SUMMARY MINUTES
Scientific and Statistical Committee
Pacific Fishery Management Council
Hilton Orange County/Costa Mesa
Emerald Bay 1
3050 Bristol Street
Costa Mesa, CA 92626

October 30-November 1, 2009

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

The meeting was called to order at 8 a.m. on Friday, October 30, 2009. Dr. Don McIsaac briefed the SSC on priority agenda items.

Members in Attendance

Dr. Louis Botsford, University of California, Davis, 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. Selina Heppell, Oregon State University, Corvallis, OR
Mr. Tom Jagielo, Oregon Department of Fish and Wildlife
Ms. Meisha Key, Alternate – California Department of Fish and Game, Santa Cruz, CA
Dr. Peter Lawson, National Marine Fisheries Service, Newport, OR
Dr. Todd Lee, National Marine Fisheries Service, Seattle, WA
Dr. Charles Petrosky, Idaho Department of Fish and Game, Boise, Idaho
Dr. André Punt, University of Washington, Seattle, WA
Dr. Stephen Ralston, SSC Chair, National Marine Fisheries Service, Santa Cruz, CA
Ms. Cindy Thomson, National Marine Fisheries Service, Santa Cruz, CA
Dr. Theresa Tsou, Washington Department of Fish and Wildlife, Olympia, WA
Dr. Vidar Wespestad, Research Analysts International, Seattle, WA

Members Absent

Mr. Tom Barnes, California Department of Fish and Game, La Jolla, CA

Scientific and Statistical Committee Comments to the Council

The following is a compilation of November SSC reports to the Pacific Fishery Management Council (Council). (Related SSC discussion not included in written comment to the Council is provided in *italicized text*).

Council Administrative Matters

> G.6. Part 2 – Management Recommendations for 2011-2012 Fisheries – Review of the Input-Output Model for Pacific Coast Fisheries

Dr. Jerry Leonard (NWFSC) briefed the Scientific and Statistical Committee (SSC) on an input-output model (IO-PAC) developed by the NWFSC for use by the Council in evaluating regional economic impacts of management actions. The model platform for IO-PAC is IMPLAN Pro, a widely accepted software package for regional economic impact analysis. Development of IO-PAC involved replacement of the single fish harvesting sector in IMPLAN with 19 vessel categories and 32 commodities (species/gear combinations) that reflect the types of fisheries found on the Pacific coast. Estimation of economic impacts associated with changes in production (i.e., harvest) is accomplished by setting regional purchase coefficients in directly impacted sectors to zero and modeling harvest changes as if they originated from final demand. This is a standard and appropriate method of customizing IO-PAC for its intended fishery management uses.

Cost/earnings survey data for the groundfish, salmon, crab and shrimp fisheries collected by the NWFSC from groundfish limited entry vessels in 2004 and open access vessels in 2005 were used to develop production functions for eight of the 19 vessel categories in IO-PAC; a generic average weighted production function was used for the remaining 11 categories. The latter categories include Council-managed fisheries for which cost/earnings data are not readily available (coastal pelagics, highly migratory species); these categories are built into the model to facilitate inclusion of customized production functions for those fisheries, as appropriate data become available. Other data used to inform IO-PAC include PacFIN landings receipt data, and data on landings taxes and mooring rates. The current version of IO-PAC is capable of estimating impacts of changes in harvest on income, employment and output at multiple geographic scales – coastwide, by state, and for selected counties or county groups.

In early October 2009 the IO-PAC model was reviewed by a panel of independent experts. The panelists included one Committee of Independent Experts (CIE) reviewer (Dr. Alan Hodges of the University of Florida) and two other reviewers (Dr. Scott Steinback of the NMFS/NEFSC and Dr. James Kirkley of the Virginia Institute of Marine Science). Among other things, the panel was asked to evaluate whether the model represented best available science for assessing regional economic impacts of changes in commercial harvest of Pacific groundfish.

Five other economists with expertise in fishery input-output models or the types of fishery and market data used to populate the IO-PAC model also participated in the meeting. They included: Dr. Phil Watson (University of Idaho), Mr. Ed Waters (PFMC), Dr. Steve Freese (NWR), Mr. Dave Colpo (PSMFC), and Dr. Chang Seung (AKFSC). While these four individuals were not reviewers, they contributed substantively to the discussion at the meeting.

Each of the three reviewers provided a separate review of the IO-PAC model. Their conclusions

and recommendations reflect considerable consensus regarding the utility of the model and recommendations for improvement. Their overall conclusion regarding IO-PAC is best summarized by Dr. Hodges as follows:

> "In general, it was found that the regional modeling approach followed by the NWFSC represents the state of the art and best professional practice in regional economic impact analysis. The modeling and supporting data are strongest for analysis of impacts of changes in groundfish harvests. The model was well documented, such that its technical merit could be fully appraised."

The three reviewers also made a number of recommendations, including the following: (1) change the wholesale mark-up from 40 percent to a more realistic 16 percent (based on Economic Census data), (2) collect complete data on annual capital costs for inclusion in IO-PAC production functions, (3) replace the hierarchical 19 vessel categories with a more robust classification using methods such as cluster analysis, (4) develop a model that captures seafood sales from harvesters to wholesalers and processors that may operate out of different study areas, (5) add a recreational component to IO-PAC, (6) consider updating to IMPLAN Pro Version 3 when it is released, (7) consider developing an input-output (IO) linear programming model that is based on less restrictive behavioral assumptions than more standard IO models like IO-PAC, and (8) update the IMPLAN component of IO-PAC every 3-5 years.

The SSC concurs with the external reviewers' overall assessment of IO-PAC as well as their specific recommendations for improvement. Recommendation (1) has already been addressed by Dr. Leonard. The longer-term recommendations (2) to (7) would require additional work – e.g., analyzing existing data more fully, exploring new models, collecting additional data – with uncertain outcomes, although they are worth pursuing. Given the intrinsically static nature of IO models like IO-PAC and the dynamic nature of fisheries and the economy, it is important – as indicated in recommendation (8) – that IO-PAC be periodically updated. Such updates would allow IO-PAC to utilize new cost/earnings data as they become available, as well as incorporate updates that are routinely made to IMPLAN (e.g., county-level employment).

The SSC also notes that model outputs can change substantially, depending on the values of product flow and production function estimates, and recommends that IMPLAN default estimates for such parameters be replaced (to the extent possible) with estimates specific to the Pacific coast. This has already been done to a great extent (e.g., for vessel production functions, product flow in Washington) and should be pursued for other parameters as well. Once models for all counties/county groups are constructed, model documentation should be expanded to include a table of all parameter values used in IO-PAC. Such documentation would facilitate feedback from fishery and seafood market experts regarding the plausibility of these values and potential methods for improving them.

The SSC considers the IO-PAC model to represent best available science for estimating regional economic impacts associated with commercial groundfish on the Pacific coast, including the 2011-2012 harvest specifications and management measures. In coming to this conclusion, the SSC notes the extent to which IO-PAC represents an improvement over the Fishery Economic Assessment Model (FEAM) currently used by the Council.

- FEAM and IO-PAC represent somewhat different modeling approaches. FEAM is a spreadsheet model based on multipliers constructed from IMPLAN, while IO-PAC involves integration of fishery production functions into IMPLAN itself. An advantage of FEAM is ease of use, as economic impacts can be estimated from spreadsheet models of this type with little knowledge of IO models or IMPLAN software. IO-PAC is less user-friendly but also more informative in that it shows the economic impacts of harvest changes by industry sector. The basic modeling approaches used in FEAM and IO-PAC are both acceptable ways to estimate fishery impacts. Also, as currently configured, IO-PAC utilizes the same 19 vessel categories used in FEAM; thus the models are indistinguishable in this regard.
- Other differences between IO-PAC and FEAM, however, are significant. For instance, IO-PAC is accompanied by extensive metadata that describe the modeling approach and underlying assumptions, data, and estimates. It is much more transparent and thus more amenable to review and replication than FEAM. IO-PAC relies on cost/earnings data that were recently collected according to well-documented survey protocols and have been analyzed for non-response bias. The basis for the methods, data, and estimates used in FEAM remains largely undocumented and FEAM has not been reviewed for the Council since 1991.
- IO-PAC does have some important limitations. For instance, assumptions regarding constant prices and fixed proportions in consumption and production limit the use of IO-PAC to evaluation of short-term multiplier effects and cause overestimation of impacts associated with decreases/increases in harvest. However, this limitation is common to virtually all fishery IO models (including FEAM).

The SSC recognizes the importance of having a sound technical basis for estimating regional economic impacts of management actions. To ensure that IO-PAC continues to provide the Council with best available science, the SSC recommends that the model be periodically reviewed as it is updated with new software, data, or estimates.

Ecosystem-Based Fishery Management

D.1. Ecosystem-Based Fishery Management Plan: Scoping and Planning

As the Council and its advisory bodies proceed with the development of an ecosystem based fishery management plan, it will be important to establish a general framework in which the plan will operate. This framework should allow the Council to monitor ecosystem characteristics, and take actions to protect the California Current ecosystem or particular ecosystem components as necessary to achieve the goals of the plan. At the same time, the plan should pay particular attention to maintaining the desirable and successful aspects of the existing FMPs and single species management. Management based on the science of single species population dynamics is well developed. However, we still know little about ecosystem dynamics, and how ecosystem considerations would be used for management. For this reason, the current FMPs and single species management should provide the underlying support for an ecosystem based management plan.

As noted in the Council's Research and Data Needs document for 2008, the development and implementation of the ecosystem management plan should be an evolutionary process, rather than a revolutionary one. Development of an ecosystem fisheries management plan should start by identifying commonalities among the current FMPs. These common elements could form the

basis of a document that would bring all individual FMPs under a single umbrella. Components of existing FMPs with potential application to ecosystem management would then form the basis for developing ecosystem-level elements of the new plan.

The plan should give the Council the ability to manage ecosystem components that are not specifically treated in the existing FMPs. This will help in developing regulations for species like krill that form the base of food webs that are important to a wide variety of managed species. This type of framework could likely be developed through a programmatic Environmental Impact Statement.

The science of ecosystem considerations in management, e.g., implementation of Marine Protected Area's in the Exclusive Economic Zone, should be reviewed using the same processes and standards the SSC currently uses to provide science advice to the Council.

The following is a list of topics or questions the Council may wish to assign the Ecosystem Plan Development Team to facilitate the development of the plan.

- Catalog aspects of ecosystem management that are already taking place under the current FMPs (e.g., habitat protection and protected species).
- Examine what gaps within or between the FMPs need to be filled by ecosystem based management.
- Analyze the goals and objective across the current FMPs and see if they can be more consistent.
- Analyze why it is important to augment single species management. What are the outcomes ecosystem based management may achieve that are not possible through single species management?
- Document the approaches to ecosystem management that have been used in other regions.

Clear and specific objectives will facilitate identification of relevant issues, data needs, potential solutions, and the ultimate success of the plan.

Salmon Management

H.1.   2009 Methodology Review

The Salmon Subcommittee of the Scientific and Statistical Committee (SSC), the Salmon Technical Team (STT), and the Model Evaluation Workgroup (MEW) met at the Pacific Fishery Management Council (Council) office in Portland, Oregon on October 5 and 6, 2009, to review the four salmon methodology issues identified by the Council at the September meeting:

- Characterization of bias in Chinook and Coho Fishery Regulation Assessment Models (FRAM) associated with multiple encounters in mark-selective fisheries.
- Forecasting impact rates in fall fisheries for Klamath River fall Chinook and Sacramento River fall Chinook.
- Assessment of the September 1 maturity boundary assumption for Klamath River fall Chinook.
- Conservation objective updates for Puget Sound coho.

A summary of each of the items discussed was given to the full SSC at the November meeting. The reviews this year covered substantive issues that have been of interest to the Council for several years. In most cases materials were well documented, submitted on schedule, and had relevant management focus. The SSC commends the authors.

The SSC recommendations on each item are summarized below.

<u>Characterization of Bias in the Chinook and Coho Fishery Regulation Assessment Models</u>

In 2008, the SSC requested an analysis to estimate the level of bias in Fishery Regulation Assessment Model (FRAM)-estimated exploitation rates for unmarked fish in mark-selective fisheries. This bias was expected to occur primarily because FRAM cannot currently account for mortalities from multiple encounters of individual unmarked fish with the fishing gear. The result is that FRAM underestimates total mortalities of unmarked fish in mark-selective fisheries. In 2008 the SSC recommended interim measures to account for this bias, pending an analysis by the MEW. Mr. Andy Rankis of the MEW described the work that has been done over the past year to address this concern.

The MEW developed a Multiple Encounter Model (MEM) which provided results identical to those of FRAM given no multiple encounters. Two multiple encounter scenarios were then considered, with and without an increasing release-mortality rate with multiple releases. FRAM models summer fisheries with either a single time step (Chinook: July to September) or three time steps (coho: July, August, September). The MEM estimates higher unmarked mortality rates than FRAM in either case, with the difference between the two increasing exponentially as the marked exploitation rate increases. With multiple time steps the bias is reduced but not eliminated. The SSC agrees that the MEM better reflects the expected dynamics of mark-selective fisheries and provides a standard which can be compared to appropriate FRAM model output to estimate the bias in FRAM. However it would be impractical to incorporate the MEM computational framework into FRAM. A partial analytical solution was proposed for implementation in 2010, with further review and development anticipated for 2011. In particular, an option will be added within coho FRAM to include an analytical equation which accounts for multiple encounters within a time-step and area in mark-selective fisheries. This option should be completed and its performance evaluated by the MEW in time for use in the February 2010 coho FRAM runs. The SSC endorses the implementation of this adjustment in the coho FRAM. If this model change is to be used to model 2010 fisheries it will require one more stage of review prior to March 2010. Review material should include documentation of changes made to the coho FRAM and a demonstration that the revised model performance achieves the expected bias reduction. In order to allow time for review, material needs to be submitted to the Council office by 8 January 2010.

In the Chinook FRAM bias correction will be more difficult to implement because of the multiple age classes that are subject to harvest. The SSC recommends maintaining the guidelines proposed in 2008, limiting exploitation rates in each modeled selective fishery to 10 percent, with a maximum 30 percent overall exploitation rate. The SSC recommends developing bias correction methods for the Chinook FRAM for review in the fall of 2010.

Forecasting Impact Rates in Fall Fisheries for Klamath River Fall Chinook and Sacramento River Fall Chinook

Dr. Mike O'Farrell summarized his investigations into the problem of forecasting impacts of fall fisheries for Chinook salmon on Sacramento River Fall Chinook (SRFC) and Klamath River Fall Chinook (KRFC). The basic problem is that fall fisheries conducted south of Cape Falcon, Oregon occur after the model-assumed end of river entry (i.e., after the end of the model year t), but before the estimate of the year t+1 abundance is available. These fisheries are termed "credit card" fisheries because they borrow from the as yet unassessed stock abundance. Hence, any harvest is deducted from the next year's allocation.

An estimate of September 1 abundance in year t is not currently available until February of year t+1 (i.e., after the fishery has occurred). Dr. O'Farrell examined whether existing modeling methods or historical data could provide the needed estimates of September 1 abundance in year t for the year t management planning cycle. He concluded that these forecasts would be of low quality and would not be useful for management purposes.

When planning fall fisheries, the degree to which these fisheries will constrain ocean fisheries in the following year is unknown. In the worst case these fisheries can affect the Council's ability to meet conservation objectives for SRFC and KRFC. Dr. O'Farrell recommended that future fall fishing opportunities not be increased above historical levels because the risk of fall fishing cannot be accurately estimated. He also recommended that the risk that fall fisheries pose to future fishing opportunity, if constrained by the California Coastal Chinook consultation standard, should be assessed by examination of historical estimates of the KRFC age-4 ocean harvest rate from fall fisheries.

The SSC endorses the conclusions and recommendations of this report. Specifically,
- Currently, there are no methods available which can reliably forecast the September 1 abundances of Sacramento River Fall Run Chinook and Klamath River Fall Run Chinook in the fall of year t at the time of PFMC fishery management planning process in the spring of that year.
- There are very few area, month, and fishery combinations for fall fisheries where the harvest of SRFC could reliably be expected to be low so time-area management to reduce the impacts of fall fisheries to the SRFC stock is currently not feasible.
- Fall fisheries harvest proportionally few KRFC in some ocean management areas. More northern areas usually harvest a higher and more variable proportion of KRFC in the fall. Time-area management to reduce the impacts of fall fisheries to the KRFC stock may be feasible
- The risk that fall fisheries pose to future fishing opportunity, if constrained by the California Coastal Chinook consultation standard, should be assessed by examination of historical estimates of the KRFC age-4 ocean harvest rate from fall fisheries.

Assessment of the September 1 Maturity Boundary Assumption for Klamath River Fall Chinook

Dr. Mike O'Farrell and Ms. Melodie Palmer-Zwahlen presented their assessment and recommendations regarding the appropriateness of the September 1 river return date for Klamath River Fall Chinook (KRFC).

Choice of an appropriate river return date has implications for harvest allocation and estimation of fishery contact, harvest, and impact rates. KRFC ocean harvest after September 1 is credited against the following year's fisheries, prior to the Council's annual preseason forecasts. This has management implications for meeting Council conservation objectives and the NMFS ESA consultation standard for California Coastal Chinook.

The KRFC cohort analysis and Klamath Ocean Harvest Model (KOHM) both make a simplifying approximation that immediately prior to September 1, mature KRFC leave the ocean for the Klamath Basin and immature KRFC remaining in the ocean advance one year in age. If the proxy date is set too early the estimated ocean abundance would be negatively biased in the cohort reconstructions, and if the proxy date is set too late the estimated ocean abundance would be biased high. Any bias in estimated cohort ocean abundance propagates to bias in contact, harvest, and impact rates. To minimize bias in cohort abundance reconstruction, the proxy date should be the midpoint for the timing of escapement from ocean fisheries.

For KRFC there was a unique opportunity to evaluate the appropriateness of the September 1 proxy from catch timing data in the Yurok Tribal gillnet fishery in and near the Klamath River estuary. The assessment concluded that September 1 was an appropriate proxy for the mid-point river return date. In addition, most of the mature KRFC were estimated to have entered the Klamath River by September 15.

The SSC endorses the report recommendation that the current September 1 river return date approximation should be retained in KRFC fishery assessment models. The SSC agrees that the September 1 date is an appropriate average midpoint date for the timing of escapement from ocean fisheries. The SSC notes that, in the future, more accurately partitioning the harvest of mature and immature KRFC in August and September may be possible with the collection of additional biological data from ocean fishery sampling to identify KRFC catch proportions, age, and maturity.

The SSC notes that both of the previous discussion items have implications to the risk posed to the KRFC stock by fall ocean fisheries. The Council may want to consider an option to reduce the risk of harvesting mature KRFC in the September fisheries, the impacts of which apply toward the conservation objectives and consultation standards in the following year. The SSC concurs with the recommendation that the risk of harvesting mature KRFC that have not yet returned to the river could be reduced by limiting ocean fisheries between September 1 and September 15, particularly the commercial fisheries in the California Klamath (KC) and Central Oregon (CO) ocean management areas, while preventing compensatory expansion of fisheries in the Oregon Klamath (KO) management area.

Conservation Objective Updates for Puget Sound Coho

Mr. Pat Pattillo presented the conservation objectives for Puget Sound coho that are currently used in the U.S. v Washington annual management process to the SSC salmon subcommittee, the STT, and the MEW. These conservation objectives are exploitation rate (ER) targets based on forecast abundances with three categories (Normal, Low, Critical) separated by abundance forecast "breakpoints." Exploitation rates and associated breakpoints were established through simulation modeling for three of five management units (MUs). For the other two MUs these

values were based on views of maximum sustainable harvest (MSH) for the systems. Mr. Pattillo explained that the objectives were designed with ER objectives for MSH rather than escapement goals because, with the use of hatchery indicator stocks and CWT data, ERs could be measured more precisely than escapements. This system is also consistent with, and coordinated with, abundance-based management of Canadian stocks as negotiated through the Pacific Salmon Treaty.

Conceptually, target ERs and breakpoints are based on MSH under two survival conditions (low and high). Simulations were run by setting fixed escapement goals and searching for ERs that provided MSH given expected levels of survival variability and management error. The resulting values are chosen to be somewhat precautionary. The SSC was concerned with the knife-edged nature of the control rule, so that in principle a change in forecast abundance of one fish could lead to a 15-25 percent change in exploitation rate. Other systems either have smaller steps (e.g., Oregon Coastal Natural coho) or tie ERs to escapement level so that escapements are maintained by increasing ERs gradually with increasing abundance (e.g., Klamath River Fall Chinook).

The methods provided in the report were not sufficient for a thorough SSC review. Documentation was insufficient to evaluate the justification for the resulting ERs and breakpoints. The SSC supports the use of a Management Strategy Evaluation approach for analysis of alternative breakpoints, but was not provided with standard outputs on strategy performance to interpret the results and conclusions. These would include presentation of the variability in model outputs and model runs to show the likely performance of a range of control rule parameters. Performance should be evaluated in terms of likelihood of meeting specific targets under a variety of environmental conditions (marine survival), and resulting expected stock abundance, catch, and escapement. This management system has been in place since 2000. An analysis of the historical performance of abundance-based management in Puget Sound would provide an empirical basis for comparing management outcomes with model expectations.

It was unclear to the SSC how the U.S. v Washington conservation objectives for Puget Sound work within the Council FMP. Because of the negotiated agreements with Canada these stocks would likely merit an international exemption. It was, again, unclear whether the exemption would apply to Status Determination Criteria as well as Annual Catch Limits and Accountability Measures. Overfishing criteria should be related to the Critical threshold only, and not to MUs crossing between Normal and Low categories.

Highly Migratory Species Management

F.1.   NMFS Report – Albacore Management Issues Paper

Dr. R. Michael Laurs and Dr. Joseph Powers discussed their draft report "North Pacific Albacore 'White Paper'" (Agenda Item F.1.a, Attachment 1) with the Scientific and Statistical Committee (SSC). Albacore are a Highly Migratory Species under joint international management by the Inter American Tropical Tuna Commission (IATTC) and the Western and Central Pacific Fisheries Commission (WCPFC). The last assessment for this stock was conducted in 2006. A new stock assessment is planned for 2011. For the next assessment, the modeling platform will change from a Virtual Population Analysis model to Stock Synthesis 3 (SS3).

The SSC offers the following comments on the albacore "White Paper":

- There are several instances in the paper which reference a concern expressed in the 2006 stock assessment that if current fishing effort levels were not capped, the stock may become overfished by about 2015. The SSC notes the reference to "overfished" used in this case is not the same definition of overfished established by the WCPFC Northern Committee (NC), i.e. when biomass falls below an established biomass threshold (average of lowest 10 years of SSB). Using the NC definition, the 2006 assessment did not indicate that the stock would be overfished in 2015.

1. Section 6.2 of the report "Trends in U.S. Albacore Fishing Effort" and Table 6 should be interpreted with caution. At the April 2007 PFMC meeting, the SSC previously reviewed similar effort data and identified problems with this type of analysis (Agenda Item J.3.c, Supplemental SSC Report, April 2007 PFMC meeting). At that time, the SSC suggested a more appropriate analysis that partitioned the fishery mortality for U.S. fisheries (U.S. partial F) out of the overall international fishery mortality. This would allow a better assessment of whether U.S. fishing effort has been stable or increasing. This analysis has been conducted by the Albacore Working Group of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) and should be provided or referenced in the draft report.

Finally, the SSC notes that the new assessment planned for 2011 using SS3 may bring better definition to the issues discussed above.

Highly Migratory Species Management, continued

F.3.   FMP Amendment 2 – Annual Catch Limits and Accountability Measures

Dr. Kit Dahl and Dr. Steve Stohs presented the Highly Migratory Species Management Team (HMSMT) Report on Amendment 2 to the HMS Fishery Management Plan (FMP). This document presents an overview of the topics recommended by the HMSMT for the Council to address. Namely, 1) classification of stocks in the FMP; 2) the Magnuson-Stevens Act (MSA) international exception to annual catch limit (ACLs) requirement for Management Unit Species (MUS); 3) determining the primary FMP for MUS also addressed by the Western Pacific Fishery Management Council's (WPFMC) Pelagics FMP; 4) establishing reference points; and 5) accountability measures. The Scientific and Statistical Committee (SSC) discussion focused primarily on Items 1-3.

The HMSMT Report is difficult to follow given the number of species in the FMP and the various ways of classifying species. It would be useful to add a table to the report that delineates all species in the FMP, how they are classified, and the rationale for the respective classification.

The Amendment 2 process provides the Council with an opportunity to reduce the number of species in the HMS FMP – particularly species with little or no recorded catch off the U.S. west coast and for which the WPFMC Pelagics FMP would likely be the primary FMP (e.g. black marlin and sailfish). This would greatly simplify the HMS FMP and allow the HMSMT to focus its limited resources on the species of greater interest to the Council.

The HMSMT recommends designating a primary FMP (PFMC HMS FMP or WPFMC Pelagics FMP) for each of the species in the FMP. This would not only establish clear lines of responsibility between the Councils but would also clarify the scope of the work needed to complete Amendment 2 to the HMS FMP. For example, ACLs would only be needed for the PFMC-primary MUS that do not fall under the international exemption.

The HMSMT has yet to take up the issue of how best to establish acceptable biological catches (ABCs) that reflect uncertainty in the HMS stock assessments. Experience in dealing with this issue for the Groundfish and CPS FMPs indicates that this issue may require considerable time and effort. However, this work would not be necessary should the Council apply the international exception to all species (as apparently the WPFMC will do for its MUS). A Council decision on the international exemption issue at this meeting would be most helpful in determining what needs to be done and in planning the workload. The SSC HMS Subcommittee is willing to work with the HMSMT on this matter.

Groundfish Management

G.2. Stock Assessments and Rebuilding Analyses for 2011-2012 Groundfish Fisheries

The Scientific and Statistical Committee (SSC) reviewed the report of the Groundfish Subcommittee that reviewed eight rebuilding analyses: bocaccio, Pacific ocean perch (POP), cowcod, canary rockfish, yelloweye rockfish, widow rockfish, darkblotched rockfish, and in addition petrale sole, which is pending.

Progress towards rebuilding for the rockfish was reviewed in relation to the median times to rebuild (T_{target}) that were adopted in Amendment 16-4 and/or the current T_{target} that was adopted in 2007 (Table 1). Rebuilding is occurring for all species (Figure 1) and the SSC notes the following:

1) Catches of six of the seven overfished rockfish stocks have been lower than what was available as a cumulative optimum yield (OY) during the period of rebuilding. The only exception is canary rockfish, which exceeded its cumulative OY by 14 percent over the period 2000-2007. This overage was due primarily to an excess harvest of 40 mt in 2001, when constraints on the groundfish fishery were first being imposed. In five of the six other cases, catches have been far below the available OY, with catches of darkblotched rockfish approaching the cumulative OY. In general, management has been very effective at curtailing fishing mortality on the overfished stocks in order to rebuild them as quickly as possible.

2) All assessments met the appropriate technical requirements by utilizing the latest version of the rebuilding program (3.12a) and by using the appropriate outputs from the rebuilding program.

3) In all instances the calculated times to rebuild are within six years of the T_{target} adopted either under Amendment 16-4 or as modified in 2007. In four cases (darkblotched rockfish, bocaccio, cowcod, and widow rockfish) rebuilding is one to five years ahead of schedule. Yelloweye rockfish is three years behind schedule. However the probability of recovering by the current T_{target} of 2084 is well above 40 percent. For these five stocks, progress towards rebuilding is considered adequate and the SSC recommends that no

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redefinition of T_{target} or adjustment to the rebuilding harvest rate is necessary.

4) Two stocks are behind schedule and are very unlikely to rebuild by the current T_{target}, i.e., canary rockfish and Pacific ocean perch. Canary rockfish is six years behind schedule, with a 26 percent probability of rebuilding by the current T_{target} (2021) under the adopted harvest rate. Pacific ocean perch is only three years behind schedule. However, the new $T_{F=0}$ (time to recover if harvest ceased in 2011) is 2018 and is greater than the adopted T_{target} (2017). For canary rockfish this deviation from T_{target} is due primarily to changes in our understanding of stock productivity and depletion due to re-estimation of the time-series of historical catches. In the case of Pacific ocean perch, the change is due primarily to revised estimates of stock productivity and depletion arising from two Northwest Fisheries Science Center (NWFSC) survey indices that were low in 2007 and 2008. These changes represent fundamental revisions to our understanding of the status of these species, which in turn warrant revisions to T_{target}.

5) Given the results of this year's assessments, new maximum times to rebuild ($T_{max(new)}$) were calculated for each stock based on the most recent assessment models and National Standard 1 Guidelines (Table 1). These are needed for the two stocks that are markedly behind schedule (canary rockfish and Pacific ocean perch). Rebuilding will occur for these stocks well before ($T_{max(new)}$) if the current target spawners per recruit (SPR) harvest rates are maintained. For this reason the SSC suggests that considering *status quo* harvest rates for all overfished stocks is a reasonable starting point for the Council's deliberative process when developing OYs for the 2011-2012 biennial cycle.

The SSC notes that while the Terms of Reference for Rebuilding Analyses were recently revised, a few of the specifications contained therein were ambiguous to some analysts and, therefore, a careful editing of the current Terms of Reference would be helpful before the next assessment cycle.
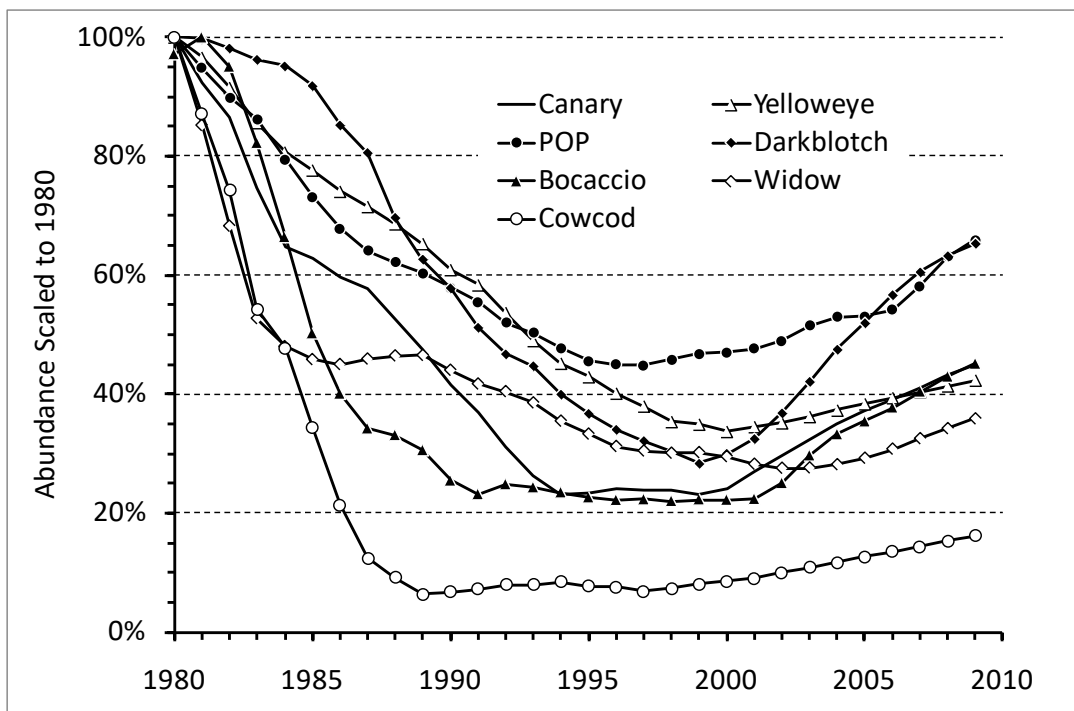
Figure 1. Relative population trajectories of overfished rockfish stocks, 1980-2009.

Table 1. Projected rebuilding target dates for overfished rockfish at current harvest rates

Species	Total Catch / Total OY During Rebuilding[1]	SPR at Adopted Harvest Rate	T_{target} Specified in Amendment 16-4	Adopted T_{target}[2]	New $T_{F=0}$	New T_{target} at Adopted Harvest Rate[3]	Difference Between Adopted T_{target} and New T_{target}[4]	$T_{max(new)}$[5]
Bocaccio	50% (2000-2008)	77.7%	2026	2026	2018	2022	4	2031
Canary	114% (2000-2007)	88.7%	2063	2021	2024	2027	**-6**	2046
Cowcod	44% (2002-2007)	79.0%	2039	2072	2060	2071	1	2097
Darkblotched	97% (2001-2007)	62.1%	2011	2028	2016	2027	1	2037
POP	47% (2000-2008)	86.4%	2017	2017	2018	2020	**-3**	2045
Widow	45% (2002-2007)	95.0%	2015	2015	2010	2010	5	2025
Yelloweye	63% (2002-2007)	71.9%	2084	2084	2047	2087	-3	2089

1. The years considered are the years with reliable catch data since the stock was designated overfished and has been under rebuilding.
2. Current T_{target} is the value adopted by the Council in 2007. In most cases it is the same as in the previous column, i.e. it was unchanged.
3. The new time to rebuild at the adopted SPR harvest rate.
4. Positive values reflect rebuilding being ahead of schedule, while negative values reflect delays. Values which are bolded and underlined indicate a substantial difference indicating a low probability of rebuilding by T_{target} (<40%).
5. $T_{max(new)}$ is the new maximum time to rebuild based on the updated stock assessment and rebuilding analysis. In the case of petrale sole, the maximum rebuilding time is defined by the 10-year rule which is interpreted here as being 10 years beyond the first year for which harvest could be set to zero given the biennial management structure for the West Coast (i.e. 2011).

Petrale Sole

The SSC reviewed the report of the groundfish subcommittee on petrale sole reference points, which met September 30 - October 1, 2009. The SSC discussed the justification for the proxy target spawning biomass level, which was proposed for all flatfish stocks at the September Council meeting. Two major points of discussion were: (1) when is it better to use a stock-specific estimate of B_{MSY} as opposed to a proxy and (2) why is a value of steepness equal to 0.8 appropriate for defining a flatfish proxy.

There are a number of reasons for basing management advice for flatfish stocks on a proxy for B_{MSY}:

(1) proxies incorporate information from a number of species rather than one species – in contrast stock-specific estimates of B_{MSY} could vary substantially from one assessment to the next;

(2) proxies provide a constant target offering stability in interpretation and management advice; and

(3) B_0 and B_{current} are generally more precisely estimated than B_{MSY}.

Although the SSC concluded that the best scientific approach at present is to base management advice for flatfish stocks on a proxy for B_{MSY}, it also agrees that stock-specific estimates of B_{MSY} could potentially be used as reference points in appropriate situations. Conditions for doing so would include: (a) robustness to assessment specifications, and (b) stability of estimates of B_{MSY} among assessments over a number assessment cycles. While the estimate of B_{MSY} from the 2009 petrale stock assessment does appear to be relatively robust to certain assumptions, it remains to be seen whether the estimate will be robust in future assessments. The estimate of B_{MSY}/B_0 for petrale sole is less than 0.2, which is below most national and international standards regarding the range for this quantity. For example, the general guidance under NS1 suggests ranges for B_{MSY} and F_{MSY}, and the values of $B_{25\%}$ and $F_{30\%}$ are at the lower limits of those ranges. This does not imply that B_{MSY}/B_0 must be greater than 0.2, but rather that B_{MSY}/B_0 estimates below 0.25 should be subject to increased scrutiny to confirm their reliability. Finally, although proxies are unlikely to equal the true value of B_{MSY}/B_0 for any single stock, the yield function is generally flat at biomass levels near B_{MSY}, so there is little loss in yield from the use of a proxy reference point.

The use of 0.8 for steepness when selecting the proxy target biomass and fishing mortality levels is based on a number of considerations:

(1) The resultant proxies should provide "Pretty Good Yield" (as conceived by MacCall and defined by Hilborn (2010)) across a number of related stocks and, in this case, should reflect the uncertainty in the correct value for B_{MSY} for petrale sole.

(2) Although the likelihood profile for petrale sole puts little density below the value of 0.8, fixed values and assumptions in the assessment necessarily decrease the perceived uncertainty in estimated parameters, including steepness. Steepness, in particular, should be better estimated in an assessment model after a partial return trip (i.e., a rebuilding period). In the 2005 assessment, the average value of steepness for the northern (0.88) and southern (0.72) stocks was 0.8. Moreover, the prior for pleuronectid flatfish from Myer's meta-analysis is centered at 0.8.

The SSC endorses the conclusion of the groundfish subcommittee report that proxy target reference points for west coast flatfish of $B_{25\%}$ and $F_{30\%}$ are the best scientific information available. This conclusion is based on a number of considerations, including information on stock-recruit relationships for all west coast flatfish that have been assessed, national and international guidance on proxies for B_{MSY} and F_{MSY}, and the results of a meta-analysis of flatfish stock-recruit relationships. Any of these factors when considered in isolation could give the impression that reference points based on a steepness of 0.8 (i.e., $B_{25\%}$ and $F_{30\%}$) are either overly aggressive for flatfish, or too precautionary. Neither view is tenable when the information is considered comprehensively (Fig. 1). The SSC continues to support the use of proxy reference points for status determination and harvest control rules. A key criterion for selecting a proxy is that it will perform well for the group of stocks to which it will be applied, and perform at least adequately for each member of the group. Consequently proxies would not necessarily be based on the average or the midpoint of the available information.

The SSC has noted previously that other aspects of the Council's harvest policy, such as the overfished threshold and the point at which the precautionary reduction for OY becomes zero (40-10), are policy decisions that are at the discretion of the Council. A policy that mimics the Council's default proxies for groundfish would be to set the MSST to $B_{15\%}$, which is 60 percent of the target stock size, and to implement a 25-6.25 precautionary adjustment for OY. Alternatively, the Council could set the MSST to 50% of $B_{25\%}$, which is the lowest value recommended by the National Standard 1 guidelines.

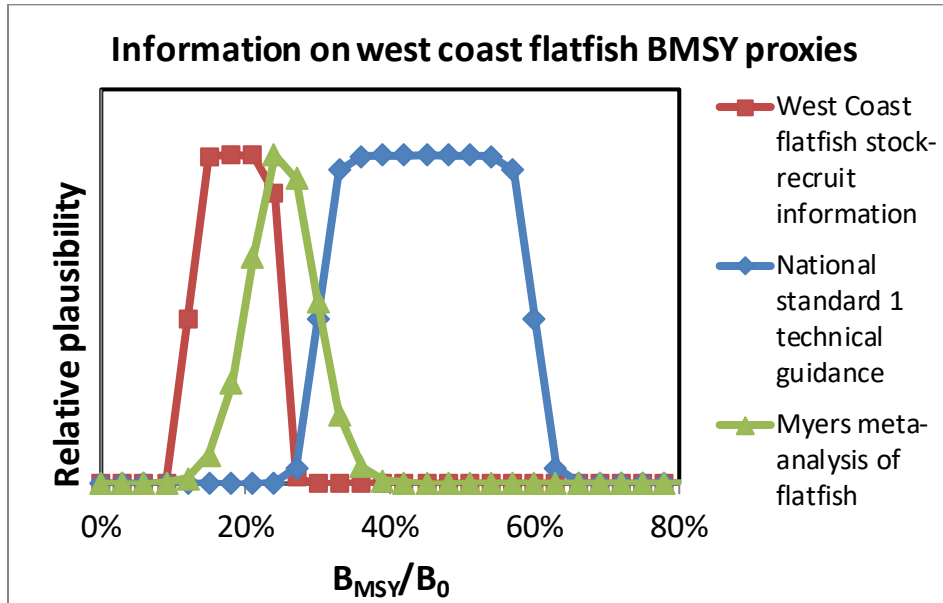*Hilborn, R. 2010. Pretty Good Yield and exploited fishes. Marine Policy 34: 193-196.*

Figure 1. Schematic of information considered when recommending a $B_{25\%}$ proxy for B_{MSY}.

Coastal Pelagic Species Management

I.1. Pacific Sardine Stock Assessment and Management Measures

Mr. Tom Jagielo presented the 2009 sardine aerial survey results and Dr. Kevin Hill summarized the Pacific sardine assessment for the Scientific and Statistical Committee (SSC). Dr. André Punt summarized the Stock Assessment Review (STAR) Panel report on the 2009 aerial survey and the 2009 Pacific sardine assessment, held in La Jolla, California, September 21-25, 2009.

The 2009 aerial survey was designed and executed based on recommendations stemming from the Survey Methodology Review panel held in May 2009. Results from the survey provide the first estimate of the absolute biomass of Pacific sardine off the U.S. west coast. The estimate of abundance used in the assessment was 1.35 million mt, with a coefficient of variation of 0.55. It was noted that this estimate could well be negatively biased due to a variety of reasons, such as schools that are missed by the aerial photographs (e.g., because they are too deep to be seen) and a survey area that excludes regions in which sardine would be expected to be found.

The previous assessment of Pacific sardine was conducted in 2007, transitioning from the ASAP model into the Stock Synthesis model (version 2). In the new 2009 assessment, changes are made in several model components, new data are added, and the Stock Synthesis 3 (version 3.03a) assessment model was utilized. However, the most notable change in the 2009 assessment is the use of an absolute abundance estimate from the aerial survey, which is a key source of information about the size of the Pacific sardine stock.

The SSC discussed and noted the difficulty in quantifying uncertainty in the aerial survey abundance estimate. The CV of the aerial survey abundance was estimated to be 0.52 using a bootstrapping procedure, while a value of 0.55 was used in the assessment model to include between-transect variation. The value of 0.55 means the model put more emphasis on the other data sources than the aerial survey abundance estimate. The main source of uncertainty in the abundance estimate is the conversion of school area to school biomass, especially for schools sizes between 4,000 and 10,000 m^2, which is due to a paucity of point-set data in that range. This problem should be solved as the aerial survey continues and more data become available.

The dome-shaped selectivity curve for the aerial survey implies an absence of large fish in the survey. Although this selectivity specification was estimated in the model, it should be more thoroughly explored in the future in order to explain the deficit of large fish.

The catchability coefficient (q) of the aerial survey could not be estimated in the model because there is only one data point. It was therefore fixed at $q = 1$. Discussion and rationalization of this value is warranted. To do so, additional survey data may be needed and, in addition, further consideration of developing a q prior is also recommended.

- A concern about correctly identifying the species composition of aerially spotted schools was raised. However, anchovy were infrequently observed in 2009 and there was a lack of valid point-sets in the southern portion of the survey where anchovy are typically more abundant.
- Other data sources that could be used to estimate coast-wide sardine biomass, e.g., satellite images and acoustics, should be considered in the future. These new data sources need to be thoroughly examined by a methodology review panel before their actual use in the assessment.
- A later start of the fishery would allow more time to conduct and finalize the stock assessment.
- The assessment would benefit by including data from Mexico and Canada.
- Efforts should continue to refine the aerial survey design and to enhance the precision of the estimate by collecting additional data to quantify the relationship between school weight and school area.
- The 2009 EFP point-set set-aside was useful and valuable information was collected.

The SSC endorsed the 2009 Pacific sardine assessment as the best available science for status determination and Council management. The SSC recommends an ABC for the 2010 fishery of 72,039 mt. The 2010 assessment is recommended to be an update.

Coastal Pelagic Species Management, continued

I.2. FMP Amendment 13: Annual Catch Limits and Accountability Measures

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) established several new fishery management provisions pertaining to National Standard 1 (NS1) to end overfishing and account for scientific uncertainty in stock assessment. The new guidelines require that all managed and monitored stocks have identified overfishing levels (OFLs), annual catch limits (ACLs), annual catch targets (ACTs), and accountability measures (AMs). These stipulations of the MSRA are required to be implemented by 2011 for most species. The SSC has discussed in general terms the new requirements over the past year and in the context of each Fishery Management Plan. The Scientific and Statistical Committee (SSC) reviewed a report developed by the Coastal Pelagics Species Management Team (CPSMT) that includes recommendations to bring the CPS Fishery Management Plan (FMP) into compliance with the reauthorized act through FMP Amendment 13.

The SSC discussed two primary issues: (1) quantification of scientific uncertainty within and among stock assessments to determine Allowable Biological Catches (ABCs) and (2) the CPSMT's recommendation to allow the current harvest control rule, which includes a buffer for uncertainty and ecosystem considerations ("CUTOFF"), to remain unchanged relative to new guidelines for ABC determination. ACLs will be needed for all species that are categorized as managed or monitored under the current FMP, except market squid (1 year lifespan) and krill, a proposed Ecosystem Component (EC) species. Other EC bycatch species may need to be identified, as noted by the CPSMT.

Under the new guidelines, ABC is determined by assigning a buffer to the OFL to account for scientific uncertainty. Scientific uncertainty was characterized by comparing stock assessments to see how biomass estimates vary among assessments for groundfish and CPS species. This analysis provides an evaluation of uncertainty by calculating ratios of all pairs of biomass estimates in a year, for the most recent 20 years of data. The analysis also provides an estimate of "within" assessment variability as the variance in the terminal biomass estimate from each assessment. Within assessment variance was generally lower than the "among" assessment variability, indicating that changes in model structure, assumptions, and data inputs have a larger effect on biomass uncertainty than uncertainty in the data inputs themselves. For CPS, the uncertainty analysis included three assessments for sardine and four assessments for Pacific mackerel. Combined, the analysis provided a standard deviation of 0.46 (sardine = 0.40, mackerel = 0.69) among assessments, and within assessment coefficients of variation of 0.41 for sardine and 0.25 for Pacific mackerel.

The CPSMT proposed a "no change" option for the harvest control rule, assuming that the current control rule sufficiently accounts for scientific uncertainty through the "CUTOFF" of 150,000 mt. The SSC notes that because this value is a constant, it becomes a smaller buffer when stock size is large, and so has diminishing effects as a buffer as stock size increases. A proportional buffer that explicitly accounts for scientific uncertainty is more likely to meet the needs stipulated in the new MSRA guidelines and provides an incentive to improve data collection.

In addition to the choice of how to compute ABCs (and hence ACLs) for assessed species such

as Pacific sardine and Pacific mackerel, there is a need to be determine how ABCs and ACLs will be computed for monitored species. Also, it is necessary for the Council to specify P*, i.e., the probability of overfishing, for each species before ABCs can be recommended by the SSC. The SSC notes that the value of P* is a policy choice with a maximum upper limit of 0.5, in which case overfishing due to scientific uncertainty would be expected to occur in half of all years if the catch equals the ABC.

The SSC concluded that it will be necessary to hold a joint meeting of the SSC CPS Subcommittee and the CPSMT if these outstanding issues are to be addressed before the March 2010 Council meeting. The SSC also recommends that this meeting take place before the proposed joint meeting of the GMT and SSC Groundfish Subcommittee (see item G.5 Supplemental SSC statement).

Groundfish Management Continued

G.5   Fishery Management Plan Amendment 23 – Annual Catch Limits and Accountability Measures

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) established several new fishery management provisions pertaining to National Standard 1 (NS1) of the Magnuson-Stevens Fishery Conservation and Management Act. On January 16, 2009, the National Marine Fisheries Service (NMFS) published a final rule in the Federal Register to amend the guidelines for NS1 that provide guidance to the Councils in revising their Fisheries Management Plans (FMPs) to conform to the new MSRA requirements. Specifically, there is now a need to implement overfishing levels (OFLs), annual catch limits (ACLs), annual catch targets (ACTs), and accountability measures (AMs) by 2011 for most species. The major task for the Scientific and Statistical Committee (SSC), however, is to satisfy provisions of the MSRA to redefine the Acceptable Biological Catch (ABC) to account for scientific uncertainty.

The SSC reviewed the draft text of Amendment 23 (Agenda Item G.5.a, Supplemental Attachment 2) and a document describing an approach for estimating the buffer between the OFL and the ABC based on inter-annual and internal variation in biomass estimates from stock assessments (Agenda Item G.5.b, Supplemental SSC Groundfish and CPS Subcommittees Report).

The SSC recommends that the scientific buffer between the OFL and ABC for groundfish species should be a simple multiplier on the OFL catch, i.e., the ABC catch for a stock would be computed as the product of the OFL catch and a fractional multiplier that accounts for scientific uncertainty.

The approach developed for estimating the extent of scientific uncertainty by Dr. Stephen Ralston is pragmatic in that it uses currently available information and it attempts to account for both uncertainty that is currently captured within most stock assessments, such as that implied by trends in survey biomass estimates, as well as other sources of uncertainty, such as choices that are made when finalizing a base model. His analysis of 15 groundfish and 2 CPS stocks indicates that for four broad species categories (rockfish, roundfish, flatfish, and CPS) the amount of variation among stock assessments is remarkably constant. The value for the standard deviation (σ), combining information across all stocks, is 0.48. The SSC recommends that this

approach be developed further by considering alternative metrics for the differences between assessment results and by implementing the sensitivity tests identified during the combined September Groundfish/CPS Subcommittee meeting. However, even if a single value for σ can be estimated using the proposed approach, the value of σ, as well as the method for estimating σ, should be frameworked within Amendment 23. This is because quantification of scientific uncertainty is an active area of research and the most appropriate way to do so is likely to change over time. Moreover, the current method of analysis does not account for all sources of uncertainty. Finally, although the analysis presented to the SSC could be used to estimate stock-specific σ values, the SSC recommends that a single value of σ be used for all species within a category.

Several steps need to take place in order for the SSC to recommend ABC values by the April 2010 meeting.

(1) The SSC needs to further review and refine the method for quantifying the extent of scientific uncertainty.
(2) The Council needs to define the probability of overfishing in any one year (P*) for each category of stocks. In this regard, the SSC notes that: (a) the value of P* is a policy choice with an upper limit of 0.5 (i.e., overfishing would be expected to occur half of the time if the full ABC is taken) and (b) the choice of P* for category 1 stocks places an upper limit on the ratio of the ABC to the OFL for category 2 and 3 species.
(3) The SSC needs to review the current basis for the OFL of each stock.
(4) The SSC needs to assign stocks to categories of uncertainty.

Given the considerable amount of work that needs to be accomplished before the March meeting, the SSC recommends that a workshop with participation by members of the SSC groundfish and Coastal Pelagic Species (CPS) sub-committees, as well as members of the Groundfish Management Team (GMT), take place in January or February 2010 with the following terms of reference:

(a) review the bases being developed by the GMT for assigning OFLs to data-poor species;
(b) revisit the OFL and ABC values for: (a) species with ABCs computed by multiplying survey swept-area biomass estimates by $0.75*M$, (b) Restrepo's method of computing 50 percent of the average catch over a period of years when catches are stable, and (c) species complexes that are aggregates of single species;
(c) assign groundfish stocks to categories of uncertainty; and
(d) provide further detailed comment on the technical aspects of Amendment 23.

The SSC notes that a 40:10 optimum yield (OY) control rule is applied to groundfish stocks. The Council's current OY control rule differs from its current ABC control rule when the stock is below the target reference point ($0.4B_0$ for most groundfish stocks). The SSC notes that the Council may wish to develop an ACL control rule based on the current OY control rule. A number of issues need to be considered when doing this. If the reasons for reducing the catch below the ABC are largely unrelated to scientific uncertainty (e.g., to enhance recovery rates for stocks that are below the target level or to avoid stocks falling below the minimum stock size threshold), then the ACL control rule could simply be the current OY control rule multiplied by the buffer for scientific uncertainty. However, if the current OY control rule accounts for scientific uncertainty, the ACL could be set to the lower of the newly defined ABC and the value

from the existing OY control rule. Other options are possible so the SSC recommends that Amendment 23 framework any proposed ACL control rule.

Finally, the SSC notes that all of the methods being used to provide advice on OFLs and ABCs should be subject to thorough analysis and review over the long term. In this regard, the SSC has previously highlighted the importance of convening a workshop on harvest policies. Such a workshop could be used to identify analytical frameworks for evaluating the trade-offs associated with different methods of analysis, as well as the conservation and harvest impacts of different values of P* that the Council may choose.

Groundfish Management Continued

G.6   Management Measures for 2011-2012 – Part 1

The Scientific and Statistical Committee (SSC) reviewed draft tables of Groundfish Management Team (GMT) recommended alternatives for 2011-2012 groundfish fishery annual catch limits (ACLs) and discussed them with Mr. John DeVore. The tables are still in development and the values presented are placeholders that have yet to incorporate the buffers that will be required to account for scientific uncertainty. The final versions of these tables will also provide explicit values of overfishing limits (OFL) and acceptable biological catch (ABC), in addition to the ACLs.

For data-poor species it is anticipated that the "depletion-corrected average catch" (DCAC) approach will be considered in lieu of simple average catch. For flatfish species (i.e., Dover sole, arrowtooth flounder, starry flounder, and English sole), the newly adopted proxy harvest rule ($F_{30\%}$) will need to be applied.

The SSC observed that for petrale sole Alternative 4 based on $F_{30\%}$ represents the maximum allowable catch (OFL). Moreover, it does not yet incorporate a scientific uncertainty buffer. Regardless of the strategy put in place in 2010 and 2011 for this stock (e.g., a constant catch approach), overfishing is not allowed in any year. A 1,200 mt ACL for 2010 is realistic.

For new assessments, such as lingcod and cabezon, where decision tables are used to develop options, it should be realized that alternatives that are based on "high" states of nature would exceed the OFL and should not be considered as realistic options. This is because ACLs will be based on the base model only.

Prior to April, a meeting of the SSC Groundfish Subcommittee, possibly part of a joint meeting with the SSC CPS subcommittee and members of the GMT, should be convened to work on 2011-2012 management recommendations. Tasks will include: 1) identifying Ecosystem Component species, 2) determining which species are in/out of the fishery, 3) how will Tiers 1-2-3 will be determined for applying uncertainty buffers and 4) developing ABC control rules for Tier 2 and 3 stocks.

Public Comment

Mr. Ralph Brown spoke in favor the Council's initiation of an Ecosystem Fishery Management Plan. As a former Council member and a long-time participant in the Council process, Mr.

Brown felt strongly that the time was right to begin thinking about Council management across the four existing FMPs and spoke to the benefits of creating a single or overarching FMP as a means of better understanding the interactions between fisheries in an ecosystem-based context.

Adjournment B The SSC adjourned at approximately 5:00 p.m., Sunday November 1, 2009.

SSC Subcommittee Assignments, November 2009

Salmon	Groundfish	CPS	HMS	Economic	Ecosystem-Based Management
Bob Conrad	**Owen Hamel**	**André Punt**	**Ray Conser**	**Cindy Thomson**	**Selina Heppell**
Loo Botsford	Loo Botsford	Tom Barnes	Tom Barnes	Todd Lee	Tom Barnes
Owen Hamel	Ray Conser	Ray Conser	Robert Conrad		Ray Conser
Pete Lawson	Martin Dorn	Owen Hamel	Selina Heppell		Martin Dorn
Charlie Petrosky	Tom Jagielo	Selina Heppell	André Punt		Pete Lawson
	André Punt	Steve Ralston	Vidar Wespestad		Todd Lee
	Steve Ralston				André Punt
	Theresa Tsou				Steve Ralston
	Vidar Wespestad				Cindy Thomson
					Theresa Tsou

Bold denotes Subcommittee Chairperson