigned to a community, could the community distribute the quota to fishermen and stipulate that they land their catch in the community?

Thank you for considering these comments, and our previous testimony and submissions.

Peter Huhtala
Senior Policy Director
Pacific Marine Conservation Council
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Subject: public comment on federal register of 5/24/04 vol 69 no 100 pg 29482
From: Bk1492@aol.com
Date: Wed, 26 May 2004 18:42:51 EDT
To: TrawlAccessEIS.nwr@noaa.gov, rodney.frelinghuysen@mail.house.gov
CC: steve.freese@noaa.gov, jim.seger@noaa.gov

us doc noaa 50 cfr part 660 id 051004B - pacific fish

how is the public protected from fishermen who will keep lying to the council and pressuring as long as you let them to take out every fish in the ocean for their own financial profit? Meanwhile, they'll be making illegal catch all they want.

The general public says that in the face of pressure by fish profiteers the council has to stand up for the interests of the general public. Turn away special segments who beg for the whole pie, when the whole pie belongs to the whole american public. That is the job of the council. Tell that to the fishermen.

I do not want a large quota in a short season, because then the fish profiteers will go to another area and overfish in that area, which is not a good idea. Let's reduce the number of fishermen - that is a good beginning.

cut quotas 50% this year and by 10% every year thereafter. Establish marine sanctuaries.

comment on page 4 - I thoroughly oppose providing for capacity rationalization through market forces - that is completely inappropriate.

I do not think "community" quotas are a good idea. The fish are not a "community" resource - they belong to the entire american public. Letting community quotas be established would mean rich powerful would get the whole quota.

comment on page 5 - We have to set up limits for these financial profiteers so that there is fish left in the ocean. It is quite clear that fish profiteers will take every single fish in the ocean for their own profit, and forget about any obligations to the general american good.

comment on page 6 - the largest issue here is putting the commercial fish profiteers in their place, since compared with american population which needs protection of fish stocks, the profiteers will take everything for their own financial wealth.

As if fully set forth herein at length, I hereby make the Pew foundation report on overfishing part of this comment, as well as the well known Pew Foundation report on councils and how they have been commandeered by the commercial fish industry to stop protecting the general american public.

b. sachau
15 elm street
florham park nj 07932



West Coast Seafood Processors Association

1618 SW 1st Ave., Suite 318, Portland, OR 97201

503-227-5016 503-227-0277 (fax)

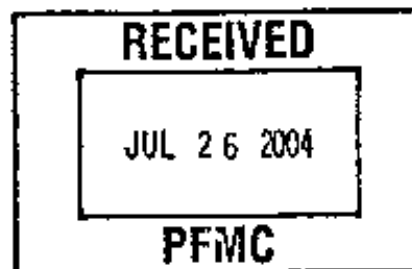
email: seafood@attglobal.net

*Serving the shore based seafood processing industry in
California, Oregon and Washington*

July 26, 2004

Dr. Donald McIsaac
Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220

Dear Dr. McIsaac:



The following comments are submitted on behalf of the West Coast Seafood Processors Association (WCSPA) in response to the notice of intent to prepare an environmental impact statement on dedicated access privileges published in the *Federal Register* on May 24, 2004. WCSPA members harvest, process, transport, and sell Pacific groundfish which would be included in a dedicated access program.

Before discussing alternatives and options to be considered in a dedicated access (DA) program, we want to express serious concern about the process chosen by the Pacific Fishery Management Council for developing a program. We believe that the issue of allocating harvest percentages among fisheries groups needs to take precedence over designing a system that might fail once allocations are made. The Council has already allocated the harvest of sablefish and Pacific whiting; some limited allocation has been made between limited entry and open access sectors; and a preliminary allocation system was established between sport and commercial harvest of lingcod and bocaccio rockfish. However, any single fishery sector could harvest enough of a single species (e.g., canary rockfish) to close down every fishery on the west coast.

It is impractical, verging on impossible, to adequately analyze the social and economic effects of a DA program when there is no way to predict on an annual basis whether any fishing will be allowed (see canary rockfish example, above). Before providing resources to analyzing and developing a program that might not be implemented, the Council needs to take the necessary step of establishing firm inter-sector allocations.

Once the necessary inter-sector allocations have been established, the Council should consider the following alternatives:

Species considered. We believe that all species of Pacific groundfish covered under the Pacific Groundfish Fishery Management Plan and legally available for harvest by limited entry trawl vessels should be included in any DA program. As a sub-option, we believe that separate DA programs should be developed, one for all Pacific groundfish *except* Pacific whiting and one for Pacific whiting.

The limited entry trawl groundfish fishery is a mixed stock fishery which remains economically viable because fishermen have a variety of fishing strategies to pursue. Providing DA privileges to some, but not all, of the species harvested will negate the economic benefits of a DA program, as well as reducing any positive impacts of bycatch reduction.

The sub-option of separating most Pacific groundfish from Pacific whiting recognizes that the whiting fishery is subject to a separate international treaty, has already been the subject of allocation between harvesting sectors, and is conducted under specific seasonal and gear restrictions; in effect, it is a separate fishery.

Initial allocation of privileges: The Council should consider three groups for initial allocation of privileges - owners of limited entry trawl permits; processing companies that purchased limited entry trawl-caught groundfish, with a sub-option of processing facilities, rather than companies; and communities where at least 1% of the annual landings of limited entry trawl-caught groundfish were made. By looking at these three groups of entities, the Council can analyze the effects on the listed objectives.

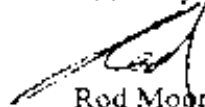
Means of allocation: The Council should consider at least two alternatives - allocating directly to recipients through a regulatory process, and distributing privileges via an auction system. Including an auction system achieves the stated goal of rationalizing capacity through market forces.

Caps on ownership: At a minimum, the Council should consider having no caps on quota ownership in order to allow maximum economic flexibility. The Council should also consider having different caps for different privilege holders. For example, if the initial allocation is made to harvesters, processors, and communities, as suggested above, a single cap (i.e., limit on total privileges that can be owned in order to avoid excessive quota concentration) might not fit each of the groups. The same might be true if Pacific whiting is considered separately from other Pacific groundfish, especially if the existing allocation within the whiting fishery is maintained.

Enforcement concerns: The Council should analyze an option that limits the number of ports where trawl-caught groundfish may be landed. This is analogous to a similar provision that is included in the Alaska halibut/sablefish individual quota program. Enforcement of a complex system involving over 80 species of fish and 100+ vessels can be facilitated if the vessels are confined to certain specific landing areas.

Thank you for allowing us the opportunity to comment. We believe that including these alternatives in the environmental impact statement will lead to a more useful and defensible document.

Sincerely,



Rod Moore
Executive Director

From <javascript:parent.toggle()>"Barbara & Tom Stickel"
<b.stickel@charter.net>
Date Friday, July 30, 2004 1:03 pm
To <TrawlAccessEIS.nwr@noaa.gov>
Cc "Craig Barbre" <preamble@earthlink.net>, "Barbara Emley"
<Barbara.Larry@worldnet.att.net>, "Zeke Grader" <Fish4IFR@aol.com>,
"Chuck Wise" <CLJuliet@mail.ap.net>
Subject Scoping Comments

On behalf of directors and members of the Morro Bay Commercial Fishermen's Organization and the Crab Boat Owners' Association of San Francisco, I've been asked to submit the following comments:

1. The manner of noticing and the timing of the scoping sessions did not give open access fishermen participating in the salmon troll fisheries adequate opportunity to consider these issues and comment.
2. At this time, we prefer Status Quo Management to any of the proposed changes in access. (We believe the current groundfish observer system should go a long way toward clarifying "uncertain" bycatch rates.)
3. We oppose any type of IFQ systems.

Barbara Stickel
F/V Regina

on behalf of:

Thomas J. Stickel, Director
Morro Bay Commercial Fishermen's Organization

Craig Barbre, Director
Morro Bay Commercial Fishermen's Organization

Larry Collins, Vice President and Director
Crab Boat Owners Association of San Francisco

"Be who you are and say what you feel, because those who mind don't matter and those who matter don't mind." Dr. Seuss (1904-91)

From <javascript:parent.toggle()>"Bob Strickland"
<bobstrickland@unitedanglers.org>
Date Monday, August 2, 2004 2:42 pm
To <TrawlAccessEIS.nwr@noaa.gov>
Subject RE: Trawl IFQ EIS Scoping Comments; ID #: 051004B

August 2, 2004

Via E-Mail

Dr. Donald McIsaac
Pacific Fishery Management Council
7700 NE Ambassador Pl., Suite 200
Portland, OR, 97220
E-Mail: TrawlAccessEIS.nwr@noaa.gov
Fax: (503) 820-2299

RE: Trawl IFQ EIS Scoping Comments; ID #: 051004B

Dear Dr. McIsaac:

United Anglers of California has several concerns regarding the proposed individual fishing quota program:

The recreational sector has been excluded from the process of designing the program thus far. The recreational sector has made repeated requests to be included but these have been rejected.

We do not know how the allocation between the commercial and recreational sectors is going to be set. Instead of developing an inter-sector allocation first, the Council is choosing to develop the program first and then do the inter-sector allocation. This prevents us from having a realistic understanding of where we stand in relationship to an IFQ program. Since the proposal does not contain a sunset provision (where the program would be reviewed after a certain number of years), we have to assume that this program would lock in for life an allocation between the commercial and recreational sectors. If this is the case, then the inter-sector allocation needs to be done first, so we can assess the proposal with the knowledge of how we will be affected and how marine resources will be affected by that level of trawling.

The recreational sector is very concerned about the impacts of bottom trawling. This proposal will lock in bottom trawling as a gear for fishing in perpetuity. We need to think very carefully about doing this: the economic implications as well as the biological implications.

Lastly, UAC is concerned that, contrary to the advice of Congress, development of this program is proceeding without the benefit of national standards. UAC fully supports the standards proposed in H.R. 2621, the Fishing Quota Standards Act and urges the Pacific Council to wait until such standards are enacted before developing the trawl IFQ program.

Sincerely,

Bob Strickland, President
United Anglers of California

From <javascript:parent.toggle()>"Bob Osborn" <bob@pacificangler.com>
Date Monday, August 2, 2004 4:20 pm
To <TrawlAccessEIS.nwr@noaa.gov>
Subject Scoping Comments for Dedicated Access Privileges for LE Trawl

UNITED ANGLERS OF SOUTHERN CALIFORNIA
5948 Warner Ave
Huntington Beach, CA
(714) 840-0227

August 2, 2004

Dr. Don McIsaac, Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, OR 97220

RE: Scoping Comments for Dedicated Access Privileges (Including Individual Fishing Quotas) for the West Coast Limited Entry Trawl Groundfish Fishery

Dear Dr. McIsaac:

United Anglers of Southern California is the state's largest association of recreational anglers. We represent approximately 50,000 affiliated sportfishermen throughout California dedicated to ensuring quality fishing today and tomorrow. We are deeply concerned about the impacts that dedicated access privileges for the trawl fishery will exact on sustainable fisheries.

UASC believes it is essential to only design dedicated access privilege programs for fisheries when fishery problems are well understood and all commercial sectors of the fishery are included. We recommend that the council complete a complete programmatic EIS for the groundfish fishery including bycatch and essential fish habitat prior to considering dedicated access privilege programs. It has been clear from public testimony that the purpose of a dedicated access program is to provide an economic shot in the arm to the trawl fishery. UASC is not opposed to management measures that provide economic benefits for fishermen; however, such measures need to be carefully considered in light of the known caveats regarding dedicated access privileges and their effects on other sectors and other fisheries. Providing extraordinary economic stability for only one sector increases the likelihood of economic instability for other sectors.

UASC believes a great risk exists in building economic value and economic certainty in a fishery for long term or indefinite term periods when that fishery uses heavy mobile equipment to scrape the seafloor. Such decisions should not be lightly considered and should not be considered until such time that the impacts of this gear on the benthic habitats that support all our fisheries are well understood. .

UASC believes that any dedicated access program needs to provide for transferability of quota within the full range of approved gears and future gears established through experimental programs. Only in this way can the council ensure our resources are being utilized at their highest and best use.

UASC believes that the hard allocation of quota for an indefinite period of time is unfair for open access fisheries. The rights of public to catch a reasonable number of fish for their own use should not be abridged. Any dedicated access program considered should at a minimum provide within the program a mechanism at no cost to the public to reclaim adequate quota over a reasonable period of time for the purpose of ensuring the public's direct access to fish. National Standard 8 states: "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities." It quite simply is unfair to design a hard allocation system that places all the economic burdens of increasing demand for fish on participants in the open access sectors while granting the equivalent of assured property rights to a percentage of the resource to a privileged class of individuals.

UASC believes that any time long-term economic benefits are granted to a sector, these benefits are a cost to the public sector in that there will be some probability that there will be a cost to the public to retrieve or cancel those benefits. Therefore, any such program should have reasonable expectations of providing conservation and habitat benefits for the resources over the course of the program. Those expectations should be modeled and mechanisms installed to adjust the program to ensure that conservation and habitat goals are being achieved. National Standard 5 states: "Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose."

UASC believes that the expectation of conservation benefits from a dedicated access program is closely coupled to the expectation that the dedicated access fishery will use the economic certainty arising from

the program to commit capital to conservation. Careful financial analysis should be conducted prior to the implementation of a dedicated access program to determine the likelihood of a reasonable investor investing additional capital in the futures of slow growing and low productivity resources such as is found in our groundfish fisheries.

Consideration should be given to a program that sunsets the dedicated access program or as part of the program withdraws quota on a regular periodic basis and disposes of that quota in a way to satisfy the needs of the public trust.

UASC believes that consideration within the dedicated access program needs to be given to unexpected events such as disaster tows and in the case of open access fisheries, increases in participation that exhausts allocated quota and how those events will require adjustments to allocations both within and outside of the dedicated access fishery so as to treat all individual fishermen fairly. National Standard 6 states: Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

UASC believes that dedicated access fisheries should not be considered until standards have been established. As one member of the current Groundfish Trawl Individual Quota Committee said: "This is an opportunity to set those standards?". We agree, however, note that all sectors need representation on any committee establishing standards for dedicated access programs that have the potential of affecting them. National Standard 4 states: "Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges." UASC notes that this standard specifically includes more than allocation and encompasses the assignment of fishing privileges.

Thank you for the opportunity to comment on the initial scoping documents.

Sincerely,

Bob Osborn, Fishery Consultant
For Tom Raftican
President, United Anglers of Southern California

Cc: Dr. William Hogarth, Assistant Administrator for Fisheries, NMFS