

**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 12-13, 2006**

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

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

The SSC discussed the misunderstanding related to one sentence in their April statement under Agenda Item E.2 regarding Klamath River fall Chinook fisheries management. The statement was "Even with improved flows in the Klamath, the first return year with the potential for substantially higher escapement is 2009." This statement was based on indicators of freshwater and marine survival that suggest the 2005 brood year is the first recent brood year with a potential for improved survival. Although this brood year could return in better numbers in 2008 at age 3, Klamath fall Chinook harvest management is based on age-4 abundance. Hence the potential for higher harvest rates comes in 2009.

Subcommittee assignments for 2006 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. 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. Owen Hamel, National Marine Fisheries Service, Seattle, WA  
Mr. Tom Jagielo, Washington Department of Fish and Wildlife, Olympia, WA  
Dr. Peter Lawson, National Marine Fisheries Service, Newport, OR  
Dr. André Punt, University of Washington, Seattle, WA  
Dr. Hans Radtke, Yachats, OR  
Dr. Steven 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

## **Members Absent**

Dr. Kevin Hill, National Marine Fisheries Service, La Jolla, CA

## **Scientific and Statistical Committee Comments to the Council**

The following is a compilation of June 2006 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***

#### C.1. Pacific Mackerel Harvest Guideline for 2006-2007 Season

A Pacific Fishery Management Council-sponsored review of the Pacific Mackerel Assessment took place on May 16, 2006, at the Southwest Fisheries Science Center in La Jolla. Reviewers at the La Jolla meeting included Tom Barnes and David Sampson of the Scientific and Statistical Committee (SSC), and several members of the Coastal Pelagic Species (CPS) Management Team. Paul Crone, a member of the Stock Assessment Team (STAT), presented the data and modeling results. The reviewers and the STAT selected a Base Model that was an update of the previous assessment.

The current stock assessment model configuration for Pacific mackerel was developed in 2004, and was first used for management during the 2005-2006 fishing season. The assessment for 2006 was conducted as an update, in that the STAT adhered to the previously reviewed model configuration in deriving the Base Model results. A full Stock Assessment Review (STAR) Panel reviewed and accepted the modeling approach in 2004, and subsequently the SSC reviewed and accepted the 2005 assessment. In the 2006 assessment the principle change was the inclusion of new fishery and survey data from 2005, as well as correcting a previous error in the treatment of four “missing” years in the California Cooperative Oceanic Fisheries Investigations (CalCOFI) survey index. The STAT and the reviewers agreed on the Base Model results that estimated the 2006 biomass to be 112,700 mt. The SSC concurs that the Base Model results are the best available science and provide a suitable basis for Council management decisions.

#### Recommendations for the Next Assessment

Several technical issues were identified that would benefit from further exploration as part of the next full assessment, including investigation of time-varying selection to account for an absence of young fish during the early part of the time series, and examination of historical CalCOFI data, which cover a wider geographic range, to explore possible north-south shifts in distribution. These issues will be brought to the attention of the next assessment team.

Under the current Council process a single STAR panel reviews the stock assessments for Pacific mackerel and Pacific sardine, even though the fishing seasons for the two species are offset by six months. For 2007 the SSC recommends that the Council convene separate STAR panels, one during the fall for sardine and another during spring for mackerel. Each panel should consist of three reviewers with at least one being external to the Council and region. The SSC will work with the Southwest Center to facilitate the STAR Panels.

Prior to the next round of CPS stock assessments, the Terms of Reference for CPS assessments

should be reviewed and revised, especially with regard to update assessments. The extant Terms of Reference do not specify what constitutes an update or the information that should be documented in an update report.

### Management Issues

Several issues have been identified concerning the Pacific Mackerel Harvest Control Rule. How this could be accomplished in the near term. The reviewers at the May meeting noted that the Harvest Control Rule is for age-1+ fish, but in some years a significant portion of the landings are age-0 fish. The basis of the harvest guidelines should be consistent with the age composition of the catch. Also, results from the current mackerel assessment indicate that spawning stock biomass is only about 15% of the unexploited level and that the level of steepness in the spawner-recruit curve is very low.

### Specific Issues to be Addressed by the Next Assessment

- *The CalCOFI time series includes several years where no Pacific mackerel larvae were collected in the samples, and for those years the zero value was replaced by the lowest observed positive value. This causes a distortion of the dynamic range in the CalCOFI index compared to the other survey indices. It is recommended that the treatment of zeros be re-examined.*
- *The lack of age zero fish in the early part of the time series is inconsistent with the assumption of constant fishery selection. The STAT investigated time-blocking for the selectivity and got improved fit and more consistent effective sample sizes, and this change should be considered for adoption.*
- *The CalCOFI index is based only on data from the southern California Bight. It would be informative to explore coastwide CalCOFI data to clarify possible shifts in the geographic distribution. Also, it may be possible to develop a southern larval index that is more closely associated with the center of geographic distribution of the stock, based on historical CalCOFI and more recent IMMECOCAL data.*
- *The maturity schedule was developed many years ago, and it should be re-examined, preferably with new data. The curve seems unusually flat. Runs should be conducted to evaluate the sensitivity of the model to the assumed maturity-at-age relationship.*
- *There should be a formal evaluation of the sensitivity of the model to the “sigma” (error) values assumed for the three tuning indices.*
- *There seems to be a mis-match between the observed recruitment dynamics (boom-bust) and the underlying spawner recruit model (uncorrelated recruitment deviations).*
- *The revised Terms of Reference should specify detailed lists of results to be included in the assessment document.*

### **SSC Administrative Matters, continued**

#### A.4. Research and Data Needs - 2006 Council Process

*The SSC discussed the need to update two documents for the Council: Research and Data Needs 2000-2002 and West Coast Fisheries Economic Data Plan 2000-2002. A comprehensive revision of these documents cannot be completed this year. Instead each SSC Subcommittee chair will draft a*

*2-3 page report that (1) describes the current status of the highest priority needs for their FMP as identified in the Executive Summary of the Research and Data Needs document, (2) highlights activities from the main body of the document that address continuing issues, and (3) identifies important activities that address emerging issues not covered in the document (e.g., ecosystem-based fishery management, highly migratory species). Activities identified in (2) and (3) will be provided in bullet form, with a brief rationale for why the activity is important. Subcommittee chairs will distribute their draft reports to Subcommittee members for comment and possible revision by July 21, and send their revised reports to Mike Burner by August 16 for inclusion in the September briefing book. A more comprehensive planning process needs to be developed that will allow the SSC to systematically update and consolidate the Research and Data Needs and Economic Data Plan into a single document by 2008.*

### **Groundfish Management**

#### **F.2. Tentative Adoption of 2007-2008 Fishery Specifications/Management Measures and Amendment 16-4**

Mr. John DeVore met with the Scientific and Statistical Committee (SSC), and provided an overview of important issues contained in the reference documents under this agenda item. Most of the analytical methods and technical issues associated with the impacts analyses presented in these documents have previously been reviewed by the SSC. Therefore, SSC discussion of the documents focused on a few topics under consideration for 2007 which were either newly developed, required further clarification, or have become of higher importance than in past years.

The SSC notes that among the management proposals in Draft Amendment 16-4 (Agenda Item F.2a, Attachment 3), there is an option on page 27 where "...the Council may establish a research reserve for any stock, that is within the ABC but above and separate from the OY for that stock." If adopted, this would represent a significant change from the way that mortality associated with research activities has been previously accounted for in groundfish management. Potential advantages to this approach are that the fishery would not be subject to early closure due to unexpectedly high research catches, and research could continue unhindered under most situations, thus providing crucial information that is not otherwise available when stocks are under rebuilding constraints. Total catch accounting means that the catch series used for assessment and rebuilding analyses includes research catches.

The evaluation of action alternatives for cowcod (Agenda Item F.2a, Attachment 3, pages 72-73) raises the issue that modifying the current Cowcod Conservation Area (CCA) boundaries could undermine the ability to replicate the recent submersible survey within the CCA. The SSC notes that the methodology used in conjunction with the previous survey to extrapolate the findings over other habitats outside the CCA would not be appropriate for future surveys, and therefore CCA management consistency would not be an issue with respect to future survey work. Of greater importance is that fishing mortality is no longer distributed across all areas, and hence future surveys should be conducted both inside and outside the CCAs, so that the abundance extrapolations may be stratified accordingly. While there may be good reasons to consider not changing the CCA boundaries, possible impacts to future survey work is not one of them.

The economic impact analyses take into consideration current economic effects, but not how these effects may change through time. For example, it is not clear how an economic sacrifice today may be mitigated by increased revenue due to higher abundances at a future date, or how loss of current fishing opportunities may result in loss of port infrastructure that reduces future fishing opportunities. A dynamic benefit-cost analysis would help inform the Council on these trade-offs. However, such an analysis would need to project forward for all fisheries and sectors impacted by overfished species, which would be a complex undertaking.

#### *Clarifications and recommendations for reference documents*

- *The analyses that report time to rebuild in fractional years imply greater precision than is appropriate. Round rebuilding times to nearest whole year.*
- *Care should be taken to not make value judgments in the analyses. For example, the risk associated with canary rebuilding is not much different among alternatives, and therefore the expected duration of rebuilding should be highlighted among alternatives, rather than risk of not rebuilding.*
- *It would be useful to present the difference in rebuilding times in both absolute years and as percent change. For example, a hypothetical one year increase is negligible if the rebuilding time is 70 years, but it is a 50% increase if the rebuilding time is 2 years.*
- *Table 1 in Supplemental Report 5 should be appended to include community impacts.*
- *In Draft Amendment 16-4, it should be clarified that the year that a stock is expected to be rebuilt is not an absolute. Statements such as “the year in which the stock would be rebuilt...(page 39)” should be revised to convey less certainty.*
- *It would be desirable to clarify the notion of a stock. In particular, for a situation such as lingcod where it has a continuous latitudinal distribution but clear geographic differences in progress toward rebuilding, it may be appropriate to have an established mechanism or process to identify a “unit to conserve” that is smaller than the overall stock.*

#### **SSC Administrative Matters, continued**

##### A.5. Off-Year Science Workshop Planning

*The SSC discussed planning for the workshops scheduled for the rest of 2006. Three of these workshops (the “Data/modeling” workshop, the “NWFSC Shelf/Slope Survey” workshop, and the “Juvenile Survey” workshop) will be held under the auspices of the SWFSC/NWFSC, one (the “RecFIN” workshop) will be held under the auspices of the PSMFC, and the fifth (the “B<sub>0</sub>” workshop) will be an SSC-sponsored workshop. The SSC confirmed that several of its members will be attending each of the workshops and that the SSC (Barnes, Jagielo, Ralston, and Punt) will also participate in the review of the sardine assessment (17 October in Portland). The SSC noted that agendas were not available for any of the workshops at present. The general availability of draft agendas will facilitate preparation of background analyses / documents, particularly by analysts not directly involved in the planning of the workshops.*

*The SSC considered that the format for the “Data/modelling”, “RecFIN”, and “NWFSC Shelf/Slope Survey” workshops could follow the previous format of presentations followed by discussions, with a brief write-up. However, it considered that there may be value in a more formal structure for the “Juvenile Survey” workshop. This workshop aims to evaluate methods for including pre-recruit*

survey data in assessments and determine how useful this is. The SSC agreed that the value of this workshop would be enhanced by having outside experts (e.g. Kevin Bailey [AFSC], Pierre Pepin [DFO, St John's]), a chair who directs discussion and works towards an agreed report, and perhaps an expert panel who would draft the report, including the conclusions of the workshop. Apart from Ralston, Hamel, Punt and Sampson from the SSC are likely to attend this workshop.

After a presentation by Martin Dorn, the SSC discussed the structure and organization for the  $B_0$  workshop. It agreed that this workshop could be structured around the following three major topics:

1. What are the performance characteristics of the Pacific Council's OY control rule?
2. What is the best way to estimate  $B_0 / B_{MSY}$  (e.g. based on the stock-recruitment relationship, or on estimates of recruitment for a recent set of years).
3. The use of priors on biological parameters ( $M$ , steepness, survey catchability,  $\sigma_R$ , etc.) in assessments.

There are other topics that could usefully be examined in a workshop of this type (e.g. how to determine ABCs and OYs when there is no age-structured assessment, evaluation of alternatives to the 40-10 rule, development of harvest policies in the face of decadal scale environmental variation, and evaluation other metrics of reproductive output), but agreed that only the topics 1) – 3) above would be considered at the  $B_0$  workshop. The other topics are important and could form the basis for future workshops.

The SSC agreed that this workshop should take place during the week of 18 December in La Jolla. Martin Dorn will act as chair of the meeting. The SSC recommended that an agenda for this workshop be circulated soon and potential analysts identified to provide preliminary analyses relevant to each topic. The SSC agreed that the comparison among the various Councils of the methods used to define  $B_0$ ,  $B_{MSY}$  and  $MSST$  should be completed and presented to the workshop.

#### A.6. Ecosystem-Based Management Discussion

The following SSC statement was presented to the Council under Agenda Item B.1, Future Council Meeting Agenda Planning:

Ecosystem-Based Fisheries Management (EBFM) is a concept that is currently attracting much attention. A number of fishery management councils around the country have begun developing some form of an EBFM plan. Congress is also now considering specific language in the re-authorization of the Magnuson-Stevens Fishery Conservation and Management Act to mandate EBFM by Councils nationwide. Several recent actions taken by the Council are consistent with EBFM principles, including the krill harvest ban, designation of groundfish EFH, and extensive spatial management of rockfish stocks. There has been a substantial amount of discussion in the scientific literature concerning the rationale and benefits of EBFM, but it remains unclear how to explicitly incorporate these concepts into Council management of exploited fish stocks.

Given the complexity of EBFM, the Scientific and Statistical Committee (SSC) proposes that the newly established Ecosystem-Based Management subcommittee of the SSC meet to review the rapidly developing literature on this subject in order to enhance SSC understanding of the scientific basis of EBFM and to further explore how EBFM principles might be incorporated in the Council's

management practices.

### ***Groundfish Management, continued***

#### 3. Trawl Individual Quota Analysis

Jim Seger (PFMC) and Marcus Hartley (Northern Economics Inc.) briefed the Scientific and Statistical Committee (SSC) on the Stage 1 Draft – IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery (Agenda Item F.3.b, Attachment 1 and REVISED Attachment 1 ERRATA).

The SSC has several comments on the proposed methods:

- Analysis of the alternatives is a work in progress and a number of different data sources and approaches are being proposed. This analysis will generate a huge amount of output. To facilitate analysis and eventual consideration of results, it would help to narrow the scope of components and elements under each alternative. In addition, the SSC requests that the Consulting Team narrow the number of indicators being considered. Changes in the RCA boundaries and other aspects of management besides the current system of cumulative trip limits, were not considered, which seems inconsistent with the goal of the IFQ program to reduce bycatch.
- An objective of the IFQ program is to reduce bycatch and discard mortality. However, some elements for each alternative distinguish between low-OY and high-OY situations using thresholds, for example B25%, with quota shares becoming inactive if abundance is less than the threshold. In this case, management of the fishery would revert to cumulative trip limits, which raises a consistency issue. In other words, any benefits of the IFQ program for reducing bycatch would be forfeited for overfished stocks because the incentive for doing so would be lost. In any case, the SSC recommends basing the low-OY situation on whether the stock is considered overfished.
- Instead of basing significance of the effects from the alternatives on an arbitrary level (i.e. 20%), the SSC recommends reporting results in terms of the actual percentage change, or at least indicate the approximate level (20-30%, 30-40%, etc.).
- The Consulting Team suggests that an interview-based approach be used to obtain information from “key informants” to “quantify the likely changes under each alternative.” While this type of information is important for understanding the current structure of the fishery, the SSC is skeptical that such information can be used as a reliable basis for evaluating future changes under hypothetical conditions (i.e. different scenarios and alternatives).
- The Stage 1 Draft document provides an overview of five models (Initial Allocation, Industry Consolidation, Incidental Catch, Observer Cost, and Profitability) that would be developed for an analysis of the alternatives. However, descriptions of these models is rather general, and it was not possible for the SSC to evaluate the structure of these models at this time. Most of the SSC discussion focused on the Incidental Catch model. An important point is

that modeling on a tow-by-tow basis may not be reliable and raises the question of how to handle relatively rare “disaster tows” that generate large amounts of bycatch. Regarding the Consolidation and Profitability models, the SSC recommends that effects on employment (e.g. crew shares) should be included as a main component of the analysis.

- The issue of dealing with changes in market power between harvesters and processors is important, and unsettled according to the Consulting Team. The SSC recommends reviewing current literature on this subject [e.g. Matulich, S., and M. Clark. 2003. North Pacific Halibut and Sablefish IFQ Policy Design: Quantifying the Impacts on Processors, Marine Resource Economics, 18(2), 149-166.].
- The SSC discussed potential problems in the initial allocation if healthy and overfished stocks are not treated differently. Specifically, past catch may work well for establishing the initial allocation of permits for healthy stocks. However, this type of allocation rule could create a perverse reward for vessels with the highest levels of catch for overfished species. An alternative is a uniform allocation of quota shares for these stocks.

Finally, the SSC wishes to highlight the complexity of the efficiency and equity trade-offs that are likely to occur under any IFQ program, and for the possibility of unforeseen consequences. The Consulting Team indicated that a range of estimates for potential efficiency gains (i.e. benefits), and costs of implementation, should be available to inform the Council after the analysis proposed in the Stage 1 Draft document is complete.

## ***Salmon Management***

### G.1 Fishery Regulation Assessment Model (FRAM)

Mr. Andy Rankis and Mr. Larrie LaVoy met with the Scientific and Statistical Committee (SSC) and described recent progress by the Model Evaluation Workgroup (MEW) on the Fishery Regulation Assessment Model (FRAM) documentation. They presented five documents:

- 1) User Manual,
- 2) FRAM Overview,
- 3) FRAM Technical Documentation,
- 4) Chinook FRAM Base Data Development, and
- 5) Coho FRAM Base Data Development.

Documents 2 through 5 were revisions of documents reviewed by the SSC and Salmon Technical Team (STT) in November 2005. Document 1, the User Manual, was newly created in response to review comments.

The MEW made a concerted effort to address the comments of the SSC and the STT from the November 2005 review. As a result, the documentation is clearer and better organized. Figures are better linked to the text, fuller explanations of processes such as Production Expansion Factor development and Out-of-Base-Period stock methods are provided, and background material has been added. These, among other changes, represent substantial improvements to the documentation.

Mr. Rankis reported that the Coho FRAM Base Data Development documentation is still under

revision. Completion depends on the work of the Coho Technical Team of the Pacific Salmon Commission, which is currently developing methods to integrate Canadian stocks into the model.

The MEW has requested comments from the SSC to guide continuing refinement of the model documentation. To achieve this, the SSC salmon subcommittee is planning a meeting, perhaps in late August, to consider these documents more fully. The MEW cited several areas where improvements are needed and will continue to work on the documents over the summer.

## G.2 Fishery Management Plan Amendment 15 (de minimis fisheries)

Ray Beamesderfer presented the analytical framework for evaluating the effects of the various alternatives for *de minimis* fisheries on Klamath River fall Chinook salmon. The general analysis approach will be to define a range of options and then simulate the outcome of these management measures. Another approach to arriving at a preferred alternative would be to define the goals of management in terms of performance and then search for a set of rules that achieves those goals.

The base model presented was equivalent to Model 1 of the “Klamath River Fall Chinook Stock-Recruitment Analysis” report (Agenda Item G.1.b, STT Report, September 2005). The Scientific and Statistical Committee (SSC) concluded previously that Model 2 better captures the variability and  $S_{MSY}$  level and should be considered for simulation. Random changes and trends in in-river survivorship should be included in simulations using Model 2, which will allow for making different assumptions about future changes in the state of the Klamath River basin.

The SSC suggests including parameter uncertainty in the stock-recruit relationship as well as implementation and process errors, and notes further that the down-turn of the descending limb of the Ricker curve at high stock size in Model 1 may be due largely to the in-river environmental effects, rather than density-dependent effects. Sensitivities to different representations of stock recruitment variance about the stock-recruitment curve may have large effects. These issues should be considered in the analysis.

It is important to adequately model the difference between management action and implementation, i.e. target  $F$  and actual  $F$ . In recent years these two quantities have been quite dissimilar. One approach to address the impacts of this difference and minimize the need for *de minimis* fisheries is a precautionary buffer above the 35,000 spawner “reference point”. The SSC further notes that the target 35,000 spawner escapement level is irrespective of spawner age, despite the difference in fecundity with age.

The SSC notes that the modeling exercise used to analyze the alternatives cannot capture all the important issues. For example, the Klamath fall Chinook stock consists of several smaller populations, and low composite spawning escapement could lead to localized extinction and damage to long-term productivity. The stock-recruitment model assumes relatively high productivity at low stock size and may underestimate threats to the stock at low stock size. Inclusion of a depensatory parameter can partially address these concerns. The SSC notes, despite the above concerns, that the proposed analysis approach is useful for comparison of the various alternatives, although the absolute numbers arrived at will be highly dependent upon the model assumptions.

**Public Comment**

None.

**Adjournment:** The SSC adjourned at approximately 4 p.m., Tuesday, June 13, 2006.

PFMC  
09/8/06

### SSC Subcommittee Assignments for 2006

Salmon	Groundfish	CPS	HMS	Economic	Ecosystem-Based Management
Alan Byrne	Steve Berkeley	<b>Tom Barnes</b>	Tom Barnes	<b>Michael Dalton</b>	Tom Barnes
Robert Conrad	Ray Conser	Alan Byrne	Steve Berkeley	Hans Radtke	<b>Steve Berkeley</b>
Owen Hamel	Michael Dalton	Michael Dalton	Alan Byrne	Cynthia Thomson	Michael Dalton
Kevin Hill	<b>Martin Dorn</b>	Ray Conser	Robert Conrad	David Sampson	Martin Dorn
<b>Pete Lawson</b>	Owen Hamel	Tom Jagielo	<b>Ray Conser</b>		Tom Jagielo
Hans Radtke	Tom Jagielo	André Punt	Kevin Hill		Pete Lawson
David Sampson	André Punt		André Punt		André Punt
	Steve Ralston		Hans Radtke		Steve Ralston
	David Sampson				Cynthia Thomson

**Bold** denotes Subcommittee Chairperson