SUMMARY MINUTES

Scientific and Statistical Committee

Pacific Fishery Management Council
Crowne Plaza Hotel
Syracuse Room
1221 Chess Drive
Foster City, CA 94404
650-570-5700
June 13-15, 2005

Call to Order and Scientific and Statistical Committee (SSC) Administrative Matters

The meeting was called to order at 8 a.m. Dr. Don McIsaac briefed the SSC on priority agenda items.

Subcommittee assignments for 2005 are detailed in the table at the end of this document.

Members in Attendance

Mr. Tom Barnes, California Department on Fish and Game, La Jolla, CA
Mr. Steve Berkeley, University of California, Santa Cruz, CA
Mr. Alan Byrne, Idaho Department of Fish and Game, Nampa, ID
Mr. Robert Conrad, Northwest Indian Fisheries Commission, Olympia, WA
Dr. Ramon Conser, National Marine Fisheries Service, La Jolla, CA
Dr. Michael Dalton, California State University, Monterey Bay, CA
Dr. Martin Dorn, National Marine Fisheries Service, Seattle, WA
Dr. Kevin Hill, National Marine Fisheries Service, La Jolla, CA
Mr. Tom Jagielo, Washington Department of Fish and Wildlife, Olympia, WA
Dr. Peter Lawson, National Marine Fisheries Service, Newport, OR
Dr. Han-Lin Lai, National Marine Fisheries Service, Seattle, WA
Dr. André Punt, University of Washington, Seattle, WA (Monday only)
Dr. Hans Radtke, Yachats, OR
Dr. Stephen Ralston, National Marine Fisheries Service, Santa Cruz, CA
Dr. David Sampson, Oregon State University, Newport, OR
Ms. Cynthia Thomson, National Marine Fisheries Service, Santa Cruz, CA

Scientific and Statistical Committee Comments to the Council

The following is a compilation of June 2005 SSC reports to the Council. (Related SSC discussion not included in written comment to the Council is provided in italicized text).

Coastal Pelagic Species Management

F.1. Pacific Mackerel Harvest Guideline for the 2005/2006 Season

Dr. Kevin Hill briefed the Scientific and Statistical Committee (SSC) on the "Assessment of the Pacific Mackerel Stock for U.S. Management in the 2005-2006 Season" (Agenda Item F.1.b, Attachment 1). The assessment and harvest recommendations are based on a catch-at-age model, ASAP, that received Stock Assessment Review (STAR) Panel review in June 2004. The SSC concluded that the current assessment and the resulting Harvest Guideline of 17,419 mt represents the best available science for the 2005/2006 fishing season.

The SSC identified several technical issues in the assessment that warrant future investigation, including questions about survey selectivity, the stock-recruit function, and reliability (weighting) of older catch-at-age data. These questions and others should be addressed with a STAR Panel in 2006.

One outstanding issue concerns the distribution of the mackerel stock south of the U.S./Mexico border. The bulk of Pacific mackerel spawning occurs off Baja California, while larval surveys are conducted in the Southern California Bight. Therefore, data used to develop abundance indices for use in the stock assessment cover only a small proportion of the area of spawning. Data from the Investigationes Mexicanas de la Corriente de California (IMECOCAL) program could provide information that covers a larger proportion of the spawning area. In addition to Pacific mackerel, these data could be used in future assessments of Pacific sardine and bocaccio. All coastal pelagic species (CPS) assessments and management would benefit from closer coordination with Mexico.

The harvest control rules for Pacific mackerel and other CPS were developed prior to the current revision of the Sustainable Fisheries Act. Once technical assessment issues have been addressed, the SSC recommends the Council initiate a process to review, and possibly revise, harvest control rules and overfishing definitions for consistency with the current authorizing legislation.

F.2. Fishery Management Plan Amendment 11--Sardine Allocation

At the April 2005 Council meeting, Dr. Sam Herrick presented the Scientific and Statistical Committee (SSC) with results of his analysis of preliminary sardine allocation alternatives ([1], [2]). At that time, the SSC made recommendations for improving the analysis and indicated a need to review the sardine processor data and the associated data collection methodology. In May, Dr. Herrick provided the SSC Economics Subcommittee with documentation on the processor methodology and data. The Subcommittee reviewed the documentation and provided Dr. Herrick with further elaboration on the SSC's April comments regarding the economic analysis ([3]). At this (June 2005) meeting, Dr. Herrick provided the SSC with an updated version of his processor data documentation ([4]), as well as a draft environmental assessment (DEA) pertaining to an updated list of allocation alternatives ([5], [6]).

The SSC appreciates Dr. Herrick's responsiveness to many of the concerns expressed at the April meeting and later by the Economics Subcommittee. Specifically, Dr. Herrick has (1) provided an analysis of alternatives based on the exvessel value of landings, (2) elaborated on the assumptions underlying his economic analysis (e.g., stability of exvessel prices), and (3) provided a rationale for not considering fixed costs in his analysis (namely, given the expected stability of processing capacity over the likely duration of the pending sardine allocation, fixed costs are likely to "wash out" in comparison of alternatives). The analysis provided in the DEA is primarily a short-run analysis.

The analysis of alternatives is based on actual 2004 sardine landings in the southern and northern subareas, projected forward to 2005-2009. Appendix B of the DEA describes the effect of each alternative in terms of catch, catch shortfalls, the frequency of catch shortfalls, and unutilized harvest guideline (HG) in each year under a range of assumptions regarding the HG (72,000 mt, 136,000 mt, and 200,000 mt) and the annual growth rate of landings in the southern and northern subareas (0%, 5%, 10%, 15%). The analysis of alternatives contained in the main body of the DEA focuses not only on catches and shortfalls (as analyzed in Appendix B), but also economic effects at the exvessel and processor levels and salmon bycatch effects. Like Appendix B, this analysis was conducted using three different HG scenarios; unlike Appendix B, the analysis assumes that sardine landings in the southern and northern subareas will grow at a uniform rate of 10%.

The SSC notes the following regarding the analysis of harvest, exvessel, and processor effects:

- According to Tables 4-7 and 4-8 (pp. 45 and 51 of the DEA), harvest opportunities in the southern and northern subareas are largely unconstrained under the base case scenario and completely unconstrained under the high HG scenario. The low HG scenario, however, is instructive in terms of illustrating the relative effects of each alternative on the southern and northern subareas when the HG has a constraining effect on landings.

- Appendix B of the DEA indicates that catches and catch shortfalls in the southern and northern subareas are sensitive to the underlying growth rate assumptions. However, the analysis of alternatives contained in the main body of the DEA is based on an assumption of 10% growth in both subareas. The rationale for the 10% assumption is not clear. (For instance, this assumption does not reflect the recent history of the fishery, which is more consistent with growth rates of 0% in the southern subarea and 5% in the northern subarea.) Given the sensitivity of the results to different growth rates, it is important that the effects of the alternatives on catches and catch shortfalls (as described in Appendix B for a range of growth rates) be incorporated into the main text of the DEA. Additionally, effects of the alternatives on exvessel value and producer surplus, as described in Tables 4-7 and 4-8, should include the growth rates covered in Appendix B.

- An important distinction among the alternatives is the extent to which they are based on geographic or seasonal allocation. Thus, for instance, fishery participants desiring a guaranteed share of the HG are likely to be receptive to geographic allocations (like alternative 7), whereas those desiring to take full advantage of harvest opportunities as they arise are likely to prefer seasonal allocations (like alternative 3). This distinction should be made explicit in the analysis of alternatives.

- Alternative 6 provides rules for transferring a portion of the HG from one subarea to another, based on the extent of each subarea's utilization of its previous year's allocation. While this alternative provides an adaptable and flexible basis for allocation, applying rules of this type to a variable fishery (like sardine) may result in anomalous outcomes, in which the feedback from the previous year may be ill-suited to fishery conditions in the current year.

- Table 4-1 (p. 30 of the DEA) provides criteria for evaluating whether the socioeconomic effects of the alternatives are "significantly adverse," "insignificant" or "significantly beneficial." For instance, the effect of an alternative on producer surplus is deemed "significantly adverse" if either subarea's share of producer surplus is less than 40% of the total under any HG scenario. The SSC notes that, while the southern subarea's share of producer surplus (described in Table 4-8) is consistently above 40%, it is generally so close to this threshold as to be indistinguishable from it. Given the many uncertainties in the analysis, the SSC cautions against characterizing the alternatives on the basis of absolute numeric thresholds (as done on pp. 56-57 of the DEA) unless a coherent rationale is provided for the threshold.

- The estimates of producer surplus provided in Table 4-8 are based on regional cost and revenue information provided by processors in southern California, northern California, and Oregon/Washington. The data were collected using a "Delphi type process" rather than statistically-based sampling methods. While the SSC recognizes the potential usefulness of group-based methods of data collection, it is important that such methods be validated to ensure results are representative and amenable to consistent interpretation across regions. Absent such validation, the producer surplus estimates should be viewed with caution and may be potentially biased. Generally speaking, industry data collections are best completed outside the context of the immediate management issue.

Ms. Liz Petras (National Marine Fisheries Service [NMFS], Southwest Region [SWR]) discussed the methodology for estimating salmon bycatch under the various sardine allocation alternatives (Table 4-3 on p. 39 of the DEA). This methodology involved: (1) projecting 2004 sardine landings to 2005-2009, based on an annual growth rate of 10% (as done in the economic analysis), (2) applying average salmon bycatch rates estimated from an observer program conducted by Washington Department of Fish and Wildlife (WDFW) to projected sardine landings, (3) estimating salmon bycatch by evolutionarily significant unit (ESU), based on the assumption that the stock composition of chinook and coho landed in the Oregon/Washington commercial sardine fishery is similar to the composition landed in the recreational salmon fishery north of Cape Falcon, and (4) assuming 100% mortality of salmon bycatch. The SSC notes the following regarding the bycatch analysis:

- According to Ms. Petras, any ESA consultations regarding salmon bycatch in the sardine fishery conducted by the SWR would be based on actual sardine landings, HGs, and allocation formulas. Thus uncertainties regarding the sardine landings projections used in the allocation analysis are academic at this point.

- The salmon bycatch rates reported in WDFW's observer program, which were the basis of the salmon bycatch analysis, are not necessarily applicable to Oregon and California, where sardine fisheries may operate differently and observer data are very limited. Observer programs in each

state are needed to provide state-specific estimates of bycatch rates. There are currently no observer programs in Washington and Oregon.

- Due to the unknown accuracy and precision for the estimates of bycatch impacts applied to specific salmon stocks, it is difficult to assess the potential impact to salmon stocks of concern, especially if the northern sardine fishery were to expand. An observer program, including non-lethal collection of tissue samples for genetic analysis, would allow a better assessment of stock-specific impacts.

- An important issue for consideration in the salmon preseason planning process is whether salmon bycatch in the sardine fishery should be treated as a component of natural mortality or included in the salmon ocean exploitation rate.

Groundfish Management

C.4. Status of 2005 Groundfish Fisheries and Consideration of Inseason Adjustments Review Open Access Nearshore Data Report and Resulting Discard Rates

Dr. Jim Hastie presented the Northwest Fisheries Science Center (NWFSC) West Coast Observer Program Data Report and Summary Analyses of Open Access Fixed-Gear Fisheries in Waters Less Than 50 Fathoms, and discussed the Groundfish Management Team (GMT) Report on Modeling Discard Mortality in the Open-Access Nearshore Fishery. Instead of continuing to assume a uniform discard rate for all species in the open-access nearshore fishery, the GMT prefers using discard rates based on observer data. The SSC endorses the GMT's preferred approach and encourages the development of discard mortality information for all fisheries that affect groundfish. Improved coordination between observer records and fishtickets would be extremely useful in accounting for retained catch in open access nearshore fisheries. In addition, establishment of logbook programs for open access nearshore fisheries, such as the voluntary program being implemented in California, is another mechanism to improve accounting of catch.

C.6. Rebuilding Plan Revision Rules

A total of 23 groundfish stock assessments will be conducted during 2005. Eight of the groundfish species are currently designated to be in an overfished state, and rebuilding plans have been developed for them. These rebuilding plans for each species include the maximum possible time to rebuild to the proxy for B_{MSY}, T_{MAX}, and the probability of rebuilding by T_{MAX} originally selected by the Council; P_0. Table 1 lists the values of P_0 for each of the overfished species.

The Council is required to periodically review the adequacy of progress in rebuilding. Such review can occur at any time, but must occur at least every two years and could lead to changes in harvest rates and values for rebuilding parameters such as T_{MAX}, and T_{MIN}. Assessment authors for stocks currently under rebuilding plans will conduct revised rebuilding analyses, which will be presented to the Council in November 2005. These authors require guidance regarding standards for defining progress towards rebuilding and on the calculations that need to be conducted if progress is deemed to be adequate or inadequate. This guidance depends on policy decisions by the Council and is not simply a technical matter.

A joint meeting between the Council, Scientific and Statistical Committee (SSC), Groundfish Advisory Subpanel (GAP), and Groundfish Management Team (GMT) led by Dr Steve Ralston was held on Monday, June 13, to clarify the need for and progress towards developing a framework and policy for revising rebuilding plans. The joint meeting highlighted a Management Strategy Evaluation approach, which could be used to contrast different standards for defining progress towards rebuilding and control rules that depend on whether progress is adequate or inadequate.

There are presently no formal rules to define whether progress is adequate and how rebuilding plans need to be modified given that progress is deemed to be adequate or inadequate, although there are many ways to define such formal rules given the standards in Amendment 16-1 of the groundfish fishery management plan (FMP). Rebuilding plans for several species (e.g., widow rockfish, Pacific ocean perch) have been updated in the past, but this has involved a largely *ad hoc* process, with each species treated separately on a case-by-case basis.

The SSC identifies the following standard for defining adequacy of progress and rules for modifying rebuilding plans, which it considers the simplest that is consistent with National Standard 1 and involves a small number of decision points (see Attached Figure). The steps below also reflect the intent underlying Amendment 16-1 to the groundfish FMP, that revisions to rebuilding plans be based on changes to the harvest control rule (or harvest rate) rather than to rebuilding parameters such as T_{MAX}.

1. Progress is deemed to be adequate if the probability of rebuilding under the current harvest rule, $P_{current}$, exceeds 0.5. This value is selected because it is the lowest probability such that rebuilding is more likely than not a standard included in Amendment 16-1 to the Groundfish FMP.
2. The current harvest rate is maintained to calculate future OYs if progress is deemed to be adequate.
3. If progress is deemed inadequate, a new, lower, harvest rate is calculated, such that rebuilding under the new rate is expected to occur with probability P_0. If even a zero harvest will not allow rebuilding, then a new rebuilding plan, wherein T_{MAX} is recalculated, and a new T_{TARGET} is chosen, should be used to determine the harvest rate used to calculate future OYs.

The above specifications do not represent the SSC's recommendation on this matter, nor do these specifications necessarily represent the default; rather they represent the simplest set of specifications that can be modified in several ways based on policy trade-off considerations, as outlined below.

i) Should the probability at which progress is deemed to be inadequate be larger than the minimum of 0.5? Increasing this probability from 0.5 would be more conservative, in that harvest rates would be reduced before the probability of recovery drops as low as 0.5. However, this may increase the number of changes in harvest rate during the rebuild period.
ii) Should the harvest rate be increased if the probability of recovery is estimated to be much larger than P_0? Increasing the harvest rate would increase the OY beyond that which would occur simply due to larger stock biomass. This could be used to share accelerated population growth, when it occurs, between reducing rebuild time and increasing the OY. However, increasing the harvest rate will lengthen the rebuild time compared to maintaining the current harvest rate.

iii) When progress is deemed inadequate, should a standard other than P_0 be used to revise the harvest rate? A lower probability may be appropriate, for example, if a high P_0 was chosen initially to account for uncertainty, but will result in longer rebuild times.
iv) Should updates to rebuilding plans be suspended if the stock is predicted to reach the target level soon? The simple rule could result in very large changes in harvest rate if recruitments at the end of the rebuilding period are low.
v) Should a major revision to rebuilding parameters occur if a very substantial reduction in harvest rate is needed to rebuild with probability P_0? The simple rule could lead to cases in which rebuilding to P_0 is possible, but only if the harvest rates are reduced to near-zero levels.
vi) Should the rules be species-specific to some extent? For example, the probability at which progress is deemed to be inadequate could be different for constraining and non-constraining species

The SSC notes that any proposed rules could be evaluated using the Management Strategy Evaluation framework. The SSC Groundfish Subcommittee is willing to work with members of the Council, GAP, and GMP between the June and September meetings to discuss policy issues and the trade-offs implied by different policy choices. However, the SSC cautions that it may not be possible to define and fully evaluate alternative rules adequately by the September Council meeting, given the complex nature of this problem. Finally, the SSC cautions that revisions to the National Standard 1 guidelines will include aspects related to progress to rebuilding. These revisions are not yet finalized, but could constrain the options available to the Council.

Table 1.

Species	$\boldsymbol{P_0}$
Bocaccio	70%
Canary Rockfish	60%
Widow Rockfish	60%
Pacific Ocean Perch	70%
Darkblotched Rockfish	>90%
Yelloweye Rockfish	92%
Cowcod	60%
Lingcod	60%

SSC Administrative Matters

A.6. Stock Assessments for 2007-2008 Management

At the June meeting, STAR Panel chairs served as discussion lead and overall rapporteur for the species on their panels. For each of the stock assessments, a rapporteur has been assigned to assist the STAR Panel Chair with note taking and statement development. Council staff and the SSC Chair compiled the resulting documents into a single SSC statement for the September Council meeting.

The Scientific and Statistical Committee (SSC) evaluated ten stock assessments at the June meeting which had been reviewed during three Stock Assessment Review Panel (STAR) meetings in April and May 2005. Draft SSC statements on these species are organized below by STAR panel and were drafted following the June SSC meeting. Therefore, these statements have not yet received a final review by the full SSC. The SSC is scheduled to review and possibly revise these statements at the September meeting. Additional notes and technical recommendations of the SSC can be found in the draft June SSC meeting minutes (Ancillary D).

April 18-22 STAR Panel, Seattle, Washington, English Sole, Petrale Sole, Starry Flounder

Drafted by David Sampson based on notes from Steve Berkeley (English sole), Andre Punt (starry flounder), and Tom Barnes (southern petrale sole).

English Sole

The SSC reviewed the assessment and STAR Panel reports for English sole. The stock of English sole off the U.S. West Coast had not previously been assessed on a coastwide basis; the most recent previous assessment, completed in 1993, was restricted to the stock off Oregon and Washington. The new assessment reconstructed the catch history back to the late 1800s, the assumed start of fishing. For the analysis the stock was divided into southern and northern fisheries and surveys, with detailed length and age composition data available primarily for the northern fishery. The only observations of trends in relative biomass were from the NMFS triennial shelf bottom trawl survey, which has indicated very large increases during the past decade in the biomass of English sole in both the southern and northern areas. The assessment concludes that the current spawning stock biomass of English sole is very large relative to the unexploited level (91.5% at the start of 2005) and that current exploitation is very low. The SSC found this to be a very thorough assessment and endorses the English sole stock assessment as providing the best available science and can form the basis for Council decision-making.

Technical recommendations (for SSC, STAT teams, etc)

- *The MSY for English sole was estimated to occur at a relative biomass level of only 19% of B_0 (rather than at 40% of B_0 as assumed in the Council's harvest control rule) which implies that the stock would be declared overfished if it were reduced to the level that produces MSY. This problem is not unique to English sole, but could conceivably occur for other stocks as well (e.g., stocks that mature at an early age and at which age at maturity is below age at recruitment to the fishery). Prior to this current round of assessments there were few assessments of West Coast groundfish that derived estimates of MSY and B(MSY).*

- *The most recent age reading for English sole was done in 1998. Age readers should be given advanced notice of upcoming assessments so that they can focus their age reading activities accordingly.*
- *The SS2 model for English sole has changing size at 50% maturity and slower growth rate in recent years, which implies that the growth coefficient k should also change, but it appears that model uses a fixed k.*

Starry Flounder

The SSC reviewed the assessment and STAR panel reports for starry flounder. This is the first assessment of starry flounder off the U.S. West Coast. It is based on the assumption of separate biological populations north and south of Pt Conception, CA and uses data on catches, indices of relative abundance based on trawl logbook data, and an index of age-1 abundance from trawl surveys in the San Francisco Bay and Sacramento-San Joaquin River estuary. Unlike most other groundfish stock assessments, no age- or length-composition data are directly used in the assessment. Both the northern and southern populations are estimated to be likely above the target level of 0.4 B_0, although the status of this data-poor species remains fairly uncertain compared to that of many other groundfish species. The SSC endorses the STAR panel conclusion that this assessment represents the best available science and that it can form the basis for Council decision-making.

Technical recommendations (for SSC, STAT teams, etc)

- *How well can the assessment estimate absolute (rather than relative) biomass? The ratio of the number of parameters to the number of data points is relatively high for starry flounder compared to other groundfish assessments and the population is "recruitment driven" (exploitation rates have seldom exceeded natural mortality). Suggestion: whether or not this assessment can reliably estimate absolute biomass could be evaluated using simulation.*
- *The population size was substantially above B_0 for some years. No conclusion was drawn regarding the plausibility of this, but it was noted that this species is more hake-like than rockfish-like, and that the impact of recruitment variation should be consequently be more substantial for starry flounder than for other longer-lived groundfish species.*
- *The asymptotic confidence intervals for the 2005 spawning biomass appear to be under-estimates. Page 14 suggests that a likelihood profile for SB2005 would indicate a much wider 95% confidence interval than the asymptotic standard errors.*
- *Future assessments should determine whether there are other sources of data on abundance, e.g., surveys in other estuaries.*
- *There should be further exploration of the RecFIN data, specifically future assessments should give consideration to including the RecFIN length-composition data.*
- *There would be value in having SS2 output the standard errors of the logarithms of the estimates of spawning stock size because the distributions for spawning stock size are likely to be highly asymmetric for data-poor species. [This suggestion may be moved to a specific "Suggested updates to SS2" section and assigned a priority rank.]*

Petrale Sole

The SSC reviewed the preliminary STAR panel reports for Petrale sole. The petrale sole STAT team decided to treat the population off the U.S. West Coast as separate northern and southern stocks. The assessment for the southern stock (occupying the Eureka, Monterey, and Conception INPFC regions) was reviewed during the April STAR Panel meeting and subsequently completed and accepted by the STAR Panel. The assessment for the northern stock, however, was withdrawn from the April STAR Panel review because age-composition data for recent years, which might strongly influence the assessment's estimate of current stock status, arrived during the STAR Panel review. The assessment for the northern stock will be reviewed during the mop-up STAR Panel in late September.

At the time of the April STAR Panel the northern and southern petrale assessments used essentially the same model structure and the decision was taken to review the two assessments as a combined assessment and the two STAR Panel reports as a combined report, with the SSC review occurring at the November Council meeting. The STAT team, however, has decided that the structure of the northern assessment is likely to be revised and to differ substantively from the southern assessment.

The SSC recommends that the assessment document for the southern stock petrale sole be reviewed by the SSC at the September Council meeting and that the final STAR report, which will not be completed until after the September mop-up STAR, should have two sections, the results of the April panel for the south and the results of the mop-up panel for the north.

May 9-13, 2005 STAR Panel, Long Beach, California – Cowcod, Gopher Rockfish, Vermillion Rockfish, and California Scorpionfish

Drafted by Martin Dorn from notes from Ray Conser (gopher rockfish), Mike Dalton (vermilion rockfish), Steve Berkeley (cowcod), and Tom Jagielo (California scorpionfish).

Gopher rockfish

The SSC reviewed the assessment and STAR panel report for gopher rockfish, *Sebastes carnatus*. This is the initial assessment of gopher rockfish. Though the distribution of gopher rockfish extends south into Southern California Bight, the assessment is restricted to the stock north of Pt. Conception. The assessment is based on landings and length composition data from commercial and recreational fisheries (primarily hook and line gear), and an index of relative abundance (catch per unit effort) from the commercial passenger fishing vessel (CPFV) Sportfish Survey database. These data sources were used to estimate population trends from 1965 to 2004. There are no fishery-independent indices of stock biomass for gopher rockfish. Assessment results indicate an upward trend in gopher rockfish biomass since the 1980s and estimates of 2005 stock abundance ranged between 60% and 110% of unfished. Recent exploitation rates are estimated to have been well below the F_{MSY} proxy for rockfish. The SSC endorses the STAR panel conclusions that this assessment represents the best available science and that it can form the basis for Council decision making.

Technical recommendations (for SSC, STAT teams, etc)

- *Although the distribution of gopher includes the Southern California Bight, the assessment was restricted to the area north of Pt. Conception. This is not uncommon for West Coast groundfish and the GMT has considerable experience in expanding results from assessed areas to the full range of the stock. At some point, however, the SSC may want to provide general advice on this issue.*

- *The CPFV CPUE index is considered more reliable than the RecFIN CPUE index because it uses data collected by onboard observers who record location and identify species. However, this time series ended in 1998 and offers no information on current biomass, and will become increasingly problematic for future assessments.*

- *As recommended by the STAR panel, the RecFIN CPUE index was not used in the final runs. However, these data and all discussion of them were also removed from the revised assessment document. For this assessment and more generally for all assessments, all data sources which were considered should be included in the final assessment documents.*

- *Projections were carried out using the 40:10 control rule. For gopher rockfish, the projected catches in the first years of the projection were more than twice the current catch. The 40:10 projections should be supplemented with projections that set these catches at a level more similar to current catch.*

Vermilion rockfish

The SSC reviewed the assessment and STAR panel report for vermilion rockfish, *Sebastes miniatus*. This is the initial assessment of vermilion rockfish. The assessment is restricted to the stock in California waters. Separate assessment models were developed for the stock north and south of Pt. Conception. Recent genetic research suggests that vermilion rockfish is actually two species, however nothing is known about biological differences between the two species, or their relative abundance. The assessment uses data on recreational and commercial catches, length-frequency data, and indices of relative abundance derived from CPFV and RecFin CPUE data. There are no fishery-independent indices of stock biomass for vermilion rockfish. Biomass estimates for most model configurations show an upward trend since about 1990, and recent exploitation rates are estimated to be near the F_{MSY} proxy for rockfish. However, fishing mortalities may have exceeded the F_{MSY} proxy for rockfish historically, and vermilion rockfish may have dropped temporarily below the overfished threshold prior to the recent increase. For the northern component, estimates of 2005 biomass ranged between 41% and 89% of unfished biomass, while for the southern component, the range was between 30% and 88% of unfished biomass.

The STAR panel concluded the vermilion assessment is on the threshold of acceptability, and noted that model results show a very broad range of current stock sizes. The STAR panel also concluded the stock does not currently appear to be overfished and overfishing is not occurring. The SSC does not fully concur with the STAR panel conclusions. The SSC notes the available data indicate the stock was overfished in the past, and a few recent outliers appear to drive the recent upward trend in

abundance. The assessment model produced divergent results and exhibited extreme sensitivity to what should be innocuous changes in data or assumptions. Vermillion rockfish is currently in a group of rockfish that are subject to precautionary management. Given concerns about assessment reliability, the SSC questions whether moving vermilion rockfish out of this precautionary group and basing management on this stock assessment can be justified. SSC considers the assessment to be best available science, but at this stage does not endorse the results as being suitable for setting OYs.

Technical recommendations (for SSC, STAT teams, etc)

- *The model and data problems for vermilion rockfish do not appear solvable at this time. The SSC, however, encourages further assessment work on vermilion rockfish in a future assessment cycle, perhaps with a simpler modeling approach with fewer data requirements.*

Cowcod

The SSC reviewed the assessment and STAR panel report for cowcod, *Sebastes levis*. The first assessment of cowcod, in 1999, led to the stock being declared overfished and the establishment of a rebuilding plan. Like the previous assessment, this assessment is restricted to the stock south of Pt. Conception, although the distribution of cowcod extends further north. The assessment is based on catch data from commercial and recreational fisheries, an index of relative abundance (catch per unit effort) derived from commercial passenger fishing vessel (CPFV) data from 1963-2000, and a single visual transect survey conducted by submersible in the Cowcod Conservation Area (CCA) in 2002. Although assessment results suggest that cowcod are not as depleted as was estimated in the initial assessment, they are still overfished by Council criteria. Estimates of stock depletion in 2005 ranged from 14 to 21% depending on a plausible range of assumptions for the stock-recruit relationship. Rebuilding measures appear to have been successful in reducing cowcod exploitation rates to negligible levels. The SSC endorses the STAR panel conclusions that this assessment represents the best available science and that it can form the basis for Council decision making.

Technical recommendations (for SSC, STAT teams, etc)

- *The cowcod assessment did not attempt to estimate recruitment variability. While this approach is reasonable given the lack of informative data, it presents difficulties for rebuilding analyses. The software for conducting rebuilding analyses uses variation in future recruitments to evaluate rebuilding probabilities. The SSC suggests two possible methods for introducing uncertainty in stock projections:*

    1. *Estimate recruitment variability from a meta-analysis of other rockfish species for which a time series of recruitments is available.*
    2. *Use the probabilities assigned to steepness (h) by the STAR panel to infer a probability density function, which can then be sampled to obtain alternative values of steepness to use in stock projections, or make separate runs using each of the values of steepness and then weigh the outputs by their assumed probabilities (30%/40%/30%).*

- *The second concern of the SSC is that currently there is no mechanism in place to monitor stock recovery. The SSC recommends that any future monitoring survey should include the*

area outside as well as inside the CCA. The SSC recommends either a visual survey be continued or some other non-lethal sampling technique be employed. Suggestions included non-lethal genetic sampling (i.e. a genetic mark-recapture experiment), or yet to be developed acoustic survey methods.

California scorpionfish

California scorpionfish (*Scorpaena guttata*) is related taxonomically to rockfish, but exhibits different behavior and biology. Unlike rockfish, scorpionfish form dense spawning aggregations and releases eggs rather than larvae. Although the species ranges south into Mexican waters, the assessment evaluates stock status in US waters south of Pt. Conception. This is the first stock assessment of California scorpionfish. The assessment is based on landings and length composition data from commercial and recreational fisheries and an index of relative abundance (catch per unit effort) derived from commercial passenger fishing vessel (CPFV) logbook data from 1980-1999. A fishery-independent index of abundance was obtained by combining trawl surveys by sanitation districts in southern California. Assessment results indicate an upward trend in California scorpionfish biomass since the 1970s. Estimates of 2005 stock abundance ranged between 60% and 80% of unfished stock size. Estimates of historical exploitation rates are uncertain, but apparently were significantly higher than the Council's FMSY proxy of F50% for most of the last three decades. The current high abundance of scorpionfish is most likely the result of favorable environmental conditions. The SSC endorses the STAR panel conclusions that this assessment represents the best available science and that it can form the basis for Council decision making.

Technical recommendations (for SSC, STAT teams, etc)

- *Estimates of historical exploitation rates were very sensitive to the assumed coefficient of variation in length at age. A high priority should be given to obtaining additional length-at-age data to resolve this uncertainty.*

It was noted that some of the recruitment estimates are near zero. The SSC found no good explanation why this should be occurring, but it merits further investigation as it may indicate some pathology in model behavior.

May 16-20, 2005 STAR Panel, Seattle, Washington – Darkblotched Rockfish, Pacific Ocean Perch, and Cabezon

Drafted by Steve Ralston based on notes from Bob Conrad (darkblotched rockfish) and Tom Barnes (Pacific ocean perch)

Darkblotched Rockfish

The SSC reviewed the assessment and STAR Panel report for darkblotched rockfish (*Sebastes crameri*), which was assessed as a single stock ranging from California to the Canadian border. The last full stock assessment occurred in 2000 and estimated spawning biomass to be 22% of the unfished level. It was subsequently declared overfished in January 2001 and a rebuilding plan was implemented, based on results from an updated assessment conducted in 2001. The

assessment model was again updated in 2003 using recent data. Notably, both updated stock assessments resulted in depletion estimates considerably lower than the original assessment. The 2005 analysis was a full assessment and incorporated a number of significant changes to the model, including: (1) use of Stock Synthesis II, (2) starting the model in 1928 vs. 1963, (3) estimating growth parameters within the model, (4) estimation of discard rates and retention curves within the model, (5) eliminating all age composition data except for shelf trawl survey ages read in 2004, and (6) use of delta-GLM estimates of abundance from the AFSC slope survey. Model estimates of abundance are influenced primarily by three fishery-independent surveys, i.e., the AFSC triennial shelf and slope trawl surveys and the NWFSC combined trawl survey. Results of the assessment indicate that spawning output has more than doubled since 1999 (i.e., 8% to 17% of the unfished level) and that rebuilding is occurring due to strong 1999 and 2000 year-classes. Moreover, recent exploitation rates have been quite low (2-3%). The SSC endorses the STAR panel conclusion that this assessment represents the best available science and that it can form the basis for Council decision-making.

Technical recommendations (for SSC, STAT teams, etc.)

- *A major area of uncertainty in the assessment is in accurately aging this species. A fundamental change from the 2003 assessment update is that the majority of the age composition data were discarded in the 2005 assessment, due to uncertainty regarding its accuracy. An attempt should be made to understand the nature of biases in the age data and to utilize, to the extent practicable, this information in the next assessment.*

- *The SSC recommends that future stock assessments examine whether a two-stock (north-south) model may be more appropriate for this species or, alternatively, that survey stratification be based on the existence of known "hot spots," i.e., localized areas of very high abundance.*

- *The SSC recommends that the rebuilding analysis for darkblotched rockfish use a spawner-recruit curve and resample the recruits.*

Pacific Ocean Perch (POP)

The SSC reviewed the updated assessment and STAR Panel report pertaining to the stock of Pacific ocean perch (POP, *Sebastes alutus*) residing in the combined US Vancouver-Columbia INPFC areas. Historically POP catches were characterized by removals in excess of 5,000 $mt \cong yr^{-1}$ from 1962-68, largely due to extensive foreign fishing. In 1981 the Council adopted a 20-yr plan to rebuild what was considered a depleted resource, representing the first attempt at stock rebuilding by the PFMC. POP was declared overfished in 2001 and a rebuilding plan was officially adopted as Amendment 16-2 to the Groundfish FMP. The 2005 assessment is an update of the stock assessment model prepared in 2003. Consequently the model code is unchanged but data time series were extended to include: (1) catches through 2004, (2) fishery size compositions for 2003 and 2004, (3) NWFSC slope survey biomass estimates through 2004, (4) NWFSC slope survey age compositions for 2001, 2003, and 2004, (5) the triennial shelf survey biomass estimate for 2004, and (6) triennial shelf survey age compositions for 1995 and 2004. Results of the assessment show that exploitation rates have been very low since 2000

(–1% per yr) and that the stock is slowly rebuilding (depletion in 2005 was 23.4%, up from 20.9% in 2000). Relatively strong recruitments occurred in 2002 and 2003, representing the 1999 and 2000 year-classes. The SSC endorses the STAR panel conclusion that this assessment represents the best available science and that it can form the basis for Council decision-making.

Technical recommendations (for SSC, STAT teams, etc.)

- *MCMC diagnostics for POP were well-behaved, which allowed for a comprehensive accounting of uncertainty in the stock assessment. Comparisons of MCMC posterior distributions with delta-method error approximations were informative and revealed no major differences between the two approaches.*

- *A decision table was produced based on the lower and upper quartiles of 2005 spawning biomass distribution, which represents the statistical uncertainty in the base model.*

- *The SSC recommended that the final document should include specific responses to all STAR panel requests, which could be included in an appendix.*

- *Standardization of "phase plots" should be required by revising the stock assessment terms of reference. For example, the biomass axis (abscissa) should range from 0-2.5, with the target stock size ($B_{40\%}$) equal to 1.00*

Cabezon

The SSC reviewed the assessment and STAR Panel report for cabezon (*Scorpaenichthys marmoratus*). The assessment only considered cabezon residing in the State of California and divided the population into two stocks, one north of Point Conception (NCS) and one south of Point Conception (SCS), based on different historical patterns of exploitation. The northern stock has been the primary area from which removals have occurred, principally due to a greater commercial harvest in that region. Splitting the assessment model into separate northern and southern stocks departs from the approach taken in the previous assessment that was conducted in 2003, which treated the entire State as a unit stock. In addition, 6 fisheries were modeled for each substock (4 recreational and 2 commercial) and 3 trend indices were evaluated for each area. Results of from assessment show that exploitation rates for the NCS and SCS stocks are close to their target values ($F_{45\%}$). Depletion levels, however, differ among the two areas, with the NCS stock close to its target population size ($B_{40\%}$), while the SCS stock is close to the minimum stock size overfished threshold ($B_{25\%}$). Furthermore, assessment results show that spawning output from the SCS stock was very low as recently as 2002 (i.e., 5% of the unfished level), but that strong recruitment has apparently occurred due to the 2000 and 2003 year-classes. Uncertainty about the strength of the 2000 year-class, in particular, was highlighted in a decision table analysis. The stock assessment included projections for both stocks under the Council's default 40:10 harvest policy, as well as the State of California's nearshore management plan 60:20 harvest policy. The SSC endorses the STAR panel conclusion that this assessment represents the best available science and that it can form the basis for Council decision-making.

Technical recommendations (for SSC, STAT teams, etc.)

Not available at this time.

A.9 September SSC Agenda Review

The SSC reviewed a draft of the September SSC agenda. Discussion focused on the large number of groundfish stock assessments to be reviewed in September. The SSC offered recommendations on priority issues and the order of the reviews. Mike Burner will incorporate comments and send out a new version of the agenda in July for full SSC review. The following are items that were either discussed at the June meeting or were added after the June meeting:

- *Reordered and prioritized the list of assessment reviews per SSC comments.*
- *Added a review of the southern portion of the petrale assessment*
- *Removed the krill agenda item because the Council moved this matter to the November Council meeting*
- *Added review of alternatives for community involvement in IQs per Council action in June. The Council tasked the Groundfish IQ Analytical Group with developing the alternatives for SSC review in September and Council consideration in November.*
- *Added a minor matter relative to the review of EFPs for highly migratory species.*

Public Comment

None.

Adjournment B The SSC adjourned at approximately 4 p.m., Tuesday, April 5, 2005.

PFMC
08/31/05

SSC Subcommittee Assignments for 2005

Salmon	Groundfish	CPS	HMS	Economic	Marine Reserves
Alan Byrne	Steve Berkeley	**Tom Barnes**	Tom Barnes	**Michael Dalton**	Tom Barnes
Robert Conrad	Ray Conser	Alan Byrne	Steve Berkeley	Han-Lin Lai	Steve Berkeley
Kevin Hill	Michael Dalton	Michael Dalton	Alan Byrne	Hans Radtke	Michael Dalton
Pete Lawson	**Martin Dorn**	Ray Conser	Robert Conrad	Cynthia Thomson	Martin Dorn
Hans Radtke	Tom Jagielo	Tom Jagielo	**Ray Conser**	David Sampson	Tom Jagielo
David Sampson	Han-Lin Lai	André Punt	Kevin Hill		Pete Lawson
	André Punt		André Punt		André Punt
	Steve Ralston		Hans Radtke		Steve Ralston
	David Sampson				**Cynthia Thomson**

Bold denotes Subcommittee Chairperson