DRAFT REPORT
of the
SCIENTIFIC AND STATISTICAL COMMITTEE
to the
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
December 3-5, 2007

The SSC met during December 3-5, 2007 at the Hilton Hotel, Anchorage, Alaska. Members present were:

Pat Livingston, Chair *NOAA Fisheries—AFSC*	Keith Criddle, Vice Chair *University of Alaska Fairbanks*	Robert Ames *Oregon Department of Fish and Wildlife*
Bill Clark *International Pacific Halibut Commission*	Sue Hills *University of Alaska Fairbanks*	Anne Hollowed *NOAA Fisheries—AFSC*
George Hunt *University of Washington*	Franz Mueter *SigmaPlus Consulting*	Lew Queirolo *NMFS—Alaska Region*
Terry Quinn II *University of Alaska Fairbanks*	Farron Wallace *Washington Dept of Fish and Wildlife*	Doug Woodby *Alaska Department of Fish and Game*

Members absent were:

Gordon Kruse *University of Alaska Fairbanks*	Seth Macinko *University of Rhode Island*

C-4 LLP Trawl Recency (Queirolo, Criddle, Hunt)

Jim Richardson (NPFMC) presented an overview of the revised draft RIR/IRFA. The proposed amendment contains a suite of alternatives designed to extinguish LLP permits that have not been actively employed in the authorized fishery in recent years (i.e., latent licenses). A second component of this amendment package bears on a perceived shortfall in the number of authorized LLPs available in the AI management area with which to prosecute groundfish fisheries for P.cod, Atka mackerel, POP, and, perhaps to a lesser extent, pollock. Mr. Dave Fraser (Adak Fisheries), offered public testimony.

The SSC recommends that the draft analysis be released for public review after it has been revised to address the following:

- Inclusion of diametrically opposed management actions (i.e., extinguishing LLP licenses, on one hand, while creating new fishing permits, on the other) creates some incongruity in the analytical presentation and supporting discussion. The rationale for combining these actions should be discussed.
- The proposed delegation of authority to the Aleut Corporation to exempt 4-10 trawl vessels from the otherwise required AI endorsement appears to create a *de facto* "limited access program", albeit somewhat dissimilar in structure to other Limited Entry programs the Council has considered. The proposed alternative creates, in effect, a closed-class of authorized participants, to be selected solely by the Aleut Corporation and solely upon the criteria that the Aleut Corporation selects. The SSC notes that the proposed alternative, in effect, establishes a "sole owner" use structure in significant portions of the AI groundfish fisheries for Atka mackerel, POP, P.cod, and, perhaps to a lesser degree, pollock. The draft analysis should be expanded to include analyses required by the MSA for creation of a Limited Access Program, or explain why such analyses are not required in this instance.

C-5 Amendment 90

Jon McCracken (NPFMC) presented an overview of the initial review draft RIR/IRFA for Amendment 90 to allow post-delivery transfer of shares and amendment 80 limited access rollovers in the BSAI Amendment 80 program. There was no public testimony on this agenda item.

The SSC recommends that the draft analysis be released for public review after it has been revised to address the following:

- The analysis should include a discussion of the potential undesirable incentives associated with provision of post-delivery transfer authorization.
- The absence of a numerical "threshold" associated with the current proviso that a fishing trip may not begin unless the operator "… has quota" could be problematic. The analysis should include a discussion of possible alternative threshold levels.
- The analysis should note that the proposed action may increase the overall amount of Amendment 80 species harvested, because it will transfer unharvested iTAC to sectors that have not yet exceeded bycatch caps.
- Add language to clarify that this is intended as a minor modification of Amendment 80 and that as such, it does not consider management alternatives that would alter the basic structure of the co-ops created under Amendment 80.
- Additional discussion to explain whether the discards referenced on page 10 are regulatory or economic in nature.
- Table 2-7 needs to identify the units of value.
- General editing for grammatical errors.

C-6 Observer Program

Nicole Kimball (NPFMC) and Jason Anderson (NMFS AKR) presented the RIR/IRFA for a regulatory amendment to revise administrative and procedural aspects of the North Pacific Groundfish Observer Program. Martin Loefflad (AFSC) and Bill Karp (AFSC) assisted in answering SSC question. No public testimony was given. The SSC thanks the authors for including a complete history of the issue in a particularly readable document.

The SSC considers this document ready to be released for public review after minor additions and some reformatting. The addition of a cross-walk summary table of issues and alternatives would help to orient the reader. The SSC felt that including NMFS comments with the analysis of the alternatives was awkward and requests that the material be removed to an appendix of NMFS comments. The Observer Advisory Committee (OAC) minutes should also be included as an appendix, as should the additional data from the national bycatch report as soon as it is available. It is not the intent of the SSC that release of the document be delayed to wait for the national bycatch report data but its inclusion as soon as it is available would be helpful. The rationales for the alternatives, including the new alternative 4, were clearly presented, as were the pros and cons. The fact that the OAC's May 2007 recommendations were taken into account strengthens the document. Table 13; page 56, is a useful way of comparing the alternatives.

This progress on a long-standing issue is welcome. The SSC reviewed alternatives for restructuring the observer program in June 2005 and a revised analysis of that document in February 2006, but has had numerous additional discussions about the quality of the data from the observer program over the years. Two fundamental external obstacles to the program were identified whose resolution was necessary before further substantive progress could be made. The issues were: 1) legislative authority needed to be established for fee-based alternatives, and 2) Fair Labor Standards Act (FLSA) issues needed to be clarified to make it possible to estimate costs associated with the fee-based alternatives. The first issue

was addressed in the January 2007 reauthorization of the MSA, which included language authorizing the NPFMC to adopt fee-based observer program. The second issue of lack of cost data remains unresolved but the actions analyzed in this document would begin the process of adequate data collection. The present document details administrative, operational and procedural changes to the existing observer program that are considered necessary regardless of observer program restructuring.

The document is formulated as seven issues with alternatives for each. Four of the seven—(Issue 1) remove the appeals process for observer candidates for certification; (Issue 2) remove NMFS oversight of observer behavior, (Issue 3) clarify that observers from observer providers are allowed to provide coverage for EFPs and other research activities; and (Issue 7) several minor housekeeping corrections—seem straightforward. After consultation, NMFS has recommended withdrawal of the proposed change, issue (Issue 6), regarding debriefing observers whose deployments span the end of the calendar year. The remaining two issues—(Issue 4) revise the definition of a fishing day and (Issue 5) require observer providers to submit detailed economic data to NMFS—are more substantive.

Issue 4, which revises the definition of a fishing day, addresses but does not fix the issue of non-representative fishing behavior (and perhaps location) when an observer is on board. This issue has long been a concern of the SSC. In March 2003, the SSC suggested:

> **"an experimental approach may be of value in evaluating the potential bias that may occur in observer data.** Currently, there are concerns about possible bias in the data from the segment of the fleet that has only 30% observer coverage. Because the fishers have some choice over when they will have an observer on board, the observed trips probably are not representative of the unobserved trips in terms of fishing locations. Furthermore, there may be subtle differences in fishing operations when vessels have observers onboard. Modifying the observer system so that NMFS staff chooses the trips that will be observed may provide more uniform representation of fishing locations but this change will not rectify the problem of observed vessels having modified fishing behavior. For the revised observer system there may be merit in conducting some experiments that attempt to directly measure the bias of the current system. A portion of the new system could have the fishers selecting the trips that would be observed and a separate portion would have the observed trips selected by NMFS staff. An additional portion of the fleet could have 100% observer coverage for extended periods; say several months, with the idea that these vessels would be more likely to behave as if they were unobserved. Contrasts amongst these three portions might provide some indication of the two kinds of bias that are probably inherent in the current observer system."

On Issue 4, the SSC is concerned that there does not appear to be a viable solution to the identified problem of "fishing for observer coverage," until such time as there is a full revision of NMFS' Observer Program (a result that is not likely to be achieved in the near-term). This observer coverage compliance "loop-hole" has been recognized as a problem for many years for coverage of the 30% fleet sector; the abusive behavior continues to the present; and the adverse impacts of this behavior on observer data quality remains indeterminate, but cannot be impact-neutral. Correcting this deficiency should be an immediate priority. The proposed change to the definition of a fishing day begins to address the issue. While the proposed change does not quantifying the bias, it will provide some idea of the magnitude of the problem. **As stated many times before, the SSC considers good representative data essential for proper management of the fisheries and urges that additional information be gathered on how "fishing for coverage" affects the data.** Rather than waiting for the entire observer programs to be restructured, the SSC suggests that NMFS seek additional funds to conduct something like the experimental approach outlined above.

Issue 5, the requirement that observer providers provide detailed economic data, is in line with an increased emphasis by NPFMC and NMFS on the collection of social and economic data. It is an attempt to begin to accumulate the data needed to addresses the second obstacle to a fundamental restructuring of the observer program. However, the SSC questions the wisdom of the proposed "sunset provision" in the collection of economic data. The management process has waited more than 20 years to acquire the authority under MSA to require submission of economic data. Now that this authority has been provided to the Council and NMFS, it is counter-intuitive and counter-productive to suggest a 3-year duration for collection of these economic data. There are scientific and analytical justifications for acquiring data on a consistent and systematic basis, over time. **The SSC recommends that there be no sunset provision on the economic data collection outlined in Issue 5.** The SSC also suggests that sub-sampling vessel operators to verify data reported by observer providers would be advisable.

D-1 Groundfish Management

Recommendations to Assessment Authors of stocks subject to the $B_{20\%}$ threshold

The SSC requests that if stocks drop below tier 3a and they are subject to the B20% stopping rule (pollock, cod and Atka mackerel), that the analysts evaluate the probability that the stock will drop below the $B_{20\%}$ threshold. This calculation is currently produced in the GOA pollock assessment. In this assessment the author projects the stock forward for five years and removes catches based on the spawning biomass in each year and the author's recommended fishing mortality schedule. This projection incorporates uncertainty in stock status, uncertainty in the estimate of $B_{20\%}$, and variability in future recruitment.

Recommendation to all assessment authors with respect to calculations for biological reference points

The SSC notes that the approach for calculating ABC and other biological reference points is not fully described in the SAFE's. It would be desirable to have a general description in the introduction of the SAFE. In each SAFE chapter, specific details could be provided, if the calculation is done differently. For example, the range of years that is used to calculate average recruitment for converting SPR to B_{40} should be given.

D-1 (d) BSAI SAFE and Harvest Specifications for 2008/09

Grant Thompson (AFSC,) presented the BSAI plan team report and recommendations for BSAI groundfish with support from Jim Ianelli (AFSC). The following table (Table 1) summarizes the SSC recommendations for ABC and OFL for 2008/09 for BSAI groundfish. Specific SSC comments on the assessments follow the table.

Table 1. SSC recommendations for BSAI Groundfish OFL and ABC for the 2008-2009 fisheries (mt). (Text in bold indicates where SSC recommendations differ from the plan team recommendations.)

Stock/Assemblage	Area	2007				2008		2009	
		OFL	ABC	TAC	Catch	OFL	ABC	OFL	ABC
Pollock	EBS	1,640,000	1,394,000	1,394,000	1,350,000	1,440,000	1,000,000	1,320,000	1,000,000
	Aleutian Islands	54,500	44,500	19,000	2,488	34,000	28,200	26,100	22,700
	Bogoslof District	48,000	5,220	10	0	58,400	7,970	58,400	7,970
	BSAI Total	1,742,500	1,443,720	1,413,010	1,352,488	1,532,400	1,036,170	1,404,500	1,030,670
Pacific cod	BSAI	207,000	176,000	171,000	172,655	**207,000**	**176,000**	**207,000**	**176,000**
Sablefish	BS	3,520	2,980	2,980	1,090	3,380	2,860	2,910	2,610
	AI	3,320	2,810	2,810	1,080	2,890	2,440	2,510	2,230
	BSAI Total	6,840	5,790	5,790	2,170	6,270	5,300	5,420	4,840
Yellowfin sole	BSAI	240,000	225,000	136,000	119,332	265,000	248,000	296,000	276,000
Greenland turbot	BS		1,680	1,680	1,435		1,750		1,750
	AI		760	760	511		790		790
	Total	15,600	2,440	2,440	1,946	15,600	2,540	16,000	2,540
Arrowtooth flounder	BSAI	193,000	158,000	20,000	11,700	297,000	244,000	300,000	246,000
Northern rock sole	BSAI	200,000	198,000	55,000	37,013	304,000	301,000	379,000	375,000
Flathead sole	BSAI	95,300	79,200	30,000	19,500	86,000	71,700	83,700	69,700
Alaska plaice	BSAI	241,000	190,000	25,000	19,411	248,000	194,000	277,000	217,000
Other flatfish	BSAI	28,500	21,400	10,000	5,840	28,800	21,600	28,800	21,600
Pacific ocean perch	BS		4,160	2,160	811		4,200		4,140
	WAI		7,720	7,720	7,421		7,590		7,490
	CAI		5,050	5,050	4,423		4,970		4,900
	EAI		4,970	4,970	5,116		4,890		4,820
	AI total		17,740	17,740	16,960		17,500		17,200
	BSAI Total	26,100	21,900	19,900	17,771	25,700	21,700	25,400	21,300
Northern rockfish	BSAI	9,750	8,190	8,190	3,940	9,740	8,180	9,680	8,130
Shortraker rockfish	BSAI	564	424	424	318	564	424	564	424

Stock/Assemblage	Area	2007 OFL	2007 ABC	2007 TAC	2007 Catch	2008 OFL	2008 ABC	2009 OFL	2009 ABC
Rougheye rockfish	BSAI	269	202	202	163	269	202	269	202
Other rockfish	BS		414	414	205		414		414
	AI		585	585	430		585		554
	BSAI Total	1,330	999	999	635	1,330	999	1,290	968
Atka mackerel	WAI		20,600	9,600			16,900		13,200
	CAI		29,600	29,600			24,300		19,000
	EAI/BS		23,800	23,800			19,500		15,300
	BSAI Total	86,900	74,000	63,000	56,620	71,400	60,700	50,600	47,500
Squid	BSAI	2,620	1,970	1,970	1,190	2,620	1,970	2,620	1,970
Other species									
Sharks						617	463	617	463
Skates						**50,100**	**37,600**	**50,100**	**37,600**
Sculpins						53,100	39,800	53,100	39,800
Octopus						324	243	324	243
Other Total		91,700	68,800	37,400	26,500	**104,000**	**78,100**	**104,000**	**78,100**
BSAI Total		3,188,973	2,676,035	2,000,000	1,849,192	3,161,934	2,440,291	3,161,684	2,557,250

Walleye pollock

The SSC received a staff presentation from Jim Ianelli (AFSC). Public testimony was received from Ed Richardson (Pollock Conservation Cooperative), Brent Paine (United Catcher Boats), Jon Warrenchuk (Oceana), and Joe Plesha (Trident Seafoods). Richardson and Paine suggested setting ABC at 1.17 million t, the maximum permissible, because they felt the assessment is already precautionary and is working well. Paine noted that the loss in revenue in going down to 1 million t would be about $150 million. Warrenchuk felt that the Plan Team ABC was too high, given the importance of pollock in the ecosystem. He also thought that female spawning biomass was getting too close to the B_{20} harvest threshold, which would close directed fishing for pollock under the SSL protection measures. Plesha supported the Plan Team recommendation, because he was concerned about the pollock resource and wants it to be sustained.

This assessment is a straightforward update of last year's assessment with some model enhancements related to sample size, use of length data, and development of an age 1 index of abundance. Results show that pollock biomass will drop below the target B_{MSY} level in 2008. This is due to a series of poor recruitments in recent years and some other factors. This year's new data suggests that neither the 2000 nor 2005 year-classes are as strong as they appeared to be in prior years. Also, average weight-at-age was much lower than average in 2006, suggesting that forage for pollock such as zooplankton was reduced. Unfortunately, it has not been possible to obtain zooplankton data for the recent time period. Finally the arrowtooth flounder population continues to grow, which may increase juvenile mortality. Another concern is that the 2008 female spawning biomass of 1.38 million t is not that much larger than the B_{20} level of 1.00 million t (taking 20% of B_0=5.013 as given on page 85).

However, the 2006 year-class appears strong based on age-1 abundance in both the EIT and bottom trawl surveys, although it uncertain whether this will prevail as the year-class ages. If it does not remain strong, the population could decline further in the future. Projections suggest that the population can rebuild to the MSY level by 2010, although it should be noted that there is much uncertainty in those projections.

The assessment model and the harvest policy to determine ABC for pollock is precautionary in a number of ways: a constraint on the spawner-recruit steepness parameter, the use of geometric mean biomass instead of average biomass, a quadratic downward adjustment as biomass decreases, a larger buffer between ABC and OFL as uncertainty increases, and the use of the harmonic mean harvest rate rather than the average harvest rate.

As in past years, the SSC recommends that this stock be considered in Tier 1 and agrees with the authors and Plan Team that the maximum permissible ABC is 1.17 million t under Tier 1b, the harmonic mean of the ratio of MSY and its corresponding biomass. For the reasons and concerns stated above, the SSC believes that extra conservatism is desirable and agrees with the authors and Plan Team that the 2008/09 ABC should be further lowered to 1 million t. This corresponds to the harvest rate that would lower female spawning biomass to about 39% of the unfished level, which is similar to what this value has been in the past. The OFL for 2009 using the Tier 1b calculation is 1.44 million t. Table 1 has the 2008/09 SSC recommendations for ABC and OFL.

Economic implications
The reduction proposed by the Plan Team, from the 1.17 M t Tier 1b ABC, to the recommended 1.0 M t figure, has been asserted to pose a *potentially* adverse economic threat to the Bering Sea commercial pollock industry. Empirical economic data necessary to critically evaluate this assertion at a disaggregated, net performance level are not available at present. The use of sector-wide 'gross' fishery data that are presented in the 2007 Economic SAFE, nonetheless, may provide some insights into the

likely economic implications of selecting the Plan Team recommendation, versus the Tier 1b model projection.

By comparing historic economic performance of the EBS pollock sector with equivalent data for the most recent year's fishery (2006), the following emerges. Since implementation of the AFA, aggregate industry-wide operating costs per unit output have (according to industry sources) decreased, as excess capacity has been removed (or idled) and pollock co-ops have availed themselves of the operational and management flexibility engendered in AFA. Cooperatives have the authority to more nearly optimize net returns, by matching quota to available productive capacity (e.g., utilizing the 'best' combination of inputs – vessels, plants/lines – for the physical conditions, quota, markets, etc.). The Economic SAFE reveals that, in the aggregate, participants in this fishery have benefited substantially by slowing the pace of pollock fishing. Since implementation of the AFA, the industry has significantly improved product recovery rates and, simultaneously, total gross product value. Production data reveal increasing output of traditional product forms, as well as development and production of new pollock products.

From the 2007 Economic SAFE, Figures 1 and 2, page 170, the following may be discerned (in the aggregate, for the EBS pollock industry). When 2000 pollock fishery data are compared to 2006 data, wholesale prices for pollock products have increased for all but two product forms (i.e., meal/oil, and 'other') and prices for these two are unchanged. Final product output has increased, in most instances quite significantly, for all pollock product forms. Higher unit prices, combined with increased total output, yield substantial increases in estimated sector-wide gross receipts.

It appears that over this same period, global retained harvest of walleye pollock has declined, while the U.S. retained harvest has risen (Figure 4, Economic SAFE). The result is that U.S. pollock market-share has increased, both relatively and absolutely, vis-à-vis other pollock suppliers. Clearly, pollock competes it a broader world whitefish marketplace and, therefore, may not benefit from supply-driven price increases that might otherwise be expected in response to reduced global pollock supplies. At present, this remains an empirical question.

What is apparent from these aggregate data is that, on the whole, the EBS pollock industry is far better positioned, economically, to weather the recent and near-term projected pollock ABC reductions, post-AFA, than would have otherwise been the case. The implication of this for conservation and management of the EBS pollock resource is important. At present, the 1.0 M t ABC (in contrast to the 1.17 M t alternative ABC), while likely to have some adverse impact on 'net revenue' performance for the sector, would not be expected to result in wide-spread economic failure and dislocation, as would have been the expectation, pre-AFA. At the individual operator's level, the economic implications of the 170,000 t difference between the two alternatives may be greater for some than for others. Nonetheless, the AFA has made possible a degree of economic stability in the EBS pollock industry that, in effect, may substantially 'buffer' the sector as a whole from the most severe economic impacts of ABC reduction.

Aleutian Islands Walleye Pollock

This is a straightforward update of last year's assessment. Estimated biomass increased from 1999 to 2004 and has remained stable since then. Model 2B is similar to the model accepted last year.

The SSC concurs with the Plan team for assignment to Tier 3a and the resulting 2008/09 ABCs and OFLs recommended by the author and plan teams (Table 1).

Bogoslof Walleye Pollock

This is a straightforward update of last year's assessment. Estimated biomass has been stable and low for several years.

The SSC has determined that this stock qualifies for Tier 5 management. The recommended ABC comes from a formula similar to a Tier 3 calculation substituting a reference biomass level of 2 million t for $B_{40\%}$ and is below the maximum permissible. The recommended 2008/09 ABCs and OFLs are in Table 1.

Pacific Cod

Grant Thompson presented the assessment, which included four candidate models, and the Plan Team's ABC recommendation, based on Model 1. Mark Maunder of Quantitative Resource Assessment LLC, appearing for the Freezer Longliner Coalition, gave public testimony. His main points were (i) that Model 1 overestimated historical recruitment and therefore present depletion; and (ii) that the natural mortality rate (0.34) chosen for the model was just one of a wide range of other possible values.

This assessment has been through a number of evolutions over the last 15 months. An industry group requested an external review in the fall of 2006, and this was conducted along with the 2006 assessment. Following the November plan team meeting an external reviewer located an improved fit of the model adopted by the team. The assessment author produced a revised assessment for the December 2006 Council meeting, which the SSC declined to endorse because the Plan Team had not reviewed it. The SSC did recommend that AFSC hold a workshop to examine a number of standing concerns about the assessment, including weak convergence, modeling of growth and selectivity, and procedures for estimating survey catchability (q) and/or natural mortality (M).

These issues and others were examined at the subsequent workshop in April, and at the September and November plan team meetings. A number of alternative models were fitted in advance of each meeting and examined at the meeting. The SSC reviewed a suite of models at the October meeting. At that time the most serious concern about the assessment was the validity of the age data. The Age and Growth Unit at AFSC expressed confidence about the accuracy of the ages, but model fits including the age data failed to match the first few modes in survey length distributions, suggesting that some of the ages of young fish were being read a year too high. A second issue in October was whether or not to estimate M within the model. The SSC expressed skepticism about these estimates and asked to see one model fit with the old fixed value M=0.37 and another fit with a fixed value based on life history theory.

The four candidate models in the 2007 SAFE differ in a number of ways from the ones reviewed in October. Perhaps most importantly, changes in the method of incorporating survey age data (from joint age/length compositions to marginal age compositions) and survey CPUE (from CPUE in weight to CPUE in number) have produced good agreement between predicted and observed survey length compositions of young fish. The authors have not yet investigated why this is the case, but doubts about the validity of the age readings are lessened. Models 1-3 are similar to previous assessments in terms of population trends and predictions. They differ only in regard to natural mortality: in Model 1, M is fixed at 0.34, a value based on life history theory as suggested by the SSC; in Model 2, M is fixed at 0.37, the previous fixed value, also as suggested by the SSC; and in Model 3, M is estimated internally to be M=0.22. Model 4, developed in response to public comment, differs from the others in a number of ways. Most importantly, it does not include the age composition data in the fit and it models some of the selectivities differently. None of the models uses commercial CPUE or longline survey CPUE data for abundance estimation, but some catchability parameters are calculated analytically so that the model

predictions can be compared with the data. Model fit with longline data is poor, meaning that the longline data show different trends from the commercial and survey trawl data.

This is a challenging assessment. Several kinds of data are available and they are inconsistent in some respects. In this situation the model estimates of biomass inevitably depend on what data are included and how they are weighted. This is not uncommon in stock assessments. The cod assessment is still a work in progress, but the present assessment is the result of a lot of hard work by a number of highly qualified people.

The author and the Plan Team prefer Model 1, and the SSC agrees. All the other models have internal estimates of natural mortality, and we remain doubtful about the reliability of estimates of M obtained by model fitting when catchability is also a free parameter. Experience has shown that such estimates can be highly variable, and the range of values displayed by Models 3 and 4 (0.22-0.46) illustrates the hazard in this case. In fits of any given model, biomass estimates are usually quite sensitive to the value of natural mortality, as is the calculated value of target fishing mortality rates such as $F_{40\%}$. Adopting a policy of estimating natural mortality by model fitting is therefore likely to lead to large year-to-year variations in ABC, to no purpose. We favor the previous policy of choosing a reasonable value and sticking with it. The value chosen for Model 1 is reasonable, and is very close to the old fixed value.

Another reason for preferring Model 1 over Model 4 is that it makes use of the age data (although not fitting them very well). Age data are usually much more informative than size data and therefore should not be set aside absent clear evidence of bias. Some questions have been raised about the cod age data, but the readings have been reconsidered and rechecked by the AFSC age readers, and they stand by them. We rely on ages read the same way in other assessments. We should continue to rely on the cod ages until we find something more than circumstantial evidence of a bias.

While endorsing Model 1 in principle, we accept the point made in public testimony that Model 1 overestimates historical recruitment because the recruitment time series effectively includes the estimates of recruitment used to construct initial conditions, and therefore are outside the intended range of recruitments (1977-present). In addition, estimates are complicated by other features of the way that the SS2 software initializes the 1977 stock. **An accurate estimate of average recruitment would reduce the estimate of present depletion of the stock and raise the ABC by 20-30%, to around the level of the 2007 ABC (176,000 mt).**

While the recent trawl survey trend has been downward and present biomass is low relative to the mid 1980s, the model indicates that the spawning biomass will be on an upward trend from 2008. This suggests keeping ABC where it is for the time being and the SSC therefore recommend that ABC remain at 176,000 t in 2008/09 and OFLs for 2008/09 also rollover the 2007 OFL value of 207,000 t (Table 1).

The SSC continues to support the idea of estimating a fixed natural mortality rate external to the assessment on the basis of life history theory. In the next assessment we would like to see some discussion of the alternatives considered for estimating M outside the model and the rationale for the author's choice.

Flatfish

The SSC acknowledges the authors of the flatfish assessments for their responsiveness to previous SSC comments and applauds the considerable amount of work that has been devoted to improving the models over the past year.

With the notable exception of Greenland turbot, all flatfish stocks are currently at high levels of abundance and are either stable or increasing. Age-structured models are used to assess all flatfish stocks except the "other flatfish" category. In most cases, the models appear to provide a reasonable fit to the data and both yellowfin and rock sole currently qualify for Tier 1 management. For these Tier 1 stocks, authors examined sensitivity to various assumptions about selectivity, catchability, natural mortality, and recruitment variability. While F_{MSY} within any given model appears to be very well estimated (particularly for rock sole), estimates vary considerably among models. In particular, assumptions about recruitment variability and the length of spawner-recruit data series included in the analysis affect both the estimates of F_{MSY} and its uncertainty.

The SSC notes that flatfish assessments were reviewed in 2007 by the Center of Independent Experts and we request that results from the review and the authors' responses be presented to the SSC at a future meeting, if possible as a special agenda item at the February SSC meeting in Seattle.

SSC comments to all flatfish authors

- Structural uncertainty and uncertainty about recruitment trends in several flatfish species highlight the need for management strategy evaluations, which are under development for several species. The SSC encourages further development of the MSE analyses and looks forward to seeing their results.
- As noted last year, an examination of the relationship between bottom temperature and q for all flatfish species would be useful to standardize the treatment of bottom temperatures in the assessments. The recent cold years should provide additional contrast for this analysis.

Yellowfin Sole

The assessment is a straightforward update of the 2006 assessment. Different configurations of last year's preferred model were used to examine the sensitivity of Tier 1 reference points (F_{MSY} and its uncertainty) to different assumptions about selectivity, catchability, natural mortality, and recruitment variability. Uncertainty in F_{MSY}, as measured by the proportional reduction in the harmonic mean relative to the geometric mean, was most sensitive to recruitment variability.

The base model with M fixed at 0.12 and survey catchability q modeled as an exponential function of average annual bottom temperature was selected by the authors and the Plan team for ABC calculations. The SSC determined in December 2006 that the stock qualifies for management under Tier 1a, which resulted in a substantial increase in the ABC over the previous year. Further increases in ABC are seen in this year's 2008/09 Tier 1a estimates.

The SSC concurs with the Plan Team's recommended 2008/09 ABC and OFL estimates (Table 1) but, as noted last year, the potential for significant increases in TAC has implications for bycatch in other fisheries.

SSC comments to the assessment authors:

- The SSC appreciates the author's efforts to continue an exploration of the robustness of Tier 1 management when changes in productivity occur and looks forward to reviewing results of these MSE analyses in the future.
- The SSC last year suggested the need for separating the dynamics of male and female yellowfin sole in the model and looks forward to results from a split-sex model that is slated to be developed next year.

- The SSC notes that selectivity is assumed to be constant over time and encourages the authors to evaluate the assumption of constant selectivity
- The ecosystem considerations table (p. 461) erroneously refers to rock sole instead of yellowfin sole
- Table 4.9: q should have a subscript for year (q_t) and the terms for 'qlike' and 'mlike' should be labeled as priors rather than likelihood components.
- See comments to all flatfish authors

Greenland Turbot

The assessment was a straightforward update of the 2006 assessment with recent catch and survey data. Survey data include biomass estimates from the shelf and slope trawl surveys and an aggregated longline survey index for the EBS and Aleutian Islands region. The slope trawl survey, last conducted in 2004, has been assumed to index 75% of the Greenland turbot stock in US waters based on earlier analyses. Compared to most flatfish assessments, model fits to the size composition data are relatively poor. The reasons for this are not well understood but could include small sample sizes, variability in the availability of different size classes to the surveys, or variability in natural mortality.

While the stock qualifies for Tier 3 assessment, the authors and Plan Team for several years have recommended a more conservative approach than the maximum permissible ABC that bases F_{ABC} on the 5-year average catch and computes the OFL under Tier 3.

The SSC concurs with the Plan Team's recommended 2008/09 OFLs and ABCs using this approach (Table 1). The SSC also supports the recommendations for regional ABC apportionments. However, the SSC requests strengthening the rationale for the more conservative approach in next year's assessment or considering the maximum permissible ABC under Tier 3.

The SSC re-iterates the potential importance of the slope trawl survey and concurs with the Plan Team recommendation that the survey be conducted in 2008.

Comments to the assessment authors:

- The SSC notes several lack-of-fit issues such as the poor fit to size data, and residual patterns in survey abundances. We encourages the authors to explore differences in availability to the surveys over time, for example by examining the spatial distribution of different size classes to the extent data are available.
- The Plan Team notes that the author will attend a workshop on management strategy evaluation for Greenland turbot in the Atlantic. As this is the same species in both the Atlantic and Pacific, a brief comparison of management strategies may be a useful addition to next year's assessment.
- The SSC requests that the author evaluate the importance of the slope survey data to the current model.
- The SSC appreciates the inclusion of archival tag data showing extensive daily vertical migrations of Greenland turbot.
- See comments to all flatfish authors

Arrowtooth Flounder

The assessment is a straightforward update of the 2006 assessment to include new data from the 2007 EBS shelf trawl survey. The assessment for the first time includes Aleutian Island survey data, thereby increasing abundance estimates. Recent survey and model estimates have been the highest in the time series and continue the increasing biomass trend. Although Kamchatka flounder have been separated from arrowtooth flounder in the survey in recent years, the two species are not distinguished in the fishery and

are assessed as a single stock. As in previous assessments, a range of natural mortality values for males was explored and the author and Plan Team recommend a higher natural mortality for males (0.33/yr) compared to females (0.2/yr) to account for the preponderance of females in the surveys and fishery.

Considerable structural uncertainty in the model remains and several data components are poorly fit by the model. For example, the magnitude of the observed increase in shelf survey biomass from 1982 to 1994 is greatly underestimated in the model. The SSC concurs with the author and Plan Team's recommendation that some of the structural uncertainties should be resolved before further considering Tier 1 management for arrowtooth.

The author and Plan Team recommend management under Tier 3 using a model with a higher male than female mortality (M = 0.33 and 0.2, respectively) and a survey catchability that was fixed at 1 overall and partitioned among three survey areas (shelf, slope, Aleutians). The model results suggest that the stock is at a high and increasing level of biomass. **The SSC concurs with the authors' and Plan Team's recommended 2008/09 ABCs and OFLs under Tier 3a (Table 1).**

The authors included an expanded ecosystem considerations section in response to a previous SSC request. The SSC appreciates the author's summary of the trophic role of arrowtooth flounder and their role in the ecosystem. The high trophic level of arrowtooth flounder highlights their importance as a predator on both juvenile and adult walleye pollock, as well as on juvenile Atka mackerel in the Aleutians.

Comments to the assessment authors:

- The SSC looks forward to further development of the model along the lines suggested by the authors to resolve some of the structural uncertainties. In particular, reasons for the model consistently underfitting shelf survey biomass in the mid-1990s should be explored. For example, change in the relative proportions of arrowtooth flounder on the shelf and slope (in addition to those accounted for by a temperature effect) may account for a much more rapid increase in survey biomass estimates relative to the model.
- see also comments to all flatfish authors

Northern Rock Sole

The assessment this year is a straightforward update of last year's assessment. When both M and q were estimated in the model, as in last year's preferred model, an unrealistic estimate for q was obtained. Therefore q was fixed at last year's estimate (q = 1.5, M = 0.15). Unlike for other flatfish species, no apparent temperature effect was found on survey catchability. The stock is lightly fished and appears to be in good condition overall.

Last year, the SSC determined that this stock qualifies for management under Tier 1 based on MSY and F_{MSY} values calculated from a spawner-recruit relationship. The authors examined 3 different time periods for fitting a spawner-recruit relationship (1978-1988, 1989-2001, 1978-2002), which results in quite different estimates of F_{MSY}. **As for yellowfin sole, F_{MSY} and uncertainty in F_{MSY} are quite sensitive to changes in the assumptions about recruitment variability, emphasizing the need for management strategy evaluation.** The author and Plan Team recommend using the full period of spawner-recruit data (1978-2002) for estimating F_{MSY} because using a shorter recent period resulted in unrealistic estimates of B_{MSY}. The SSC concurs with this recommendation and notes that this is consistent with the use of post-1977 regime shift recruitments in other stocks. **The SSC concurs with the author's and Plan Team recommended 2008/09 ABCs and OFLs under Tier 1a (Table 1).**

Comments to assessment authors:

- The SSC appreciates the author's discussion of the trophic role of rock sole in the Eastern Bering Sea and other ecosystem considerations.
- We look forward to seeing a split-sex model in the future
- Because of the very small buffer between ABC and OFL, reflecting very little uncertainty in the estimates of F_{MSY} from a single model, the SSC emphasizes the continuing need for considering several alternative models in future assessments and in MSE analyses.
- Table 7.8 should be updated to include 2007 data.
- Table 7.9 should clarify that the terms for q and m reflect priors, not likelihood components!
- see also comments to all flatfish authors

Flathead Sole

The new assessment was a straightforward update of the 2006 assessment to include new 2007 survey and fishery data. The authors considered four models that differed with respect to whether they included a Ricker SR curve (v.s. assuing that recruitment is independent of stock size) and whether they allowed q to vary with temperature or not. The model with no spawner-recruit relationship and with a temperature-dependent q was the preferred model.

This was one of the stocks recommended for Tier 1 by the SSC. The authors discussed the potential confounding between environmental effects and density-dependent effects and felt that a reasonable estimate of F_{MSY} could not be obtained. The SSC concurs with the authors and Plan Team that further work is necessary before the stock can be considered for Tier 1 management.

This stock qualifies for management under Tier 3 and the SSC concurs with the authors' and Plan Team's recommended OFLs (based on $F_{35\%}$) and ABCs (based on $F_{40\%}$) under Tier 3a for 2008/09 (Table 1).

The Plan Team recommended removing Bering flounder from the assessment and including it in the "other flatfish" category, although Bering flounder cannot be distinguished in older catch and survey data. This would address concerns over excessive harvest rates on Bering flounder, although the authors found little indication that the fishery overlaps with the northerly distribution of this species. **Nevertheless, the SSC supports the removal of Bering Flounder from this assessment to address any concerns about relative productivity of the two species.** However, we note that the Bering flounder has a more Arctic distribution than most of the species in the 'other flatfish' group. Therefore, the Plan Team should consider breaking out an "Arctic other flatfish group" from the 'other flatfish' group, which primarily contains species found in subarctic waters.

Comments to assessment authors:

- See comments to all flatfish authors

Alaska Plaice

This year's assessment is a straightforward update of last year's assessment with updated input data. In response to a previous SSC request, length bins and the length-age transition matrix were extended from 45 to 60 cm.

The authors evaluated the use of stock-recruit models within the assessment but found large uncertainties in estimates of stock productivity and F_{MSY}. The SSC concurs with the author's conclusion that it is

premature to use estimates of F_{MSY} for management under Tier 1 at this point. The stock is lightly exploited and variability in biomass is primarily a function of recruitment trends.

The stock qualifies for management under Tier 3. The SSC concurs with the author's and Plan Team recommendations for OFL (based on $F_{35\%}$) and ABC (based on $F_{40\%}$) under Tier 3a for 2008/09 (Table 1).

Comments to the assessment authors:

- The SSC looks forward to results from a split-sex model in 2008.
- See also notes to all flatfish authors

Other Flatfish

Survey biomass estimates are the principal data sources for assessing this complex, which consists of 15 species, including Dover sole, rex sole, longhead dab, Sakhalin sole, starry flounder and butter sole in the EBS and Dover sole, rex sole, starry flounder, butter sole, and English sole in the AI.

Starry flounder dominates the survey catch in the EBS, while rex sole is the major species in the AI. The dominant species differ between the BS and AI, but the complex is managed with a single TAC. The SSC re-iterates suggests monitoring the relative composition of the harvest versus the survey in each area.

This complex qualifies for management under Tier 5. The assumed rates of natural mortality are based on the best available data (rex sole = 0.17, Dover sole = 0.085, remaining species estimated at 0.20). **The SSC concurs with the authors' and Plan Team's recommended OFLs (based on F = M) and ABCs (based on F = 0.75 M) for 2008/09 (Table 1).**

Comments to the assessment authors:

- See also comments to all flatfish authors and the discussion of moving Bering flounder from the flathead sole assessment to the other flatfish group (see "Flathead sole" section above.

Rockfish

Full assessments of rockfish in the Bering Sea/Aleutian Islands area are now conducted on a biennial basis, coinciding with even year surveys in the Aleutian Islands and the eastern Bering Sea slope; hence, full assessments were not conducted in 2007 for these stocks. For this reason, responses to the December 2006 SSC comments, with one exception, are being deferred by the SAFE authors to next year's assessment documents.

Pacific Ocean Perch (POP)

Projections for spawning stock biomass for BSAI POP for 2008 and 2009 have been revised from last year with addition of 2006 and 2007 fishery catch data. Female spawning biomass is projected to decline slightly (about 1%) each year for the next two years, resulting in slightly lower ABC and OFL levels for 2008 and 2009. **The SSC agrees with the Plan Team's recommendation for tier 3a status and the projected ABC and OFL levels for 2008 and 2009, as well as the area apportionments of ABC to the four areas (eastern Bering Sea, as well as the eastern, central, and western Aleutian Islands), which are based on the same percentages approved in 2006 (Table 1).**

In December 2006 the SSC noted with concern that the depth distribution of fishing effort was shown to increase. The authors investigated this anomaly and discovered that this was simply a result of an error in the way in which data were accessed in the Observer database. The SSC appreciates the authors' efforts to resolve this issue.

Northern Rockfish

The projection model of total stock biomass for BSAI northern rockfish was run with updated estimates of fishery catch for 2006. Biomass is projected as quite stable in the next two years. **The SSC agrees with the Plan Team's recommendation for tier 3a status and the projected ABC and OFL levels for 2008/09 (Table 1).**

Shortraker and Rougheye Rockfish

There are no new survey results for shortraker and rougheye rockfish for 2007; hence, the specifications for 2008 and 2009 are based on the biomass projected in 2006 for 2007 and 2008. The stock assessment authors consider information on genetics as well as size and age structure that appear to indicate stock separation for rougheye rockfish between the Aleutian Islands and the eastern Bering Sea. However, the authors note that rougheye rockfish are taken in proportion to biomasses in each area, suggesting that area apportionments are not needed as long as the catches remain proportional to area biomass estimates. Stock separation for shortraker rockfish across the management areas is not apparent.

The SSC agrees with the Plan Team recommendations to continue with tier 5 management with area-wide specifications. The SSC also supports the 2008/09 rollover estimates for ABC and OFL levels for both species (Table 1).

Other Rockfish

Biomass estimates are rollovers from last year, such that the catch specifications are unchanged from last year. **The SSC agrees with the Plan Team recommendation to continue with tier 5 management for this group, comprised primarily of short-spined thornyheads and dusky rockfish. The SSC supports the continuation of area-wide OFL and separate ABCs for the eastern Bering Sea and Aleutian Island areas. The SSC agrees with the Plan Team recommendations for OFL and ABC levels for 2008 and 2009 (Table 1), noting that the 2009 area-wide OFL and the Aleutian Islands ABC are lower than the 2008 levels due to the removal of dark rockfish, which is expected to occur by that year.**

Atka Mackerel

The assessment completed in 2007 for Atka mackerel in the Aleutian Islands is based on the same model used in the past 2 years (Model 4). The SSC notes that NMFS has submitted a proposal to the Center for Independent Experts to conduct a review of the Aleutian Islands Atka mackerel assessment, and that this is the reason for staying with Model 4 for another year.

New information incorporated for this assessment includes 2006 catch data, 2006 age data from the fishery and the AI trawl survey, and 2006 fishery and survey weight at age data. Selectivity at age for population projections was updated from a series based on 2001-2005 to a series based on 2002-2006 data. As in the GOA SAFE, the BSAI SAFE includes an expanded section on ecosystem considerations, and the SSC commends the authors for including both the narrative and the table of ecosystem effects (Table 15.14)

Female spawning biomass in 2008 is projected to decline about 15% from the 2007 projection to 110,200t, but to remain above $B_{40\%}$ (94,100t) such that the AI stock remains in tier 3a. Spawning biomass is projected to continue to decline to 89,900t in 2009, placing the stock in tier 3b in that year. **The SSC concurs with the designations of tier 3a in 2008 and tier 3b in 2009, and supports the recommendations of the Plan Team and stock assessment authors for ABC and OFL levels in 2008 and 2009 (Table 1). The SSC also supports the area apportionment of ABCs to the three AI management areas based on the 4 most recent surveys.**

SSC Comments to the Atka mackerel stock assessment authors:

The SSC asks that the stock assessment authors refer to the request above for assessment of the stock status relative to the $B_{20\%}$ reference point set as part of Steller sea lion conservation measures.

Squid

The SSC accepts Plan team and authors' recommendations for squid using Tier 6 for establishing 2008-2009 ABCs and OFLs (Table 1). The SSC supports, setting the OFL equal to the average catch over the period 1978-1995, and the ABC equal to 75% of this value. The SSC recognizes that reliable biomass estimates do not exist, but that catch data on the squid complex are reliable.

Other Species

Sculpins, skates, sharks, and octopus comprise the "other species" group. The SSC supports the Plan Team recommendation for using tier 5 criteria for sculpin and tier 6 criteria for sharks and octopus. The assessment authors proposed the use of the maximum incidental catch for octopus in the proposed "other species" plan amendment so as not to constrain fisheries that unintentionally take octopus as bycatch. Octopus contributes only a small portion of the complex ABC and OFL, and therefore the SSC felt it was unnecessary to make changes to current methods. **The SSC disagrees with the Plan Team and authors' recommendation to move Alaska skate under Tier 3 due to ongoing skate assessment concerns SSC discussed during the October, 2006 meeting.** In particular, the lack of fit of the model to survey biomass trends and growth are the main concerns. The SSC recommends using the tier 5 criteria to specify skate harvest levels. Thus, the ABC and OFL contributions of skates to the "other species" ABC and OFL for 2008/09 are 37,600 t and 50,100 t, respectively. **The SSC recommends setting the 2008 and 2009 OFL and ABC for other species category to 104,000 and 78,100 respectively.**

D-1 (e) GOA SAFE and Harvest Specifications for 2008/09

Diana Stram (NPFMC) and Jim Ianelli (NMFS-AFSC) presented the GOA plan team report and recommendations for GOA groundfish. The following table (Table 2) summarizes the SSC recommendations for ABC and OFL for 2008/09 for GOA groundfish. Specific SSC comments on the assessments follow the table.

Table 2. SSC recommendations for GOA groundfish OFL and ABC for the 2008-09 fisheries (mt). (Text in bold indicates where SSC recommendations differ from the plan team recommendations.)

Stock/Assemblage	Area	2007				2008		2009	
		OFL	ABC	TAC	Catch	OFL	ABC	OFL	ABC
Pollock	W (61)		25,012	25,012	18,012		17,602		23,700
	C (62)		20,890	20,890	19,366		19,181		25,821
	E (63)		14,850	14,850	14,315		13,640		18,367
	WYAK		1,398	1,398	86		1,517		2,042
	Subtotal	87,220	62,150	62,150	51,779	72,110	51,940	95,940	69,930
	EYAK/SEO	8,209	6,157	6,157	0	11,040	8,240	11,040	8,240
	GOA Total	95,429	68,307	68,307	51,779	83,150	60,180	106,980	78,170
Pacific Cod	W		26,855	20,141	13,227		25,932		25,932
	C		37,873	28,405	23,404		37,901		37,901
	E		4,131	3,718	65		2,660		2,660
	GOA Total	97,600	68,859	52,264	36,696	88,660	66,493	88,660	66,493
Sablefish	W		2,470	2,470	1,996		1,890		1,727
	C		6,190	6,190	5,536		5,500		5,026
	WYAK		2,280	2,280	1,769		1,950		1,782
	SEO		3,370	3,370	3,238		3,390		3,098
	GOA Total	16,906	14,310	14,310	12,539	15,040	12,730	12,924	11,633
Deep-water flatfish	W		420	420	8		690		707
	C		4,163	4,163	247		6,721		6,927
	WYAK		2,677	2,677	2		965		995
	EYAK/SEO		1,447	1,447	10		527		543
	GOA Total	10,431	8,707	8,707	267	11,343	8,903	11,583	9,172
Rex sole	W		1,147	1,147	413		1,022		948
	C		5,446	5,446	2,432		6,731		6,241
	WYAK		1,037	1,037	1		520		483
	EYAK/SEO		1,470	1,470	0		859		796
	GOA Total	11,900	9,100	9,100	2,846	11,933	9,132	11,065	8,468

Stock/Assemblage	Area	2007				2008		2009	
		OFL	ABC	TAC	Catch	OFL	ABC	OFL	ABC
Shallow-water flatfish	W		24,720	4,500	281		26,360		26,360
	C		24,258	13,000	7,761		29,873		29,873
	WYAK		628	628	0		3,333		3,333
	EYAK/SEO		1,844	1,844	0		1,423		1,423
	GOA Total	62,418	51,450	19,972	8,042	74,364	60,989	74,364	60,989
Flathead sole	W		10,908	2,000	696		12,507		13,001
	C		26,054	5,000	2,407		28,174		29,289
	WYAK		2,091	2,091	2		3,420		3,556
	EYAK/SEO		57	57	0		634		659
	GOA Total	48,658	39,110	9,148	3,105	55,787	44,735	57,962	46,505
Arrowtooth flounder	W		20,852	8,000	3,134		30,817		31,080
	C		139,582	30,000	21,808		167,936		169,371
	WYAK		16,507	2,500	63		15,245		15,375
	EYAK/SEO		7,067	2,500	68		12,472		12,579
	GOA Total	214,828	184,008	43,000	25,073	266,914	226,470	269,237	228,405
Pacific Ocean Perch	W	4,976	4,244	4,244	4,428	4,376	3,686	4,397	3,704
	C	8,922	7,612	7,612	7,125	9,717	8,185	9,764	8,225
	WYAK		1,140	1,140	1,242		1,100		1,105
	SEO	3,260	1,640	1,640	0		2,028		2,038
	E(subtotal)	3,260	2,780	2,780	1,242	3,714	3,128	3,732	3,143
	GOA Total	17,158	14,636	14,636	12,795	17,807	14,999	17,893	15,072
Northern rockfish	W		1,439	1,439	1,107		2,141		2,047
	C		3,499	3,499	2,982		2,408		2,302
	E		0	0	0		0		0
	GOA Total	5,890	4,938	4,938	4,089	5,430	4,549	5,120	4,349
Rougheye rockfish	W		136	136	71		125		124
	C		611	611	175		834		830
	E		241	241	153		327		325
	GOA Total	1,148	988	988	399	1,548	1,286	1,540	1,279

Stock/Assemblage	Area	2007				2008		2009	
		OFL	ABC	TAC	Catch	OFL	ABC	OFL	ABC
Shortraker rockfish	W		153	153	193		120		120
	C		353	353	155		315		315
	E		337	337	244		463		463
	GOA Total	1,124	843	843	592	1,197	898	1,197	898
Other Slope Rockfish	W		577	577	252		357		357
	C		386	386	319		569		569
	WYAK		319	319	49		604		604
	EYAK/SEO		2,872	200	45		2,767		2,767
	GOA Total	5,394	4,154	1,482	665	5,624	4,297	5,624	4,297
Pelagic shelf rockfish	W		1,466	1,466	595		1,003		986
	C		3,325	3,325	2,440		3,626		3,566
	WYAK		307	307	293		251		247
	EYAK/SEO		444	444	1		347		341
	GOA Total	6,458	5,542	5,542	3,329	6,400	5,227	6,294	5,140
Demersal rockfish	SEO	650	410	410	178	611	382	611	382
Thornyhead rockfish	W		513	513	338		267		267
	C		989	989	247		860		860
	E		707	707	184		783		783
	GOA Total	2,945	2,209	2,209	769	2,540	1,910	2,540	1,910
Atka mackerel	GOA Total	6,200	4,700	1,500	1,441	6,200	4,700	6,200	4,700
Big Skate	W		695	695	68		632		632
	C		2,250	2,250	1,218		2,065		2,065
	E		599	599	8		633		633
	GOA Total	4,726	3,544	3,544	1,294	4,439	3,330	4,439	3,330
Longnose Skate	W		65	65	46		78		78
	C		1,969	1,969	814		2,041		2,041
	E		861	861	240		768		768
	GOA Total	3,860	2,895	2,895	1,100	3,849	2,887	3,849	2,887

Stock/Assemblage	Area	2007				2008		2009	
		OFL	ABC	TAC	Catch	OFL	ABC	OFL	ABC
Other Skates	GOA Total	2,156	1,617	1,617	1,617	2,806	2,104	2,806	2,104
Other Species	GOA Total	NA	NA	4,500	2,695	NA	NA	NA	NA
GOA Total		615,879	490,327	269,912	171,310	665,642	535,704	690,888	555,687

Walleye Pollock

Public testimony was received from Jon Warrenchuk (Oceana). He was concerned about an increase in bycatch of several species in the pollock fishery, suggesting that harvesters were fishing closer to the bottom this year. In particular, he felt that eulachon is an important forage species and perhaps should be considered as a candidate for PSC status.

This assessment is a straightforward update of last year's assessment. The authors responded to the SSC concern last year about retrospective patterns in assessments and concluded that deviations can be both positive and negative. Indices of abundance send mixed signals, with the Shelikof Strait survey showing a decrease and the NMFS and ADF&G trawl surveys showing increases.

The assessment model is the same as the one used last year. Catchability is fixed at 1 for added precaution; previous attempts to estimate this parameter result in estimates near 0.75. There have been no significant recruitment events since 2000, so the stock has been declining. However, the strength of the two most recent year-classes may be at least average, although those estimates are highly uncertain. The 2008 female spawning biomass is about 26% of the unfished level.

As in past years, the SSC recommends that this stock be considered in Tier 3b and agrees with the constant buffer approach recommended by the authors and Plan Team, which reduces ABC from the maximum permissible. Projected ABC and OFL for 2008/09 are given in Table 2. For EYK/SEO, the calculations are done using Tier 5 methodology using natural mortality and survey biomass from the bottom trawl survey.

Pacific Cod

Work on the Bering Sea/Aleutian Islands cod assessment during 2007 preempted a fully-developed Gulf cod assessment. An abbreviated assessment was reported at the end of the Plan Team meeting in November, but the author had little time to examine it thoroughly and the Plan Team had little opportunity to review it. The Team therefore opted to revert to a Tier 5 calculation for determining ABC and OFL. That procedure was preferred over a rollover because the tier 5 calculations included the most recent biomass estimate from the 2007 bottom trawl survey and the 2007 ABC and OFL was already a rollover from the previous assessment.

The SSC discussed several alternatives for calculating an interim ABC, including a rollover of the 2007 ABC and OFL and applying a scalar correction to the 2007 bottom trawl survey biomass based on the ratio of 2005 ABC and trawl survey biomass. It seemed inappropriate to place great reliance on the 2005 Gulf assessment. The SSC concurs with the Team's comments about the importance of this assessment and the pressing need to do a full and timely assessment in 2008.

The SSC agreed with the Plan Team decision to use a Tier 5 calculation for determining 2008/09 ABC and OFL (Table 2).

Sablefish

The present assessment updated the data and considered three models. Model 1 provides an update from the 2006 split sex model where growth was only modeled in one time period with partial data from 1981-1993. Model 2 examines the implications of considering new, randomly collected samples from 1996-2004 and corrections for bias in older length-stratified data (1981-1993), as well as revised estimates of

length-at-age and weight-at-age parameters. Model 3 added informative prior distributions on the catchability coefficients for each abundance index. The authors recommend using Model 3 for the basis of setting ABCs and OFLs for 2008 and 2009 under Tier 3b.

The present assessment introduced an alternate projection model that accounts for uncertainty in the assessment. This projection propagates uncertainty throughout the assessment based on MCMC estimation and Tier 3 harvest control rules. **The SSC appreciates inclusion of this projection and encourages the continuation of research on projection methods.**

The author notes that the results of Model 3 suggest that previous assessments overestimated growth and therefore biomass, resulting in a recommended harvest rate that was higher than it should be.

The SSC endorses the use of a split by sex model configuration, the use of female spawning biomass, flexible selectivity, and the use of trawl survey data. All of these changes provide a more realistic representation of the sablefish fishery and the sablefish population. **The SSC endorses the authors' and Plan Team recommendations to accept Model 3 as the base model for estimation of biological reference points. The SSC appreciates the author's response to their request to incorporate the available growth information into the model.**

The author recommends using an alternative weighting scheme for area apportionments. The Plan Team recommended continued use of the current weighting scheme. The current method applies a 5-year exponential weighting of longline survey and fishery relative abundance indices with the survey data weighted twice as heavily as the fishery data. The SSC agrees with the Plan Team and recommends no change to the weighting scheme. The SSC echoes the Plan Team recommendation that the author should explore models that incorporate the spatial dynamics of the population to assess to what extent the change in apportionment could be incorporated into the assessment.

The stock currently qualifies for management under Tier 3b. **The SSC also agrees with the author's recommendation on a Tier 3b assignment**. The SSC agrees with the plan team's recommended 2008/09 ABC and OFLs and area apportionments for BSAI/GOA sablefish (Tables 1 and 2).

Additional SSC suggestions for the author:

- The authors note that retrospective analyses show an apparent bias in the model. The SSC requests that the authors explore this trend to determine what is causing the trend.
- The authors acknowledge that the catch rates under a IFQ system may provide an inferior index of abundance in comparison to the catch rates estimated under the previous derby fishery. The SSC agrees with the author's speculation that the IFQ system could have resulted in more selective fishing that could lead to hyperstability in the fishery CPUE. The SSC requests that the authors conduct a sensitivity analysis with and without the recent fishery CPUE data to assess the impact of inclusion of recent fishery CPUE on the assessment of stock status.
- The SSC appreciates the inclusion of forecasts for future spawning biomass and the associated uncertainty in these forecasts (Figure 3.24) and encourages continued development of this methodology.

Flatfish

All of these assessments are straightforward updates of last year's incorporating the latest data. Except for deepwater flatfish and rex sole, 2007 TAC was far below ABC. In all cases 2007 catch was well below TAC.

Rex sole is unusual in that the commercial selectivity schedule lies well to the right of the maturity schedule, so an inconceivable level of fishing mortality would be required to reduce spawning biomass per recruit to 40% of the unfished value ($F_{40\%}$=4.87). At this level of fishing mortality, ABC is the entire fishable stock, consisting approximately of age 10+ fish, amounting to some 50,000 mt. The authors and the plan team take this result to mean that there is no reliable estimate of $F_{40\%}$ because if the catch quota were set anywhere near this level the commercial selectivity schedule would surely shift to the left by some unknown amount. In view of this uncertainty, the plan team performed a Tier 5 calculation, using the maturity schedule to calculate an "adult biomass" and applying 0.75M to that to set ABC. In effect this calculation uses the maturity schedule as a commercial selectivity schedule to define a fishable biomass. It would therefore be possible to calculate $F_{40\%}$ using this schedule and move this stock into Tier 3.

The SSC endorses the plan team's 2008/09 ABC and OFL recommendations, apportionments and tier assignments for all flatfish stocks (Table 2).

Additional SSC suggestions for the author:

- The SSC recommends that the authors consider the above alternative for calculating $F_{40\%}$ and a Tier 3 ABC in the next assessment.

Rockfish

SSC suggestions for all rockfish assessment authors:
For all of the rockfish assessments, the SSC recognizes the efforts of the stock assessment authors to respond fully to the 2006 CIE review comments. The SSC requests that the draft response to the CIE review be finalized and made available.

The SSC agrees with the plan team that the shallow water strata be included in the area apportionments. However, the SSC requests that authors evaluate the impacts of this change on the apportionments for next year, along with the rationale for the change.

Pacific Ocean Perch (POP)

Gulf of Alaska Pacific Ocean Perch are assessed on a biennial assessment cycle. The assessment was conducted this year using the same modified generic rockfish model that was used in 2003 and 2005, but with new survey biomass and fishery catch data, as well as survey and fishery age data. The following changes were made to the assessment model used in 2006: 1) fishery age compositions and associated likelihood components were added, 2) the spawner-recruit relationship was removed from the estimation of beginning biomass (B_0), and 3) survey catchability q was estimated. The estimated catchability from the preferred model was 2.1.

The Gulf of Alaska POP stock qualifies for management as a tier 3 stock. The 2008 and 2009 projections of spawning biomass are both larger than $B_{40\%}$, placing the stock in Tier 3a. **The SSC concurs with the determination of tier 3a management for this stock. The SSC also supports the Plan Team and SAFE authors' recommendation for 2008/09 OFL and ABC levels, as well as the area apportionments of ABC and OFL for both years to the western, central and eastern areas, including the eastern GOA split of the ABCs to the West Yakutat and Southeast Outside areas (Table 2).**

SSC Comments to the POP stock assessment authors:

- Estimates of spawning stock biomass of POP have been increasing steadily, at least since the early 1990s, despite large variations in recruitment. The SSC appreciates the discussion of uncertainty in the estimates of M and q (Figs. 9-8 and 9-9) and the inclusion of confidence intervals on biomass (Figures 9-10 and 9-11). The SSC encourages the authors continue to project uncertainty in future spawning biomass, as shown in Figure 9-18. Given the longevity of POP, the author might consider running the projection through 2040.
- The SSC agrees with the authors that the Central Gulf Alaska Rockfish Pilot program has the potential to change the spatial distribution of fishing effort within the Central GOA. **The SSC requests that the authors include plots of the spatial distribution of the catch in future assessments. The SSC also requests that the tables of commercial catch should include estimates of discard as well as retained catch.** It was noted that the Economic SAFE provides these estimates.
- The SSC encourages continued research to collect data to verify the estimated catchability coefficient.

Northern Rockfish

Assessment of northern rockfish in the Gulf of Alaska was conducted with essentially the same model as last year with updated survey biomass data, catch data, and fishery age data. One change in model configuration was an increase in the assumed coefficient of variation from 15% to 45% for the prior on survey catchability. Another change was a change in the fishery weights for fishery age composition.

Estimates of spawning biomass have been decreasing slowly but steadily since the early 1990s, with a projected point estimate of 29,170 t in 2008 and 28,180 t in 2009. Both estimates are above the projections for $B_{40\%}$. Northern rockfish qualify for management under Tier 3a in 2008 and 2009. The authors recommend changing the apportionment methodology to include the shallow strata. The Plan Teams agreed with these recommendations. **The SSC agrees with the determination of Tier 3a for this stock, and supports the Plan Team's recommendations for ABC and OFL levels for 2008 and 2009, as well as the area apportionments for the western and central Gulf, with no allocation to the eastern Gulf (Table 2).**

SSC Comments to the northern rockfish stock assessment authors and Plan Team:

As recognized last year, the SSC again notes that the estimates of spawning biomass have low precision, as shown by the very wide confidence bounds around both the survey and model estimates (Figures 10.4 and 10.11). The SAFE authors recognize this in their remarks that the stratified random survey design does a poor job of assessing the stock, and that the issue of untrawlable survey grounds is an added concern. Given this imprecision, we suggested in our minutes from December 2006 that an evaluation of the appropriate tier level may be needed. In response, the SAFE authors suggest that the model continues to improve as more data accumulates, and that tier 3a is appropriate. The SSC accepts this rationale and looks forward to future opportunities to evaluate the performance of the assessment.

Rougheye Rockfish

The assessment model used this year is unchanged from the model used last year, but there was a substantial increase in new data added to the model. In addition to the usual updates of ongoing data, including recent fishery catch and survey biomass data, an extensive series of trawl survey age composition data extending back to 1984 was added. The additions have provided apparently more

accurate estimates of biomass, which are increased substantially from last year not because the stock size has undergone dramatic increases, but because catchability estimates for both the trawl and longline surveys have declined.

The SSC agrees with the determination of tier 3a management for this stock. The SSC supports the Plan Team and SAFE authors' recommendation for 2008/09 OFL and ABC levels, as well as the area apportionments of ABC and OFL for both years to the western, central and eastern areas of the Gulf (Table 2.

SSC Comments to the rougheye rockfish stock assessment authors and Plan Team:

- The SSC wishes to thank the assessment authors for their continued efforts to address a request we first made in our December 2005 minutes for a sensitivity analysis of the influence of the weighting of trawl and longline surveys on model fits to the data. This was done last year and this year the authors conducted further analyses with the more data enriched model. Results of this new analysis (Appendix 11A) are explained in very informative detail, with a conclusion that no changes in the weighting scheme are warranted at this time, recognizing that the trawl and longline surveys provide information on different aspects of the population. **The SSC agrees with this decision.**
- The SSC notes that the assessment approach used for mixed species groups differs in the Gulf of Alaska. In the case of northern and southern rock sole, the authors have recommended that the stock is managed in tier 4, while in the case of the two species of rougheye rockfish an age structured assessment is used and ABC and OFL is based on a tier 3 recommendation. **The SSC requests that the assessment authors work to bring forward a rationale for decisions regarding assessment of mixed species groups with attention to the potential for overfishing the weaker stock.**

Shortraker and Other Slope Rockfish

The shortraker and "Other Slope" rockfish assessments are updated with the 2007 trawl survey biomass estimates that now include the 1-100 m stratum. Information in the current assessment shows the exclusion of the 1-100 m stratum from the exploitable biomass computations for these groups is unnecessary. The assessment also uses a revised natural mortality value for silvergray rockfish due to a recent publication by Malecha et al. (2007). The SSC notes that new age results are available for shortraker, redstripe, harlequin, and silvergray rockfish and that these species could potentially be moved into Tier 4. The SSC agrees with Plan Team recommendations not to consider adjustment in tier levels until additional research and better verification of the new ages is available, along with additional age results.

The SSC agrees with Plan Team and SAFE authors recommended 2008/09n ABC and OFL for both shortraker and "Other Slope" rockfish (Table 2) along with the respective area apportionments.

Pelagic Shelf Rockfish

Pelagic shelf rockfish includes dark, widow, yellowtail and dusky rockfish. As in previous years, an age structured assessment was used to assess dusky rockfish. This year represented an update form last year's model. The authors and the Plan Team recommend that these species continue to be managed as a complex. The authors estimate the reference points for the complex as the sum of species specific ABCs and OFLs for the members of the complex. Using this practice, ABCs for dark rockfish, widow rockfish and yellowtail rockfish were estimated using a tier 5 approach, while a tier 3 approach was used to for

dusky rockfish. **The SSC agrees with this approach to management of the Pelagic shelf rockfish complex.**

The SSC notes that management of dark rockfish will be moved to the State of Alaska in 2009. This will necessitate removal of this species from the 2009 ABC and OFL calculations. The SSC agrees with the plan team recommendations for Tier assignment, area apportionment and 2008/09 ABC and OFLs for this group (Table 2).

Demersal Shelf Rockfish (DSR)

The biomass estimate for the DSR complex is estimated from a habitat-based stock assessment based on yelloweye rockfish density derived using line transects conducted from submersibles. This year's assessment incorporates new survey data from the CSEO management area and new average weight data from SEO using fish sampled from the 2007 IPHC survey. **The SSC agrees with authors and Plan Team to establish a harvest rate lower than maximum under tier 4 by applying F=M=0.02 to survey biomass and agrees with the resulting 2008/09 ABCs and OFLs and area apportionments (Table 2).**

The SSC remains concerned that the DSR stock is at risk of overfishing due to unreported discard in both the sport and commercial halibut fishery and an apparent decline in yelloweye abundance in the CSEO area. It was noted that the yelloweye survey might be discontinued or only occur intermittently. Given SSC concerns, it is unlikely that management of DSR will remain in tier 4 and this would result in lower ABC's and OFL's. The SSC strongly recommends that yelloweye survey continue on a sufficient basis to maintain a series of biomass estimates to inform management of stock status for this important complex.

SSC recommendations to authors:

- If possible, obtain yelloweye length estimates for the video survey to develop length compositions and average weight as an alternative to using mean weight from samples collected from the IPHC survey.
- Evaluate potential bias resulting from current expansion methods and investigate other alternatives.

Thornyhead Rockfish

In past years, the average of the last two trawl surveys was used to compute apportionment and ABC. In the current assessment, both authors and Plan Team recommended using only the most current survey biomass (2007). Concern was expressed that averaging would not appropriately account for the area specific decrease observed in the western GOA. It was noted that thorneyheads have relatively low CV's (4-5%) and the survey covered all depths and areas. **The SSC agrees with the Plan Team recommendations and continues to support the tier 5 calculations. The SSC also concurs with Plan Team 2008/09 ABCs, OFLs, and area apportionments (Table 2).**

It was brought to the SSC's attention that age and growth research on shortspine thornyhead is being conducted and we look forward to results following completion of this study. The SSC encourages development of an age structured assessment for shortspine thornyhead.

Atka Mackerel

Public testimony was provided by Jon Warrenchuk (Oceana), who raised the concern that the ABC calculation was based on historic catches that may have been excessive, and that the stock needs protections as an important component of the diet of Steller sea lions. For these reasons he suggested that the SSC alert the Council for the need to continue with a much reduced TAC relative to ABC.

Stock assessment for Atka mackerel in the Gulf of Alaska is on a biennial assessment schedule to coincide with the survey schedule. A new assessment was conducted this year using 2007 NMFS trawl survey data, fishery catch data (2005, 2006 as well as partial data for 2007), age data from 2006 GOA fisheries, and age data from the 2005 NMFS trawl survey. The SAFE included an expanded section on ecosystem considerations, and the SSC commends the authors for including both the narrative and the table of ecosystem considerations (Table 16.5).

Atka mackerel in the GOA have been managed as a tier 6 stock since 1996 because the biomass estimates have been judged to be unreliable for purposes of estimating allowable catches. The species is difficult to assess given its preference for rocky bottom substrates that are not well represented in the NMFS bottom trawl survey, and given the highly patchy nature of their distribution in the GOA. Lacking a swim bladder, they are also not easily assessed with standard acoustic methods.

The SSC concurs with the continued management of GOA Atka mackerel in tier 6, and supports the Plan Team and stock assessment author recommendations for ABC and OFL for 2008 and 2009 (Table 2). Recognizing the limitations of the biomass estimates and the potential that the historic catches do not represent sustainable harvest levels, the SSC encourages the Council to continue to set a conservative TAC in the GOA.

Skates

The current assessment incorporated the 2007 GOA bottom trawl survey biomass value for tier 5 calculations of ABC and OFL's. GOA bottom trawl survey biomass estimates declined for both big and longnose skate from 2005 to 2007, while other skate survey biomass increased slightly over the same time period. **The SSC supports the Plan Team's recommended apportionment of ABCs to the western, central, and eastern Gulf of Alaska and Gulf-wide OFLs for 2008 and 2009 (Table 2).**

Other Species

The SSC accepts Plant Team reasoning for setting a 4000 t catch level to meet incidental catch needs. In anticipation of a future analysis to separate other species, five preliminary stock assessments were review by the Plan Team. These assessments together with the full assessments will be used for the forthcoming FMP amendment analysis to evaluate the impact of establishing separate harvest specifications for the complex by species or in aggregate. No specifications will be established based on these assessments until the FMP amendment is finalized.

D-1 Appendix C: Ecosystem Considerations for 2008

Kerim Aydin (AFSC) provided an overview of the ecosystem considerations appendix and some additional work that was done as a result of discussions of the pollock assessments at the November plan team meetings. No public testimony was given on this agenda item.

As usual, the ecosystem chapter presents interesting "big picture" analyses. The SSC commends Dr. Aydin on his presentation and the continually developing ecosystem assessment. As more material is added to the chapter, good summaries are increasingly important; the SSC found the summary bullets in the presentation helpful. Nine new sections were added: ice seal and bowhead whale population status, groundfish pelagic trawl effort in the AI and GOA, distribution and abundance of the human population in the GOA area, response to the AI FEP, strength of eddies in the AI, distribution of rockfish along environmental gradients in GOA and AI bottom trawl surveys, trends in jellyfish bycatch from BASIS, and pot fishing effort in all areas.

The SSC appreciates the clear timeline of updated and new information on pages 13 and 14 and the responses to previous SSC comments. In December 2005, the SSC suggested that in the future the principal discussion of the Ecosystem Considerations chapter be conducted during the October SSC meeting, that there should be a brief review of the most salient points in December, with an emphasis on those findings that could impact decisions about the setting of ABCs. In practice, having all the ecosystem discussions at the December meeting is more efficient and the SSC agrees with the revised schedule. We also note that some of the 2006 SSC requests were not fulfilled and request that they continue to be listed under "responses to SSC comments" until they are dealt with. In particular, the SSC again requests that condition indices (weight-at-length, age-1 weights) be included.

The recent trends of fishing effects on the ecosystem show that no significant adverse impacts of fishing on the ecosystem relating to predator/prey interactions, energy flow/removal, or diversity were noted either in observed trends or ecosystem level modeling results. Of concern is the increased bycatch of Chinook salmon in the Bering Sea pollock fishery, and the increased bycatch of forage fish. For the first time ever, the Chinook Salmon Savings Area was closed to fishing during the pollock A season in 2006. Also the catch of forage fish increased in the BSAI and decreased in the GOA. The SSC notes that Table 1.2 of the GOA pollock chapter shows increased bycatch in that fishery but those data were not discussed in the Ecosystems chapter nor were the ecosystem implications of these removals discussed.

Recent trends in climate effects on ecosystems shows that the Bering Sea was relatively cold in winter and spring 2007 with warming in late spring and above normal upper water temperatures by summer. For a second year in a row, an extensive cold pool was present, resulting in strong thermal stratification. Despite late spring ice in the Bering Sea and probably the first ice edge bloom since 1999, the amount of sea ice in the Arctic was at a record low in summer 2007. A weak La Nina may develop for 2007/08. In the Gulf, anomalous mixing on the shelf resulted from SW winds in winter and low SLP in spring.

In this year's assessment, an extended analysis of forage production and predation vs. fishing mortality combines model results and data. The SSC agrees with the general strategy of focusing on different indices each year for fuller analysis and treatment. The ultimate goal of this strategy is to develop a set of indices to describe ecosystem status and the direction of possible future interactions.

The SSC suggests that the findings from the BEST/BSIERP programs may be useful and interesting and requests that at least a summary of that work be included in future ecosystems appendices (BEST/BSIERP start in 2008, NPRB and NSF will combine resources for three years of field research on the eastern Bering Sea Shelf, from St. Lawrence Island to the Aleutians, followed by two more years for

analysis and reporting). In last year's ecosystem chapter, the SSC was pleased to see the new zooplankton index but noted that it was not updated for this year. Zooplankton are important and yearly update of this information is desirable. Also, it would be interesting to estimate the production of forage fish in addition to their standing stock.

D-1 Appendix D: Economic Status of the Groundfish Fisheries in 2006

Kerim Aydin (NMFS-AFSC) presented an overview of the draft Economic Status of the Groundfish Fisheries in 2006. There was no public testimony on this agenda item.

The SSC commends the authors of the Economic SAFE for the obvious efforts made to expand and enhance the content of this important document—these changes are responsive to SSC requests. The SSC is encouraged about the future contribution the revised Economic SAFE format may offer to the Council and public understanding of the economic and social impacts attributable to alternative management actions.

In particular, it is important to correctly distinguish between fisheries occurring in Federal waters off Alaska, and fisheries occurring in Alaska State-waters (i.e., 0-3nm seaward of the baseline). Imprecision invites confusion. References to the "Alaska EEZ," "groundfish fisheries of Alaska," "Alaskan catch," and the like should be avoided when making references to Federal EEZ fisheries, resources, or management programs. Casual or careless use of terms may result in undesirable and avoidable misunderstandings.

D-2 Crab Overfishing

The staff presentation was given by Diana Stram (NPFMC). Public testimony was given by Frank Kelty (City of Unalaska). The revision of crab overfishing definitions has been a four-year process with many meetings, novel scientific research, a workshop, several reviews and a major commitment of time by the Crab Plan Team and Crab Workgroup. The SSC congratulates the Team and Workgroup for work well done and for bringing the revision to fruition. **The document has been revised in response to previous SSC comments and is well written and complete. It is clearly sufficient for aiding the Council in making its decision.**

The SSC usually does not participate in "final action" items, because it does not deliberate on policy decisions. However, in this case, the policy decision involves the use of science in defining overfishing and tasking for the SSC in the future, so the SSC involvement is appropriate. **First and foremost, the SSC is convinced that the current overfishing definitions do not provide sufficient flexibility, so Alternative 1 is clearly unacceptable.**

The choice between Alternative 2 (five-tier system) versus Alternative 3 (six-tier system) essentially involves how to handle data-poor species. Stock structure, genetics, and stock status for many of these species are poorly understood, making it difficult to come up with a standard way to specify OFL. However, the document does show that it is possible to develop OFL levels for all of these stocks, particularly under a 6-tier system. Option A removes 12 stocks from the FMP for which there is either: 1) no directed fishery, 2) harvest occurs incidentally during fisheries targeting crab stocks, 3) harvest only occurs in limited exploratory fisheries, or 4) the majority of catch occurs in State waters. The main advantage of this option is that it simplifies the consideration of OFL, in that Alternative 3 (the six-tier system), would no longer be required. The selection of Option A reduces the amount of scarce staff and Council time that will be needed in the future to prepare and review assessments and the SAFE. If these stocks are removed from the FMP, the SSC does not foresee any conservation concerns arising in the near-term.

The potential downside of selecting Option A is that it takes away the ability of the Council and the Federal government to be involved in management of these stocks unless a plan amendment is adopted to bring some stocks back into the FMP. As an example, future tagging or genetic studies might demonstrate that some of these 12 stocks are parts of a FMP stock. The FMP stock management strategy might have to be adjusted to account for removals in both segments of the population. There would also be less incentive to measure bycatch of these stocks in Federal fisheries. **Ultimately, the choice of Option A versus Option B is primarily a policy call involving management authority and not one involving a conservation concern. If Option A is selected then there is no need for a six-tier system (Alternative 3).**

If Option A is not adopted, then a choice needs to be made between Alternative 2 and Alternative 3. The additional tier 6 in Alternative 3 sets a default OFL of 0 in terms of retained catch for data-poor stocks with insufficient catch history. Thus, Alternative 3 provides a system that eases the OFL determinations for the stocks listed in Option A.

There is also a decision to be made about timing for stocks that rely on trawl survey abundance. Option 1 would set OFLs in June before the trawl survey using last year's information, while Option 2 would set OFLs in the fall before the state of Alaska sets GHLs on October 1. Because of the volatility in crab population size from year to year, setting an accurate OFL can only be done if the data from the trawl survey in the same year are available. Otherwise, the population could easily be projected too high or too low. **Therefore, the SSC recommends that Option 2 be adopted.**

In discussion with staff, it is clear that there are implementation issues still to be resolved. Adoption of this amendment will create additional work for Council, NMFS, and State staff, as well as creating a more involved process for the Council family. The SSC recommends that Council, NMFS, and State develop an implementation plan as soon as possible that details the phasing-in of assessments, how the review process will work, and what additional staff resources may be required.