

North Pacific Fishery Management Council

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MINUTES Scientific and Statistical Committee December 6-8, 1998

The Scientific and Statistical Committee of the North Pacific Fishery Management Council met December 6-8, 1998 at the Hilton Hotel in Anchorage, AK. All members were present:

Richard Marasco, Chair
Harold Weeks
Sue Hills
Doug Eggers

Jack Tagart, Vice-Chair
Terrance Quinn
Keith Criddle
Dan Kimura

Doug Larson
Seth Macinko
Al Tyler
Steve Klosiewski

C-1 STELLER SEA LIONS

The SSC received the staff presentation by Tim Ragen (NMFS), and public testimony from: Rick Marks, John Roos (PSPA), Ken Stump (Greenpeace/American Oceans), Glenn Merrill (Aleutian East Borough), Chris Blackburn (AGDB), Steve Drage (ADA), Vidar Westpestad (PWCC), Donna Parker (Arctic Storm), Paul MacGregor (APA), Mike Hyde (American Seafoods), Francine Bennis (AMCC).

In general, the SSC shares the discomfort with the speed of the process expressed in public testimony and by others. The process has hampered the SSCs ability to thoroughly review the document. Further, it has provided less peer review than is desirable. There is inadequate understanding of the roles of the Council, the public, and the SSC in the ESA legal process. The SSC was told that once a Section 7 consultation is initiated, the questioned activity cannot take place until that Opinion is finished and signed, so that the speed of the process was a result of an effort on the part of NMFS to complete the Opinion in time for the 1999 pollock fishery to take place. All parties involved in the process would benefit from a clarification of the roles of the various bodies.

Biological Opinion. The SSC again shares the general discomfort over the large amount of uncertainty in the data and large data gaps. Uncertainty allows many approaches and interpretations, none of which can be overwhelmingly supported by rigorous science at this time. However, the basic facts remain: 1) the Western Steller Sea Lion numbers are greatly reduced, 2) the stock has been listed as endangered, 3) pollock forms a large part of their diet, and 4) pollock fisheries remove potential prey. These facts have lead to the formation of the working hypothesis that competitive interactions between the fishery and the Steller sea lions somehow make survival for this endangered species more difficult. There is a lack of data with which to test this

hypothesis. The findings in the Biological Opinion rely on various correlations. Simple correlations do not by themselves establish causation. Under the ESA, unlike more familiar Council situations, if the activity in question cannot be shown to NOT cause jeopardy or adverse habitat modification, then the endangered species, in this case the Steller sea lions, are given the benefit of the doubt. The SSC also notes that, although the original cause of the decline is of interest scientifically, it may be irrelevant in this process. Other factors such as environmental conditions or fishing may also be important now. Fishing does not have to be the primary cause of the current decline for the fishery to be the subject of an ESA Section 7 consultation. Fishing is the activity about which the Opinion is written, and the only activity that can be modified.

RPA "Guidelines." Continuing with the working hypothesis, the Opinion gives RPA guidelines to reduce the probability of competitive interactions in the times and places where Steller Sea Lions are thought to forage. Unfortunately, the present state of knowledge does not permit any assessment of the probable success of the RPAs in stemming or reversing the present declines. Although we were told that the Guidelines cannot be changed, the SSC warns that some of them may have unintended consequences, some potentially detrimental to sea lions. For example, in public testimony it was brought out that the provision for no rollovers among seasons could result in four "races for fish." Also, although the general objective of increased protection near rookeries and haulouts is certainly reasonable and warranted, the detailed designation of the criteria for which new areas should be protected should receive further examination.

Emergency Measures. Although the SSC was requested to comment on appropriate actions that might be taken at this meeting to meet the RPAs for the 1999 fishery, the SSC declines to do so. We were not presented with information to complete such a task..

Future Directions. The SSC notes that to date, this process has been primarily a legal one rather than a scientific one in the sense to which we are accustomed. As it appears that this situation will continue for some time, perhaps a briefing on the ESA process would be useful for the Council family. This may clarify the possible roles for the Council in this process, what kinds of actions the Council might take in future that could trigger consultations such as this, and what is necessary to change RPAs once they are put in place.

The SSC continues to believe strongly that any management measures that are taken must incorporate, as an integral part, thorough monitoring and evaluation measures. The monitoring outlined on page 120 of the Opinion is not sufficient. Further, the SSC reiterates the recommendation that adaptive management measures be designed to test the competitive interaction hypothesis so that something is learned that may help in the future. For example, a panel was convened by NMFS in May of 1997 to advise on research to test the efficacy of the no-trawl zones in place at that time. The Panel's report and NMFS' subsequently developed plans may provide a starting place for such measures.

Public testimony and subsequent SSC discussion brought up several interesting ideas for further exploration and research such as evaluating the effectiveness of time/area restrictions already in place in the GOA, evaluation of the dynamics of the Bogoslof rookery in relation to the closing of that area to pollock fishing, examination of other pinnipeds with high fetal mortality rates and the causes thereof, and surveys of pollock distribution at other times of the year and before and after fisheries.

Clearly many alternates to the primary hypothesis underlying the Opinion can be formulated. Testing the array of hypotheses will require collection of new data and re-analysis of existing data. Rather than attempt to detail the research and data collection needs here after inadequate time for review and discussion, the SSC strongly recommends that a group be convened specifically for this task. The SSC recognizes that several Steller sea lion advisory groups already exist, such as the Steller sea lion recovery team, but the SSC believes that none of the groups have the specific terms of reference and membership that would be required to make timely progress on this issue.

D-1(b) EXPERIMENTAL FISHING PERMIT

The SSC received an oral report from John Gauvin (Groundfish Forum) and Craig Rose (NMFS, AFSC) on the use of an experimental halibut excluder device in flatfish trawling. The SSC encourages the permittees to develop a full report to assist the SSC in offering comments on the experimental design and extrapolations from the results. Pending a full report, it appears that the experiment was successful demonstrating promising results. The experiment also represents interesting complement to the previous experiment conducted by this group involving individual bycatch accounts.

D-3 GROUND FISH SAFES

General considerations

The passage of Amendment 44 has codified a harvest policy approach for setting upper limits to ABCs and overfishing levels (OFLs). The maximum permissible ABC and OFL is determined based on the level of available information (tier) with the option of the Plan Teams and the SSC to recommend a lower level based on additional considerations such as the trend in recruitment, level of the population, uncertainty in the stock assessment, and ecosystem considerations. The Plan Teams have proposed ABCs lower than the maximum allowed for GOA Pacific cod; roughey, northern, other slope, pelagic, and demersal shelf rockfishes, and Atka mackerel; and for BSAI walleye pollock, Pacific cod, Greenland turbot, Atka mackerel, and Other Species. There are compelling and well stated reasons for these recommendations, and the SSC has concurred in nearly all (GOA Pacific cod and BSAI other species being the two exceptions). However, the SSC is concerned that deviating from the Amendment 44 tiers may create a perception of arbitrariness. The process of setting maximum ABCs is intended to have several conservative elements incorporated into it, and it is desirable to have an easily understood set of rules (ideally quantitative and consistent) to explain the need for additional conservatism. We recognize that this may not be possible given the uncertainty inherent in stock assessments and ecological relationships. Nevertheless, the SSC is interested in working with the Plan Teams toward this goal. As an initial step, the SSC suggests that the Plan Teams include a summary table listing the appropriate tier for each species, the corresponding maximum fishing mortality rate and ABC, and the recommended fishing mortality rate and ABC when reduced for added conservation concerns. Table 3 of the GOA SAFE summary and Tables 4 and 6 of the BSAI SAFE summary already provide some of this requested information and could serve as templates. The SSC also urges the Teams to evaluate their ABC/OFL policy statement and determine whether it can be suitably modified or refined to codify reductions to maximum ABC based on considerations related to recruitment levels, environmental relationships, and/or ecosystem considerations.

D-3 (a,b) BS/AI SAFE

BS/AI - WALLEYE POLLOCK

The SSC received the Plan Team report from Grant Thompson and was also able to question the Chapters' lead author, Jim Ianelli. Public testimony was received from Ed Richardson, At Sea Processors; Vidar Weststad, Pacific Whiting Conservation Coop, Ken Stump, Greenpeace American Oceans Campaign.

The SSC recommendations of ABC and OFL by management area are:

EBS	ABC = 992,000 mt OFL = 1,720,000 mt
AI	ABC = 23,800 mt OFL = 31,700 mt

Bogoslof ABC = 15,300 mt
 OFL = 21,000 mt

The SSC commends the authors for the new assessment which now reliably estimates a full probability density function (pdf) for F_{MSY} . The SSC concurs with the authors and Plan Team that EBS pollock now quantifies for management under Tier 1 of Amendment 44. Under both Model 1 (author's choice) and model 2 (Plan Team's choice) the projected level of spawning stock biomass is somewhat below the new point estimate of B_{MSY} (1,740,000 mt), placing EBS pollock in Tier 1b.

The maximum allowable ABC under Tier 1b of Amendment 44 is 1,370,000 mt, based on the MSY fishing rate. The SSC recommends a lower ABC based on $F_{40\%}$. We recommend continuation of this harvest strategy for consistency with previous years as well as for the first six reasons listed by the Plan Team. 1). The 1998 trawl survey biomass estimate is the lowest since 1980 and the second lowest in the entire time series; 2) future catches and biomass levels will be heavily dependent on the strength of the 1996 and 1997 year classes, the estimate of which are currently accompanied by high levels of uncertainty; 3) the projected 1999 spawning biomass is only 31% of the estimated pristine level (if no stock-recruitment relationship is assumed; 4) pollock has been the most common item in the diet of steller sea lions; 5) the impacts of Russian harvests of pollock in the Western Bering Sea on future recruitment to the Eastern Bering Sea stock are currently unknown by potentially significant; 6) the age distribution of the stock is narrower than was the case during the late 1980s and early 1990s, raising possible concern about the short-term spawning capacity of the stock.

With the harvest strategy established, the next decision is model of choice. The SSC concurs with the Plan Team that model 2 should be used. The difference between models 1 and 2 is the number of years over which selectivity is averaged (10 years versus 3 years). The SSC notes that a short-term average may be better approximate the current way the EBS pollock fishery is prosecuted. However, neither estimate may be accurate next year, the SSC had no compelling reason to change the Team's recommendation. The remainder of the nine model runs were presented primarily in response to requests of the Council family, or to explore aspects of the model's behavior.

In the Aleutian Island, the SSC accepts a rollover of ABC and OFL, because there is no new information available. The SSC encourages the collection of new information on stock structure and population size to improve this assessment. Public testimony indicated interest from industry in carrying out a scientific survey if a way can be found to obtain an exempted fishing permit.

In the Bogoslof, the Team used the same procedure as in the past with the latest survey estimate. The SSC concurs with this approach.

BS/AI - PACIFIC COD

The SSC endorses the ABC of 177,000 mt recommend by the analyst and Plan Team (down from 210,000 last year). Last year, the SSC determined that reliable estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ existed, and that Pacific cod qualified for management under Tier 3 of Amendment 44. The undated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{30\%}$ from the present assessment area 343,000 mt, 0.29, and 0.41 respectively. Fishing at the $F_{40\%}$ rate (0.29) is projected to result in a 1999 spawning biomass of 328,000 mt, thereby placing Pacific cod in sub-Tier "b" of Tier 3. Fishing at the slightly lower rate 0.28 is projected to result in a 1999 spawning biomass of 329,000 yielding a maximum permissible F_{ABC} value of 0.28. Fishing at this instantaneous rate yields a maximum permissible ABC of 196,000 mt. The SSC concurs with the recommendation to set 1999 ABC at 177,000 mt, about 9% below the maximum permissible level. The recommendation is supported because the estimated trawl survey biomass had decreased for four years in a row to the point only slightly higher than the all-time

low and because the last three year classes (assessed at age 3) have all been below average. The F_{OFL} , 0.39, yields an OFL of 264,000 mt.

The SSC commends the analyst for his attention to a plan for examining the adequacy of sampling the fishery catches, and an investigation of potential biases due to sampling with respect to the complexities of gear and season data categories, as stated in the October 1998 minutes.

The SSC heard testimony from the trawling industry (Ed Richardson and Dr. Jose-Antonio Perez-Comas) expressing concern about the representativeness of the trawl survey in sampling larger cod. The SSC has previously noted that Pacific cod may not be well sampled by the NMFS survey. An analysis of the "goodness of sampling" in the commercial gear sectors will help to resolve this problem.

BS/AI - YELLOWFIN SOLE

The SSC concurs with the Plan Team's recommendation for ABC (212,000 mt; $F_{40\%}=0.11$; Tier 3a) and OFL (308,000 mt; $F_{30\%}=0.16$). The modeling approach is the same as used last year. Although the 1998 Bering Sea survey reflects an estimated 8% increase in biomass, the recommended ABC has declined due to changes in the population age structure and the relatively late age at which this species recruits to the survey and the fishery.

BS/AI - GREENLAND TURBOT

The SSC concurs with the Plan Team's recommendations for ABC (14,200 mt) and OFL (29,700 mt). As discussed in the assessment, the recommended ABC level is some 24% lower than the maximum permitted under Tier 3b of Amendment 44. The maximum permissible value of F_{ABC} , 0.21, translate into a 1999 catch of 20,000 mt. The assessment, is considered conservative because it doesn't include biomass estimates for portions of the species range (deep waters and Aleutian Islands), and low weighting of increasing trends in the long-line survey indexes. Nevertheless, we agree that it is undesirable to increase exploitation on this species given continued declines in biomass and repeated low recruitment. We agree with the Plan Team's recommended approach to reduce the 1998 ABC by the ratio of the projected 1999 age 2+ biomass (177,000 mt) to the 1998 age 2+ biomass (188,000 mt). This ratio is 0.94 which applied to the 1998 ABC of 15,000 mt yields a recommended 1999 ABC of 14,200 mt.

BS/AI - ARROWTOOTH FLOUNDER

The SSC concurs with the Plan Team's recommendation of ABC (140,000 mt; $F_{40\%}=0.23$; Tier 3a) and OFL (219,000 mt; $F_{30\%}=0.36$). The 1998 survey indicated a 28% decline in biomass, while new modeling parameters that incorporate a changed sex ratio into the assessment suggested a significant biomass increase. This result strongly contradicted the observed biomass decline and suggested that retaining the current modeling approach is preferable for at least one more year.

BS/AI - ROCKSOLE

The SSC concurs with the Plan Team's recommendation for ABC (309,000 mt; $F_{40\%}=0.16$; Tier 3a) and OFL (444,000 mt; $F_{30\%}=0.23$). The 1998 bottom trawl survey shows a 20% decline in estimated biomass; the modeling approach for this population is unchanged.

BS/AI - FLATHEAD SOLE

The SSC concurs with the Plan Team's recommendation for ABC (77,300 mt; $F_{40\%}=0.25$; Tier 3a) and OFL (118,000 mt; $F_{30\%}=0.39$).

A new length structured synthesis model (previewed last year) moves this stock from Tier 4 to Tier 3 for specifications settings. Survey biomass declined an estimated 14%.

BS/AI - OTHER FLATFISH

We concur with the Plan Team's recommendation for ABC (154,000 mt; $F_{40\%}=0.29$; for Alaska plaice, $F_{40\%}=0.16$ for others; Tier 3a) and OFL (248,000 mt; $F_{30\%}=0.47, 0.23$ respectively). This species group is dominated by Alaska plaice. The 1998 bottom trawl survey showed a 30% decline in Alaska plaice, while other species in this group increased by approximately 5%. Biological parameters for Alaska plaice are used as proxies for the other species in setting specifications. There are no substantive model changes from 1997 to 1998; but significant changes in emphasis factors and estimates of natural mortality occurred in the 1997 assessment.

General Flatfish concerns

BSAI flatfishes - other than Greenland turbot - have shown high abundance supported by strong recruitment in recent years. We note an apparent pattern of below average recruitment for all flatfishes other than yellowfin sole in the 1990's. This may be a consequence of low recruitment of younger age-classes to the survey. However, it may also be a harbinger of lower productivity patterns which may reduce future harvest specifications.

Fran Bennis (AMCC), provided the only public testimony on flatfish specifications. Ms. Bennis expressed support for very conservative Greenland turbot specifications and expressed some concern for the levels of Alaska plaice discards.

BS/AI/GOA combined - SABLEFISH

The biomass for this species continues to decline as the strong year-classes of the late 1970's and early 1980's die out. Projected spawning biomass is about 31% of the unfished level. The combined biomass is expected to decline until 2002, and then stabilize. There is increasing evidence that the 1995 year-class is stronger than average.

The SSC supports the Plan Team's recommendation for a combined ABC of 15,900 mt. Projected spawning biomass is 155,000 mt, which is less than $B_{40\%}$ (202,000 mt). ABC is based on the adjusted $F_{40\%}$ (0.11). OFL levels are based on the adjusted $F_{30\%}$ (0.17). ABC's and OFL's are distributed among management area's based on exponential weighted moving average of biomass distribution among areas.

Area	Average Biomass	ABC (mt)	OFL (mt)
Gulf of Alaska	84.0%	12,700	15,650
Eastern Bering Sea	7.7%	1,340	1,650
Aleutian Islands	8.3%	1,860	2,300
TOTAL	100%	15,900	19,600

The same averaging procedure was used to apportion ABC within the Gulf of Alaska.

<u>Area</u>	<u>ABC</u>
Western Gulf of Alaska	1,820
Central Gulf of Alaska	5,590
West Yakutat	1,920
East Yakutat/SE Outside	3,370
TOTAL	12,700

The SSC questioned whether the IFQ selectivity (1995-1997) represents actual changes in selectivity due to IFQ, or whether the IFQ selectivity just represents change in selectivity over time. It was also noted that it would be more consistent to compare fishing and survey selectivities or similar timer periods (e.g. 1995-1997).

The SSC discussed bias in the retrospective analysis of the sablefish model and concluded that isolating the cause of bias might significantly improve model performance.

BS/AI - PACIFIC OCEAN PERCH

The SSC concurs with the Plan Team's ABC's and OFL's for the EBS/AI Pacific ocean perch. Catch data for 1997 was revised and 1998 data added. An $F_{40\%}$ management strategy was used in place of the $F_{44\%}$ strategy used last year. Changes in stock productivity for POP in the EBS/AI region indicated that a standard $F_{40\%}$ harvest strategy may be more appropriate than an $F_{44\%}$ strategy. The models were left unchanged from last year, which means that the EBS and AI populations were modeled separately. For the EBS, a Tier 3b adjusted $F_{40\%}=0.040$ give an ABC=1,900 mt; and an adjusted $F_{30\%}=0.066$ gives an OFL=3,600 mt. For the AI, a Tier 3a $F_{40\%}=0.068$ gives and ABC=13,500 mt; and $F_{30\%}=0.095$ gives an OFL=19,100 mt. Based on surveys, the AI ABC is apportioned between WAI=6,220 mt, CAI=3,850 mt, and EAI=3,430 mt. The SSC suggests that the assessment authors consider combining POP in the EBS and AI regions into one assessment model. The limited survey data for POP in the EBS makes such an approach attractive.

BS/AI - OTHER ROCKFISH

The SSC concurs with the Plan Team's ABC's and OFL's for EBS/AI Other rockfish. Although catch tables were updated, there are no new survey data on which to base a change in the assessment. The ABC's and OFL's for 1999 are unchanged from 1998:

<u>Species Group</u>	<u>ABC</u>	<u>OFL</u>
<u>Aleutians</u>		
Northern/Sharpchin	4,230	5,640
Shortraker/rougheye	965	1,290
Other rockfish	685	913
<u>Eastern Bering Sea</u>		
Other red rockfish	267	356
Other rockfish	369	492

BS/AI - ATKA MACKEREL

The SSC accepts the Team's and analysts recommendations for an ABC of 73,300 mt (based on $F_{52\%}$) and an OFL of 148,000 mt (based on $F_{30\%}$). The ABC is below than the maximum permissible, because there is great uncertainty in survey estimates, the stock has declined markedly, and the Plan Team had other concerns about the stock and lack of information about it.

BS/AI - SQUID AND OTHER SPECIES

The squid and other species category includes a group of otherwise unrelated species. While some of these species are targeted in other regions, there is little directed fishing effort on these species in the BSAI at this time. The SSC heard public testimony from Paul Peyton on this agenda item.

The SSC concurs with the Plan Team's recommendation for squid ABC (1,970 mt) and OFL (2,620 mt). These recommendations are based on the application of Tier 6 criteria under Amendment 44. Although the SAFE includes a surplus yield representation of squid population dynamics, the SSC concurs with the Plan Team judgement that the model is preliminary and should not be used as a basis for OFL and ABC determination this year. Nevertheless, the SSC encourages further development of this model.

The SSC disagrees with the Plan Team recommendations for the other species ABC (25,800 mt). The SSC notes that $M=0.20$ has been accepted as a reasonable estimate of natural mortality for the other species category. Given an estimate of M , other species fall into Tier 5 under Amendment 44. Tier 5 allows F_{ABC} to be up to 75% of M . That is, ABC could be set as high as 96,500 mt ($643,000 \text{ mt} \times 0.15$). Rather than move immediately from the 1998 ABC of 25,800 mt, to the ABC the SSC recommends a 10-year phase-in. The SSC recommendation for the 1999 ABC is $25,800 + 1/10 (96,500 \text{ mt} - 25,800 \text{ mt}) = 32,865 \text{ mt}$.

The SSC concurs with the recommended OFL level calculated from $F=M=0.2$. This level is 129,000 mt.

D-3 (c, d) GOA SAFE

Eastern Gulf Split

The split of the Eastern Gulf management area into W. Yakutat and E. Yakutat/SE Outside because of the trawl ban in the latter area has caused an evaluation of whether ABCs need to be adjusted. The Plan Team has established a philosophy that ABCs should be split if a directed harvest is likely to result in a disproportionate removal in relation to estimated biomass. This situation is more likely to occur with sedentary species with a high proportion of biomass toward the East. The SSC accepts the Team approach and specific recommendations with one exception subject to the comments listed below. The SSC recommends no split of walleye pollock in the Eastern Gulf, because it is a migratory population and its harvest in W. Yakutat should not damage the overall Eastern Gulf population.

The SSC recognizes that the Team procedure is an interim procedure for this year and that improvements need to be made. First and foremost, the RACE Division needs to examine the triennial survey design to determine if credible estimates of biomass in West Yakutat and/or the proportions of biomass in the West and East, can be obtained. Second, the Team needs to develop a stronger rationale for deciding to split particular species. The management and fishing consequences of making a split should be determined (particularly for some rockfish components such as northern rockfish in which an amount as low as 10 mt can be the result of a split). Third, the SSC recommends that splitting should be done more consistently for the various rockfish species complexes next year, because these components maybe most vulnerable to overfishing. Fourth, the Team

should reexamine the use of the upper 95% confidence level. In most cases, the SSC suspects that the point estimate is the most appropriate choice and a rationale should be given for deviating from this default.

GOA - WALLEYE POLLOCK

The SSC heard public testimony from Chris Blackburn, AGDB; Ken Stump, Greenpeace.

The walleye pollock fishery in the Gulf will largely depend on the 1994 year-class over the next six years. Indications are that year-class sizes during the decade of the 1990's have been well below average except for the 1994 year-class. It will take another year to evaluate fully the potential of this year-class for the fishery.

The SSC accepts the Plan Team recommendations for assessment model A, ABCs (W/C - 94,400 mt, EG - 8,620 mt) and OFLs (W/C - 134,100 mt, EG - 12,300 mt), as well as apportionments to Shumagin, Chirikof and Kodiak. The W/C ABC is an adjusted $F_{40\%}$ and the OFL is an adjusted $F_{30\%}$.

The SSC disagrees with the split recommended by the Plan Team for the EG. Because pollock is a migratory species and there is no evidence that EG pollock can be partitioned into different stocks, the SSC does not believe that harvest in West Yakutat of the EG ABC would damage the EG population. Therefore, the SSC recommends that there be no split in the EG for pollock. In order to have a rational means to split the EG ABC, an understanding of seasonal pollock distribution in the EG is needed, because the fishery occurs in the winter while surveys occur in the summer.

Prince William Sound Pollock -- As reported in 1995, 1996, and 1997, the SSC remains unconvinced that PWS pollock fishery exploits a resource that is entirely independent of the assessed GOA pollock population. The SSC hopes that an age-structured analysis of the GOA pollock stock will shed some light on this issue. The SSC reviewed a report of recent ADF&G surveys and strongly encourages NMFS and ADF&G to coordinate the upcoming GOA triennial survey with ongoing ADF&G surveying activities. An effort should be made to collect and contrast age and length data from these surveys. The 1999 GHL for PWS is 2,100 mt of pollock. The SSC recommends that this quantity be subtracted from the GOA ABC in proportion to the combined regional ABCs for the Western/Central and Eastern GOA regions.

GOA - PACIFIC COD

The SSC recognizes the concerns of the Plan Team that spawning biomass has shown a decreasing trend during the current decade due to decreased recruitment. In the face of this decline it is difficult to accept the increase in ABC proposed by the analyst. Nevertheless, the ABC recommendation represents the best scientific estimate and uses new data from the 1998 fishery. In order to recognize the best estimate in light of recent biomass decline, the SSC recommends an ABC stepped up from last year as the average value of the two: 77,900 mt and 90,900 mt, resulting in an ABC 84,400 mt. The 1999 OFL ($F_{30\%}=0.52$) is 134,000 mt based on Tier 3a.

GOA - FLATFISH

The SSC concurs with the Plan Team's recommendations for ABC and OFL levels for the deepwater, rex sole, shallow water and flathead sole groups. These recommendations are identical to those for 1998 except that there is no longer an extrapolation to estimate Dover sole biomass at unsurveyed depth strata. This effectively reduces the recommended deepwater ABC by 15.6%, but this is not expected to be constraining to industry based on a comparison of 1998 TAC and catch levels.

Recommended ABC and overfishing levels are:

	<u>ABC</u>	<u>F_{ABC}</u>	<u>OFL</u>	<u>F_{OFL}</u>	<u>Tier</u>
Deep water	6,050	0.075	8,070	0.10	5,6
Rex sole	9,150	0.15	11,920	0.20	5
Shallow water	43,150	0.15-0.17	59,450	0.2-0.25	4,5
Flathead sole	26,110	0.15	34,010	0.20	5
Total	84,460				

The SSC also concurs with the recommended biomass-based regulatory area apportionments of ABC. As noted elsewhere in our minutes, we encourage 1999 survey design and analysis to help us understand and resolve how to recommend harvest limit apportionments between West Yakutat/East Yakutat-Southeast Outside subareas.

<u>Species Group</u>	<u>Western</u>	<u>Central</u>	<u>WYAK</u>	<u>EYAK/SEO</u>	<u>Total</u>
Deep water	240	2,740	1,720	1,350	6,050
Rex sole	1,190	5,490	850	1,620	9,150
Shallow water	22,570	19,260	250	1,070	43,150
Flathead sole	8,440	15,630	1,270	770	26,110
Total	32,440	43,120	4,090	4,810	84,460

GOA - ARROWTOOTH

The SSC concurs with the Plan Team's recommendation for ABC (217,110 mt) and overfishing (308,875 mt). Arrowtooth flounder specifications fall under Tier 3a. $F_{ABC}=F_{40\%}=0.189$, $F_{OFL}=F_{30\%}=0.278$.

Recommended area apportionments are:

<u>Western</u>	<u>Central</u>	<u>WYAK</u>	<u>EYAK/SEO</u>	<u>Total</u>
34,400	155,930	13,260	13,520	217,110

The recommended values are based on a length based stock synthesis model. An analysis based on AD Model Builder is presented in an appendix. It is expected this new model will be applied next year; if applied this year it would have result in a higher biomass estimates due to differences in selectivities. However, it would also estimate $F_{40\%}$ at a lower value, and the comparable ABC would decline by 17%.

GOA - SLOPE ROCKFISH

The SSC supports the Plan Team's ABC recommendations for GOA shortraker/rougheye, norther rockfish, and other slope rockfish.

Because little new information is available for the assessment of these species, the recommended ABC and OFL levels are the same as those adopted by the Council for 1998.

Pacific Ocean Perch

The SSC supports the Plan Team's ABC for Pacific ocean perch. The stock assessment model was updated to include age data from the 1996 trawl survey, which again supported the experience of a strong 1996 year-class. The catchability coefficient for the preferred stock synthesis model was $q=2.8$, which makes for a

relatively conservative assessment. Using Tier 3b, the adjusted $F_{40\%}=0.60$ with an $ABC=13,120$ mt. The corresponding overfishing level using the adjusted $F_{30\%}=0.086$ is 18,490 mt.

	<u>ABC's mt</u>	<u>OFL mt</u>
W	1,850	2,610
C	6,760	9,520
WYAK	820	
EYAK/SEO	<u>3,690</u>	<u>6,360</u>
Total	13,120	18,490

Shortraker/rougheye - The current estimates of exploitable biomass are 16,670 mt for shortraker rockfish and 48,710 mt for rougheye rockfish. As in the past, the average of the exploitable biomasses for the 1990, 1993 and 1996 surveys were used to arrive at this estimate. Applying the definition for ABC and OFL places shortraker rockfish in Tier 5 where $F_{ABC}<0.75$ M. Thus, the recommended F_{ABC} is 0.023 ($0.75*0.03$). Applying Tier 4 to rougheye rockfish ($F_{ABC}<F_{40\%}$) results in $F_{ABC}=M=0.025$, which is less than $F_{40\%}=0.032$. ABCs for these species are 370 mt and 1,220 mt, respectively. Overfishing is defined by $F_{30\%}=0.046$ for rougheye rockfish and $F=M=0.03$ for shortraker or 2,740 mt

	<u>ABC's mt</u>	<u>OFL mt</u>
W	160	
C	970	
E	<u>460</u>	
Total	1,590	2,740

Northern Rockfish - Because little new assessment information is available for northern rockfish, the 1999 ABC is set equal to the 1998 value.

	<u>ABC's mt</u>	<u>OFL mt</u>
W	840	
C	4,150	
E	<u>0¹</u>	
Total	4,990	9,420

Other slope rockfish - Because little new assessment information is available for other slope rockfish, the 1999 ABC is set equal to the 1998 value.

	<u>ABC's mt</u>	<u>OFL mt</u>
W	20	
C	650	
WYAK	470 ¹	
EYAK/SEO	<u>4,130</u>	
Total	5,270	7,560

1/ The EGOA ABC of 10 mt, for northern rockfish has been included in the WYAK ABC for other slope rockfish.

PELAGIC SHELF ROCKFISH

The SSC supports the Plan Team's ABC recommendations on Pelagic shelf rockfish.

Under Amendment 46 of the GOA FMP, black and blue rockfish management were transferred to the State of Alaska. The 1990, 1993, and 1996 trawl survey data were reassessed excluding these species and a Tier 4 strategy applied ($F=M=0.09$). This is more conservative than an $F_{40\%}$ strategy of 0.10. The resulting ABC is 4,880 mt. An OFL based on $F_{30\%}=0.15$ gives a value of 8,190 mt.

	<u>ABC's mt</u>	<u>OFL mt</u>
W	530	
C	3,370	
WYAK	560	
EYAK/SEO	<u>420</u>	
Total	4,880	<u>8,190</u>

GOA - DEMERSAL SHELF ROCKFISH

The SSC supports the Plan Team's ABC and OFL for demersal shelf rockfish.

The recommended values are unchanged from the 1998 recommendations, but additional information is presented concerning survey, survey data, and the line transect method.

<u>ABC's mt</u>	<u>OFL mt</u>
530	950

GOA - THORNYHEAD ROCKFISH

The SSC supports the Plan Team's ABC for thornyheads.

Catch data were updated and the resulting ABC was decreased by 10 mt to 1,990 mt. The OFL was decreased by 40 mt to 2,800 mt.

	<u>ABC's mt</u>	<u>OFL mt</u>
W	260	
C	700	
E	<u>1,020</u>	
Total	1,990	<u>2,800</u>

GOA - ATKA MACKEREL

The SSC concurs with the Team and analysts that only limited information is available and that a rollover of last year's ABC of 600 mt to satisfy bycatch needs in other fisheries is warranted. The OFL is 6200 mt, the average catch for 1978-1995. The SSC encourages AFSC and the analysts to develop a research plan to collect the necessary information to do an integrated assessment with the Aleutian Islands component.

Evaluation of 16 bit versus 32 bit Stock Synthesis

In the last assessment the SSC noted that a large change the stock assessment of GOA Pacific ocean perch (POP) could only attributed to changing from a 16 bit to a 32 bit version of stock synthesis. In the current

GOA POP stock assessment, the difference in model fit between the two versions of stock synthesis are explored. However, the presentation leaves open the question whether these results are due to precision only, or if one version of stock synthesis had a coding “bug”. One further way the difference between the 16 bit and 32 bit versions of stock synthesis can be examined to initiate the 16 bit version at the solution of 32 bit version. One would suspect that the solution from the 16 bit version would then be unchanged from the initial values should the differences be due to precision alone.

State waters catch accounting

There is a need for consistency and coordination in the assessment and management of stocks that co-occur in State and Federal waters. Where this consistency is missing, it is possible that components of the stock may be unassessed, resulting in low ABC recommendations (e.g., PWS pollock). Similarly, stocks may be underharvested if state waters catches are assessed against the Federal TAC despite the GHL having been subtracted from the ABC (e.g., P. cod).

The SSC recommends that Federal and State agencies coordinate in the assessment and management of shared stocks. Surveys and other measures for estimating abundance and stock composition should, to the extent possible, be coordinated to provide estimates of abundance throughout those portions of State and Federal waters utilized by these stocks. Where possible, State and Federal resource managers should agree to common management objectives, particularly with respect to exploitation rates and to scaling fishing removals to reflect temporal and spatial differences in stock density. Timely reporting of catch information is crucial to ensure that TAC limits are not exceeded.

Models intended to reflect stock dynamics should clearly indicate that portion of the stock that they attempt to represent and should employ appropriate catch and abundance data series.

Ecosystem Considerations

This chapter continues to present a diverse suite of topics that place North Pacific fisheries in a broader context. We appreciate that the Teams continually seek present new material and limit repetition of past material.

We are very supportive of the proposed new direction of this chapter which will emphasize ecosystem-based management indices and ecosystem status indicators. We are also similarly supportive of efforts to coordinate and integrate Bering Sea ecosystem research.

Of the four specific ecosystem concerns raised by the Plan Teams; fishery effects on species composition warrants particular notice. We strongly encourage assessment authors, and the Plan Teams and other researchers to develop and present time series of biomass trends and exploitation rates that facilitate direct comparisons. Stock assessments often present time series of data, but changes in modeling often lead to changes in biomass estimates independent of actual changes in resource. Thus, it is difficult for the public and those not closely familiar with stock assessment details to maintain a broad yet accurate conceptual picture. These same time series will also facilitate a perspective on multi-species patterns that are essential to developing an ecosystem level perspective.

D-3(e) HALIBUT DISCARD MORTALITY RATES

Gregg William (IPHC) presented the proposed 1999 halibut discard mortality rates (DMRs) to be used for PSC cap accounting. He also presented information on more in-depth analyses of DMRs in the GOA flatfish sole and deepwater flatfish fisheries.

Theresa Kandianis offered testimony that the disparity between DMRs for catcher vessels and catch-processors in the GOA flathead sole fishery is surprising given the small vessel and tow sizes of GOA catch processors in this fishery.