DRAFT
MINUTES
SCIENTIFIC STATISTICAL COMMITTEE
February 2-4, 2004

The Science Statistical committee met February 2-4, 2004 at the Hilton Hotel in Anchorage, AK. Members present:

Rich Marasco, Chair	Gordon Kruse, Vice Chair	Keith Criddle
Mark Herrmann	Doug Woodby	Ken Pitcher
Sue Hills	Terry Quinn	Franz Mueter
Patty Burke	Farron Wallace	Anne Hollowed

Rich Marasco was elected Chair and Gordon Kruse was elected vice-chair.

C-2 OBSERVER PROGRAM

Dr. Karp (Alaska Fishery Science Center) and Nicole Kimball (NPFMC) provided an overview of the Observer Program and discussed the status of proposed modifications to the program. Public comment was provided by Paul MacGregor (At-Sea Processors Association), Gerry Merrigan (Prowler Fisheries), John Gauvin (Groundfish Forum and Alaska Groundfish Databank), Jon Warrenchuck (Oceana), and Joe Kyle (Observer Advisory Committee).

In April 2000, we noted: "Historically, the SSC has been a strong advocate for an effective and comprehensive observer program. For the SSC these terms imply that the observer program should representatively gather biological data from each of the fisheries engaged in harvest while simultaneously providing data for unbiased estimates of total catch. Secondarily, to the extent practicable, the Observer Program should provide requisite data on compliance with the many regulatory requirements imposed on the fisheries."

Many of the concerns that we have with the structure and function of the Observer Program are long-standing. For example, in September 1995, we noted that:

- observer placement must be flexible in order to be representative of the fleet,
- compensation and treatment of observers must be sufficient to retain experienced and well-trained personnel,
- there is a need for flexibility in establishing coverage levels and distribution of coverage across the fleet. Although well distributed observer coverage of 20% to 30% may be adequate for stock assessment; bycatch estimation levels for some species may need closer to 90% coverage, and management programs requiring individual vessel compliance will require 100% or greater coverage,
- the observer program should undergo a periodic, independent evaluation of objectives, methodologies and data collected, and
- data needs and priorities should be assessed and provided to observer program managers annually.

The SSC is disappointed that, nearly a decade later, so little progress has been made in addressing these concerns. The SSC is concerned that the need for the changes to the Observer Program may have become increasingly overshadowed by discussions over perceptions regarding the equitable distribution of costs, the intricacies of administrative procedure requirements and contract law.

Despite its many laudable characteristics, there is a major flaw in the current Observer Program. For many segments of the fishery, the deployment of observers does not ensure representative sampling of retained and discarded catches. This flaw must be addressed to ensure the quality and representativeness of the data because these data are essential for stock assessment and in-season management. If this flaw is not addressed, the stock assessments and in-season management decisions will become increasingly difficult to defend. This flaw is most acute in the smallest vessel size categories. While vessels in these categories account for a small portion of the total catch, they are often prosecuted in areas where there are elevated concerns about incidental catches and adverse interactions with seabirds and marine mammals. We recognize that there are pragmatic and financial challenges associated with the implementation of changes in Observer Program that must be overcome to address concerns about potential undersampling and strategic biases present under the current program. We have repeatedly encouraged experimentation with electronic monitoring and other approaches that may generate required data at the lowest possible cost to industry.

NMFS is concerned over the inadequacies of the service delivery model, the inability to implement statistically valid sampling protocols, the inability to address performance problems in a timely fashion and its ability to administer different programs in the GOA and BSAI. Failure to address these issues could imperil the credibility for the entire management system groundfish in the North Pacific.

It is our understanding that MRAG has recently completed a review of strategies for the deployment of observers in the GOA. The results of the previous MRAG review (September 2000) have helped elucidate program shortcomings and suggested useful improvements. In preparation for the March-April meeting, the SSC would like an opportunity to review this most recent MRAG analysis.

C-4 HAPC

The SSC received a presentation from Council and NMFS staff providing an overview of initial HAPC proposals, suggested methodology and an evaluation matrix. Public comments were provided by Ben Enticknap (AMCC), John Gauvin (GFF) and John Warrenchuck (OCEANA).

The evaluation matrix is intended to assist the Plan Teams in their detailed assessment of the proposals. Each proposal will be assessed for ecological, socioeconomic and management implications and practicability. The Plan Teams will evaluate each proposal on the basis of how well it meets the Council designated priority areas: (1) Sea Mounts in the EEZ, named on NOAA charts, that provide important habitat for managed species, and (2) largely undisturbed, high relief coral beds that provide important habitats for managed species. HAPC proposals will then be required to meet at least two of the four HAPC considerations established in the EFH Final Rule: (1) importance of ecologic function; (2) sensitivity; (3) vulnerability; and (4) rarity as a mandatory criterion. Each proposal will be ranked, using the evaluation matrix, on how well it meets Council priorities and the four HAPC considerations. Based on the overall proposed HAPC relative score, the Plan Teams will make recommendations directly to the Council. During the April meeting, the Council will determine which if any of the proposals move forward for analysis or may refer the proposals for further review.

Council staff proposed to sum the rankings across categories to provide an overall measure of how well the proposal meets Council priorities and HAPC considerations. The SSC cautions against performing such a summation without further consideration of the importance of each category. It will be very difficult to define, let alone quantify, the relative merit of the proposals because information is largely deficient to objectively weight categories. The Council will need to clarify its desired weighting of the categories, realizing that the default would be equal weighting of each category.

The SSC stresses the importance of scoring the proposals in a uniform manner to ensure some level of objectivity. A clear definition must be established for all Council priorities and HAPC considerations. The analysts should provide clear definitions for the relative rankings of rarity, sensitivity, and vulnerability as done for "importance of ecological function". For example, is "rarity" thought to be: (1) low if coral is common in GOA and BSAI or (2) medium if coral occurs throughout AI, but uncommon in GOA and BS and (3) high if coral is distributed only in portions of AI? The SSC notes that there is need to distinguish between what is rare on the global scale and what is rare on the local scale. The SSC also noted that rarity in the context of HAPC could refer to a spectacular collection of species (e.g. a coral garden) or a region that supports a rare species of fish or coral. The ranking of HAPC regions could be quite different depending on which of these two definitions is used in a proposal. In cases where HAPC was defined on the basis of a spectacular collection of species, efforts should be made to identify the criteria used to distinguish one region of from another.

Plan Teams when reviewing proposals should provide a short and concise narrative clarifying how the relative score was determined, what data were used, and level of scientific certainty of the information used to support the proposal. Rationale must be clearly defined for each HAPC proposal and include a definition of habitat form and function. Direct or indirect benefits and how the HAPC provides for the production and protection of the resource should be summarized. Finally, an integrative step should be taken by the Plan Teams to jointly consider all proposals to determine if elements of multiple proposals could be combined to constitute a integrated program of protection.

The SSC recommends that HAPC definitions should periodically be reviewed to reflect improved knowledge derived from research. The need for this type of review would be particularly relevant with respect to proposals that based HAPC definitions on encounters with spectacular habitats observed during submersible dives. The fraction of the sea floor that has been mapped by submersibles is currently quite small. Thus, it is possible that as sea floor exploration is expanded habitats that appear to be rare, may occupy large areas of the sea floor. The SSC notes that NMFS and ADF&G scientists are currently working on a research project designed to associate topographic features with incidence of coral. If this project is successful, HAPC definitions may need to be revisited based on the estimates of the aerial extent of coral habitats in the Aleutian Islands.

C-5 CRAB EIS

Gretchen Harrington (NMFS) and Mark Fina (NPFMC) provided an overview of the Initial Council Review Preliminary Draft Analysis of the Environment Impact Statement for the Bering Sea and Aleutian Islands Crab Fisheries. Public testimony was received from Linda Kozak, Arni Thompson (Alaska Crab Coalition), John Garner (North Pacific Crab Association), and Earl Comstock (C.R.A.B.). **The SSC recommends that the analysis be released for public review following consideration of the issues discussed below.**

Comments on Chapter 1-3.

The SSC recommends a more complete discussion of the implications of the alternatives from the interplay of high-grading, soak time, discards, and estimation of total fishing mortality relative to the TAC. Some of these issues are discussed in various sections, such as pages 2-57 – 2.59, 4-19, 4-88 – 4-90. If all sources of fishing mortality are to be counted toward the TAC (not just crab in the landings), these interacting factors should be more fully discussed. Differences in discards (coupled to handling mortality rates) could affect whether the TAC is exceeded by total fishing mortality. Another issue is that the biological effects of differences in pot soak times are not entirely clear. Some experimental studies have found that pots soaked longer result in more selective catches of legal males and greater escape of sublegal males and females, whereas other studies are not so clear. On page 4-89, in the last paragraph before "Deadloss," pot selectivity is incorrectly termed "highgrading." Whereas the net effect could be somewhat similar, the SSC takes highgrading to mean the conscious selection of crabs with particularly desirable attributes (e.g., size or shell condition) from the catch brought aboard the vessel while deadloss consists of crabs that die in the pot before they are brought aboard the vessel. Other factors to discuss include potential additional mortality within pots associated with longer soaks, including predation by octopi, injuries inflicted by fish (e.g., halibut), and amphipod predation. Such mortalities could counteract reduced handling mortality of females and sublegal males associated with more selective catches.

The SSC received public comment about the desirability of including references to ADF&G reports, such as RIR 4K03-02, in which observer data are analyzed in detail for bycatch, discards, CPUE, and soak times in both CDQ and open access crab fisheries. The SSC agrees that reference to these reports would strengthen the discussion of these topics. Lastly, in Table 4.2-6 and the preceding discussion, the estimated number of legal males in the discards is taken as an index of highgrading. While this is reasonable, as a caveat the SSC notes that other factors can account for some legal crabs in the discards, including measurement errors (e.g., crabs mismeasured as sublegal when they were actually legal) by the crew. One would expect measurement errors to increase in crab fisheries with higher CPUEs. Perhaps some estimate of these measurement errors could be obtained by considering the amounts of sublegal males in the retained catch. Also, if onboard observers estimate whether male king crabs are legal by converting crab length to width rather than using a "stick," then some crabs identified as legal could result from errors in this conversion.

The SSC recommends strengthening the discussion contrasting the Status Quo relative to the other alternatives concerning changes in crab abundance. For instance, the qualitative impacts of future increases in crab abundance should be considered over the long-term, when contrasting the Status Quo with the other alternatives. Characteristics of the fishery under present low crab abundances may differ markedly when crab populations are high. For instance, the proportionate distribution of landings among BS/AI processors and those in GOA home ports may differ particularly for vessels with GOA home ports depending upon whether vessels make only one landing during a short season (e.g., current low crab abundance) or multiple landings during a long season (e.g., future high crab abundance).

Section 2.6 (Alternatives Considered and Eliminated from Detailed Study) of the EIS should be expanded to include a brief discussion of alternatives suggested for consideration in the SSC minutes (April 2002), or if these alternatives are addressed in the RIR, the corresponding discussion from the RIR should be summarized in section 2.6. Specifically, section 2.6 should include a rationale for including all BSAI crab fisheries in a single rationalization program rather than developing programs specifically tailored to each crab fishery. In addition, section 2.6 should include a discussion of the rationale for not considering a rationalization alternative based on species specific spatial use rights.

Major Comments on Chapter 4 -- Economics.

1) The definition of efficiency used in the document is critical. In the EIS the concept of sector efficiency gets confused with the concept of "overall efficiency" and the discussion of efficiency in the harvesting and processing sectors is not consistent. In this report, efficiency is defined sector-by-sector which embeds the distribution of net national benefits in the measurement of efficiency. This definition of efficiency is pivotal for the economic discussion that takes place from 4-138 to 4-171. Key to this discussion is that any changes in the exvessel price simultaneously affect both harvester and processor efficiency. This definition can be used to directly evaluate the intent of the Council's *BSAI Crab Rationalization Problem Statement,* to select an alternative that "maintains healthy harvesting and processing sectors." If this is assumed to mean existing harvesting and processing sectors, measuring harvester and processing efficiency separately allows the direct evaluation of whether the individual sectors will win or lose under each of the alternatives.

2) The definition of the time period, whether it be the short-run (the transitional period) or the long-run, plays a critical role in an analysis of the different alternatives. The entire theoretical justification of using processor quotas to protect existing processors is to provide compensation to processors during the period when their capital is nonmalleable (the short-run – which may be a quite lengthy period of time if physical capital is durable and technological change is absent). In the long-run processor compensation is not an issue and it is not clear that compensation needs to be provided on an essentially permanent (long-term) basis. A more thorough discussion of short-run vs. long-run perspectives needs to take place in the document. The Table of "significance conclusions" (4-140) appears to refer to long-run outcomes. It needs to be reproduced for the short-run. In this short-run table the S+ in processor efficiency under alternative 3 needs to be changed to an S- (with the understanding that this judgment applies to existing processors on average). Again, this focus on transitional impacts is very important as it is the entire theoretical justification for processor quotas.

3) Throughout the document there seems to be an assumption that binding arbitration will occur and that prices will not be successfully negotiated without resort to binding arbitration. In fact, it may be that the threat of binding arbitration (which is potentially expensive in terms of delays to fishing and out-of-pocket expenditures for arbitration services) is what is actually important. Arbitration is designed only for the purpose of price dispute resolution, not price formation. For example, (4-145 – 11th from the bottom) the text reads "*Whether these efforts maximize efficiencies across both sectors will depend, in part, on the ability of parties and the arbitration system to balance the different efficiencies across the two sectors in setting price.* Binding arbitration need not occur to have a successful price negotiation (and therefore an acceptable level of negotiated rent-sharing).

4) It is not clear that U.S. consumers will benefit from any alternative under crab rationalization. Indeed it is theoretically possible that increased product quality, and landings dispersed over time, could make a crab product more desirable in Japan, thus raising domestic prices, decreasing domestic quality, and therefore decreasing the nation's consumer surplus. In the Table of "significance conclusions" (4-140) "Consumer benefits" should be changes to "U.S. Consumer benefits" and the S+ (under alternatives 2-4) should be changed to U.

5) The discussion of several important issues is limited due to data confidentiality constraints. The recent action by Congress contains specific language regarding confidential data that may allow the analysts to expand the discussion of several issues being considered; for example, the discussion of which communities are eligible for the first right of refusal program). The SSC encourages the Council to seek clarification on the Congressional language (Sec. 801(8)) and to incorporate as much information on the distribution of benefits as possible into the EIS.

6) The SSC expressed concern that the thrust of the legal opinion regarding "delegation of authority" included in the briefing book under the Gulf Rationalization item (see Agenda Item C-1(B) Attachment D) would logically apply to the crab rationalization program. The crab rationalization program features leasing, cooperative sub-assignments of harvest opportunities, CDQ allocations (with attendant sub-allocations), and community protection measures that all arguably contain delegations of authority similar to those addressed in the legal opinion. Council staff indicated that the legal opinion was confined to the specific community allocation options in the Gulf Rationalization program. The SSC suggests that the Council specifically request clarification on this issue as it could alleviate considerable confusion in the future.

7) The discussion regarding the effect of the various alternatives on fish tax revenues in the local communities should be expanded. First, it is not clear that the community protection measures will unambiguously result in maintaining or increasing local tax revenues. As we have seen under the halibut/sablefish programs, ex-vessel price increases in a competitive market situation may (or may not) make up for the migration of deliveries to different locations. Conversely, the restriction of markets under the crab plan may lead to lower prices relative to an unrestricted rationalization program and thus lower tax revenues even though the geographical pattern of deliveries is preserved. Further, the preservation of delivery patterns is not at all certain. As the document notes, the right of first refusal provision applies to firms, not plants. The implication of this detail is that only small processing firms (those with only one plant) are effectively restricted by the right of first refusal provision. Second, the current discussion does not address the potential for various communities to engage in aggressive taxation policies. The degree to which a community is able to expropriate resource rents through taxation corresponds to the extent that deliveries are effectively guaranteed into that community (e.g., the north region).

8) The document suggests that relatively little can be said about the effects of the proposed action on communities. In contrast, it would seem that coastal Alaska offers abundant evidence of the community-level effects of more versus less market competition.

9) The document should contain some discussion of the potential value of the harvesting and processing privileges being created and distributed by this action. For example, public testimony suggested that harvesters are already trading in a market for future shares at a level suggesting an overall value of $500 million for harvest shares distributed among the 250-300 participants. While the current distribution of rents between harvesting and processing sectors is not known, for the purposes of illustration, a 50/50 split would imply an equal $500 million value in processing shares distributed among eligible processing firms (public testimony suggested that in excess of 85% of the crab harvested in the Bering Sea is processed by 9 firms).

Comment 1 Examples

Example 1: Because of the sector-by-sector definition of efficiency, for balance, in Tables ES-2 and Table 4.6-1 (page 4-144) after "Harvester efficiency", "(revenues and costs)" should be inserted for each of the first points in alternatives 2-4. This should duplicate what was done for processor efficiency in Table 4.6-2 (page (4-148).

Example 2: (Third sentence top of page 4-141). "Consequently, the primary differences in harvester efficiency under the different alternatives arises from differences in costs of harvest and landing of crab." Under the sector efficiency definition it would seem that the primary differences would be due to the distribution of quasi-rents.

Example 3. (Last paragraph 4-142 and footnote 2). Again, in this section there is a failure to note that harvesting sector efficiency is based on net benefits. If fully compensated for traveling longer distances,

harvesting efficiency is not decreased, despite the fact that more fuel is burned (see footnote bottom of page 4-143).

Example 4. (4-143) The second full paragraph concerning B-shares. The fourth sentence incorrectly states that if a processor is willing to pay more for B-shares, then naturally occurring gains in harvesting efficiencies (lower delivery costs) would be lost. But higher exvessel prices would negate higher costs in terms of harvester efficiency. Here again is an error that results from considering harvesting efficiencies only in terms of costs rather than net benefits.

Example 5. (Last sentence 4-143). "A harvester may choose to sacrifice efficiency by delivering to a processor that is willing to pay a greater price." But under the sector definition of efficiency if a processor is willing to pay a greater price this is an increase in efficiency to a fishermen. Harvester efficiency cannot be sacrificed to gain a higher price. Price is part of efficiency.

Example 6. In the Table of "significance conclusions" (4-140) the row measuring "Distribution of benefits between the harvest and processing sectors" should be deleted. It is redundant with the measurement of processor and harvest efficiency.

Other Comments on Chapter 4 -- Economics.

1) (Page 4-145 – first sentence) The first sentence is not necessarily correct because processor-provided goods and services are nothing more than negative revenues. If more G&S are paid out presumably the benefits of those services would be countered by lower exvessel price.

2) (Page 4-145 – the last paragraph lines 9-11 beginning "*Some processing efficiencies could be lost to accommodate harvester preferences, if the processors are able to reduce exvessel prices by accommodating harvesters."* Some processing efficiencies will be lost if the processors have to pay higher prices that result in harvester efficiency gains.

3) (Page 4-151 – the middle paragraph) Opportunities for substitution are misrepresented. For example, see the statement in the middle of the page: "*So, although fewer crab lines will be required under rationalization, some of the facilities that become excess might be usable for other processing activity.*" In the next paragraph. "*Since processors can use many of the facilities used for crab processing in other processing activities..., the capitalization of the processing sector may not change dramatically...*" misrepresents what "capitalization" refers to. Capitalization is not a physical concept; it is an economic concept.

4) (Page 4-154) The concept of intrinsic value introduced in the first two paragraphs needs to be changed "Intrinsic value" does not only occur when a crab is harvested. Crab has both "existence value" and value as part of the ecosystem.

5) (Page 4-157) The last sentence on this page "*If harvesters are able to drive processors to compete for B share landings....*" is conditional. It should not be. Replace "If" with "Depending on the extent that".

6) (Page 4-159 – first full paragraphs) The SSC recommends the removal of the second sentence of the first full paragraph. "Vertical integration reduces any dependence on harvesters for landings and provides additional information to processors that can be used in negotiations." That is only true if the firm is 100% integrated. Crab firms are substantially less integrated than that.

7) (Page 4-166) The first full paragraph suggests a leasing market for quota is not likely because processors might wish to protect long-term interests in the fishery. Why does leasing jeopardize a long-term ownership interest? Clarification is needed.

C-8 DPSEIS

The SSC received a report on the biological assessment (BA) for the Draft Programmatic Supplemental Environmental Impact Statement (DPSEIS) from Mr. Steve Davis and Ms. Brandee Gerke (NMFS). The conclusion of the BA is that the scope of the proposed action of the preliminary preferred alternative does not require re-initiation of a formal section 7 consultation under the Endangered Species Act regarding adverse effects on listed species or critical habitats. Mr. Davis described the timeline of the BA process, noting that the final BA will be available prior to the April Council meeting.

C-9 SSL MITIGATION

Larry Cotter (Chair of the SSLMC) and Bill Wilson (NPFMC Staff) presented reports. The only public testimony was from Julie Bonney (AK Groundfish Data Bank). Shane Capron (NMFS PR) clarified issues with the Informal Section 7 consultation. The majority of the SSC's questions were regarding the lack of detail in the Informal Consultation. The SSC was reminded that the Consultation is a "first cut" and that the complete analysis will be included in the coming EA. The EA analysis will explain how the proposed actions are consistent with "no net loss" policy.

D-1 GROUNDFISH MANAGEMENT

D-1(a) National Bycatch Strategy and Alaska Region Report

Sue Salveson (NMFS) presented a report on the "Alaska Region Current Bycatch Priorities and Implementation Plan." The SSC received a supplemental report on the "NOAA Fisheries Objectives, Protocol, and Recommended Precision Goals for Standardized Bycatch Reporting Methodologies." Public testimony was provided by Lorie Swanson (Groundfish Forum), Paul MacGregor (At-sea Processors Association), and Julie Bonney (Alaska Groundfish Databank).

The SSC offers three comments on the Alaska Regional Implementation Plan. First, under Section 3.3 that addresses gear technology to reduce bycatch, the SSC recommends explicit mention of experimental fishing permits as a means to achieve this objective. Involvement of industry expertise is important to developing practical means to reduce bycatch through technological developments. Second, the Alaska Plan proposes new funding for bycatch-related activities, and potential new Congressional appropriations for the amounts identified would go a long way toward meeting the goals of the National Strategy. However, these funds may be insufficient and new federal funding is uncertain, so developing creative ways for additional funding should be considered. Options include advancing bycatch research priorities in the Saltonstall-Kennedy Program, North Pacific Research Board funds, and potentially Alaska Sea Grant. Third, the SSC noted that there is substantial overlap in the objectives of the Alaska Regional Implementation Plan and the objectives in proposed revisions to the observer program.

The SSC received testimony and discussed the definition of "bycatch" in the MSFCMA and National Bycatch Strategy document. Apparently, the MSFCMA considers only discards as bycatch, whereas the National Bycatch Strategy considers bycatch as the sum of discards and retained incidental catch. The

difference is more than a matter of semantics, because the National Bycatch Strategy strives "to implement conservation and management measures … that will minimize … bycatch." Whether retained bycatch should be reduced depends upon the stated objective. Certainly, if retained bycatch causes the ABC or OFL to be exceeded, then such bycatch reduction is needed to achieve conservation objectives. However, if a species is not targeted by any fishery, but is caught and retained as bycatch in a multispecies fishery and that catch falls within acceptable TAC levels, the goal of reducing this bycatch is unclear. On the other hand, if a species is taken and retained both as catch in a directed fishery and as bycatch in a non-directed fishery, then decisions to apportion this species' TAC among these fisheries are probably best left for arbitration by the Regional Council. The SSC recommends that NOAA Fisheries consider these implications.

The four-page NOAA Fisheries document also addresses standardized bycatch reporting methodologies. Precision goals are 20-30% coefficient of variation (CV) for each protected species and for total discards of fish for each fishery. NOAA Fisheries notes that these levels are goals it "strives to achieve" (not requirements) and lists several caveats. Nevertheless, the SSC notes that a variety of factors ultimately determine the CV, including size of the fishery, sample size, species-specific aggregating behaviors, proportion of the fishery observed, and the distribution of bycatch amounts and species by area, time, and vessel. Without a database of CV values for current levels of bycatch, it is impossible to evaluate whether these precision goals are achievable or useful.

Moreover, an equally important consideration in catch or bycatch estimation is the bias, the expected difference between the observed bycatch and the true bycatch due to failures to achieve a strictly random sample. NOAA Fisheries should also include a goal to develop statistically sound sampling strategies that minimize significant levels of bias.

D1(b) Exempted Fishing Permit (EFP) Request for Rockfish Fishery in SEO/GOA

Mr. Chip Treinen (Alaska Fisheries Development Foundation: AFDF) and Dan Falvey (Alaska Longline Fishermen's Association: ALFA), the EFP Project Manager and Project Contractor/Coordinator respectively, presented the details of the proposal. AFDF is requesting an EFP for the SE Outside (SEO) District of the GOA. The purpose is to analyze the feasibility of using two longline gear designs to access the underutilized rockfish TAC in the SEO. These rockfish species have traditionally been harvested by trawl gear, which has been prohibited in the SEO since 1998. A two phase EFP is being proposed. The first phase will focus on the development of longline gear types and the efficacy of fishing operations in targeting desired species. The second phase will compare catch rates among gear types and evaluate economic viability of this fishery.

NPFMC Executive Director, Chris Oliver introduced the EFP proposal to the SSC and reported that, in its review of this proposal, the Alaska Region determined that halibut and sablefish bycatch retention will be covered by IFQ held by the participants in the EFP. The EFP proposers objected to this requirement, stating that this would limit the EFP at-sea work and constrain the time necessary to adequately conduct the research. **This issue must be resolved prior to proceeding with the EFP**.

The SSC supports forwarding the EFP to the Council for consideration with the following suggestions to enhance the design of the proposed EFP:

- Phase 1 of this EFP should include a specific analytical design that would measure the efficacy and performance between gear types**.** Data collection must provide for estimation of species specific catch of non-targeted species on a per set basis. This will be required in order to establish the feasibility of Phase 2.

- The experimental design and data requirements for Phase 2 of the EFP are not fully developed. The AFSC recommended that the EFP for Phase 2 be dependent on the results of Phase 1. The SSC supports this recommendation and requests the opportunity to review the results of Phase 1 and the analytical/research design for Phase 2 at that time.

- This EFP will require the use of smaller vessels. The SSC recommends that individuals employed to perform observer duties and data collection in this EFP have equivalent training. NOAA Fisheries Observer Program staff informed the SSC that they will be working to accommodate this recommendation.

D-1(c) Groundfish Management (SSC only)

D-1(c)(1) National Standard 1 Guidelines

For the past few years, the NPFMC and NMFS have disagreed over the guidelines for National Standard 1 regarding harvest policy and definition of overfishing. In April 2003, the SSC assisted the Council in preparing comments regarding a NMFS proposal to revise these guidelines. Since then, NMFS formed a workgroup to prepare the revision, which should soon be released as a proposed rule. Grant Thompson (AFSC) briefed the SSC on this revision, though it should be noted that the actual language in the proposed rule is not yet available. It appears that NMFS has been very responsive to the issues raised by the Council. The revised set of guidelines will likely contain increased flexibility to respond to the needs of different Councils and fisheries. It will directly acknowledge the NPFMC's conservative harvest policy that provides for automatic rebuilding. It will provide more consistency in specifying rebuilding times. It will replace the onerous term "overfished" with "depleted" in most cases. **The SSC commends the workgroup for their excellent work and their careful consideration of issues raised by the Council. The SSC looks forward to the opportunity to examine revisions to the NPFMC overfishing definitions after the revised guidelines are published.**

One of the proposed changes to the guidelines would direct NMFS to distinguish between core species and other species. Core species would include target species and stocks that are vulnerable to unintended mortality. Other species would include non-target species. Core species would be managed as single species while other species would be managed as assemblages. The SSC noted that this change could impact the non-target management proposals currently under discussion by the Council and NMFS. In previous meetings, Council staff presented a framework for management of non-target species that would treat non-target species as a new category of species. Under the proposed framework, estimates of ABCs, OFLs and MSSTs would not be required for species in the non-target category. The SSC notes that some vulnerable species may be included in the non-target category under the proposed framework. The proposed change to the guidelines could impact NMFS approval of the proposed framework.

D-1(c)(2) Crab Overfishing

Lou Rugolo (NMFS) and Shareef Siddeek (ADF&G) presented an overview of the progress of their working group to revise the overfishing definitions in the crab FMP. Public comment was provided by Arni Thomson of the Alaska Crab Coalition.

The crab working group is comprised of four members, two from NMFS and two from ADF&G. When the overfishing definitions were originally developed by the crab plan team, they had intended that they be revisited in a period of 5 years or so. Now, 5 years later, this working group is embarking on this task. In its

September 2003 meeting minutes, the crab plan team specified that the charge of the working group is to "lead the analysis of a new FMP amendment to revise overfished/overfishing definitions."

The SSC believes that it is appropriate to undertake a review of these crab plan definitions. A number of inconsistencies and unnecessary complexities have been uncovered, and improvements can be made.

Top priority should be given toward a careful examination and revision of the definitions of overfishing and overfished, as indicated by the crab plan team. In the course of embarking on this priority task, other closely related issues must be reevaluated, such as B_{msy}, natural mortality rate (M), MSST, and MFMT. There is a linkage among all these parameters, so population simulation modeling, biomass dynamic modeling, and yield-per- recruit analyses would inform this analysis. For instance, MFMT should be considered under alternative definitions of MSST in the context of stock rebuilding and attainment of other management objectives. Effects of natural variation in recruitment and uncertainty in stock assessments and mortality on these estimates should be considered.

The SSC notes that the estimation of M and B_{msy} is difficult for these crab species. For instance, estimates of B_{msy} depend upon the period over which data are used, and the choice of the appropriate time period may be subjective. The current FMP defines overfishing using explicit values of M for king and Tanner crab stocks that were developed based on estimates of longevity. As new estimates of M are developed, the SSC recommends frameworking these definitions in the FMP so that future plan amendments are unnecessary when new data and analyses result in new estimates of M.

The working group discussed an intention to explicitly link M estimates in population models with M estimates used in harvest control rules. The SSC supports this goal, but also notes that there could be reasons for these two sets of estimates to differ. First, M used to define harvest control rules may be based on life history considerations, whereas M may be estimated internal to the population dynamic model such that best fits are attained. However, survey catchability and selectivity are confounded with M in population models, so neither one of these parameters may be estimated with much confidence. It may be possible to craft a stock assessment scenario, in which M is fixed at the same level as in the harvest control rule, allowing catchability and/or selectivities to be estimated. Second, to the extent that some crab stocks apparently experience large, short-term increases in M perhaps due to disease or environmental causes, it may be undesirable to trigger commensurate increases in F at a time of population crash. Presumably, this would be the outcome if population model estimates of M were directly translated into harvest policy. Instead, simulation modeling can be used to develop long-term harvest policies that are more risk averse to these and other uncertainties in stock dynamics.

The SSC recommends that the working group consider one additional facet in their work plan. Typically, crab abundance is estimated by summer crab surveys or population models that incorporate summer survey data. To estimate the overfishing level, MFMT should be applied to estimated crab abundance at the time of the fishery. As crab fisheries occur in fall or winter, summer crab abundance should be discounted for the natural mortality that occurs between the time of the survey and the time of the fishery. Failure to do so results in misapplication of the overfishing definition.

Since the analysis has not yet been conducted, statements made during the presentation suggested that a plan amendment could include higher estimates of B_{msy}, higher MSSTs, lower estimates of M, lower MFMTs, and perhaps lower target harvest rates to stay safely below MFMT. Such statements should be avoided until the analyses are completed and reviewed.

As a plan amendment is developed, it should be brought forward to the NPFMC and Alaska Board of Fisheries on parallel tracks. This should be workable, as the Board of Fisheries is scheduled to address BS/AI crabs in March 2005.

For its next meeting, the SSC asks the working group to present an outline of the new draft control rule system that might be applied to BS/AI crabs. A more formalized procedure for setting overfishing levels, such as the tier system for groundfish, is preferred. Like the groundfish tier system, rather than a constant F limit reference point, the working group should consider scaled-down reductions in F_{OFL} as the stock declines to low levels.

D-1(c)(3) Population Modeling and Harvest Strategies

At the SSC's request Joshua Sladek Nowlis (NMFS) give a presentation of his evaluation of the North Pacific groundfish fishery management system. This work evaluates how well various harvest control rules perform that are similar in character to those used in the Council's Tier system. Performance measures for five different management objectives (such as maximizing yield and maintaining high abundance) are calculated with computer simulation modeling and compared with each other. This work is novel and informative both in its methodology and its results. The results show that there are tradeoffs in achieving management objectives, so that it is important to explicitly state the goals of management in constructing a management policy. The results also suggest that the Council's management strategy of reducing fishing mortality when biomass is low (along with similar policies) is a good idea to promote rebuilding and to avoid population collapse. Furthermore, treating MSY as a limit rather than a target (by keeping fishing mortality below the MSY level) is necessary to achieve particular management goals related to conservation. Another implication of this work is that current work by NMFS to improve stock assessment is desirable to move stocks from low-information tiers.

This work also contains an interesting evaluation of the Tier system regarding reductions in TAC relative to biomass status. Biomass status was estimated from time series by taking current biomass over maximum biomass across the series. While there was not an increase in the reduction in TAC at poorer levels of biomass status (as might be expected with a conservative management system), further work is needed to understand whether other factors such as species groupings, socio-economics, or various management actions are more important than biomass status. When the Council revisits overfishing definitions, it may be worth considering whether these levels of biomass status could be used to further refine the classification of fish stocks into Tiers. For example, could a correction factor to adjust fishing mortality downward be developed from these biomass indices for species in Tiers 4 and 5? The adjustment could be done similarly to the way it is now done in Tiers 1 - 3.

D-1(c)(4) Multispecies/Ecosystem Models

Dr. Kerim Aydin (AFSC) provided an overview of current multispecies and ecosystem modeling efforts at the Alaska Fishery Science Center. Models in development include MSVPA/MSFOR (operational for the EBS), a multispecies statistical model for EBS pollock and cod (under development), and the Ecopath/Ecosim approach (operational or under development for GOA, AI, and EBS). An extension of the Ecopath/Ecosim approach (Ecosense), developed at AFSC, provides retrospective fits to time series of abundance and diet composition for various groups (100+ groups, ranging from size classes of individual species to large functional groups such as phytoplankton). Ecosense model outputs include estimates of diet composition for each predator (possibly by year, depending on data availability), estimates of predator-specific predation rates on each prey item (by year, where possible), and the corresponding estimates of natural mortality for each prey group. In addition, various composite indices (e.g. average trophic level across

groups) are available or under development. The Ecosim/Ecosense approach allows forward projections to examine various fishing scenarios.

In addition to continuing to develop these models, it may be advantageous to explore multivariate time series modeling approaches. These models could be stand-alone representations of the dynamic behavior of population and recruitment trajectories, or as a mechanism for adjusting the forecasts and simulations that derive from the multispecies and ecosystem models already being developed. When structural relationships involve latent variables, when the form of functional relationships is unknown, or when the dynamics of modeled processes are important relative to contemporaneous relations with other variables, simple multivariate time series procedures may have an advantage over complex structural models so long as the processes that generate the time series are stationary. (Zellner and Palm[1]). The choice of model complexity involves tradeoffs between added sampling error from joint modeling and reduced specification error due to representation of additional interactions.

While the SSC encourages continued development of multispecies and ecosystem models, we note that models are metaphors; abstractions intended to approximate certain aspects of the behavior of real systems. When models are used in simulations or for forecasting, there is valid concern as to whether the simulations (forecasts) reflect the behavior of the system or are merely an artifact of the model specification, a concern that cannot be resolved based on how closely the model tunes to data used in the estimation of model parameters or fitting of free variables.

D-2 Scallop SAFE

The SSC received a report on the scallop SAFE and the scallop FMP from Diana Stram (Council Staff) and Jeff Barnhart (Scallop Plan Team chair, ADF&G). Public testimony was presented by Teressa Kandianis. The SSC notes that this is the first SAFE report since the implementation of the FMP. We fully support the Plan Team's intentions to prepare a SAFE document annually. The SSC suggests several improvements and additions for future SAFE reports as follows:

1. The SAFE report should be more user-friendly by summarizing important information up front, with clear identification of where supporting, detailed information may be found in any attachments or published documents. The BSAI or GOA groundfish SAFE documents are recommended as templates.

2. Tables of past and present survey abundance estimates and time series of age composition should be included in the SAFE document.

3. Survey biomass and catch must be presented in consistent units.

4. The current practice of limiting surveys to regions previously fished may misrepresent scallop biomass. Efforts should be made to design surveys that will serve as index areas for biomass estimation. A time series of abundance should be maintained for areas that are consistently sampled over time. If new beds are discovered, survey abundance estimates should be treated separately from the historical index areas.

[1] Zellner, A. and F. Palm. 1974. Time series analysis and simultaneous equation models. *Journal of Econometrics* 2:17-54.

5. If possible, index areas should be established for scallop beds currently not surveyed. If cost is prohibitive, ADF&G should explore whether NMFS trawl surveys, NMFS – ADF&G small mesh surveys or depletion estimators could be utilized for abundance estimation.

6. Given that there are a number of apparently discrete beds dispersed across large areas of the Gulf of Alaska and the Bering Sea, the treatment of Alaskan scallops as a single stock for overfishing determinations needs further evaluation. This evaluation might include results of recent genetic analyses, duration of the larval stage, and estimation of advection rates by dominant currents.
7. The determination of stock status should be supported by catch data in the summary section, including a graph of catch history relative to the OY level for the state as a whole.

The SSC supports use of an age-structured analysis in the estimation of population biomass, mortality rate, and historic harvest rates for the Kamishak Bay population. We requests that the model be fully specified and that the parameters be clearly identified as to which are fixed and which are free. Likewise the document should distinguish data from parameters. The SSC requests a presentation when the model is updated.

The SSC notes that the cooperative structure of the industry is a unique and salient feature of the fishery, for which a more complete treatment would be useful. The SSC appreciates Ms. Kandianis's offer to supply economic information for inclusion in a SAFE report, and the SSC suggests that this could be incorporated into the Economic SAFE report, and referenced in the scallop SAFE report. A separate, standalone report that describes this cooperative may be worthwhile for comparison to other cooperative systems.

The SSC supports an amendment of the scallop FMP that, at a minimum, would be a housecleaning rewrite to bring the plan up to date in a coherent, easier-to-read document. As noted by the presenters, the FMP has gone through a number of amendments without a substantial rewrite. In its current form, it is a challenge to read the FMP and determine how the fishery is managed.

MISCELLANEOUS

The SSC recommends that Mr. David Carlile be appointed to the Bering Sea/Aleutian Islands Groundfish Plan Team.