

North Pacific Fishery Management Council

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MINUTES Scientific and Statistical Committee September 16-18, 1996

The Scientific and Statistical Committee of the North Pacific Fishery Management Council met September 16-18, 1996 at the Centennial Building in Sitka. All members were present:

Keith Criddle, Chair
Al Tyler
Harold Weeks
Phil Rigby
Marc Miller
Terry Quinn

Jack Tagart, Vice-Chair
Rich Marasco
Jim Balsiger
Sue Hills
Doug Larson
Doug Eggers

B-5 IFQ REPORTS

Evaluation of IFQ implementation is of critical importance. Reports and analyses of the IFQ program deserve rigorous review before they are adopted as a basis for policy. Careful review will determine if appropriate methods and data were used and what conclusions can be supported. It is not apparent that the documents presented to the Council have received adequate review. In addition, to the extent possible, emotion laden appellations such as "speculators" and "leftouts" should be avoided in documents that the Council incorporates in an evaluation of the IFQ program.

The SSC encourages the Council to form a working group to examine the suite of reports with the goal of identifying the additional information and analyses needed to evaluate the benefits and impacts of the IFQ program. Members of the SSC Socioeconomic subcommittee would be pleased to participate in such a working group and could recommend qualified reviewers.

B-6 BERING SEA ECOSYSTEMS REPORT

The NRC Bering Sea Ecosystem report provides a good summary of information about the Bering Sea. **The report strives to generate new ideas rather than to provide a rigorous proof of the causes and effects in the ecosystem over time.** The description of the physical system is superb and the compilation of information about various biological resources is useful. For the most part, the committee included appropriate caveats for their speculations. However, there are some weaknesses in their arguments and recommendations. For example, the report speculates that local depletions of pollock may have contributed to marine mammal and seabird declines. There is no evidence that this is true, as the report admits. Further, some statements in the volume are inaccurate and show lack of understanding of the Council management process. *One glaring example is on page*

243: *"For example, in decisions about the size of commercial fishing levels, the focus may have been on employment and current resource utilization and allocation patterns, whereas little attention may have been directed at the effects of current fishing levels on future productivity."* The SSC asserts that the Council has always shown concern for future productivity by setting TAC's below ABC levels and knows of no circumstance where employment levels, utilization, and allocation patterns have taken precedence over biological resource considerations. Moreover, the ABCs recommended to and adopted by the Council represent harvest strategies selected for their focus on maintaining the long-term productivity of harvested populations.

The spirit of the report is similar to the direction that the Council itself is moving in, as evidenced by the Ecosystem Considerations chapter in SAFEs, consideration of forage fish, and formation of the Ecosystem Committee. The report suggests that adaptive management experiments could be used to generate the understanding needed to move towards ecosystem management. The SSC urges the Council to move slowly and cautiously in pursuing adaptive management because irreversible changes could occur if the experiments are improperly designed. Moreover, without careful structuring, adaptive experiments may be uninformative.

The report advances the "cascade" hypothesis to explain changes in the Bering Sea ecosystem. The hypothesis suggests that removals of whales and fishes (such as POP) in the 1950's-1970's created surplus production that allowed pollock to "explode" in the 1960's and fill the niches of capelin and other forage fish. The claim is that the system changed from a whale dominated system to a pollock dominated system. The SSC notes that several other hypotheses can explain the observed changes and that there is insufficient information to support or refute the cascade hypothesis. The arguments for this hypothesis seem to rely on terrestrial ecology theory about niches, predator-prey theory, and competition theory. This would seem to require the assumption that species relationships are strongly enough coupled to provide direct measurable effects (See page 236.). An underlying theme in the report is that fishing for one species must necessarily have downstream effects on other species. It may be as likely that current fishing at the low exploitation rates applied by the Council, does nothing more than follow the ups-and-downs of species driven by a myriad of environmental and biological processes.

The SSC has formed a subcommittee to further evaluate the report and to glean suggestions on directions to be pursued in moving toward the incorporation of ecosystem considerations into the fishery management process. To be successful this movement requires approaches that use solid scientific principles, take advantage of experiences of all stakeholders, and show appreciation of uncertainty in the system and risk associated with decisions that are made.

C-1 CRAB BYCATCH

The SSC heard a staff report from Dave Witherell who reviewed recent industry negotiations on C. bairdi bycatch levels and the recent crab Plan Team meeting. Peggy Murphy, Plan Team chair, provided additional information regarding the Team's concerns over C. opilio recruitment, the quality of crab bycatch data and the need for increased bycatch composition sampling. Public testimony was received from Arne Thompson, John Gauvin, and Laure Jensen.

The merits and constraints of alternative PSC systems, such as percentage versus steps and averaged versus annual abundance estimates, were reviewed by the SSC in April. Development of a measure of adult equivalents to be used in the management of crab bycatch was also discussed. In response, the Plan Team has indicated that we do not have enough information to determine the best currency for C. bairdi and C. opilio. Consequently, the proposed C. bairdi caps are based on the estimated total number of bycaught crab. Although the current observer program can provide estimates of the total number of C. bairdi and C. opilio crab bycaught, **determining, the size or sex composition of bycaught crab would require observer sampling substantially beyond the limited sample counts and average weights presently being taken.** If it is determined that biomass (weight) based caps are appropriate, sampling of size, sex and reproductive condition, and partial and whole crab will be

necessary. If mortality based caps are desired (as used in determining halibut PSCs) additional sampling will be required.

The SSC recommends that the Plan Team meet with NMFS staff to discuss: (1) estimation and sampling issues associated with numbers based management systems for C. bairdi and C. opilio, and (2) the feasibility of alternative systems such as a sized based program.

The SSC notes that the stair-step method agreed to for C. bairdi has the advantage of providing stability over the range of each step at the cost of instability at the boundaries between steps.

C-2 IR/IU

The SSC heard a staff report from Chris Oliver, with additional information provided by Lew Queirolo and Steve Meyer. The SSC heard public testimony from Thorn Smith, Fred Munson, Theresa Kandianis, and Paul MacGregor.

The SSC believes the analysis contained in the EA/RIR represents the best information available on the potential impacts of the IR/IU options. However, it does not provide a quantitative basis for choosing among the options. The SSC cautions that, as noted in the EA/RIR, estimates of "discard savings" cannot be interpreted as measures of net benefits. It may be that the net economic benefits of the alternatives will be negative. Consequently, the status quo should be considered as a viable action alternative.

There are several reasons why the reported quantitative estimates are likely to overstate the benefits: (1) operating costs are not included; (2) costs of adjustment and compliance with IR/IU mandates are not included; (3) it is assumed there are no price responses in markets which will need to absorb additional products totaling about 20% of current gross product; and (4) the size distribution of the bycatch is assumed to be the same as in the target fisheries for each species.

Experience with the pollock CDQ fishery suggests that one benefit of IR/IU may be that by slowing down the fishery, industry will retain and utilize some product that is currently discarded because of the "race for fish." However, it may be less costly to achieve this objective by specifying individual or group catch quotas. The analysis indicates that there will probably be disproportionate impacts on some segments of the harvesting and processing industry. Smaller, less mobile, and less diversified operations will be most severely affected. Vessels that are unable to comply with IR/IU may be forced to leave the industry. The EA/RIR also discusses the formidable monitoring and compliance issues associated with IR/IU. The SSC is concerned that efforts to ensure compliance with IR/IU could divert observer energy from data collection efforts critical for accurate estimation of total removals of target and incidental species.

If an IR/IU option is adopted, the SSC recommends that results be evaluated through time to see whether the objectives stated in the Council's problem statement are achieved, particularly the reduction of bycatch. The SSC notes that the IR/IU alternatives appear to address the disposition rather than the minimization of bycatch.

C-3 OBSERVER PROGRAM

The SSC was unable to take-up discussion of this agenda item.

D-1 INITIAL GROUNDFISH SPECIFICATIONS FOR 1997

This is the first year that the BSAI and GOA groundfish specifications have been developed under the guidelines of Amendment 44, which revises the overfishing definition to provide a buffer between ABC and OFL and to reflect current scientific knowledge about conservative fishing levels. **Although the six Tiers defined in Amendment 44 impose increasingly conservative rules for specifying ABC for less well understood populations, even these conservative ABCs are above the 1996 TACs for most species.** As noted in our June minutes, if the Amendment had been in place in 1996 “reductions in TAC would have been necessary only for GOA rex sole, sablefish, and shortraker/rougheye rockfish and some of the BS/AI rockfish complexes.”

The initial groundfish specifications are preliminary and may change as data from the 1996 stock surveys are incorporated into the stock assessments. In particular, the GOA stock assessments may be affected by the results of the triennial survey. SSC initial recommendations for 1997 ABCs and OFLs are contrasted with Plan Team recommendations for 1997 and the 1996 TACs in the attached summary tables.

D-1(a, b) BSAI SAFE

BSAI - Pollock

Preliminary estimates of BSAI pollock 1997 biomass were determined from analyses originally presented in December 1995, with the exception of the Bogoslof area. New estimates of Bogoslof biomass were obtained from a 1996 hydroacoustic survey. Revised estimates of abundance for the EBS and AI, which will incorporate 1996 survey and fishery data, are expected in December.

Estimated biomass for the EBS pollock is 7.36 million mt. The Plan Team has recommended an ABC of 1.29 million mt. However, in December 1995, the SSC expressed concern regarding the projected recruitment used to derive this ABC. We proposed accepting an ABC based on a lower recruitment resulting in an ABC of 1.19 million mt; and, it is this estimate that we propose for 1997. This ABC is based on an $F_{40\%}$ exploitation strategy, and since current biomass is above $B_{40\%}$, it requires no adjustment.

The 1996 Bogoslof survey estimates a biomass of 680,000 mt contrasted with the 1995 estimate of 1.1 million mt. The Plan Team has recommended an ABC of 150,000 mt based on an $F_{40\%}$ exploitation rate (22%). (Note, $F_{40\%}$ 0.27, was inferred from previous estimates of $F_{30\%}$ and $F_{35\%}$). The SSC believes the Bogoslof ABC should be reduced by the ratio of current biomass to target biomass, where target biomass is assumed to be 2 million mt. Consequently, the SSC recommends a 1997 Bogoslof ABC of 51,000 mt. The corresponding overfishing level, 69,000 mt, is estimated from the $F_{30\%}$ exploitation rate (30%) adjusted by the ratio of current to target biomass.

The SSC's recommended AI ABC is also different from that proposed by the Plan Team. In 1995, the SSC added estimated biomass from the Unimak-Unalaska region, 55,505 mt, to the remaining AI biomass of 87,000 mt for a total AI biomass of 142,505 mt. At that time we applied a 25% exploitation rate to estimate the ABC. Our 1997 preliminary AI ABC is derived using this biomass and the 28% exploitation rate recommended by the Plan Team. The resultant ABC is 39,900 mt. The OFL is computed from the $F_{30\%}$ exploitation rate (33%) with a resulting value of 47,000 mt.

The SSC remains concerned regarding the expected recruitment for the EBS pollock stock. Recent removals of pollock in the Russian zone of the EBS may have contributed significantly to the exploitation of incoming year classes. We hope to see an evaluation of these potential impacts in the revised December assessment. An additional area of interest to the SSC involves the available size, sex and age data for the AI region. For years, the AI ABC has been derived simply from the trawl survey estimates of biomass. Although the AI ABC is smaller than the EBS ABC, it is by no mean inconsequential. The SSC believes the population dynamics of this stock deserves a more sophisticated examination.

The current model of stock structure on which the assessment of EBS/Bogoslof/AI pollock complex is based, should be reevaluated. The biomass of Bogoslof pollock, 1994 - 1996, is more variable than can be explained by mortality, growth and recruitment processes. This suggests that abundance of Bogoslof pollock is determined by migrations of pollock from areas other than the Aleutian Basin. The current assessment model may be overestimating the biomass of the EBS/AI/Bogoslof pollock complex, due to double counting of pollock in the winter Bogoslof and summer shelf surveys. The SSC notes that this issue can be resolved by determining the post-spawning migrations of the Bogoslof pollock, which may be available from recent Korean and Japanese surveys of the Bogoslof and Aleutian Basin areas.

BSAI - Pacific Cod

The SSC accepts the analyst's ABC as preliminary, and recognizes that the final value to be presented in at the December meeting will depend on the incorporation of the new survey data. As with last year's assessment, the SSC continues to be concerned with the estimates of M and the selectivity coefficients. This year, rather than set or constrain the values a priori, the analyst allowed the model to fit these parameter values. The SSC notes that the level of M estimated is possibly the lowest ever applied to Pacific cod. The level of M affects projected catch levels and subsequent economic benefits. The value applied in this year's assessment results in an ABC that is much lower than last year's. The assessment report notes that estimated values for M range as high as 0.70 in the Bering Sea.

The SSC requests that the analyst give additional attention to the nonstationarity of M. In addition the SSC encourages the analyst to examine whether gear selection coefficients may be confounded with estimates of M. In the preliminary assessment, selection patterns are either dome shaped or asymptotic shaped, depending on season. The SSC requests that the author provide a biological rationale for the treatment of these issues in the updated assessment. Lastly, the SSC requests that the author evaluate the effect of the change in the model versus the change in data on the estimate of projected yield.

BSAI - FLATFISH

Yellowfin sole, Arrowtooth flounder, Rock sole, Other flatfish complex, and Flathead sole

Since 1996 survey biomass information was not available, the Team used estimates from last years' assessments and applied $F_{40\%}$ exploitation rates as required by Amendment 44 to develop preliminary 1997 ABCs. The SSC supports the approach taken by the Team. OFL's were determined by applying $F_{30\%}$ exploitation rates. ABCs and OFLs by species or species group are summarized below.

<u>Species</u>	<u>ABC</u>	<u>OFL</u>
Yellowfin sole	235,000	342,000
Arrowtooth flounder	105,000	162,400
Rock sole	296,000	433,000
Other flatfish	84,000	120,000
Flathead sole	97,100	140,000

Corresponding exploitation rates were:

<u>Species</u>	<u>F_{40%}</u>	<u>F_{30%}</u>
Yellowfin sole	0.11	0.16
Arrowtooth flounder	0.22	0.34
Rock sole	0.15	0.22
Other flatfish(Alaska plaice)	0.14	0.20
Flathead sole	0.16	0.23

BSAI - Greenland turbot

The Team's recommended ABC for the 1996 season was based on results of a stock synthesis analysis. The SSC noted that the model used provided a solid basis for development of the ABC. While the SSC supported the Team's ABC (17,000 mt), that was derived by applying $F_{40\%} = 0.24$ to the mean exploitable biomass 67,000 mt derived from the stock synthesis analysis, it recommended that the higher number be phased in over a three year period. Our ABC recommendation was 10,300 mt ($67,000 \text{ mt} * 0.154$). The exploitation fraction used was derived by determining the exploitation fraction for an ABC of 7,000 mt ($7,000/67,000=0.104$), calculating the exploitation fraction for the Team's proposed 1996 ABC ($17,000/67,000=0.254$), calculating the difference between these two fractions ($0.254-0.104=0.15$), and dividing the difference by 3. Exploitation fractions developed for 1996, 1997, and 1998 were 0.154, 0.204 and 0.254. Since no new information is available, the SSC developed a 1997 ABC (13,700 mt) by applying the exploitation fractions for the second year of the phasing-in period to the mean exploitable biomass used last year (67,000 mt). The SSC supports the eastern Bering Sea and Aleutian Island split recommended by the Team, 2/3 and 1/3 respectively.

The preliminary OFL is the same as the 1996 value, 25,100 mt, that was calculated using $F_{30\%}=0.37$.

Sablefish (Combined BSAI and GOA)

The sablefish assessment is unified for the Bering Sea/Aleutian Islands and Gulf of Alaska and the preliminary ABC levels represent a substantial reduction from the 1996 specifications. This results from a combination of three factors: (1) Changes in the Council's definition of ABC and OFL under Amendment 44 ($F_{ABC}=0.086$ calculated as $F_{40\%}$ adjusted by the ratio of projected 1997 biomass and $B_{40\%}$), (2) continuing biomass declines with apparent low recruitment, and (3) a shift to an age-structured analytic model. As a preliminary specification, the SSC concurs with the Plan Teams' recommendations for Acceptable Biological Catch (ABC) and overfishing (OFL). The 1996 survey results have not yet been incorporated into the analysis; these will be incorporated into the final SAFE to be considered in December. As in the recent past, recommended ABC levels are apportioned geographically based on a weighted five year average of survey biomass distribution.

<u>Area</u>	<u>ABC</u>	<u>OFL</u>
Bering Sea	790	1,170
Aleutian Islands	890	1,320
Gulf of Alaska		
West	1,500	
Central	4,690	
W. Yakutat	2,060	
E. Yakutat	3,370	17,210 (GOA combined)
Total	13,300	19,700

The SSC commends the assessment authors for their transition to an age based assessment model. We concur with the Plan Team's request that the authors assess hypothetical levels of under-reported catch to which the model is sensitive. We also encourage the assessment authors to incorporate updated estimates of recruitment

from the 1992 and 1993 year classes for the final SAFE, and to include a table of estimated numbers-at-age for the sablefish stock.

The SSC received substantial public testimony on this report from John Marr, Jake Phillips, Jude Hensler, Mike Mayo, Ken Stump, Bob Alverson, and Neil Huff. Several individuals expressed consternation about the recommended ABC levels considering their observations of high CPUEs in sablefish fisheries. Much of the conservation concern for this species is a reflection of continuing low recruitment. A tabular presentation of numbers-at-age will help underscore this point. For future assessments, the SSC encourages authors to incorporate trawl survey length information as auxiliary information to better capture the strength or weakness of year classes not yet recruited to the fishery.

Fishery interference with long-line survey efforts seems to be declining, but continues to be a concern. The SSC encourages continued efforts to minimize future fishery-survey interference.

BSAI - Pacific Ocean Perch Complex

The SSC concurs with the Plan Team's ABC recommendations for Pacific Ocean perch (*S. alutus*), and other POP Complex species. The "true POP" ABC for the EBS, 1,550 mt, is based on estimated abundance from an age-structured model and $F_{44\%}$ exploitation rate as modified by the ratio of current stock biomass to target biomass. The OFL, 2,380 mt, is similarly derived from the application of the $F_{30\%}$ exploitation rate. In the Aleutians the "true POP" ABC is 12,200 mt. In this case the ABC is derived from simulation modeling of the projected long-term catch associated with an $F_{44\%}$ exploitation strategy. This is a departure from routine ABC setting procedures and the SSC has requested, under General SAFE Issues found elsewhere in our minutes, that the stock assessment authors and Plan Teams review this method and discuss the merits or limitations of the procedure in the December SAFE. The AI OFL, 27,300 mt, is estimated using the $F_{30\%}$ exploitation rate.

ABCs for the other POP Complex species/species groups are estimated from the application of the 0.75M rule found in Amendment 44 (Revised OFL and ABC Definitions), with OFL derived from an $M \times \text{Biomass}$ calculation. The ABC for northern/sharphin complex is 4,360 mt with an OFL of 5,810 mt. The shorttraker/rougeye complex has a preliminary estimated ABC of 938 mt, with an OFL of 1,250 mt. The recommended ABC for the remaining members of the POP Complex is 1,050 mt, with an OFL of 1,400 mt.

The SSC requests that the Plan Team evaluate whether the ABCs for the Other POP complex species should be regionally distributed as is now done for "true POP".

BSAI - Atka Mackerel

The Team's recommended 1997 ABC for Atka mackerel is 42% lower than the 1996 level. This decline is partially due to the projected decline in biomass and is consistent with last year's assessment. The decline was also due to a lower equilibrium $F_{40\%}$ resulting from a structural change in the stock synthesis model, where spawning biomass was calculated at the middle of the spawning period (i.e., August) rather than at the beginning of the year. The SSC is uncertain why the $F_{40\%}$ rates were inconsistent under the alternate methods of calculating spawning biomass and whether the new method has been applied consistently in the other GOA species stock assessments. The SSC recommends that the advantages and disadvantages of the two specifications be identified, and consistency of application of the method to other GOA species assessments be clarified before adopting the new method for estimating $F_{40\%}$.

The SSC recommends a range of ABC and OFL be specified for Atka mackerel at this time. The upper end of range is consistent with the use of spawning biomass calculated at the beginning of the year and was taken to be the prior year ABC/OFL discounted by the estimated 78% relative decrease in exploitable biomass from 1996 to 1997. The lower end of the ABC/OFL range is the Team's proposed ABC/OFL and was calculated using the

spawning biomass calculated at the middle of the spawning period. The range of ABC for Atka mackerel is 90.6 to 66.7 thousand mt, and the range of OFL is 109.3 to 81.6 thousand mt.

BSAI - Squid and other species

The SSC concurs with the Plan Team's recommendations for Acceptable Biological Catch (ABC) and overfishing level (OFL) for squid (1,970 mt and 2,620 mt respectively) and for other species (25,800 mt and 137,000 mt respectively).

Some members of the public expressed concern that squid specifications could constrain some CDQ operations even though squid harvests over the past ten years have not approached current ABC levels. This might occur if CDQ allocations of bycatch species were made in proportion to pollock.

Squid are an important forage species for marine mammals, and may be of interest for expanded future fisheries. The SSC requests the Plan Team to identify what additional information would need to be developed (and whether it is feasible to do so) to enable ABC and OFL to be based on Tier 5 of the Council's definitions of ABC and OFL. The SSC suggests that an examination of squid bycatch rates in the mid-water pollock trawl fishery may be helpful in this respect.

D-1(c) Initial VIP Standards

The SSC was unable to take-up this agenda item.

D-1(d) Draft Amendment 46

Jane DiCosimo reported on Amendment 46 separating the pelagic shelf rockfish complex. Tory O'Connell provided additional fishery information. The SSC believes that additional thought should be given to how dark and light dusky rockfish will be managed if the complex is split as proposed under Alternative 2, 3, 4. The SSC notes that Alternatives 2 and 3 create very small ABCs which may be difficult to manage and Alternative 4 requires a means to regulate harvests outside state managed waters.

The SSC recommends that the EA/RIR be released for public review.

D-1(e, f) GOA SAFE

GOA - Walleye Pollock

The SSC concurs with the Plan Team's recommendation for GOA pollock ABC and OFL. The recommended ABC for the western and central GOA is 74,100 mt with an overfishing level of 102,200 mt. Recommended ABC for the eastern gulf is 4,010 mt with an OFL of 5,530 mt.

The SSC has two requests of the Plan Team and stock assessment authors. First, we believe it is time to reevaluate the utility and influence of the bottom trawl and hydroacoustic survey data by incorporating them into the model separately and in combination. We are requesting that this analysis be completed for the 1998 stock assessment cycle. Second, while the SSC does not expect to receive information which resolves the stock structure of GOA and Prince William Sound pollock issue, we are requesting that the Plan Team re-evaluate the available evidence and recommend a harvest policy which addresses the treatment of the PWS catch relative to

GOA ABC and TAC. The SSC notes that coordination between Federal and State stock assessment and fisheries management is important for other stocks also, such as rockfish and sablefish.

The SSC heard public testimony from Chris Blackburn.

GOA - Pacific Cod

The ABC for Pacific cod in the Gulf of Alaska last year was 65,000 mt, down from 69,200 mt the year before. The Team's ABC is in line with ABC levels anticipated under low recruitment levels. The team chose 52,000 mt for 1997 by applying the proportionate biomass decrease to last year's ABC; the SSC supports this as an interim recommendation, pending incorporation of the 1996 survey results. The SSC recommends that the analyst examine the potential overparameterization problem of the stock synthesis model that he used, and develop alternatives within the model's framework.

GOA - Flatfish

ABCs developed by the Team for each species or species group in this complex were calculated by applying $F_{40\%}$ s, rather than $F_{35\%}$ s, as required by Amendment 44 to abundance estimates from the 1993 triennial trawl survey. $F_{30\%}$ exploitation rates were used to determine OFLs. The SSC agrees with the approach taken by the Team to develop the preliminary ABCs.

Species	West	Central	East	Total
Deep water	1,020	12,380	8,760	22,160
Rex sole	1,080	5,640	2,250	8,970
Shallow water	31,590	25,980	3,160	60,730
Flathead sole	<u>9,790</u>	<u>18,940</u>	<u>3,020</u>	<u>31,750</u>
TOTAL	43,480	62,940	17,190	123,610

Exploitation rates used were:

Species	$F_{40\%}$	$F_{30\%}$
Deep water	0.10	0.13
Rex sole	0.10	0.13
Shallow water		
Rock sole	0.17	0.25
Yellowfin sole	0.19	0.28
Other species	0.16	0.23
Flathead sole	0.16	0.23

GOA - Arrowtooth Flounder

The SSC supports the ABC recommended for this species by the Team, 245,790 mt. This ABC was calculated by using a stock synthesis derived 1997 exploitable biomass and the $F_{40\%}$ fishing mortality rate of 0.179. It also agrees with the spatial allocation of the ABC proposed by the Team given below.

<u>West</u>	<u>Central</u>	<u>East</u>	<u>Total</u>
35,390	175,250	35,150	245,790

The OFL for this species is 347,906 mt and the $F_{30\%}=0.26$.

GOA - Sablefish

See BSAI-Sablefish for a unified assessment and recommendation.

GOA - Slope rockfish

For regional apportionments the SSC asks the Team to review differing apportionment methods and provide adequate justification for them.

GOA - POP

The analysis is similar to last years' assessment updated by 1995 and 1996 catch data. Abundance and composition estimates from the 1996 survey were not yet available to the analysts. Current female spawning biomass was estimated as 131,896 mt, 12% below the rebuilding target of 150,000 mt. The adjusted $F_{44\%}$ as used for prior assessments, was slightly greater than that (adjusted $F_{40\%}$) specified under Tier 2b. The increase in the 1997 ABC (11,780 mt) above the 1996 ABC (8,060 mt) was primarily due to growth and an increased adjustment fraction because the population is closer to its target biomass.

GOA - Shortraker/Rougheye

Rougheye rockfish ABC (Tier 4) was calculated similarly to last year. The $F=M$ strategy was more conservative than $F_{40\%}$. For shortraker the ABC under Tier 5 was modified from $F=M$ to $F=0.75M$. The SSC recommends that before December the analysts look at exploitation for each species to determine if different rates are justified.

GOA - Northern Rockfish

No changes were made. $F=M$ is less than $F_{40\%}$.

GOA - Other Slope Rockfish

The new ABC is 17.5% less than the current ABC. Applying $F=M$ for sharpchin, a major component of this group, is less than using $F_{40\%}$ (Tier 4) and yields the same ABC as last year (2,161 mt). Applying Tier 5 to the other species in this group reduces M by 25%. ABC for group is 3,703 mt and the combined other slope ABC 5,864 mt. The OFL is 8,364 mt.

GOA - Pelagic Shelf Rockfish

The ABC for this group is based on $F=M$ applied to the trawl survey biomass of dusky rockfish and did not change. The 1996 survey results were not yet available. For this species group, the SSC recommends that the Team develop an analysis of separate specifications for the nearshore and offshore groups as referenced in the draft Amendment 46.

GOA - Demersal shelf rockfish

As no new data are available, the SSC supports the Team's recommendation that last year's ABC and OFL be rolled-over. The SSC also shares the Team's concern about the possibly high level of unreported DSR bycatch mortality and supports measures to promote reporting of the true mortality.

GOA - Thornyhead rockfish

As no new data are available, the SSC supports the Team's recommendation that last year's ABC and OFL be rolled-over.

GOA - Atka Mackerel

The SSC remains concerned about the lack of recruitment for this species. Because the species may be particularly sensitive to fishing pressure and its importance as a prey species for Steller sea lions, the SSC recommends that conservative exploitation rate of $M/2$ be used to calculate ABC. The SSC recommends a preliminary ABC of 3,240 mt for Atka mackerel, based on an application of this rate to the 1993 survey conflict of biomass. The SSC notes that ABC will be recalculated using the results of the 1996 survey.

D-1(misc) MISCELLANEOUS SAFE ISSUES

GOA and BSAI Ecosystem Considerations

Although the majority of the ecosystem chapter has not yet been revised, the SSC received an update from Richard Merrick on progress in reclassifying the Western stock of Steller sea lions as endangered under the ESA, and on recent and planned research.

Reclassification should be decided by October 4, 1996, and is unlikely to result in immediate impacts on the fishing industry. Current management measures are being reviewed and at the December meeting possible adjustments to those measures will be presented for discussion. However, any required Plan amendments are unlikely to be initiated before September 1997.

Preliminary results of the 1996 site counts show an overall decline of 7.5% from the 1994 site counts. However, some areas show small increases of stable numbers.

General SAFE Issues

The SAFE documents, implications of Amendment 44 on ABC's and OFL's, and ecosystem considerations led the SSC to raise the following issues with the groundfish teams for their examination and comments. The SSC recognizes that these issues may not be resolved between now and December.

1. Adjustment of $F_{40\%}$ to the middle of the spawning period (e.g., Atka mackerel): The issue is whether $F_{40\%}$ should be calculated based on spawning biomass at the middle of the spawning period. The Atka mackerel assessment showed how different the recommended F and corresponding ABC can be when the middle of the spawning period is used rather than the typical January 1 spawning biomass. It is unclear which approach has been used in other groundfish stock assessments. The advantages and disadvantages of the two approaches need to be laid out, and a consistent approach adopted for all assessments.
2. Biomass-based adjustment of $F_{40\%}$ by the factor $(1-B/B_{40\%})$: The issue is whether total biomass, exploitable biomass, spawning biomass, or some other biomass measure should be used in the adjustment. Currently, where this is done, it appears that spawning biomass is used. This choice needs to be justified. Because the adjustment is related to full-recruitment fishing mortality, the adjustment should probably be related to fully-recruited ages, which often are similar to mature ages. An evaluation of harvest policies with different measures of biomass should be undertaken, with clear specification of objective criteria.

3. Use of harvest policies based on use of historical average recruitment: Most groundfish harvest policies are based on multiplication of projected biomass by a harvest rate. Some assessments (e.g., POP in the Bering Sea and Aleutians, the Gulf Team's recommendation for *P. cod* ABC) are using an alternative procedure, which involves determining the expected or equilibrium yield based on historical recruitment patterns. The SSC would appreciate Plan Team comment on which approach is appropriate. As in 2, evaluation of these harvest policies is needed.
4. Determination of $B_{40\%}$. One of the main features of Amendment 44 is to use $B_{40\%}$ as a target biomass level and to adjust fishing mortality downward when biomass is less than this target biomass. $B_{40\%}$ is determined by multiplying biomass per recruit by an estimate of average recruitment. The issue is the best measure of central tendency: average, median, mode, and which set of time periods to use. The current default appears to be using the average over all years. However if recruitment is highly variable and skewed, then the average recruitment could exceed recruitment in most years, requiring downward adjustment of fishing mortality in those years. If recruitment is assumed to be lognormal, then a better choice would be to use the geometric mean or median. A rationale needs to be laid out.
5. Additional information needed in the SAFE's: Amendment 44 has resulted in greater complexity of the ABC and OFL specifications. At least until basic procedures are specified and followed, there is need to present clearly how these specifications were obtained, that is, which tier, which ranges of years were used for average recruitment, which measure of biomass was used for downward adjustment.
6. Overparameterization: Many stock assessment models have tens if not hundreds of parameters. An emerging issue is whether these models are overparameterized. (An overparameterized model may fit the data but has biased parameter estimates that could lead to errors in ABC and OFL.) Because data are frequently variable and data sets are sometimes contradictory, uncertainty in stock assessments needs to be made more explicit. At least three potential directions could be followed: (1) use the Akaike or Bayesian Information Criterion to select parsimonious models; (2) conduct sensitivity and/or Monte Carlo studies to examine parameter effects on biomass and ABC estimates; or, (3) place prior probability distributions on uncertain parameters and use Bayesian methods with stock assessment models to develop posterior distributions for these parameters.
7. Differential exploitation: The Teams note in the Ecosystem Considerations section of the SAFE that flatfishes are exploited at lower exploitation rates than many other groundfish species. The lower exploitation relates to constraints imposed by bycatch limits and the overall OY cap. It is unclear what changes in species compositions might result by persistent differential exploitation. It might be possible to learn more about these effects by GIS studies of survey and observer data to see if areas can be delineated where flatfish exploitation has been above or below average and whether differences in species compositions are apparent. Second, it might be possible to define adaptive management policies or experiments that attempt to learn more about this issue. For example, one might protect flatfish on a number of small areas and see if species composition differs compared to similar unprotected areas.

D-3(a) BAN NIGHT TRAWLING

The SSC was unable to take-up discussion of this agenda item.

D-3(b) SLIME & ICE / IFQ OVERAGES

The SSC listened to a presentation by John Lepore and Steve Meyer (NMFS-AK) on the Draft EA/RIR to provide standard deductions for ice and slime and to revise the adjustment procedure for the IFQ program.

The SSC is concerned that failure to standardize and enforce slime and ice deductions could lead to underestimation of catches. Deductions of 0-2% have historical precedence. Larger deductions might require downward adjustments to the TAC.

The practice of carrying over up to 10% of underages from one year creates the possibility of exceeding TAC in the subsequent year. Although the magnitude of carried-over underages may not yet be large, it seems imprudent to allow this possibility. The present treatment of overages differentiates between "minor" overages and "gross" overages. Minor overages do not trigger fines, but are deducted from the individual's subsequent IFQ. Although "gross" overages trigger prosecution, they are not deducted from the individual's subsequent IFQ. Alternative 2 addresses this problem by deducting any overage from the individual's IFQ in the subsequent year. The SSC suggests that the analysts develop a simple numerical example, demonstrating the effects of the alternatives on TAC and IFQ's for individuals who have underages, overages or exact catches, before the document is released for public review.

PLAN TEAM NOMINATIONS

The SSC endorses the nomination of David Jackson, the ADF&G area biologist for Kodiak and the Alaska Peninsula to the GOA Plan Team. His management and fisheries experience should make him a helpful addition to the Team.