

**SUMMARY MINUTES**  
**Scientific and Statistical Committee**

Pacific Fishery Management Council  
Doubletree Hotel  
California Ballroom Salon 2  
2001 Point West Way  
Sacramento, CA 95815

**March 5-6, 2007**

***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.

Subcommittee assignments for 2007 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. Martin Dorn, National Marine Fisheries Service, Seattle, WA  
Dr. Owen Hamel, National Marine Fisheries Service, Seattle, WA  
Dr. Tom Helser, 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. Todd Lee, National Marine Fisheries Service, Seattle, WA  
Mr. Lyman McDonald, West Incorporated, Laramie, WY  
Dr. André Punt, University of Washington, Seattle, WA  
Dr. Stephen Ralston, National Marine Fisheries Service, Santa Cruz, CA  
Dr. David Sampson, Oregon State University, Newport, OR  
Ms. Cindy Thomson, National Marine Fisheries Service, Santa Cruz, CA

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

The following is a compilation of March 2007 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.2. Stock Assessment Terms of Reference**

The Scientific and Statistical Committee (SSC) endorses the *Terms of Reference for a CPS STAR Process* (Agenda Item C.2.a, Attachment 1). While not a CPS-specific issue, the SSC also discussed provisions in the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) that may affect the SSC's operating procedures. In particular, the SSC's traditional role of overseeing the review of stock assessments, coupled with a new concomitant role of providing the Council with more detailed advice on harvest levels, may blur the science-management boundary that has served the Council process well in the past. When the implications of the MSRA are more fully understood, the SSC encourages discourse with the Council to more clearly define the SSC's role and to implement clearly-defined processes.

### ***Groundfish Management***

#### **E.3. Pacific Whiting Management for 2007**

Dr. Tom Helser from the Pacific Whiting Stock Assessment Team presented the Scientific and Statistical Committee (SSC) with an overview of the stock assessment of Pacific Hake (whiting) in U.S. and Canadian Waters and responded to questions arising during the SSC discussions. Dr. Ray Conser summarized the report of the joint Canadian and U.S. Pacific Whiting Stock Assessment and Review (STAR) Panel. The Panel was conducted using the Council-approved Terms of Reference for Groundfish Stock Assessments.

As in the 2006 stock assessment, two alternative models were presented based on the value of the acoustic survey catchability coefficient ( $q$ ). Both models were considered equally plausible. The SSC endorses the use of the 2007 Pacific whiting assessment for management purposes and recommends that the results from both models be combined to form the basis for management advice giving each model equal weight.

The 2007 assessment was conducted using the same stock assessment package (Stock Synthesis 2) and assumptions about natural mortality and steepness as used in the 2006 assessment. However, a new coastwide recruitment index was incorporated into the 2007 assessment and the Santa Cruz pre-recruit index for the years prior to 2001, which was used in the 2006 assessment, was excluded. The removal of the early Santa Cruz time series and inclusion of the new coastwide index has resulted in slightly higher 1999 and 2003-2004 recruitments. As a result, spawning biomass in the most recent years is slightly greater than predicted by the 2006 assessment. These changes account for the similarity in the estimates of spawning biomass and depletion between the 2006 and 2007 assessments.

The projections based on the two alternative models indicate that the stock is in the precautionary range (0.25-0.40  $SSB_0$ ). The spawning biomass is predicted to decline in the future for almost any level of harvest because the strong 1999 year class, which has been sustaining the stock in recent years, is now past its peak biomass. Catches of 400,000 mt or more are forecast to reduce the spawning stock below the overfished threshold in two years.

$F_{40\%}$  was selected as an  $F_{MSY}$  proxy for Pacific whiting based on the results of a meta-analysis that used stock and recruitment data for other whiting species. However, the Pacific whiting stock is predicted to fall below 25%  $B_0$  if management is based on  $F_{40\%}$  primarily due to the impact of the highly variable recruitment characteristic of this stock. There is therefore a lack of consistency for Pacific whiting between aiming to maximize yield on average and preventing depletion to below 25% of  $B_0$ .

The SSC again notes that there is only one fishery independent index of abundance (the hydroacoustic survey) that can be used in tuning the assessment and this index is essentially flat, in contrast to the extensive age and size composition data that indicates the stock is in decline from very high biomass levels since the mid 1980's. Model runs in which size and age composition were downweighted still resulted in a declining trend in spawning biomass. While the absolute biomass level is very sensitive to the value assumed for  $q$ , the trend is less so.

*SSC notes:*

- 1. Need to document how indices are treated relative to bias corrections.*
- 2. Need to document and account for trawl discards by size and age.*
- 3. Appendix 2 needs to be put into context and authorship correctly assigned.*
- 4. Need to determine if there is a level of harvest that will avoid the stock reaching the overfishing threshold.*
- 5. Need to find a model that fits the survey index data. To do this will require new assumptions about natural mortality, selectivity, catchability, etc.*
- 6. The selectivity pattern of the survey comes from net tows to confirm size and age composition and appear to be under sampling the small fish (based on the ascending limb of the selectivity curves for the acoustic survey). But net tows are not necessarily sampling the same fish as the acoustics are seeing. Experiments should be conducted using pocket nets or other similarly modified nets to evaluate possible differential escapement of small fish in the wings of the net.*
- 7. Model weighting to reduce emphasis on age composition should be continued until diagnostics suggest that the model no longer fits the data to provide a better fit to the survey data.*
- 8. Alternative values for steepness should be explored in the next assessment.*

9. *Given the observed variability in growth, models with length based selectivities should be explored.*

10. *Aging error should be evaluated and if necessary, incorporated into future assessments.*

11. *Figures of selectivity patterns that demonstrate the extent of “cryptic biomass” should be included in either the assessment or STAR panel report.*

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

#### **E.1. Groundfish Harvest Policy Evaluation Workshop**

The Scientific and Statistical Committee (SSC) hosted a workshop to evaluate aspects of the Council’s groundfish harvest policy. The discussions centered around three issues: (1) the performance of the 40-10 harvest policy for stocks with different life history and stock-recruitment patterns, (2) alternative methods for estimating  $B_0$  and  $B_{MSY}$  proxies, and (3) the use of priors for natural mortality and stock-recruitment steepness.

The SSC notes that considerable progress had been made towards addressing these topics. However, it is not possible at present to draw definitive conclusions about the first two issues as further work is required. Regarding the third issue, the SSC endorses the recommendations of the workshop regarding which empirical methods should be used to estimate natural mortality and the need for assessment authors to show the impact of the value of natural mortality on model fit by means of likelihood profiles. In addition, the SSC recommends that the work to calculate a prior for steepness for rockfish species be completed as soon as possible and the results sent to the groundfish stock assessment coordinator who should provide it to relevant assessment authors and Stock Assessment and Review (STAR) Panels.

The SSC notes that some of the work presented to the workshop indicates that stocks with high recruitment variability have a larger probability of dropping below the overfished threshold. The workshop discussed two ways in which to modify the current harvest policy for such stocks: reduce the harvest rate or change the overfished threshold. Operationalising either of these ideas will require additional work to evaluate the performance of alternatives. In principle, stocks could be classified into categories depending on perceptions regarding recruitment variation, and separate control rules developed for each category.

The SSC emphasizes the importance of providing a way to compare the trade-offs in terms of catch and risk between the 40-10 and 60-20 control rules, as the optimum yield (OYs) for several of the California nearshore groundfish are based on the 60-20 rule.

The SSC notes that the concept of “dynamic  $B_0$ ” provides a means for evaluating stock status given “prevailing conditions”. The SSC does not believe that dynamic  $B_0$  has been evaluated sufficiently at present for it to form the basis for changes to the current harvest policy. However, the SSC encourages further work on developing and testing control rules based on dynamic  $B_0$ . Also, the SSC recommends that assessment authors report stock depletion in terms of dynamic  $B_0$  in addition to

current measures of depletion, to help elucidate causes for stock declines (environment versus fishing).

The SSC endorses the need to develop and examine harvest control rules for data-limited stocks. Several researchers are working on potential control rules for data-poor species and SSC review of this work in a workshop setting could provide focus for Council action in this regard. The SSC also endorses the workshop recommendation that harvest policies that account for and are robust to climate be developed and tested.

The harvest policy evaluation workshop focused on groundfish species. However, many of the considerations discussed during the workshop pertain to other Council-managed species groups. The SSC notes the importance of considering the issues discussed during the harvest policy workshop if the harvest policies for Coastal Pelagic Species (CPS) species are reviewed and possibly revised.

The workshop provided a means for reviewing and discussing the research being conducted outside the Council process in relation to its ability to improve the quality of the advice the Council receives. Interaction between the SSC and outside researchers should help focus the research so that it is of greatest benefit to the Council. The SSC therefore recommends that an additional meeting be held to review the work conducted in response to the recent workshop and perhaps begin the process of refining the harvest policy. Given time constraints, such a meeting could not occur before the next off-year and hence impact OYs for 2009-2010. Participation in the recent workshop by scientists from outside the Council family enhanced the discussions and the SSC recommends that such scientists be invited to any further meetings.

#### *SSC Notes:*

- *There are no standards for deciding when to base management advice on estimates of  $F_{MSY}$  rather than  $F_x\%$  and the current work is not aimed at addressing this.*
- *Consideration should be given the developing and evaluating control rules that account for the uncertainty of the reference points.*
- *The whiting control rule will need to be revised based on the new Canada-US whiting treaty. Account should be taken of the results of the simulations presented to the workshop.*
- *A figure should be added to the report which shows the 40-10 control rule in terms of catch rather than fishing mortality.*
- *A figure showing “dynamic” statistics should be added to the report.*

### ***Salmon Management***

#### G.1. Review of 2006 Fisheries and Summary of 2007 Stock Abundance Estimates

Mr. Dell Simmons, Chair of the Salmon Technical Team (STT), reviewed the 2006 fisheries and the preliminary 2007 ocean salmon stock abundance estimates for the Scientific and Statistical Committee (SSC). Mr. Allen Grover presented material on the Klamath River fall Chinook (KRFC) stock which constrained Chinook fisheries south of Cape Falcon in 2006.

In 2004 and 2005, the post-season estimate for the KRFC age-4 ocean exploitation rate was far greater than the pre-season estimate, and exceeded 16 % in both years. This resulted in fewer than the escapement floor of 35,000 natural spawners, and was due in part to higher than expected contact rates in some fisheries. Beginning with the 2006 pre-season analysis, the relationship of effort to contact rate in the Klamath Ocean Harvest Model (KOHM) has been re-estimated for each fishery by using only the last 4 years of data instead of the full time series. This resulted in a better prediction of age-4 ocean impact rate for KRFC in 2006, although the natural spawner floor was missed again, triggering an Overfishing Concern. In the investigation into why contact rates were higher, a data issue related to coded wire tag (CWT) coding for the in-river tribal fisheries was discovered. This has now been corrected, and the estimates of contact rate are somewhat lower, but still considerably higher than those based upon the full time series. These higher estimated contact rates and the resulting reduced fishing opportunity appear to be the current reality. The SSC recommends that the STT investigate the causes of these changes to contact rates.

For KRFC, the abundance of age  $a$  (for ages 3-5) is estimated from age  $a-1$  in-river returns. The spawning escapement is composed of age-3, 4 and 5 Chinook, although 5 year olds tend to be a relatively minor contributor to the total escapement. The 2007 pre-season estimate of age-3 abundance is very high (515,409) while that of age-4 abundance is very low (26,085). Based upon a no-fishing prediction of over 75,000 natural spawners, the maximum age-4 ocean impact rate (16%) can be implemented while still exceeding the 35,000 natural spawner floor. However, uncertainty in the estimates of ocean abundance is not considered in this analysis. Prediction intervals or a distribution about the regression should be used to assess the risk of missing the natural spawner floor. Pre-season and post-season abundance estimates can differ by a factor of 2 or more, and thus the risk is far from negligible. Furthermore, if the relative abundances of age-3 and 4 KRFC are accurate, the spawners will be dominated by age-3 fish which are smaller and produce fewer and possibly lower quality eggs than age-4 or 5 fish. These differences in fecundity and egg quality are not considered when using the natural spawner floor as a target, but may be important to the resulting recruitment.

Ocean fisheries north of Cape Falcon may be constrained by the Endangered Species Act listing of lower Columbia River wild coho stocks and the U.S. fishery 10% exploitation cap on the Thompson River coho stock. The STT expressed concern about their ability to estimate impacts on recent listed lower Columbia River coho. Low predictions for threatened Columbia River Tules may limit fisheries South of Cape Falcon.

The pre-season forecast of the central valley index (CVI) for Chinook salmon is at its lowest level since 1992. The regression used to predict the CVI is likely highly dependent upon the 2005 data point. A sensitivity analysis should be done to see how the current estimate changes if this data point is removed. Alternatively, an errors-in-variables or functional regression approach could be taken (this approach would be useful in the KRFC contact rate to effort relationship as well). In any case, the CVI forecast of 499,900 appears high given data from years with similar age-2 returns. While this change would have little or no impact on fisheries in this year, a more accurate estimate of the relationship could improve future management.

The SSC wishes to reiterate a few recommendations it has made in the past to improve the usefulness of STT reports. Tables I-1 and I-2 in Preseason Report I present several years of preseason predictors for Chinook and coho stocks under Council management. The SSC requests the STT add post-season estimates to these tables, where available, to facilitate a reader's ability to compare the abundance predictors with the actual abundance estimates. A graphical representation of the pre- and post-season stock abundance estimates would facilitate this review.

The SSC would like to see prediction intervals for estimates of salmon abundance and exploitation rates. Given the uncertainties in abundance projection and exploitation rate estimation it is difficult to know the likelihood of meeting management objectives or to evaluate whether or not a management goal has been attained. The explicit recognition of uncertainty in salmon statistics is a necessary first step towards incorporating uncertainty and risk in salmon management.

### ***Salmon Management, continued***

#### G.3. Identification of Stocks Not Meeting conservation Objectives

Mr. Dell Simmons reported to the Scientific and Statistical Committee (SSC) that three salmon stocks have failed to meet escapement goals for three or more consecutive years. These are Queets Spring/Summer Chinook, Quillayute Spring/Summer Chinook, and Klamath River fall Chinook. The Queets and Quillayute runs are exceptions to the Council's overfishing policy because they are harvested at less than a 5% exploitation rate in Council fisheries.

The failure of Klamath River fall Chinook to meet their escapement floor for three consecutive years is not a surprise. The Council has spent considerable energy and resources anticipating and preparing for this event. The draft report, "Factors affecting the low abundance of Klamath naturally-spawning fall Chinook salmon in 2004 and 2005" by the Habitat Committee, the states of Oregon and California, and the Yurok Tribe, highlights the range of freshwater habitat problems currently limiting Klamath River fall Chinook. However, the report does not specifically address the reasons for the low escapements in 2004 and 2005.

Fishery restrictions play an important role in the protection and recovery of Klamath River fall Chinook, and there have been fishery management failures leading up to the current situation. The history of Klamath fishery management and its role in contributing to the current overfishing concern should be added to the draft document. The rebuilding plan should emphasize that, ultimately, recovery is not possible without actions to improve both in-river habitat and fishery harvest management.

The Draft Report is incomplete, missing many sections including discussions of harvest management, the federal Klamath irrigation project, hatcheries, and ocean conditions. The SSC requests an opportunity to review a draft of this report in a more complete form before it is finalized.

## *Groundfish Management, continued*

### E.6. Trawl Rationalization (Trawl Individual Quota Program)

Mr. Jim Seger briefed the Scientific and Statistical Committee (SSC) on the status of the Council's efforts towards rationalizing the limited entry trawl fishery by implementing a Trawl Individual Quota (TIQ) system of management. Although a variety of briefing materials was made available to the SSC, the presentation was primarily limited to a review of Table 2 (Summary of IFQ alternatives) in the Groundfish Allocation Committee (GAC) report on trawl rationalization (Agenda Item E.4.b, GAC Report, March 2007). It is clear that the package of alternatives that is now being considered by the Council has been simplified since September 2006, when the SSC last considered this topic. This simplification will serve to highlight the key policy decisions that the Council will make as the TIQ issue moves forward. However, the link between the revised set of options and the stated objectives of the TIQ program is still not clearly articulated.

Following the presentation, the SSC's discussion largely centered on the topic of area-based management and, in particular, the GAC's request that "the SSC groundfish subcommittee identify species susceptible to localized depletion and other factors to consider in establishing biological regions." This is now an important issue because the GAC also made the recommendation to "eliminate the community stability program and rely on other measures to address community concerns (e.g., area-based management and potential regional fishery management associations.)"

The SSC notes that the term "localized depletion" is extremely ambiguous and may have different meanings to different people. If defined as the fraction of current spawning biomass relative to the unfished level (e.g., the 40:10 rule that regulates groundfish harvests), it would be impossible to determine "depletion" on localized and/or regional spatial scales with our current level of knowledge for almost all species. However, if defined simply as a site-specific relative reduction in catch rate more progress could be achieved. Hence, the first issue to resolve is: what is the precise concern about localized depletions? Although unstated, the implied concern is that implementation of a TIQ system will cause fishing effort to undergo a spatial shift that concentrates fishing effort and leads to localized depletions.



To respond to the GAC's request and to move things forward, the SSC agreed to hold a meeting of the groundfish subcommittee sometime before September to consider several issues. These would include a consideration of different ways of defining localized depletion and identification of data sources that would be useful in describing spatial and temporal patterns in the distribution and abundance of trawl-caught groundfish on the US West Coast. These data sources would likely include port-specific landings, trawl logbooks, NMFS fishery-independent surveys, and observer data. It would then be helpful to identify a reasonable set of analytical procedures that could be applied to the data and, finally, to task the work to a team of analysts. Once completed, the SSC notes that a significant ancillary benefit of this type of analysis would be to formalize a methodology for apportioning a coastwide optimum yield (OY) into smaller spatial units (e.g., States, INPFC areas, etc).

In addition, the SSC has the following three specific comments regarding the TIQ options as they are currently framed:

1. With respect to the use of area-based management tools as a means to protect and stabilize fishing communities, the SSC notes that area-based management may or may not be the best way to achieve this goal, if it is desired. Area-based management may more closely correspond to the protection of regional economies rather than individual communities.
2. The overall economic rationale for TIQs is to reduce excess capacity in the harvesting sector. Consequently, it is not obvious why quota shares should be allocated to the processing sector. Therefore, a clear justification for this option should be developed.
3. The SSC recommends that the option for an expanded voluntary program for collection of socio-economic data be dropped, and that the collection of such information be mandatory under the TIQ program. It is also important that the specific types of data collected should allow subsequent evaluation of the effectiveness of the program in achieving its goals and objectives. In particular, the collection of *ex-ante* and *ex-post* data is necessary to accomplish this.

### ***Council Administrative Matters***

#### **D.2. Review and Planning for Implementation of New Requirements Resulting from Reauthorization of the Magnuson-Stevens Act**

The Scientific and Statistical Committee (SSC) discussed new provisions of the 2006 Magnuson-Stevens Conservation and Management Reauthorization Act (MSRA) as they relate to the role of the SSC in the Council process. The SSC has a number of questions regarding these provisions:

Provision: "The Council shall establish annual catch limits for each managed fishery that may not exceed the fishing level recommendations of its SSC" (MSA 302(h)(6), p. 51)

The Pacific Council has maintained a clear distinction between scientific analysis and advice and policy decisions, with the SSC taking the lead on the science. With regard to coastal

pelagic and groundfish catch limits, the SSC's role has been to review the harvest control rule and the stock assessments that are fed into the control rule. The Council's role has been to establish annual catch limits, which (for groundfish) involves taking into consideration the decision table showing harvest levels associated with high, medium, and low levels of risk to the stock. While not mandated by the SSC, it has generally been Council practice not to exceed the risk-neutral level of harvest indicated by the control rule.

If the "fishing level recommendations" that the SSC is expected to provide under the MSRA are intended to be numeric catch limits, this will be a major deviation from Council practice, as it will require the SSC to make policy decisions. This raises several issues: (1) Is the SSC supposed to establish catch limits strictly on the basis of biological considerations? If so, this will be tantamount to an implicit policy decision to disregard ecosystem and socioeconomic issues in setting catch limits. (2) What types of information would the SSC be required to consider in establishing catch limits? For instance, would the SSC consider results of a regulatory analysis and take input from advisory bodies and the public? If so, then what is the role of the Council with regard to setting catch limits? If not, does this leave the Council and NOAA Fisheries Service vulnerable to claims of procedural violations under the National Environmental Policy Act (NEPA) and the Magnuson Act?

Provision: "The SSC shall provide recommendations for acceptable biological catch, preventing overfishing, maximum sustainable yield and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, socioeconomic impacts of management measures, sustainability of fishing practices (MSA 302(g), pp 49-50).

Clarification is needed with regard to SSC responsibilities entailed by this provision. For instance, does this responsibility pertain to all species (including salmon and highly migratory species)? In terms of "preventing overfishing" and "achieving rebuilding targets", is the SSC supposed to set numeric bycatch levels associated with rebuilding? If so, then the same issues raised above with regard to the SSC setting of catch limits would apply here as well.

Does the requirement that the SSC "provide" reports on stock and habitat status, bycatch, socioeconomic impacts of management measures and the like mean the SSC will "produce" these reports. If so, given the Council's practice of separating analysis from review, who will review the SSC's production of these reports?

The SSC also discussed pending efforts by NOAA Fisheries Service to integrate NEPA requirements with fishery regulatory requirements in such a way as to streamline the management process. Given that rationale for the biennial groundfish management and assessment cycle was the cumbersome nature of the regulatory process, would such streamlining reduce the time lag between groundfish management actions and the stock assessments on which they are based?

## **Public Comment**

Mr. Duncan MacLean, California Troll Representative on the Salmon Advisory Subpanel, addressed the proposed adjustments to the contact rates for age-4 Klamath River fall Chinook proposed by the STT and presented to the SSC. Mr. MacLean stated these small adjustments in contact rates can have profound changes in salmon seasons and the corresponding socioeconomic impacts to fishing communities.

None.

**Adjournment:** The SSC adjourned at approximately 5 p.m., Tuesday, November 14, 2006.

PFMC  
03/08/07

## SSC Subcommittee Assignments for 2007

Salmon	Groundfish	CPS	HMS	Economic	Ecosystem-Based Management
<b>Pete Lawson</b>	<b>Martin Dorn</b>	<b>Steve Ralston</b>	<b>Ray Conser</b>	<b>Cindy Thomson</b>	<b>Steve Berkeley</b>
Robert Conrad	Steve Berkeley	Tom Barnes	Tom Barnes	Todd Lee	Tom Barnes
Owen Hamel	Ray Conser	Ray Conser	Steve Berkeley	David Sampson	Martin Dorn
Lyman McDonald	Owen Hamel	Tom Jagielo	Robert Conrad		Tom Jagielo
David Sampson	Tom Helser	Tom Helser	André Punt		Pete Lawson
	Tom Jagielo	André Punt			Todd Lee
	André Punt				André Punt
	Steve Ralston				Steve Ralston
	David Sampson				Cindy Thomson

**Bold** denotes Subcommittee Chairperson