DRAFT SUMMARY MINUTES
Scientific and Statistical Committee

Pacific Fishery Management Council
Hyatt Regency Islandia
Mission C
1441 Quivira Road
San Diego, CA 92109
619-224-1234
October 31 - November 1

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. Owen Hamel, 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. André Punt, University of Washington, Seattle, WA
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

Members Absent

Dr. Peter Lawson, National Marine Fisheries Service, Newport, OR

Scientific and Statistical Committee Comments to the Council

The following is a compilation of November 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

D.1. Pacific Sardine Stock Assessment and Harvest Guideline for 2006 Rebuilding Plan Revision Rules

Dr. Kevin Hill (Southwest Fisheries Science Center) presented the stock assessment of Pacific sardine to the Scientific and Statistical Committee (SSC). The assessment is based on the age-structured assessment program (ASAP) model and is an update to last year's assessment which was based on the same methodology. This model was reviewed by a Stock Assessment Review (STAR) Panel during June 2004. The new data included in the assessment are 2004-05 catches for the U.S. fisheries, revised catches for the Ensenada fishery for 2000-2005, a recalculated series of spotter plane indices, and a daily egg production method estimate of abundance for 2005.

The assessment presented by Dr. Hill represents the best available science regarding the status of the Pacific sardine resource. The SSC endorses the use of the harvest guideline (118,937 mt) estimated using the fishery management plan control rule and the biomass estimate of 1.1 million mt for management of the Pacific sardine fishery for 2006. This harvest guideline is 13% lower than the 2005 harvest guideline. The SSC notes that the U.S. catches have been below the Council-specified harvest guidelines. However, after accounting for catches by Canada and Mexico, the total catches for 2002 and 2004 are now estimated to have been greater than the retrospective estimates of the stockwide harvest guidelines calculated as part of this assessment.

The biomass time-series from the assessment is similar to that from last year's assessment for the years after 1998-1999 and somewhat higher for the years prior to this. Last year's assessment estimated the 2003-2004 recruitment to be the largest in the time-series, but that estimate was based on a very limited amount of data (primarily the number of age-0 fish caught during 2003-2004). The data on which the 2006 assessment are based have now confirmed that there was a strong recruitment during 2003-2004.

The SSC notes that the harvest guideline depends on population weight-at-age, which is poorly known. The SSC supports regular systematic sampling, such as the proposed coastwide survey planned for 2006, which can provide annual estimates of population weight-at-age and as well as of maturity-at-age.

The next STAR Panel to review the Pacific sardine assessment is scheduled for 2007. The SSC anticipates that it should be possible to include the results from the coastwide survey in the assessment to be reviewed by this STAR Panel. The SSC recommends that review of the Pacific sardine and mackerel assessments will be enhanced if the SSC Coastal Pelagic Species subcommittee can meet to discuss the draft assessments prior to the Council meetings at which these assessment are to be presented.

D.2. Alternatives Analysis for Krill Management

Ms. Susan Smith and Mr. Svein Fougner met with the Scientific and Statistical Committee (SSC), and summarized the data and analyses used in the "Draft alternatives analysis for the management of krill fishing off the U.S. West Coast" (Agenda Item D.2.a., Attachment 1). Information in this document will be used in the Council's process of determining how krill may be managed off the U.S. West Coast.

Two species of krill are included in the proposed action, *Euphausia pacifica* and *Thysanoessa spinifera*. Although both species may range throughout the Exclusive Economic Zone, the distribution is patchy and varies annually. Areas of high krill abundance with the presence of predators have been proposed as defining "hot spots" for the purposes of management. However, the underlying data for those area determinations was not presented. The SSC suggests that maps of krill abundance be included in the document so that an objective approach to the designation of "hot spots" can be better understood. Also, the geographic inter-annual variability of krill should be provided for the discussion of "hot spots".

Abundance data were assembled for the document from several sources, based on different sample designs and survey methods. Issues such as avoidance of sample gear during daylight surveys, and the possibility that samples may not have been taken randomly may affect the interpretation of survey data, but the influence of these effects on the analyses was not clear. The question of abundance would benefit from standardized survey methods applied coast-wide, including hydroacoustic (multi-beam) and random survey design for plankton-net sampling.

Estimates of the krill standing stock that are provided in the document appear to be reasonable based on the available data, and may serve as a provisional range of values for B_0. However, the range for B_0 provided in the document (Table 3-3) only captures the uncertainty associated with habitat assumptions used to derive the values. The SSC notes that the range would be considerably broader if the CVs from the underlying density estimates were brought into the calculations.

If the Council desires to develop a control rule for West Coast krill stocks, the concept of maximum sustainable yield (MSY) does not appear to be practical or appropriate. As in the case of market squid and sardine, the SSC suggests that explicit dependence on MSY be avoided in developing a krill control rule. The technical review for market squid (Amendment 10) determined that attempts to estimate MSY were not scientifically supportable, and it is reasonable to expect that a more thorough review for krill would reach the same conclusion. The SSC recommends that an F-based approach to developing a krill control rule be explored as an alternative, if the Council decides to manage the stock and provide for a fishery. This approach may not be dependent on unreliable estimates of biomass, and could provide an advisable level of precaution for a resource that is ecologically important as forage for other species that are managed by the Council. The approach of adding krill to the CPS FMP would appear to be a reasonable way to provide management oversight for the krill resource, while also providing an opportunity to support research into the significant

data gaps that exist. However, the SSC cautions that additional work on krill may divert or dilute research resources that are important for ongoing management of other Council-managed species.

Considerable research on krill populations and harvest rates has previously been done for Antarctic krill stocks, and existing literature could provide additional insights into modeling a possible West

Coast krill fishery. Also, estimates of fishable krill harvest may be possible using existing ecosystem models.

Salmon Management

G.1. Salmon Methodology Review

A joint meeting of the Scientific and Statistical Committee (SSC) Salmon Subcommittee and the Salmon Technical Team (STT) was held on October 12, 2005 in Portland. Presentations were given on the two items identified for review at the Council's September 2005 meeting:

- Documentation of the Coho and Chinook Fishery Regulation Assessment Models (FRAM), and
- Ocean abundance forecasts for Columbia River Fall Chinook salmon.

Coho and Chinook FRAM Documentation

Mr. Andy Rankis, Mr. Jim Packer, and Mr. Larrie LaVoy of the Model Evaluation Workgroup (MEW) gave presentations on the documentation of the Coho and Chinook FRAM models. Currently, the models are described in three documents:

1. Fishery Regulation Assessment Model (FRAM). An Overview for Chinook and Coho (2005 Update).
2. Coho FRAM Base Period Development.
3. Chinook FRAM Base Period Development.

The FRAM models project fishery effects in a given year using stock abundances and fishing efforts "scaled" to stock abundances and fishery exploitation rates (age-specific for Chinook) during a defined base period. The base period development reports were the focus of the meeting discussions.

FRAM Overview for Chinook and Coho - 2005 Update:

The overview document describes the modeling steps used by each FRAM to calculate fishery impacts for 33 Chinook stock groups and 123 coho stock groups. Unless a separate FRAM User's Guide is to be prepared, questions will arise regarding its application. A section describing the process through which FRAM parameter values are established during preseason planning processes would be helpful. The overview documentation also lacks any discussion of the interpretation of FRAM results. This is an extremely important area that should be addressed.

Although the FRAM steps are outlined in flow charts (Figure 1 for coho and Figure 2 for Chinook) and a discussion of some of the algorithms used in the model is included in the report, there is no linkage between these figures and text. If the steps in the figure and the corresponding text were linked a reader could refer to a specific section in the report for details on the methods used at each step.

The FRAM program interacts with two species-specific (Chinook and coho) Terminal Area Management Module (TAMM) spreadsheets that allow users to specify terminal fishery impacts on a finer level of time and area resolution. The Coho TAMM now serves more as a recipient of

FRAM output for customized report generation. In contrast, the Chinook TAMM remains a critical element of pre-season modeling for Puget Sound fisheries, as many populations of management interest need to be "extracted" from the aggregated FRAM stock groupings. The TAMM fishery inputs, in addition to a fixed catch, allow for two fishery control mechanisms that are not used by FRAM: (1) percent of terminal area abundance (TAA) and (2) percent of extreme terminal run size (ETRS). The SSC finds the documentation for the TAMM (section 7 of the overview document) incomplete. The SSC requests that a flow chart and the algorithms used to derive TAA and ETRS, and other TAMM calculations, be included in the overview document.

Coho FRAM Base Period Development:

The Coho FRAM Base Period Development documentation is in draft form. Although Figure 1 provides an overall view of how the data were put together and how the base period was developed, it is difficult to match each step in the figure with the corresponding text that describes the step in the document. The report would benefit if each step in Figure 1 was linked to a section in the document. A reader could then refer to that section in the report for details on the methods used. The text section that is linked to a step in Figure 1 should include all the data input files, data output, the programs used, a brief explanation of what each program does (not the program code), and the algorithms used to manipulate the data. The documentation of the model calibration process provided in the section 3 of the Chinook FRAM Base Period Development report provides an example of this level of documentation. Creating a linkage between the steps in Figures 2 – 9 with text would improve the value of each figure and the report as a whole.

Some of the 123 coho stock groups in the base period do not have coded-wire tag (CWT) data associated with them yet Production Expansion Factors (PEFs) are assigned to them. The report should include a section that describes the methods used to develop PEFs for stock groups without CWT recoveries.

Mr. Packer stated that work on the Coho FRAM is ongoing and the base period will include additional years in the future. The SSC recommends that any changes to the model or the base period be noted in the documentation.

Chinook FRAM Base Period Development:

The documentation for the Chinook FRAM base period was incomplete; consequentially it was difficult to track how the base period calculations were made. It appears that all steps used to develop a base period data set for Chinook are included in Figures 1, 2, 2a, and 3. The SSC suggests that these figures form the basis of the documentation. All steps outlined in these figures should be linked to a section in the report that describes all the data input files, data output, the programs used, a brief explanation of what each program does (not the program code), and the algorithms used to manipulate the data (similarly to the documentation for section 3 of the Chinook report).

A primary point of confusion among the SSC and STT was the derivation of an "all stocks" CWT recovery data set that includes CWT recovery data of stocks tagged during the base period with simulated CWT recoveries of stocks that were not tagged during the base period (Out of Base Stocks or OOB stocks). Because of the importance of stock abundance estimates in the base period for FRAM calculations, this report needs to provide a clearer explanation of the methods used to bring the OOB stocks into the base period. Providing a simple numerical example of how an OOB stock

could be incorporated into the base period would clarify this process.
The documentation for the Chinook FRAM is not yet sufficient to allow SSC review of the model, especially as it applies to mark-selective fisheries. The MEW has indicated that the changes requested could be available for SSC review at the June 2006 Council meeting. If a complete draft document were available in June, the SSC would be able to thoroughly review the documentation and provide additional feedback to the MEW for finalization of the documentation for review during the September/November 2006 PFMC meetings.

To facilitate better understanding of what FRAM does and how it works, the SSC recommends that all programs and data that are used in both the coho and Chinook FRAMs be archived in a single web FTP location and that they be accessible to the public. All changes and modifications to the models, programs, and input data sets should be documented and copies of the documentation should be available from the FTP site.

Ocean Abundance Forecasts for Columbia River Fall Chinook Salmon

Mr. Henry Yuen (U. S. Fish and Wildlife Service) gave a presentation on methods to forecast ocean abundances for four Columbia River Chinook salmon stocks. Currently the Oregon Technical Advisory Committee (TAC) provides forecasts of the return to the mouth of the Columbia River for these stocks. These river-mouth forecasts must then be converted into ocean cohort abundance estimates for use in the Chinook FRAM. The current procedure for making this conversion introduces bias into the preseason planning models and processes. A method which is based on direct forecasts of ocean cohort abundance for these stocks that could be directly entered into Chinook FRAM would address this bias.

A number of the models presented in the report appear promising for forecasting ocean cohort abundance of these four Columbia River Chinook stocks. However, it is unclear how these methods could be utilized in the current management process to establish ocean abundance cohort sizes for Columbia River stocks for use in the Chinook FRAM. Currently, there are no forecast methods that are consistently applied annually to either stocks, age groups, or between years. Each year the TAC evaluates a large number of models and selects a forecast for each stock and age group. The proposed methods will increase the number of forecasts that the TAC evaluates each year and will produce forecasts of ocean cohort abundance estimates rather than Columbia River mouth abundance estimates as is done currently.

Additional work in this area is warranted, and further review is needed, before the SC can endorse the proposed methodologies. Specifically,

- There are several methods that could be used to calculate the ocean abundance of Columbia River Chinook stocks. For this report, a ratio of Columbia River mouth returns (estimated by WDFW) to Columbia River coded wire tag (CWT) recoveries was used to convert the ocean abundance of CWT recoveries to ocean abundance of Columbia River fish. Two other possible methods of estimating ocean abundance use: (1) a run reconstruction algorithm (cohort analysis) or (2) a recursive method which uses estimates of ocean mortality and survival. Before a decision on which forecast models are "best", an analysis of the differences between the estimates of ocean cohort size provided by the different methods and an examination of the advantages and disadvantages of each method is needed.

- The TAC should evaluate the advantages of using methods which forecast ocean abundance directly and determine whether the continued use of river-mouth abundance forecasts is warranted.

G.3. Klamath River Fall Chinook Conservation Objective

Mr. Michael Mohr presented the "Klamath River Fall Chinook Stock-Recruitment Analysis" report by the Salmon Technical Team (STT) to a joint meeting of the Scientific and Statistical Committee (SSC) Salmon Subcommittee and the STT on October 12, 2005 in Portland. The report presents information on:

- Two Ricker-type stock-recruit analyses for Klamath River fall chinook salmon,
- A meta-analysis based on Ricker stock-recruit analyses and watershed area, and
- Correlation analyses of survival and flow during two time periods.

The analyses were technically sound and thoroughly documented.

The first Ricker-type stock-recruitment model was a standard analysis of recruits as a function of spawners. The second Ricker-type model included a measure of out-migration and early ocean survival. Including this survival measure adjusts for variability that is ostensibly not due to the density-dependent relationship between spawners and recruits and, in this case, substantially improved the fit of the model. Compared to model 1, the estimated spawners at maximum sustainable yield (S_{MSY}), for model 2 increased from 32,700 to 40,700 spawners. This latter is calculated using the mean of the logarithm of the survival measure, which results in a point estimate with an unrealistically small confidence interval. A simulation model could produce a more realistic point estimate of and confidence interval around the optimal escapement level for long term average harvest or other management goal. This would likely be larger than 40,700 spawners for model 2.

The meta-analysis was based on a study developed for the Pacific Salmon Commission that relates S_{MSY} (based on Ricker stock recruit functions) to watershed area. The Klamath Basin is south of and much larger than any of the systems in the original analysis and the results are based on extrapolations beyond the range of data used to develop the model.

The flow analyses correlated flow data from stations on the Trinity and Klamath Rivers with aggregate hatchery survival. Flows during juvenile out-migration and adult spawning migration were tested. Weakly significant correlations were found suggesting that higher flows related to higher survivals. Natural production is expected to be more sensitive to flows than hatchery production, but no natural survival data are available. Temperature in the Klamath Basin is known to be a problem for chinook salmon, but no appropriate time series of temperature data were available. In conclusion, the flow analysis is incomplete and necessary data are lacking. It does not provide an adequate basis for management decisions.

The stock-recruitment models estimated S_{MSY} as 32,700 spawners without an early life-history survival index and 40,700 spawners with an early life-history survival index. The habitat based model S_{MSY} was 70,900, however this was derived from a regression well outside the range of data used to develop the model. The analysis is thorough and informative, given the limitations of the data available. The SSC endorses the Ricker model analyses as the best available science that could be used to assess whether the 35,000 fish escapement floor is consistent with management goals.

Groundfish Management

H.2. Stock Assessments and Rebuilding Analyses for 2007-2008 Groundfish Fisheries

Stock assessments for Petrale sole, lingcod, and canary rockfish were carried over to the September wrap-up Stock Assessment Review (STAR) Panel, which also reviewed rebuilding analyses for the seven overfished species. The September STAR Panel consisted of six members of the Scientific and Statistical Committee (SSC) groundfish subcommittee, one stock assessment scientist from the Southwest Fisheries Science Center (SWFSC) and one committee of independent experts reviewer. Revised stock assessments for all three species were reviewed and approved by the STAR Panel. The STAR Panel report was presented to the SSC by Dr. Martin Dorn, who chaired the STAR Panel.

Petrale Sole

The northern petrale sole stock assessment, originally scheduled for review at the April STAR Panel, was withdrawn because age composition data for recent years arrived during the review. Final review of both northern and southern petrale stock assessments were deferred to the September wrap-up STAR Panel.

The SSC reviewed the revised stock assessment and STAR Panel reports for both southern and northern petrale stocks (Agenda Item H.2.a, Attachment 2). The Stock Assessment Team (STAT) identified a number of issues with the northern stock concerning the modeling of multiple fisheries with dome-shaped selectivity patterns using sex-specific age data from different agencies. The model performed erratically and the complexity of the model made it difficult to interpret the results. To resolve these issues, the STAR Panel recommended that a radically simplified model, with all fisheries having the same asymptotic selectivity and with the sexes combined, be used. The simple model fit the data almost as well as the more complex model, giving very similar biomass trends.

Model results indicate that both stocks were above the overfishing threshold; Petrale sole in the north was estimated to be at 34% of unfished spawning biomass in 2005, and at 29% of unfished spawning biomass in the south. Biomass trends were quantitatively similar in both areas and the SSC recommends that a single coastwide assessment be considered in future stock assessments if issues with data patchiness can be resolved.

The current stock assessment presents a very different picture of stock trends over time in the north compared to the previous assessment. For example, in the 1999 stock assessment, spawning stock biomass in 1998, was estimated to be 39% of B_0, while the current assessment now estimates that the 1998 spawning biomass was 12% of B_0. The reason for these differences is unclear, but the SSC notes that there were many changes to the model and the catch data that may account for these results. The stock appears to have recovered from this very low level of abundance despite a long period of relatively stable catches.

The SSC endorses the STAR Panel conclusions that this assessment represents the best available science and can form the basis for Council decision-making.

Lingcod

Lingcod was first reviewed at the August STAR Panel meeting but was not approved largely because of uncertainty concerning the strength of the 1999 and 2000 year classes that were strongly influencing the perception of stock recovery. The STAT examined the evidence for these strong year classes and presented their findings at the September STAR Panel meeting.

The STAR panel found that the commercial age composition in 2001 and 2004, and the survey biomass estimates in 2001 and 2004 provided some support for above average year classes in 1999 and 2000, but the magnitude of these increases was uncertain. Data from the recreational fishery did not provide support for above average 1999 and 2000 year classes. However, sensitivity runs in which year class strength for 1999 and 2000 was set to the long term mean still showed the Lingcod-North (LCN) stock rebuilding, a result of the much higher productivity of lingcod compared to other groundfish stocks, and because of the substantial catch reductions in the northern area in recent years. In contrast, the southern stock has been rebuilding more slowly due to smaller reductions in catches and lower recruitment in recent years.

Estimated spawning stock biomass is 87% of unfished for the northern component of the stock and 24% of unfished for the southern component. The coastwide spawning stock biomass is estimated to be 64% of unfished biomass in 2005. Since the Council currently manages lingcod as a single coastwide stock, the stock is considered rebuilt. However, the SSC notes that the large disparity in spawning biomass between the north and south components, combined with different biological parameters suggest that there is some basis for managing lingcod on a regional basis.

The SSC endorses the STAR Panel conclusions that this stock assessment represents the best available science and can form the basis for Council decision making.

Canary Rockfish

At its September meeting, the SSC raised several technical issues with the canary rockfish assessment, and recommended that the canary assessment be revisited by the September STAR Panel. Specifically, the SSC requested that the STAT address the following four issues:
1. Survey catchability (q) was unusually high.
2. Assumed variability in the spawner-recruit relationship was low compared to other rockfish.
3. More complete documentation should be provided.
4. Inclusion of the Santa Cruz juvenile rockfish survey data should be considered.

The STAT complied with these requests and presented their findings at the September STAR Panel meeting. Comparing the survey q for canary with values estimated for other rockfish, it was determined that the q estimated for canary was larger than that estimated in other 2005 shelf rockfish assessments. Although the relatively high q estimate may be inconsistent with what is known of canary habitat (they are found in areas of high relief and complex substrate), this did not constitute sufficient evidence to reject the assessment. The SSC recommends further investigation of this matter in the next canary assessment.

The STAR Panel also noted that recruitment variability (sigma r) used in this and the previous canary stock assessment was the lowest of any rockfish, although there are other rockfish at or near the value used for canary (fixed at 0.4). However, the value of sigma r output by the assessment

model was even lower (0.29), driven largely by the age data, which showed remarkable consistency over time, suggesting very stable recruitment. Furthermore, it was noted that age data are considered more reliable for canary than for most other rockfish.

The STAT also explored the effect of including the Santa Cruz juvenile survey data and the STAR Panel concluded that this could be influential depending on how the survey data are modeled. Modeling as in the widow rockfish assessment resulted in higher recent recruitments and higher estimated spawner-recruit steepness, but there are technical issues with incorporating these kinds of data that were identified by the widow STAR Panel. In addition, it was noted that the juvenile survey is at the southern end of the range of canary and may not provide a good index of recruitment. The STAR Panel consensus was that exclusion of the juvenile survey data was not sufficient to reject the assessment.

The STAR Panel concluded that the variability around a single base model underestimated overall uncertainty. The STAT recommended, and the STAR Panel concurred, that an alternate model be run in which male and female length-based selectivity was the same ("no-diff" model). Both the "no diff" and the original model accepted by the August STAR Panel ("diff") were considered equally likely. Profiles on steepness were conducted for the two models which were then blended with equal weighting to capture more of the statistical uncertainty. These results were carried forward into the rebuilding analysis.

The SSC endorses the STAR Panel conclusions that this stock assessment represents the best available science and can form the basis for Council decision making.

Rebuilding Analyses

Rebuilding analyses were reviewed for all overfished stocks according to guidelines and standards that were in effect when the rebuilding analyses were conducted. Currently it is uncertain how the recent court ruling on darkblotched rockfish will impact rebuilding targets, but it appears that current rebuilding targets and time frames may not be consistent with the court ruling. Nevertheless, the SSC reviewed the current rebuilding analyses for consistency with previously established guidelines and notes that these analyses still provide important guidance on stock recovery and effectiveness of Council management actions to recover overfished stocks.

There are seven overfished stocks for which rebuilding analyses were conducted. A rebuilding analysis was not conducted for lingcod because this stock is now estimated to be above the $B_{40\%}$ recovery target (coastwide spawning biomass is estimated to be 64% of unfished). The overfished stocks are: bocaccio, canary, cowcod, darkblotched, Pacific Ocean perch, widow, and yelloweye. Of these, canary, cowcod, darkblotched, POP, and widow are rebuilding ahead of schedule. Progress is barely adequate for bocaccio, while yelloweye rebuilding is behind schedule. The SSC notes that it will be increasingly difficult to evaluate progress toward rebuilding for yelloweye because this species is not sampled by the survey and there is no fishery data being generated.

Six runs were requested of each STAT to evaluate rebuilding. These runs and the results for each overfished species are presented in the STAR Panel report, Rebuilding Analyses for Overfished Groundfish Stocks (Agenda Item H.2.a, Attachment 8). Agenda Item H.3.a, Supplemental Attachment 2 also summarizes rebuilding progress for each of the overfished stocks. The SSC notes, however, that this table contains some errors and should be corrected according to the STAR Panel

report before use by the Council. A corrected table is appended to this report.

The SSC reviewed the rebuilding analyses for each overfished stock and endorses the STAR Panel conclusion that these rebuilding analyses represent the best available science and can provide the basis for evaluating progress towards rebuilding given the guidelines that were in effect at the time the analyses were conducted. The SSC notes that the rebuilding tool developed and used in the current rebuilding projections can be used to evaluate other management alternatives and targets.

Summary of Stock Status Updates for Overfished Groundfish Species in the PFMC Area 1/

Species	Status Change	Target Rebuilding Year in the FMP	Previous Rebuilding Parameters			Updated Rebuilding Parameters				Comments/Implications
			Tmin	Tmax	Pmax	Tmin	Tmax	Pmax 2/	Ptarget 3/	
Lingcod	Rebuilt	2009	2004 N 2005 S	2009	60%	NA	NA	NA	NA	Coastwide biomass estimated to be B64%
POP	No signif. change	2026	2014	2042	70%	2015	2043	78.9%	59.7%	
Darkblotched	Much better	2030	2011	2044	>90%	2009.5	2033	97.2%	96.2%	
Yelloweye	Worse	2058	2027	2071	92%	2036	2080	0.3%	0%	Reduce harvest rate to get to ≥50% Pmax
Canary	Slightly better	2074	2057	2076	60%	2048	2071	55.4%	57.4%	FMP amendment required 4/
Widow	Much better	2038	2026	2042	60%	2013	2033	94.0%	96.3%	FMP amendment required 4/
Cowcod	Better	2090	2062	2099	60%	2035	2074	75.0%	82.0%	FMP amendment required 4/
Bocaccio	No signif. change	2023 5/	2018	2032	70%	2018	2032	67.8%	24.0%	FMP amendment required 4/

1/ Assuming the SSC endorses and the Council approves the 2005 assessments and rebuilding analyses for these species.

2/ Probability of rebuilding under the re-estimated Tmax assuming no change in harvest rate.

3/ Probability of rebuilding by the target year in the FMP assuming no change in harvest rate.

4/ Implied action is to change the target rebuilding year according to the tenets of the Pacific Coast Groundfish FMP. For canary, widow, and cowcod, this is because the target year in the FMP is outside the range of the re-estimated Tmin to Tmax. For bocaccio, the target year was originally mis-specified (see footnote #5).

5/ The target year was incorrectly specified as 2023. The actual year in accordance with the Council-specified harvest rate and Pmax should have been 2027.

Groundfish Management(continued)

H.3. Management Recommendations for 2007-2008 Groundfish Fisheries

The Scientific and Statistical Committee (SSC) heard a report from Mr. John DeVore and Dr. John Field summarizing the Groundfish Management Team (GMT) recommendations for 2007-2008 groundfish optimum yield (OY) alternatives. It is apparent that the recent court ruling on darkblotched rockfish has created uncertainty regarding how to set OY's for species requiring rebuilding, and consequently what the constraints on other species will be due to bycatch.

The SSC discussed the following specific issues of concern with the GMT:

1) Four new assessments are now available for species currently managed as part of species complex groups. The SSC discussed the merits of developing separate OY's for these species, as opposed to continuing to manage them within their respective complexes. The SSC sees merit in managing starry flounder under an OY separate from the flatfish complex, in consideration of protecting other potentially weak species in the complex. The SSC notes that, given the management considerations voiced by the GMT, it is reasonable to continue to manage blackgill, gopher, and kelp greenling within complexes.

2) With regard to Petrale sole, the SSC discussed the apparent paradox that the OY recommended for the southern area increased, despite a new assessment that indicates a relatively more depleted stock. It appears that the reason for the higher OY in the south in the short term is due to a transient and uncertain recruitment pulse. For the purpose of establishing a separate OY for the southern area, the SSC notes that using the 25% precautionary catch reduction as specified in the groundfish fishery management plan may be appropriate.

3) With regard to Dover sole, the SSC discussed the relatively large increase in OY, and considered the merits of analyzing an alternative lower OY option. The SSC notes that the estimate of maximum sustainable yield from the assessment (16,500 mt) may provide a logical alternative OY that could be sustainable in the long term.

Marine Protected Areas

I.1. Channel Islands National Marine Sanctuary

At its September 2005 meeting, the Scientific and Statistical Committee (SSC) reviewed a document from the Channel Islands National Marine Sanctuary (CINMS) dated May 25, 2005 and entitled "Supporting Materials," which described draft alternatives for marine reserves in Federal waters at CINMS. "Supporting Materials" was not a self-contained analysis but drew heavily from a document cited therein as "Leeworthy and Wiley (2005)." Based on its ongoing technical concerns regarding previous analyses conducted by Leeworthy and Wiley in 2002 and 2003, the SSC noted the importance of having access to the Leeworthy and Wiley (2005) document cited in "Supporting Materials." CINMS has provided that document.

At this meeting, the SSC reviewed the document: Leeworthy, Dr. Vernon R., Peter C. Wiley, and Edward A. Stone. October 7, 2005. *Socioeconomic Impact Analysis of Marine Reserve Alternatives for the Channel Islands National Marine Sanctuary*. The specific reserve alternatives analyzed in

the 2005 document differ from the alternatives analyzed by Leeworthy and Wiley in 2002 and 2003; however, the methods of analysis are quite similar. The SSC's concerns regarding the methods used in the 2002 and 2003 analyses continue to be unaddressed in the 2005 analysis. Major concerns include: (1) the method of estimating consumer surplus for consumptive and non-consumptive use value, (2) the method of projecting changes in non-consumptive recreation activity and value, and (3) the method of estimating passive-use value. In addition, the analysis largely disregards the SSC's recommendation (made in July 2004) that a baseline of 2003 be used to analyze the current draft alternatives; this change in baseline is important to ensure that the analysis reflects recent regulatory changes, including the establishment of reserves in State waters at CINMS.

The SSC supports the Council in its efforts to collaborate with CINMS on issues of mutual interest. The SSC understands that some modification to the Council's regulatory process may be warranted to accommodate CINMS. The Council is being asked to formulate fishing regulations and thus implicitly select a preferred alternative. The Council is expected to take this action on the basis of an analysis – portions of which are technically inadequate. The SSC is concerned about the potential precedent created by this major departure from the Council's customary requirement for a Draft Environmental Impact Statement to inform its decisions.

Groundfish Management (continued)

H.5. Off-Year Science Improvements

The Scientific and Statistical Committee (SSC) received a briefing from Dr Jim Hastie Northwest Fisheries Science Center (NWFSC) regarding off-year science activities. The NWFSC has committed to supporting a workshop to examine the two available pre-recruit groundfish surveys. Also under consideration is a de-briefing meeting, which probably would be held in conjunction with the March Council meeting, to review the lessons learned during the 2005 assessment cycle and begin development of terms of reference for the 2007 cycle.

The SSC strongly recommends that plans for the de-briefing meeting be developed as soon as possible. For this meeting the SSC requests that the NWFSC staff summarize the comments provided by the committee of independent experts (CIE) reviewers regarding technical as well as process and logistical issues that arose during the 2005 Stock Assessment Review (STAR) Panels. The SSC recommends that Dr. Robert Mohn, the CIE reviewer who participated in all of the 2005 STAR Panels, be invited to the de-briefing meeting to share his view on how the STAR Panel process could be improved.

Members of the SSC identified numerous issues that could be organized into a series of four workshops during 2006 (not listed in priority order): (1) a RecFIN Workshop to discuss issues regarding recreational data collection, estimation, and use in in-season management, (2) a Data Workshop to discuss issues such as reconstructing historical catches and developing guidelines for pre-processing of assessment data and producing abundance indices for assessments, (3) a Modeling Workshop to develop guidelines for issues such as adjusting input CVs on tuning indices and effective sample sizes for length and age composition data, and (4) an Assessment Science Workshop to discuss approaches to estimating B_0 and threshold biomass levels, and using these estimates in harvest control rules. The workshops probably will not be able to occur until summer or fall 2006, and times for the workshops should be identified soon so that interested parties will be able to plan their schedules.

The SSC Groundfish Subcommittee will take the lead in developing a comprehensive list of issues arising during the 2005 assessment cycle and topics for discussion at each of the 2006 workshops. SSC Groundfish Subcommittee will collaborate with the NMFS and Council to develop terms of reference for the workshops. Members of the Groundfish Management Team and Groundfish Advisory Subpanel will be invited to share their thoughts on the 2005 assessment cycle and how the process could be improved for the next cycle.

Possible Workshop Topics Arising during SSC Discussions:

- *Use of juvenile surveys.*
- *Tuning data errors.*
- *Biomass-based targets and thresholds.*
- *RecFIN especially CRFS.*
- *Age data, ageing errors, age composition generation.*
- *Pre-assessment workshop to encourage input from industry and other groups.*
- *Spatial assessments.*
- *Priors on steepness and q.*
- *Reconstructing historical catch series.*
- *Model complexity.*
- *Steps towards developing an ecosystems report.*
- *Longitudinal review to compare modeling approaches and look for common patterns across species.*
- *Guidelines for dealing with trans-boundary stocks, e.g., lingcod.*
- *Estimating (defining) SB_0 when there are changes in growth and/or maturity.*
- *Guidelines for assessments lacking current tuning indices (e.g., cowcod and yelloweye).*

Groundfish Management (continued)

H.11. Update on Trawl Individual Quota Process and Community Concerns

Mr. Jim Seger updated the Scientific and Statistical Committee (SSC) on the process for trawl individual quotas (TIQs) in the West Coast Limited Entry Groundfish Trawl Fishery. This update was a follow up to the presentation by Ms. Kate Quigley and Ms. Suzanne Russell at the September 2005 Council meeting that reviewed literature on TIQ programs with a community-based component. The SSC understands that prior to an April 2006 workshop, the range of alternatives for general elements of the TIQ program (e.g. initial allocation, rules for trade, etc.), and the mechanisms for community involvement will be narrowed. An analysis will be provided to the SSC that evaluates efficiency-equity trade offs among the different options. With the Council's approval, members of the SSC Economics and Groundfish Subcommittees plan to review that analysis and participate in the April 2006 TIQ workshop.

Public Comment

None.

Adjournment – The SSC adjourned at approximately 4 p.m., Wednesday, September 21, 2005.

PFMC
02/10/06

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	Hans Radtke	Steve Berkeley
Owen Hamel	Michael Dalton	Michael Dalton	Alan Byrne	Cynthia Thomson	Michael Dalton
Kevin Hill	**Martin Dorn**	Ray Conser	Robert Conrad	David Sampson	Martin Dorn
Pete Lawson	Owen Hamel	Tom Jagielo	**Ray Conser**		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