SUMMARY MINUTES
Scientific and Statistical Committee

Crowne Plaza Hotel
Drake I
1221 Chess Drive
Foster City, CA 94404
650-570-5700

June 7-9, 2008

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

The meeting was called to order at 1 p.m. on Saturday, June 7, 2008. Dr. Donald McIsaac briefed the SSC on priority agenda items.

Subcommittee assignments for 2008 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. Robert Conrad, Northwest Indian Fisheries Commission, Olympia, WA
Dr. Martin Dorn, National Marine Fisheries Service, Seattle, WA
Dr. Owen Hamel, National Marine Fisheries Service, Seattle, WA
Dr. Tom Helser, SSC Vice-Chair, National Marine Fisheries Service, Seattle, WA
Dr. Selina Heppell, Oregon State University, Corvallis, OR
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. Stephen Ralston, SSC Chair, National Marine Fisheries Service, Santa Cruz, CA
Dr. David Sampson, Oregon State University, Newport, OR
Ms. Cindy Thomson, National Marine Fisheries Service, Santa Cruz, CA
Dr. Theresa Tsou, Washington Department of Fish and Wildlife, Olympia, WA
Dr. Shizhen Wang, Quinault Indian Nation, Mercer Island, WA
Dr. Vidar Wespestad, Research Analysts International, Seattle, WA

Members Absent

Dr. Ramon Conser, National Marine Fisheries Service, La Jolla, CA
Dr. André Punt, University of Washington, Seattle, WA

Scientific and Statistical Committee Comments to the Council

The following is a compilation of June 2008 SSC reports to the Council. (Related SSC discussion not included in written comment to the Council is provided in *italicized text*).

Salmon Management

E.1. Klamath River Fall Chinook Overfishing Concern

The Scientific and Statistical Committee (SSC) focused its review for this agenda item on Agenda Item E.1.a Attachment 3 (Alternative Rebuilding Plans for Klamath River Fall Chinook), the Salmon Technical Team (STT) Report (Agenda Item E.1.c), and Agenda Item E.1.c Supplemental STT Report 2. Mr. Chuck Tracy was present to report on the STT conference call that resulted in Supplemental STT Report 2.

There are two proposals for the criteria to end the overfishing concern (OC) and rebuild Klamath River fall Chinook (KRFC):

> The original STT proposal - Consider the OC of KRFC ended when a natural spawning escapement of at least 35,000 adults is achieved in three out of four consecutive years, with a natural spawning escapement of 40,700 adult KRFC or more in at least one of those three years.
>
> The proposal forwarded for public review by the Council - Consider the OC of KRFC ended when a natural spawning escapement of at least 35,000 adults is achieved in three out of four consecutive years, or when a natural spawning escapement of at least 40,700 adult KRFC is achieved in two consecutive years.

At the March Council meeting, the SSC recommended a more quantitative assessment of the recommendation for ending the KRFC OC proposed in "Assessment of factors affecting natural area shortfall of Klamath River fall Chinook salmon in 2004-2006" (Agenda Item D.3.b March 2008 Council meeting). The Stochastic Spawner-Recruit Model (SSRM) was suggested as a possible tool for evaluating the recommendation. Subsequently, the STT used the SSRM to evaluate the difference between their recommendation and the Council's modified proposal, and reported the results in the STT Report (Item E.1.c). In its Supplemental Report 2, the STT concluded "The results of this analysis indicate that differences in outcomes between these two management regimes are small in terms of expected benefits to the fishery or risks to the population." However, the STT expressed concern about "the plausibility of some of the SSRM results." One particular concern, as reported by Mr. Tracy, was that tribal harvest share did not show the expected increase of several thousand fish under the higher escapement option.

The SSC also has concerns about the usefulness of the SSRM as a tool to quantitatively evaluate and compare the two proposals. Specifically, some of these concerns are:

- The model does not appear to capture the annual variability in marine survival that the KRFC stock has experienced. This variability is likely to affect the resiliency of the stock.

- The metrics produced by the model that were compared may not be the metrics that are best suited for comparing the projected long-term performances of the proposals.
- Experience with stochastic life-cycle models such as the SSRM has shown that they are relatively insensitive to changes in exploitation rates or escapement goals.
- The model structure and parameterization resulted in high resiliency of the stock to recover from depressed spawner levels. Even with no spawner floor the model predicts that escapements would exceed 35,000 over half the time in the next 5 years.

Given these concerns about interpreting the results of the SSRM output and its suitability for comparing these two proposals, the SSC recommends that the two proposals also be evaluated and compared based on underlying biological principles. STT describes the basic difference between the two proposals: "the STT criteria requires that a minimum of two strong recruitments be demonstrated following the Overfishing Concern, whereas the Council criteria requires only two strong spawning events be demonstrated." (Agenda Item E.1.c Supplemental STT Report 2). The SSC agrees in principle that multiple successful recruitments are more indicative of recovery than a single spawning event that provides two adequate escapements. In addition, spawning escapements of 35,000 or 40,700 should not be described as "strong" given that 35,000 is the escapement floor.

In order to evaluate the short-term population dynamics of stocks at low abundance, models need to be developed that allow for a more realistic evaluation of alternative management strategies that could be applied not only to KRFC, but to other salmon stocks as well.

Groundfish Management

F.2. Stock Assessment Planning for 2011-2012 Groundfish Fishery Decision Making.

The Scientific and Statistical Committee (SSC) reviewed the proposed list of assessments for 2009, the draft terms of reference (TOR) for groundfish stock assessments, and TOR for groundfish rebuilding analysis. All three draft documents were reviewed by the SSC and adopted by the Council for public review during the March 2008 Council meeting. Since then, the SSC has reviewed and revised the TORs, and the Northwest and Southwest Fisheries Science Centers have reviewed and commented on the proposed list.

Dr. Jim Hastie (NWFSC) presented the proposed schedule for groundfish assessments in 2009. The SSC notes that splitnose, greenstriped, bronzespotted, and greenspotted rockfishes are listed as potential candidates for full assessments. It was reported that good data are available for splitnose and greenstriped rockfish, including survey and age composition data. Greenstriped rockfish is a non-targeted species and assessment results may provide good contrast to other targeted species. Also, splitnose rockfish and greenstriped rockfish are important components of the southern slope and northern shelf species complexes, respectively, and full assessments will enhance our understanding of their responses to exploitation or will serve as indicator species associated with those complexes. Therefore, the SSC concurs with the recommendation of the Science Centers that splitnose and greenstriped rockfishes be full assessments in 2009. In the case of bronzespotted and greenspotted rockfishes, it was recommended that, over the coming fall, data for these two species be

evaluated for their suitability in conducting a full assessment and that the Groundfish Subcommittee will recommend to the Council in November which of these species to assign to a Stock Assessment Review (STAR) Panel (i.e., only one of these stocks would be fully assessed and reviewed).

The SSC recommends that the next full Pacific ocean perch assessment be conducted in 2011 because the current assessment model is stable and there is a large number of un-aged historical otoliths, which will be aged during 2010. This schedule will also allow a full assessment to be conducted during the year when the Pacific ocean perch is currently expected to be rebuilt, based on the most recent assessment. As for lingcod, the SSC recommends it to be elevated to a full assessment in 2009 due to concerns regarding differences in regional status that were evident in the last assessment.

Table 1 summarizes the SSC's recommendations for stock assessments to be conducted in the next cycle. The SSC anticipates that reviews of the ten full assessments for the species discussed above will be conducted by five STAR Panels, each covering two species. Members of the SSC Groundfish Subcommittee are prepared to chair and participate in these five STAR Panels as specified under the TOR. The SSC recommends that the Groundfish Subcommittee chair, Council staff, and the stock assessment coordinator at the Northwest Fisheries Science Center develop specific dates, species to be reviewed, and STAR Panel membership for the five proposed panels for consideration at the September Council meeting. In addition, depending on how the Pacific whiting stock assessment is handled next year, the SSC is prepared to assist in its review.

Table 1. Summary of SSC Recommended Stock Assessments for 2011-2012 Decision Making

	Full Assessments	**Updated Assessments**
1	Bocaccio rockfish	Pacific ocean perch
2	Widow rockfish	Canary rockfish
3	Yelloweye rockfish	Cowcod rockfish
4	Petrale sole	Darkblotched rockfish
5	Cabezon	
6	Lingcod	
7	Spiny dogfish	
8	Splitnose rockfish	
9	Greenstriped rockfish	
10	Bronzespotted rockfish or Greenspotted rockfish	
*	**Pacific whiting**	

The SSC next reviewed the updated TOR for groundfish stock assessments and, in response to an edit made to the document by the Council in March, the SSC emphasizes the importance of having two more reviewers than the number of assessments being reviewed. Based on the combined experience of members of the SSC and STAT teams, n+2 is the number of reviewers needed to adequately review full groundfish stock assessments. Thus, the SSC requests that the third full paragraph on page 6 of the TOR be replaced with the following text:

"STAR Panels will include a Chair (appointed from the SSC) and other members with experience gained from having conducted stock assessments. The total number of STAR Panel members (including the chair) should be *n*+2 (where *n* is the number of assessments being reviewed) unless extenuating circumstances preclude this. More specifically, of these other members, one should have a thorough familiarity with West Coast groundfish stock assessment practices, data sources, and modeling methods, and one should be a qualified independent reviewer, such as a reviewer from the Center for Independent Experts (CIE). In addition, individuals with a supervisory relationship with a STAT Team member are disqualified from serving on the STAR Panel. The same exclusion applies to individuals who contributed significantly to the development of an assessment. For example, a significant contribution might include the provision of input data (e.g., an index of abundance), but only if the use of the index is new and had not been subject to a previous STAR Panel review. In addition to Panel members, STAR meetings will include GMT and GAP advisors with responsibilities described in their terms of reference. STAR Panels normally meet for four full days."

The current TOR for groundfish stock assessments is not explicit about the requirements for data-poor assessments, especially in the definition of an annual catch limit (ACL). Amendments or modifications to the current TOR may be necessary after the national standard guidelines become available. The SSC also identifies the need to establish management control rules for assessments based on limited data.

Regarding the TOR for rebuilding analysis, the SSC notes that the directive that $0.4B_0$ be used to define the rebuilding target in all cases (the first paragraph on page 5, the last sentence) should be treated as a general guideline. The intent is to be consistent with the threshold used in the assessment that led to the overfished declaration.

Council Administrative Matters

C.2. Magnuson-Stevens Act Reauthorization Implementation

The Scientific and Statistical Committee (SSC) discussed the proposed Integrated Fishery and Environmental Management Statements (IFEMS) and the procedures proposed for "framework" type fishery actions such as annual specifications. The SSC supports the framework process as it has the potential to improve the current groundfish annual specification process used by the Pacific Fishery Management Council. Specifically, the framework process could potentially shorten the time between when assessments are finished and when assessment results are used in the fishery management process. However, the final rule should provide more details on how frameworks could be developed that streamline the annual specification process.

Marine Protected Areas

I.1. Review of Rationale for Marine Protected Areas in the Monterey Bay National Marine Sanctuary (MBNMS)

The Scientific and Statistical Committee (SSC) reviewed the Briefing Book materials regarding the rationales for Marine Protected Areas (MPAs) in Federal waters of the Monterey Bay National Marine Sanctuary (the Sanctuary). Dr. Lisa Wooninck of the Sanctuary staff read a statement and was available to respond to questions. Dr. Richard Parrish, a fishery science consultant, also participated in the discussion.

The SSC supports continuation of a dialogue between the Council and the Sanctuary on a process to identify and evaluate alternatives for MPAs in the Sanctuary. Alternatives should include a "no action" alternative, for which the adequacy of current protections will be evaluated; therefore support of the process does not necessarily imply support for MPAs in the Sanctuary.

The Sanctuary is currently looking for advice on evaluative processes for developing alternatives. The current rationales imply differing scales for MPA implementation; data may be inadequate to evaluate the need for MPAs at some of these scales; this disconnect will have to be addressed in developing the evaluation process. While not all criteria are amenable to rigorous scientific evaluation, those brought before the SSC should be.

In terms of process, the SSC agrees with the Sanctuary that science and policy should be kept separate and recommends that proposal development and review be done by separate entities. The SSC Ecosystem-Based Management Subcommittee is available for providing scientific input to the process. The SSC white paper "Marine reserves: objectives, rationales, fishery management implications, and regulatory requirements" provides useful background.

The SSC makes the following recommendations in developing and evaluating alternatives:

1) Proposed actions should be contrasted with protections afforded by current state and Federal regulations (the "no action" alternative) and, in particular, the added value of additional protection to Sanctuary management goals should be evaluated.

2) Consolidation of existing spatial management measures should be considered as one of the alternatives for evaluation.

3) It should be clear that the role of members of the Sanctuary's working group is as stakeholders or institutional representatives, and the role of members of the Sanctuary's science advisory panel is as independent scientists.

4) There should be experts from a variety of fields within the social sciences on the science advisory panel. A separate socioeconomics panel is not desirable.

5) Interactions between the Council and the Sanctuary should be formalized to help ensure that communication is efficient and timely. A Council staff member acting as a liaison between the Council and the Sanctuary would be helpful in this regard. SSC members, if on the science advisory group, would not speak for the SSC or the Council.

6) The Sanctuary, along with its partners, should develop monitoring plans to go along with each of the alternative proposed actions.

7) The potential loss of sampling and surveying opportunities could have a significant effect on data series used for stock assessments. Replacement of these surveying opportunities with alternative methods should be a high priority if MPAs are implemented.

SSC Notes:

Dr. Lisa Wooninck presented the overarching goals of the sanctuary: to protect biodiversity and ecosystem components. The rationale for MPAs in federal waters include NMSA ecosystem goals, to help rebuild overfished stocks, to protect biodiversity, to restore the age and size structure of populations, and to provide ecosystem resilience. There is a great deal of uncertainty about how components of ecosystem work, and therefore the precautionary principle dictates designating areas protected from direct human impacts. In summary: 1. precautionary approach, 2. demographics of single species populations, 3. complexity 4. resilience 5. biodiversity.

Research is needed to adequately differentiate between natural and anthropogenic drivers, including baseline and continuing monitoring and research.

The process is being developed with partners. Although the goal is ecosystem management, MPAs will have an affect on fishery management and therefore the Sanctuary is here to discuss the process with the Council before it begins in earnest.

Previous PMFC recommendations include: SSC members on science panel, a separate formal review of science, and the inclusion of the Davidson seamount as part of sanctuary. The Sanctuary, NOAA fisheries and PFMC should work together on this.

RCAs and EFH are MPAs, but with different levels of protection and permanence. So as a dynamic tool, RCAs may not meet the ecosystem or research goals of the Sanctuary.
The implementation of very large MPAs could affect Council action, possibly leading to opening up areas (parts of RCAs) so maybe not as big an effect of fishing communities.

The science advisory panel will come up with scientific criteria for the working group to use. The working group works with science advisory panel, and the science advisory panel will evaluate working group products for their criteria plus NEPA requirements

The Sanctuary plans review by outside experts (e.g. from east coast). The SSC may not have the full set of expertise to cover what is reviewed in the science advisory panel

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Richard Parrish expressed concerns about differences in goals (of say ecologist and fishery biologists) causing differences in sizes of MPAs and the need for a variety of sizes to meet various goals –protection of unique sites/habitats/species vs. protection and restoration of ecosystems/species.

Coastal Pelagic Species Management

G.1. Pacific Mackerel Management for 2008-2009

The Scientific and Statistical Committee (SSC) received a presentation on the 2008 Pacific mackerel stock assessment by Dr. Emmanis Dorval. In addition, Dr. Tom Helser briefed the SSC on the results of an assessment review that was sponsored by the Council on May 13, 2008, in Long Beach, CA. The review was conducted by two members of the Coastal Pelagic Species (CPS) sub-committee of the SSC, and several members of the CPS Management Team.

The last full assessment of Pacific Mackerel occurred during May 2007 and the current assessment was prepared as an update assessment. The SSC considers that the assessment has satisfied the Terms of Reference for a CPS Stock Assessment update because (a) the base model that was selected and approved at the 2007 Stock Assessment Review (STAR) Panel formed the basis for the update assessment, (b) this assessment used the same model structure and estimation framework (ASAP) as the last full assessment, and (c) only updates to the data used during the 2007 full assessment were included in the updated assessment. The updated assessment included revised catch landings, catch-at-age and weight-at-age data for 2006-07, and new 2007-08 data. The assessment was based on three indices of abundance (California Cooperative Oceanic Fisheries Investigations [CalCOFI], commercial passenger fishing vessel [CPFV] and spotter). Only one of the indices of abundance (CPFV) was updated to include data for 2007-08. The CPFV index is now the primary index of abundance for Pacific mackerel, but is based on fishery-dependent sampling and is therefore subject to the concerns associated with such data. In addition, the CPFV index may not reflect trends in abundance for the southern portion of the range.

Dr. Dorval indicated that the stock assessment team (STAT) intends to continue to investigate an SS2-based Pacific mackerel assessment. If completed, an SS2-based assessment should be reviewed at a May 2009 STAR Panel. The SSC also notes that the ASAP model has been updated and that some of its new features may be useful for the Pacific mackerel assessment. Should the work on SS2 modelling for Pacific mackerel prove problematic, the updated ASAP model should be considered as a possible alternative modelling platform.

The SSC endorses the update assessment as the best available science and its use in Council management decisions. Based on the Council's harvest control rule, the acceptable biological catch (ABC) and maximum allowable harvest guideline for Pacific mackerel from the update assessment is 51,772 mt.

REPORT OF THE COASTAL PELAGIC SPECIES SUBCOMMITTEE ON THE 2008 PACIFIC MACKEREL STOCK ASSESSMENT

A Pacific Fishery Management Council-sponsored review of the Pacific Mackerel assessment update took place on May 13, 2008, at the NOAA / Southwest Regional Headquarters in Long Beach, CA. Reviewers at the Long Beach meeting included Tom Helser and André Punt of the CPS sub-committee of the Scientific and Statistical Committee (SSC), and several members of the Coastal Pelagic Species (CPS) Management Team. Emmanis Dorval, a member of the Stock Assessment Team (STAT), presented the data and modeling results.

The last full assessment of Pacific Mackerel occurred during May 2007 and the current assessment was reviewed as an update assessment. The reviewers agreed that the assessment satisfied the Terms of Reference for a CPS Stock Assessment update because (a) the model (E1) that was selected and approved at the 2007 STAR Panel formed the basis for the update assessment, (b) this assessment used the same model structure and estimation framework (ASAP) as the last full assessment, and (c) only updates to the data used during the 2007 full assessment were included in the updated assessment. The update assessment included revised catch landings, catch-at-age and weight-at-age data for 2006-07, and new 2007-08 data. The assessment was based on three indices of abundance (CalCOFI, CPFV and spotter). Only one of the indices of abundance (CPFV) was updated to include data for 2007-08. The CPFV index is now the primary index of abundance for Pacific mackerel, but is based on fishery-dependent sampling and is hence subject to the concerns associated with such data. In addition, the CPFV index may not reflect trends in abundance for the south of the range.

The STAT and reviewers agreed that the assessment satisfactorily met the TOR for an CPS assessment update, reflects the best available science, and provides a suitable basis for Council management decisions. The harvest guideline for Pacific mackerel from the update assessment based on the Council's harvest control rule is 51,772t.

The members of the CPS sub-committee re-iterated previous concerns regarding the lack of a reliable index of relative abundance for Pacific mackerel as well as the considerable uncertainty regarding data for the component of the population off Mexico. Specifically, catch estimates for Pacific mackerel off Mexico have not been provided for use in assessments since 2005-06. The SSC CPS sub-committee was informed that data on Mexican catches of Pacific mackerel may be available by the June Council meeting and encourages that, if available, these data should be presented to the SSC and the Council.

The assessment authors indicated that they intended to continue to investigate an SS2-based Pacific mackerel assessment. If completed, an SS2-based assessment should be reviewed at a May 2009 STAR Panel. It was also noted that the ASAP model has been updated and that some of the new features may be useful for the Pacific mackerel assessment. Should the work on SS2 modelling for Pacific mackerel prove problematic, the updated ASAP model should be considered as a possible alternative modelling platform.

Other comments on the assessment:

- *No larvae were observed in the 2007 CalCOFI survey. Consequently, and consistent with how the CalCOFI data were analysed before, there was no 2007 data point for this index. A sensitivity test based on a CalCOFI time-series in which all zero values were replaced by low, but non-zero, values did not lead to results which were notably different from those for the base model.*
- *Consideration should be given to developing a CalCOFI index based on a hierarchical model.*
- *ASAP is being updated. The assessment authors should consider working with the developers of ASAP to ensure that the next version includes ways to overcome the deficiencies of the current version of ASAP identified by the 2004 STAR Panel.*
- *The confidence intervals of 1+ biomass are very narrow, almost certainly unrealistically so. It is possible that use of SS2 could lead to uncertainty being characterized more realistically, particularly if MCMC simulation is used.*
- *The estimate of 2006 recruitment is lower in the current assessment than in last year's assessment. This is due to the catch of age-1 animals in 2007-08 being lower than anticipated from the catch of age-0 animals in 2006-07. The next assessment should examine whether the data support a new selectivity period starting in 2003-04.*
- *The age-composition data prior to 1939-40 are based on converting lengths to ages. The next assessment should consider a sensitivity test in which the assessment is started in 1939-40 rather than in 1929-30.*
- *Consideration should be given to re-evaluating the control rule for the Pacific mackerel fishery. However, it is first necessary to obtain Council input on the objectives for Pacific mackerel.*

Council Administrative Matters

C.3. Update and Communication of Research and Data Needs

The Scientific and Statistical Committee (SSC) discussed the Council's Preliminary Draft Research and Data Needs 2008. The following summarizes the items discussed by the SSC:

- The SSC will modify the third priority in the salmon section of the document to reflect the need to develop models to improve evaluation of alternative management strategies.

- The SSC supports the species and research priorities identified by the Highly Migratory Species Management Team (HMSMT) (Item C.3.b Supplemental HMSMT Report).

- The SSC supports the recommendation from the California Wetfish Producers Association (Item C.3.c Public Comment) to incorporate research on the effects of ocean acidification on marine resources into the ecosystem section of the document.

The SSC supports these proposed changes to the document and publication of the document for public review. Additionally, the SSC will identify high priority items for groundfish and update the salmon and economics priorities for the Council's consideration in September.

Groundfish management, continued

F.6. Amendment 20: Trawl Rationalization Alternatives

The Scientific and Statistical Committee (SSC) heard from Mr. Jim Seger (Council Staff) regarding the Council's preliminary decision points for the current meeting, and the timeline for completing the Draft Environmental Impact Statement (DEIS) for public review and reporting on progress to Congress. The SSC also received a presentation from Dr. Steve Freese (National Marine Fisheries Service [NMFS] Northwest Region) regarding a preliminary analysis of costs associated with the Trawl Individual Quota Program (TIQ) for data collection, monitoring, enforcement and administration under the status quo and two program alternatives.

The SSC Economics and Groundfish Subcommittees met with the Trawl Individual Quota Analytical Team (TIQAT) on May 28-29, 2008 to review the Preliminary DEIS materials prepared for the Council's June meeting (Agenda Item F.6.b). The full report of that meeting is attached. Below are highlights from the report and some additional comments.

The TIQAT has made significant progress in developing documentation and supporting analyses for the TIQ program alternatives. The Council has to make a complex set of inter-related decisions to implement the TIQ program. Their task and public review of the proposed decisions would be facilitated by documentation that clearly lays out the decisions to be taken and how those decisions relate to the objectives of the program. The SSC subcommittee report suggests changes to the organization and content of the preliminary DEIS as examples of ways to improve the documentation.

The DEIS is supported by several related analyses, with results from one analysis feeding into subsequent analyses. Major analyses pertain to the initial allocation, projections of fleet consolidation and bycatch reduction, and effects on ports.

Initial Allocation

The issue of initial allocation is primarily one of equity and social policy. The gifting of initial quota shares will provide a marketable asset to some individuals and deny it to others. Over the long run, quota shares will tend to gravitate toward the most efficient fishing operations, which will be able to outbid less efficient operations for transfer or lease of quota shares. However, the identities of long term participants in the fishery, their geographic distribution, and the amount of wealth accumulated will, to varying degrees, be influenced by the initial allocation. Further, accumulation limits, grandfather provisions, capital constraints, and personal preferences could have a large effect on the long-term efficiency of the fleet. The adaptive management option could be developed to mitigate short term disruptions.

Fleet Consolidation

The TIQAT used a fleet consolidation model to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program. The results from this model will also be an input

into the regional economic impact model and will influence the costs of monitoring, data collection, enforcement and administration.

A standard econometric methodology was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the Northwest Fisheries Science Center (NWFSC). Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced to 40-60 vessels and with cost savings in the range of $18-22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50-60 foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

There is considerable uncertainty regarding the results of the fleet consolidation model. The projected size of the profit-maximizing trawl fleet may be too large, as the model assumes a constant mix of target species before and after rationalization. An individual fishing quota (IFQ) fishery may lead to a fleet with more species specialization and thus have fewer vessels than estimated by the model. On the other hand, fleet size may be underestimated, as the model assumes no constraints on accumulation of quota shares. Also, model results were based on 2004 and 2006 harvests, when optimum yields (OYs) were generally low. Projections of profits probably are low relative to the long term because, as stocks rebuild, future catches are likely to be higher than in 2004 and 2006, and costs are likely to be lower due to specialization in groundfish. Model results pertain to the endpoint of an ideally rationalized fleet, and not the transition to this state. Despite these uncertainties, the model results provide a general idea of the profits and fleet size that might be produced by a rationalized groundfish trawl fishery.

Bycatch Reduction

The TIQAT conducted a trawl bycatch reduction analysis to evaluate the likely potential increase in the harvest of target non-whiting groundfish species. The analysis used observed changes in the bycatch rates of canary rockfish in a 2001-2004 exempted fishing permit (EFP) fishery off Washington and applied them in the NMFS/Groundfish Management Team trawl bycatch model to simulate harvests that could be taken under a rationalized trawl fishery.

The EFP fishery indicated large reductions in the bycatch rates of canary rockfish when the participants in that fishery were allowed to operate under conditions similar to a rationalized fishery. It remains unclear whether these reductions are representative of what might occur under other fishing strategies or in other locations. Because the predictions from the bycatch rate reduction model serve as inputs to other analyses supporting the DEIS, it is important to consider a range of bycatch rate reductions that reflect these uncertainties. The TIQAT considered three scenarios – a low catch scenario based on industry input, and medium and high catch scenarios that assume 35 percent and 50 percent reductions in bycatch rate as observed in the EFP fishery during 2003-2004. It is not clear whether these three scenarios adequately bracket the range of uncertainty; however, very little quantitative information exists for projecting potential bycatch rate reductions.

Effects on Ports

A qualitative analysis examined the potential change in fortunes of different geographic regions

under a rationalized trawl fishery. Scores for each port were developed based on four criteria: (1) the number of non-whiting trawl vessels delivering to each port associated with efficient versus inefficient size categories, (2) the percent of each port's non-whiting trawl landings associated with lower versus higher bycatch areas, (3) the level of supporting infrastructure in each port, and (4) projected allocation of quota pounds (QPs) to each port based on two initial allocation scenarios. The results highlight a few ports that appear most likely to be affected by the TIQ program. The criteria used to score each port appear to be suitable and appropriately analyzed.

Other Issues Discussed During the Meeting

Discussions during the meeting raised a number of points that were not specific to any of the focal models or analyses, but which should be given consideration as the DEIS is developed further.

- The DEIS should clearly specify the activities eligible for support under the Adaptive Management provision and the process for administration and distribution of adaptive QP.
- The IFQ alternative includes explicit provisions for catch overages, "repayment" of overages, and sanctions in the event of non-payment. No comparable provisions exist for the Co-op alternative, even though there seems no inherent reason why a co-op would be less likely to exceed its allotment of QP.
- For species that are rarely caught in trawl gear (e.g., cabezon), the cost of maintaining a system for tracking quota shares and quota pounds may well exceed the benefits. However, aggregating these lesser species into an "other fish" category may, over time, have adverse biological side-effects unless they are monitored on a species-specific basis.
- Further elaboration and analyses are needed regarding the option for geographic assignment of quota shares (QS) with a split at 40º10' N. For many stocks there is little information to define a biological basis for spatial divisions.
- The preliminary DEIS needs a more complete analysis of the effects of the alternatives on net national benefits. Such analysis will become more feasible once cost estimates associated with the alternatives become available.

The SSC notes that the preliminary DEIS was lacking several important sections and analyses, including the following:

- The regional input/output model is not yet available to evaluate the potential impacts to the regional economies of TIQ program alternatives.
- The ecosystem model is not yet available to evaluate likely impacts to the environment of TIQ program alternatives.
- The description and analysis of likely community impacts is not yet available.
- With regards to monitoring and administrative cost estimates, the SSC notes that as cost estimates are refined and developed further, care should be taken to ensure that the assumptions regarding modeled impacts are consistent among the various analyses and models.

SSC Notes (Economics Subcommittee Report to SSC):

Review of Preliminary Draft Environmental Impact Statement
on Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery

SSC Economics and Groundfish Subcommittees
28-29 May 2008
Portland, Oregon

Members of the Economics and Groundfish Subcommittees of the SSC met with the Trawl Individual Quota Analytical Team (TIQAT) on 28-29 May 2008 to review materials prepared for the Council's June meeting, when the Council will choose a preliminary preferred alternative for the Trawl Rationalization Program. Materials reviewed included the Preliminary Draft Environmental Impact Statement (DEIS, Agenda Item F.6.b), supporting appendices, and other documents. The subcommittees heard presentations from Jim Seger and Merrick Burden (Council staff), Carl Lian (NWFSC), and Quinn Weninger (Department of Economics, Iowa State University).

The SSC subcommittees commend the TIQAT for making significant progress in developing documentation and supporting analyses for the TIQ program alternatives. The Council has to make a complex set of inter-related decisions to implement the TIQ program. Their task would be facilitated by documentation that clearly lays out the decisions to be taken and how those decisions relate to the objectives of the program. To this end, the SSC subcommittees offer the following suggestions regarding the organization and content of the preliminary DEIS, as examples of ways to improve the documentation.

- *The Introduction section of the DEIS should include a "map" and "instructions" to indicate how to use the DEIS. Although the current preliminary DEIS includes a section on the document's organization, there is nothing that clearly indicates how the different chapters relate to each other or how the information in each chapter relates to the task of selecting among the various options for the TIQ program.*
- *The tables of alternatives in the preliminary DEIS (e.g., Table 2-3, "Full description of the IFQ alternatives") should include explicit linkages to other sections that describe for each alternative (a) what it is intended to achieve and (b) evaluates its effectiveness relative to the stated objectives.*
- *The unlabelled table on p. 118 in Chapter 4, section 4.2.2 ("Utilization of analytical methods in assessing the effects of the analytical scenarios") should include page numbers or other reference points to show where to find supporting information regarding each data collection / model component. It would also be helpful to include a flowchart or table that shows the linkages between the models and the program objectives.*
- *The summaries of the effects of the five analytical scenarios provide useful information on the potential impacts (e.g., changes in vessel profits and fleet efficiency), but they do not discuss the degree to which each scenario satisfies the goals and objectives of the program.*

During the meeting with the TIQAT the SSC subcommittee members found it helpful to work from the table, provided by the TIQAT, entitled "Trawl Rationalization Decision Points" (Agenda Item F.6.a, Attachment 1), which listed the central decision points and summarized the Groundfish Allocation Committee's recommendations by sector. The SSC subcommittee review focused on scientific and technical details in the preliminary DEIS, particularly analyses and models pertaining to the initial allocation, the effects on fleet consolidation, and the potential for bycatch reduction.

Initial Allocation

There are various issues before the Council regarding the initial allocation of quota shares. Discussion at the meeting focused primarily on the issue of initial allocation to processors as well as harvesters. The SSC subcommittee members view this issue as primarily one of equity and social policy. The gifting of initial quota shares will provide a marketable asset to some individuals and deny it to others. Over the long run, quota shares will tend to gravitate toward the most efficient fishing operations, which will be able to outbid less efficient operations for transfer or lease of quota shares. However, the identities of long term participants in the fishery, their geographic distribution, and the amount of wealth they will be able to accumulate will to varying degrees be influenced by the initial allocation. Further, accumulation limits, grandfather provisions, and capital constraints may restrict this movement of quota shares to the most efficient operations. The adaptive management option could be developed to mitigate for short term disruptions.

Fleet Consolidation

One of the major economic benefits to be derived from a fishery rationalization program is the retirement of less efficient fishing operations and the resulting reduction in overcapitalization in the fishery. The TIQAT used a fleet consolidation model developed by Lian, Singh, and Weninger, to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program. The results from this model will also be an input into the regional economic impact model.

A standard econometric methodology (stochastic frontier analysis) was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the NWFSC. The data were collected by in-person interviews and seem to be representative of the fleet. Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced by 50% to 66% (to 40 to 60 vessels) and with cost savings in the range of $18 to $22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50 to 60 foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

There is considerable uncertainty regarding the results of the fleet consolidation model. The SSC subcommittees note that the projected size of the profit-maximizing trawl fleet may be too large, as the model does not account for specialization but instead assumes the same fixed mix of target species (whiting, DTS, non-DTS, crab, shrimp, and other) before and after rationalization. An IFQ fishery may lead to a fleet with more species specialization and thus have fewer vessels

than estimated by the model. On the other hand, fleet size may be underestimated, as the model assumes no constraints on accumulation of quota shares. Also, model results were based on 2004 and 2006 harvests, when OYs were generally low. Projections of profits probably are low relative to the long term because, as stocks rebuild, future catches are likely to be higher than in 2004 and 2006, and costs are likely to be lower due to specialization in groundfish. Model results pertain to the endpoint of an ideally rationalized fleet, and are not informative about how the transition to this state will occur. Despite these uncertainties, the model results provide a general idea of the profits and fleet size that might be produced by a rationalized groundfish trawl fishery.

The fleet consolidation analysis should be accompanied by an analysis of alternative fisheries likely to be targeted by vessels displaced from the groundfish fishery that are not retired.

Also, the TIQAT should examine the maximum amount of fleet consolidation that is possible given the allocation limits in each analytical scenario. This will establish a boundary condition on the fewest number of vessels that can prosecute the fishery.

Technical Note

The stochastic frontier model included a linear term for the latitude of each vessel's home port as a mechanism to account for spatial differences in fish abundance and vessel harvesting efficiency. The coefficient for this term was not significantly different from zero. The assumption of a linear trend in fish abundance or harvesting efficiency with latitude may be distorting the results. A more flexible spatial model structure (e.g., a set of dummy variables to represent ports) would provide a better representation of spatial differences in fish abundance, which are likely to vary non-linearly with latitude, and the coefficients would provide information on potential geographic shifts in fleet operations.

Bycatch Reduction

Another major potential economic benefit to be derived from a groundfish trawl rationalization program is the ability to access groundfish stocks that currently are constrained by the bycatch of overfished rockfish species. The TIQAT conducted a trawl bycatch reduction analysis to evaluate the likely potential increase in the harvest of target non-whiting groundfish species. The analysis used observed changes in the bycatch rates of canary rockfish in a 2001-2004 EFP fishery off Washington and applied them in the NMFS/GMT trawl bycatch model to simulate harvests that could be taken under a rationalized trawl fishery. The analysis of the EFP fishery data addressed previous comments made by the SSC Economics Subcommittee in September 2007 regarding possible spurious effects due to changes in the target species in the denominator of the bycatch rate.

The EFP fishery indicated large reductions in the bycatch rates of canary rockfish when the participants in that fishery were allowed to operate under conditions similar to a rationalized fishery. It remains unclear whether these reductions are representative of what might occur under other fishing strategies or in other locations. Because the predictions from the bycatch rate reduction model serve as inputs to other analyses supporting the DEIS (e.g., the fleet

consolidation model), it is important to consider a range of bycatch rate reductions that reflect these uncertainties. The TIQAT considered three scenarios – a low catch scenario based on industry input, and medium and high catch scenarios that assume 35% and 50% reductions in bycatch rate as observed in the EFP fishery during 2003-2004 (Appendix C, Table 6). It is not clear whether these three scenarios adequately bracket the range of uncertainty; however, very little quantitative information exists (other than the EFP) for projecting potential bycatch rate reductions.

To the extent that bycatch rates are influenced by the skipper of a vessel (or otherwise are caused by a vessel effect) one could expect that there will be further reductions in bycatch over time as less efficient skippers exit the fishery.

Technical Note

Additional information should be provided in Appendix C to more fully document results from the analyses and how they were derived. For example, Table 5 should include sample sizes and confidence intervals for the bycatch rate estimates. Table 6 (or the accompanying text) should include definitions of the scenarios, and should include a column for the status quo catch.

Other Models / Analyses

The SSC subcommittees also reviewed a qualitative analysis that examined the potential of different geographic regions to be made better or worse off under a rationalized trawl fishery. The analysis involved development of scores for each port based on four criteria: (1) the number of non-whiting trawl vessels delivering to each port associated with efficient versus inefficient size categories (based on results from the fleet consolidation model indicating that 50-60 foot vessels were likely to be most efficient), (2) the percent of each port's non-whiting trawl landings associated with lower versus higher bycatch areas, (3) the level of supporting infrastructure in each port, and (4) projected allocation of quota pounds to each port based on two initial allocation scenarios (catch history only versus equal allocation of buyback history). The results (Appendix C, Table 5) highlight a few ports that appear most likely to be affected by the TIQ program. The criteria used to score each port appear to be suitable and appropriately analyzed.

Other Issues Discussed During the Meeting

Discussions during the meeting raised a number of points that were not specific to any of the focal models or analyses, but which should be given consideration as the DEIS is developed further.

- *It will be important to have a mandatory socio-economic data collection program to meet the reporting requirements of an ITQ program and to determine the degree to which the program's goals are being met.*
- *The preliminary DEIS and supporting analyses start with the assumption that trip limits would be replaced by individual quotas but that other current management measures would remain in place. The Rockfish Conservation Areas (RCA) will constrain the ability of quota*

holders to fully capture the benefits of the IFQ system. The Council may wish to reconsider the need for the RCA once the effects of rationalization become more apparent.

- *The DEIS should clearly specify the activities eligible for support under the Adaptive Management provision and the process for administration and distribution of adaptive QP.*
- *The IFQ alternative includes explicit provisions for catch overages, "repayment" of overages, and sanctions in the event of non-payment. No comparable provisions exist for the Coop alternative, even though there seems no inherent reason why a coop would be less likely to exceed its allotment of QP.*
- *For species that are rarely caught in trawl gear (e.g., cabezon), the cost of maintaining a system for tracking quota shares and quota pounds may well exceed the benefits. However, aggregating these lesser species into an "other fish" category may, over time, have adverse biological side-effects unless they are monitored on a species-specific basis.*
- *The National Standards Guidelines for Annual Catch Limits accountability measures may mandate provisions that will impact the program, both in terms of defining species complexes and carryover of catch overages.*
- *Further design details and analyses are needed concerning QS that sunsets and is then sold at auction.*
- *Further elaboration and analyses are needed regarding the option for geographic assignment of QS with a split at 40º10' N. For many stocks there is little information to define a biological basis for spatial divisions.*
- *The preliminary DEIS needs a more complete analysis of the effects of the alternatives on net national benefits. Such analysis will become more feasible once cost estimates associated with the alternatives become available*
- *The preliminary DEIS has no analysis of the effects on consumers with regard to product availability and prices.*
- *The preliminary DEIS does not address how the Council will handle spill-over effects on other sectors from overages by the trawl sector, and vice versa.*
- *The preliminary DEIS only partially addresses mechanisms for handling QS of an overfished species that becomes rebuilt, or the transition (if any) for QS of species that become assessed as overfished.*
- *The preliminary DEIS does not address the spill-over of vessels displaced by consolidation and the alternative fisheries that are likely to be affected.*
- *If under an IFQ system it is advantageous to be in a cooperative, then one would expect this formation of organization to develop. It is unclear why an IFQ program would need to require the formation of coops.*
- *The TIQ program currently includes no provisions that prohibit individuals from retiring their quota shares. QS that is held but not used seems counter to the goal of full use of potential harvest. However, if the public places higher value on fish existence than on fish products, not using QS could result in increased net national benefits.*

The SSC notes that the preliminary DEIS was lacking several important sections and analyses, including the following:

- *The regional input/output model is not yet available to evaluate the potential impacts to the regional economies of TIQ program alternatives.*
- *Monitoring, data collection and management, and enforcement costs are not yet available. The desirability of some of the proposed alternatives may change considerably, once their costs are known.*
- *The ecosystem model is not yet available to evaluate likely impacts to the environment of TIQ program alternatives.*
- *The description and analysis of likely community impacts is not yet available.*

Adjournment: The SSC adjourned at approximately 12:00 p.m., Monday June 9, 2008.

SSC Subcommittee Assignments, June 2008

Salmon	Groundfish	CPS	HMS	Economic	Ecosystem-Based Management
Pete Lawson	**Martin Dorn**	**Tom Helser**	**Ray Conser**	**Cindy Thomson**	**Selina Heppell**
Robert Conrad	Ray Conser	Tom Barnes	Tom Barnes	Todd Lee	Tom Barnes
Owen Hamel	Owen Hamel	Ray Conser	Robert Conrad	David Sampson	Martin Dorn
Charlie Petrosky	Tom Helser	André Punt	Selina Heppell		Pete Lawson
David Sampson	André Punt	Steve Ralston	André Punt		Todd Lee
Shizhen Wang	Steve Ralston		Vidar Wespestad		André Punt
	David Sampson				Steve Ralston
	Vidar Wespestad				Cindy Thomson

Bold denotes Subcommittee Chairperson

PFMC
6/09/08