SUMMARY MINUTES

Scientific and Statistical Committee

Pacific Fishery Management Council
Red Lion Hotel Sacramento
Comstock 2 Room
1401 Arden Way
Sacramento, CA 95815
(916) 922-8041
March 11-12, 2002

Call to Order

The meeting was called to order at 8 A.M. by Chair Cynthia Thomson. Dr. Hans Radtke (new Council chairman) provided some brief remarks about the importance of advisory bodies to the Council process. Mr. Tom Jagielo suggested it would be useful for the Scientific and Statistical Committee (SSC) to occasionally meet with members of the Council to foster communication. Dr. Don McIsaac, Executive Director, spoke briefly about the SSC agenda. He noted the agenda appeared to be accomplishable. Dr. McIsaac highlighted that SSC advice on the Pacific whiting assessment would be of particular interest to the Council.

After discussing the need to be flexible on the timing of certain items, the SSC approved the agenda.

The November 2001 meeting summary was approved.

Members in Attendance

Dr. Brian Allee, Columbia Basin Fish and Wildlife Authority, Portland, OR
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. Robert Francis, University of Washington, Seattle, WA
Dr. Kevin Hill, California Department of Fish and Game, La Jolla, CA
Mr. Tom Jagielo, Washington Department of Fish and Wildlife, Olympia, WA
Dr. Peter Lawson, National Marine Fisheries Service, Newport, OR
Dr. Stephen Ralston, National Marine Fisheries Service, Santa Cruz, CA
Dr. Andre' Punt, University of Washington, Seattle, WA
Dr. Gary Stauffer, National Marine Fisheries Service, Seattle, WA
Ms. Cynthia Thomson, National Marine Fisheries Service, Santa Cruz, CA
Dr. Shijie Zhou, Oregon Department of Fish and Wildlife, Portland, OR

Open Discussion

The SSC discussed the strong need for expertise in economics and social science on the SSC. In the recent past, review of economic analyses has not been a major focus of SSC work, largely because of the lack of formal economic analyses in Council documents. As this information is becoming critical to the Council process, the SSC should be equipped to provide guidance on these matters.

The SSC also requested Mr. Dan Waldeck record at the end of each meeting summary "Research and Data Needs" discussed during the course of the SSC meeting.

SSC Administrative Matters

During a brief closed session, Mr. Tom Jagielo was elected chair of the SSC for a two-year term. Dr. Kevin Hill was elected vice-chair, also for a two year term.

The SSC reviewed subcommittee assignments year and determined the composition of the subcommittees for 2002. Assignments are as follows:

Salmon	Groundfish	CPS	HMS	Economic	Marine Reserves
Brian Allee	Ray Conser	Michael Dalton	Alan Byrne	Michael Dalton, Chair	Ray Conser
Alan Byrne	Michael Dalton	Alan Byrne	Robert Conrad	Cynthia Thomson	Michael Dalton
Robert Conrad	Martin Dorn	Ray Conser	Ray Conser		Tom Jagielo
Kevin Hill	Tom Jagielo	Robert Francis, Chair	Kevin Hill, Chair		Pete Lawson
Pete Lawson, Chair	Robert Francis	Tom Jagielo	Andre' Punt		Andre' Punt
Shijie Zhou	Andre' Punt	Andre' Punt	Cindy Thomson		Steve Ralston
	Steve Ralston, Chair	Shijie Zhou			Cynthia Thomson, Chair

Scientific and Statistical Committee Comments to the Council

The following text contains SSC comments to the Council. (Related SSC discussion not included in written reports to the Council is provided in italicized text).

Salmon

Final Review of Methodology Changes to the Klamath Ocean Harvest Model (KOHM) and Coho Fishery Regulation Assessment Model (FRAM)

At the November 2001 Council meeting, the SSC received updates on the progress of changes to the coho salmon Fishery Regulation and Assessment Model (FRAM) and the Klamath Ocean Harvest Model (KOHM). At that time both models still had several issues that needed to be addressed before the models could be used in the 2002 management process. Joint meetings of the SSC salmon subcommittee and the Salmon Technical Team (STT) were held on January 3 and February 5, 2002 to receive progress reports on the work to address the outstanding issues for the FRAM and the KOHM, respectively.

Coho FRAM:

Mr. Jim Packer and Mr. Larrie LaVoy from the Washington Department of Fish and Wildlife (WDFW) presented the progress report on the coho FRAM. At the November meeting, it was determined the critical problem that needed resolution before FRAM could be updated was a methodology for combining or "averaging" fishery exploitation rate estimates across the six years in the new 1986-1991 base period. Since that meeting, Mr. Packer and Mr. LaVoy have investigated four possible methods of "averaging" base period exploitation rates:

- Stock-fishery-time specific exploitations rates averaged over six years,
- Stock-fishery-time specific exploitations rates averaged over open fisheries only during the six years,
- Stock-fishery-time specific catches averaged over six years (then divided by an average cohort size), and
- Stock-fishery-time specific catches averaged over open fisheries only during the six years (then divided by an average cohort size).

Detailed comparisons of the results of using each averaging method in the final 2001 preseason FRAM run were presented. The SSC recommended that method 2 be used to estimate stock-fishery-time specific exploitations rates in the model for 2002, because this method is considered to be less biased than the others, and it can most easily incorporate new information (i.e., exploitation rates outside the base period) into the model if it becomes available. The SSC also recommends further analysis of alternative methods before the 2003 management season.

At the November meeting, the following additional tasks were identified which needed to be completed prior to the March 2002 meeting: (1) those parties responsible for producing preseason forecasts for input to FRAM needed to be aware of new stock requirements and prepare forecasts in a format compatible with the updated FRAM; (2) all output reports for the Council, South of Falcon, and North of Falcon management processes needed to be developed and incorporate the new stocks and fishery units; (3) the Terminal Area Management Models (TAMMs), which have been external to the old FRAM model, are now internal to the model, and reports analogous to the TAMM output sheets needed to be developed; (4) there are a number of other management models that use output from the FRAM as input and compatibility between models needs to continue; and (5) Washington coastal terminal area fisheries are now part of the updated FRAM. In the past, analyses for these fisheries were conducted external to the model. Agreement on the methods to be used for Washington coastal terminal area fisheries in 2002 is needed. All of these issues have been satisfactorily addressed. With reference to issue 5, WDFW and the Tribes will consider both methods of analysis (external to the model and internal to the model).

Given that all identified issues of concern have been addressed, the SSC recommends the revised FRAM for use in the 2002 fishery management process. In addition, the SSC recommends that Model Evaluation Subgroups be formed for both the coho and chinook FRAM models. These groups should have participants from all interested agencies. The purpose of these subgroups would be to:

- Increase the number of people who understand the model, can run the model, and make changes to the model; so the departure of any single person does not disrupt the viability of the FRAMs.

- Validate and document the current model. Before validation can be done, it is necessary to define an appropriate approach for model validation.

- Review and verify any changes to the model and conduct postseason evaluations of model performance.

- Propose changes to the model that would improve the model for its intended management purposes.

- Conduct a sensitivity analysis of model outputs to specific model inputs.

- Implement methods to quantify the uncertainty of model predictions.

Finally, it is very difficult for the SSC to assess the scientific validity of the FRAM models because of the lack of postseason validations and model documentation. Although there has been some progress in this area, more is needed before the SSC can comprehensively evaluate the FRAM. However, using the 1986-1991 coho cohort database for the new baseline is clearly an improvement over the previous 1979-1981 base period.

Klamath Ocean Harvest Model:

Mr. Michael Mohr and Mr. Allen Grover provided an update on the revision to the Klamath Ocean Harvest Model (KOHM). At the November meeting there were three unresolved issues that needed to be addressed prior to model use: (1) the appropriate contact rate for naturally-produced fish needed to be determined; (2) a method was needed to incorporate the non-Klamath catch into the model; and (3) a comparison of the new model with the old model and, more importantly, a hindcast evaluation of the new model using abundance and harvest estimates from previous years were needed. All three of these issues have been satisfactorily addressed. With reference to issue 3, extensive test runs indicate the model code does not contain obvious errors. Hindcast catches and exploitation rates were in the range of observed values.

The KOHM revision is a vast improvement of the model, and the SSC recommends its use for this year's management cycle. The model base data are fully documented, and the input files and sub-models within the KOHM can be easily revised to incorporate new information or to assess the effects of various management regulations. Further work that needs to be done on the KOHM are (1) a report documenting the current model and its verification needs to be produced; (2) the model interface needs to be improved

to facilitate its use by other groups; and (3) methods to quantify the uncertainty of model predictions need to be implemented. For example, if uncertainty were characterized the probability of the natural spawner escapement falling below the escapement floor could be estimated.

Review of 2001 Fisheries and Summary of 2002 Stock Abundance Estimates

Mr. Dell Simmons, Chair of the STT, reviewed the 2001 ocean salmon fisheries and preliminary salmon stock abundance estimates for 2002 for the SSC. The STT forecasts a high ocean abundance of chinook and low ocean abundance of coho salmon in 2002. The SSC did not identify any major problems with the preseason salmon abundance estimates.

Marine Reserves

Mr. Jim Seger discussed recent developments related to marine reserves in the Channel Islands National Marine Sanctuary and elsewhere. This was an informational item and no report was prepared for the Council.

Groundfish

Stock Assessment Review (STAR) Process Update

The SSC discussed three topics under this agenda item, namely (1) review of the 2001 Stock Assessment Review (STAR) process; (2) terms of reference for the 2002 STAR process; and (3) terms of reference for an abbreviated review process (e.g., as scheduled for sablefish in May 2002). Drs. Rick Methot and Elizabeth Clarke briefed the SSC on each topic.

1. Review of the 2001 STAR Process

   Three STAR Panels were convened in 2001, and an additional panel (for whiting) was held in February 2002. For discussion purposes, herein, all four panels are considered a part of the 2001 STAR process. Generally, the process worked well in terms of stock assessments being completed, reviewed, and provided to the Council family in accordance with the pre-established scheduled. In some cases, the assessment documents, provided to the STAR Panel, could have been more complete. There were also some inconsistencies in the manner in which the respective STAR Panels characterized the full range of uncertainty in assessment results. The STAR terms of reference should be strengthened in both of these areas to further emphasize their importance.

   With respect to the whiting STAR panel, it appears the 3-day session was not sufficient to fully explore and evaluate additional modeling scenarios. This has also been an issue with other STAR panels in previous years. The SSC recommends that rather than extending the time period of the STAR meetings, STAT teams should better explore modeling alternatives prior to the STAR panel review. It may be necessary to establish an informal modeling workshop each year prior to the STAR panel meetings. All STAT teams should participate in this workshop to provide informal peer review while assessments are still at the formative stage. This will require support for travel of STAT team members.

2. Terms of Reference for 2002

   The SSC recommends the 2001 terms of reference be used for 2002, and the modifications above be incorporated into the 2003 terms of reference.

3. Terms of Reference for an Abbreviated Review Process

   The SSC suggests that when the Council deems necessary an assessment update outside of the full assessment review cycle, an abbreviated review process may be possible. However, the SSC recommends proceeding with caution on abbreviated reviews. Often what appears to be a simple update can uncover unexpected issues and problems that are difficult to solve in an abbreviated

process. In these cases, it may not be possible to simply update the assessment – rather the assessment may need to be revisited in the next full assessment review cycle. The SSC will prepare, for Council consideration at its April meeting, draft terms of reference for an abbreviated review process.

Finally, the SSC is concerned there may be a tendency to schedule accelerated assessment and abbreviated review only for species with apparent high recruitment in recent years. If this indeed becomes the case, the Council's management objectives may be compromised over the long term. To maintain balance, stocks that may be decreasing in abundance should be given equal consideration for accelerated assessment and abbreviated review.

Pacific Whiting Harvest Levels for 2002

The SSC reviewed a number of documents pertaining to establishing Pacific whiting harvest levels for 2002, including "Stock Assessment of Pacific Whiting in U.S. and Canadian Waters in 2001" by Helser et al. (Supplemental Attachment 2), "Report of the Joint Canada - USA Review Panel on the Stock Assessment of the Coastal Pacific Hake/Whiting Stock Off the West Coast of North America" (Supplemental Attachment 3), and "Dissenting Views" (Supplemental Attachment 3a).

Results from the Review Panel's report (Supplemental Attachment 3) indicate that the stock has declined to 711,000 mt in 2001, with a spawning output equal to 20% of the unfished biomass. Due to the influx of an apparently strong 1999 year class, the stock is expected to grow to 32% of the unfished biomass by 2003 and 34% by 2004 if harvested under default policy ($F_{40\%}$). These conclusions are based upon acceptance of the Stock Assessment Team (STAT) Team's model 1, which assumes q=1.0 for the triennial hydroacoustic survey and represents a *status quo* model formulation from the last stock assessment, which was conducted in 1998.

Based on the documents provided and an extensive discussion of the issues, the SSC concludes the following:

1. Although model 1 displays considerable lack of fit, particularly with respect to the hydroacoustic survey biomass trend, the STAT Team and Review Panel were unable to fully explore alternative model configurations in the limited time available. However, the SSC cannot recommend a change from the existing model structure without further diagnostic information on alternative models. The SSC, therefore, considers model 1 to represent the best available scientific information on the stock.

2. The primary source of uncertainty highlighted by the STAT Team pertains to the strength of the 1999 year class, which is only partially recruited to the fishery and poorly estimated by the model. The STAT Team provides projection and decision tables based on model 1 that capture a range of uncertainty in stock status (i.e., low, medium, high 1999 year-class recruitment) and management action (i.e., $F_{40\%}$, $F_{45\%}$ and $F_{50\%}$ harvest rate policies). The decision table (Table 15 on p. 58 of the STAT Team's report) is particularly informative in terms of representing the consequences of managing under alternative risk scenarios. However, as was noted in the dissenting opinion (Supplemental Attachment 3a), this information does not represent the full range of uncertainty associated with the whiting stock, as alternative model formulations have not been presented. The SSC encourages STAT Teams and Stock Assessment Review (STAR) Panels to develop ways to express this model specification uncertainty, while simultaneously evaluating the relative merits of alternative models, in at least a qualitative manner.

3. The SSC supports the method of calculation for B_0 adopted by the STAT Team, as it is consistent with the SSC Terms of Reference for Groundfish Rebuilding Analyses.

4. The review of the whiting stock assessment was conducted jointly by the Canadian Pacific Scientific Advice Review Committee (PSARC) Groundfish Subcommittee on Pacific Hake, which advises the Canadian Department of Fisheries and Oceans (DFO), and the Council STAR Panel. While both U.S. and Canadian panel members had a common interest in conducting a sound technical review, they had different responsibilities in terms of the type of advice expected by the Council and DFO. Specifically, the Review Panel's recommendation of a $F_{45\%}$ harvest rate and a yield range bounded by the "low" and "medium" 1999 year-class recruitment is a risk adverse policy recommendation and is not consistent with the type of risk neutral advice that the Council expects from its STAR Panels. The SSC notes that risk neutral advice for whiting would consist of the current default $F_{40\%}$ harvest rate and a yield estimate consistent with the "medium" 1999 year-class recruitment.

5. According to the Review Panel, "Given concerns with the current formulation of the stock reconstruction model and the dependence of yield options beyond 2002 on continued recruitment of the 1999 year-class and recruitment from year-classes not actually observed, the Panel recommends against adopting 2003 projections until another assessment is conducted." The SSC strongly supports this recommendation and is particularly interested in the development of models that explore changes in q and selectivity of the hydroacoustic survey, which is the primary survey used to tune the whiting stock assessment model.

Update on Revision of Amendment 12 – Rebuilding Plans

The SSC reviewed and discussed "Some Issues Related to Conducting Rebuilding Analyses for Overfished Groundfish Resources" by Dr. Andre Punt (Exhibit F.3, Supplemental Attachment 1, March 2002), which describes the effect of Monte Carlo uncertainty on rebuilding projections of overfished groundfish stocks. In addition, the effect of a computer coding error on projections of the 2002 optimum yield (OY) of widow rockfish is documented and described. Based upon that discussion, the SSC has the following comments and recommendations regarding groundfish rebuilding projections:

- Rebuilding analyses should consider the effect of Monte Carlo sample size (N) on the variance of rebuilding projections and should adopt a value for final projections that reduces the variance to an acceptable level (e.g., $N \geq 1{,}000$). The SSC will consider modification of the Terms of Reference for Groundfish Rebuilding Analyses to reflect this recommendation.

- The 2002 OY for widow rockfish is probably slightly underestimated in the existing rebuilding analysis. An effort should be made to update the OY so the pending rebuilding plan amendment will include the best available scientific information. For completeness, rebuilding projections for the other overfished stocks should be checked to insure results are unaffected by the computer coding error, although no effect is anticipated.

- The Council should expect numeric details of rebuilding plans to change over time, whether due to technical errors or revised rebuilding analyses arising from updated stock assessments. The SSC recognizes that rebuilding plans must be implemented as fishery management plan (FMP) amendments. In order to streamline the amendment process, it may be desirable, to the extent legally possible, to minimize the use of hard numbers in rebuilding plans as they are described in FMP amendments.

In addition to the information from Dr. Punt discussed above, the SSC was briefed by Dr. Rick Methot on rebuilding analyses for West Coast groundfish. Dr. Methot's presentation included information about:

- *overfishing definitions used by the Council.*
- *current list of overfished species.*
- *declines in spawning biomass over time, what happened (visually) and how/why it happened.*
- *the Council's rebuilding strategy and projected time to rebuild, which is very long in some cases.*
- *rebuilding forecasts, some use recruits, others use recruits per spawner.*
- *hypotheses for low recent recruitment – density-dependent, environment, or both.*

Coastal Pelagic Species

Amendment 10

Dr. Kevin Hill of the Coastal Pelagic Species Management Team (CPSMT) presented an overview of the proposed Amendment 10 to the CPS fishery management plan (FMP). The draft amendment addresses two separate issues in the FMP: (1) establishing a capacity goal and permit transferability provisions for the limited entry fleet, and (2) establishing a maximum sustainable yield (MSY) proxy for market squid.

The SSC has the following comments regarding the draft amendment:

CPS Limited Entry

The draft amendment identifies four capacity goal options (options A1-A4), three permit transfer options (options B1-B3), five options for adjusting permit transferability to maintain the capacity goal (options C1-C5) and four options for issuing new limited entry permits (options D1-D4). The draft amendment combines a selected number of these options into two packages: (1) alternative 1, consisting of options A4, B1, C4 and D4 and designated the "status quo" or "no action" alternative, and (2) alternative 2, consisting of options A1, B3, C4 and D2 and designated the "proposed" action. Alternative 2 is apparently a composite of prior Council and CPSMT decisions on preferred options. As currently written, the narrative in the draft amendment is difficult to follow, as it requires the reader to move back and forth between alternatives and potential options. However, as explained in Exhibit H.2 (Situation Summary), the Council and the public have greater flexibility in packaging the various options than the two alternatives presented in the draft amendment. To improve clarity and to facilitate the ability of the Council and the public to consider alternative ways of combining management options, the SSC suggests that the narrative first lay out all options and describe which options can feasibly be combined into management alternatives before getting into any detailed analysis of options and alternatives.

The draft amendment should clarify whether the proposed options for issuing new limited entry permits (options D1-D4) pertain to the issuance of temporary or permanent permits. The SSC notes that, if the size of the limited entry fleet falls below the capacity goal, issuance of new permanent permits may be a plausible way to increase fleet size until the capacity goal is reached. However, if the point of issuing new permits is to increase capacity above the goal (for instance, to allow greater access to harvest under unusually high stock abundance conditions), the SSC strongly recommends that any such permits be temporary, as the issuance of additional permanent permits under such circumstances would compromise the purpose of having a capacity goal.

The analysis of limited entry options and alternatives focuses largely on effects on producer surplus, consumer surplus and fishing community economic activity. These effects are largely asserted rather than demonstrated with empirical information. The assertions regarding effects on producer surplus and fishing communities are plausible in terms of their consistency with economic theory. (For instance, theory generally supports the notion that increases in efficiency associated with capacity management have positive effects on producer surplus and potentially negative effects on fishing communities.) However, the assertions made regarding effects on consumer surplus cannot be supported by merely appealing to consistency with theory. The size and direction of changes in consumer surplus depend on a number of factors, such as the extent to which the economic benefits associated with more efficient capacity management are passed on to consumers, whether the flexibility provided by permit transferability necessarily results in higher quality fishery products, and whether the markets for CPS products are domestic or foreign. The confounding nature of such factors makes it difficult to definitively evaluate the effects of the various options and alternatives on consumer surplus. The SSC recommends that all assertions regarding consumer surplus effects be either substantiated with empirical evidence or deleted from the draft amendment.

Squid MSY

The proposed egg escapement (EE) approach (alternative 4) establishes a practical and informative annual monitoring scheme for the current market squid fishery and appears to be a workable solution to addressing the MSY deficiency in the current plan. The credibility of the EE approach depends critically on existing information regarding population productivity, growth and maturation of the stock within the current range of the fishery and on the assumption that the fishery targets the spawning population only. If the fishery expands to new areas or begins to target squid before they spawn, more active management of the squid resource will likely be warranted (e.g., inseason catch or effort control).

The EE method is described in the draft amendment as "risk averse" (p. 9). The SSC notes that it is premature to characterize the EE method in this manner. Market squid is currently a monitored-only species in the CPS FMP and the EE approach is intended to serve as an effective monitoring technique. Whether this approach is actually risk averse cannot be known without applying and further evaluating the approach. Concurrent with using the EE method, the SSC therefore supports continuation of the State of California's weekend fishery closure and establishment of an annual cap on landings. The SSC reiterates its November 2001 recommendation regarding the need to periodically review the egg escapement

approach and supports the idea of convening another Stock Assessment Review Panel in 2004.

Public Comment

During the 4 P.M. public comment period Mr. Paul Engelmeyer spoke to the SSC about SSC involvement in scoping amendments to the salmon fishery management plan. He stated the SSC should have a role in developing conservation goals and objectives.

During the Pacific whiting agenda item Dr. Vidar Westpestad presented information from the Pacific Whiting Conservation Cooperative about abundance and distribution of Pacific whiting.

Adjournment

The SSC adjourned at approximately 5:30 P.M., Tuesday, March 12, 2002.

Research and Data Needs

Coho FRAM model needs documentation, post season review, evaluation and validation. It might be useful to establish model evaluation committees. Need estimates of abundance in addition to pre-season forecasts.

SSC may need to further define the requirements for model “validation.”

Need review of coded-wire tag data.

Research recommendations from the market squid stock assessment review (STAR) panel should be incorporated into Research and Data Needs document. Note recommendation for 2004 squid STAR panel.

PFMC
03/26/02