North Pacific Fishery Management Council

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MINUTES
Scientific & Statistical Committee
December 5-7, 1994

The Scientific and Statistical Committee of the North Pacific Fishery Management Council met December 5-7, 1994 at the Hilton Hotel in Anchorage. All members were present except Marc Miller:

Terrance Quinn, Chair	Doug Eggers	Jack Tagart
Keith Criddle, Co-chair	Dan Huppert	Harold Weeks
William Aron	Richard Marasco	Al Tyler
Susan Hill	Phil Rigby	

C-4 COMPREHENSIVE RATIONALIZATION PROGRAM (CRP)

The SSC heard a Council staff presentation detailing progress on the CRP analysis. The SSC also heard public testimony concerning the CRP from John Gauvin, Paul McGregor, and Carl Ohls. In addition, the SSC reviewed Appendices VII and VIII to the analytical package for license limitation. The SSC is pleased to note that the Council has followed our recommendations to narrow the number of alternatives. These Appendices are partial analyses of specific options identified by the Council.

Council staff reported that the industry sector and community profiles have been completed. The Social Impact Analysis (SIA), however, will not be available before February 1995. The SSC stands firm on its desire to review the analysis before public release. In order to accommodate scheduling difficulties, and to expedite release of the analytical package for public review, the SSC is prepared to assemble a sub-committee to conduct the necessary review as soon as the SIA has been completed and possibly meet as a whole via teleconference.

The Council needs to establish a framework for the eventual conversion of groundfish licenses to Quota Shares (QS). The Pacific Fishery Management Council which didn't have their framework in place has run into problems in its effort to implement a QS program. Clarification of Council intentions is especially important if the Council chooses to establish tradable licenses. For example, the Council could declare that any future QS allocation will be based upon catch histories over a qualification period, and that catch histories will be assigned to initial license holders or subsequent purchasers. This would make the license or endorsement sale equivalent to a catch history sale. Alternatively, the Council could declare that future QS allocations will not go to purchasers of licenses and endorsements, but rather will be based on personal (or vessel) catch history.

Economic analysis of license limitation typically focuses on net benefits (efficiency) and equity issues. By defining the qualification criteria for licenses or QS, the Council determines the initial distribution of economic opportunities. The analytical package developed by Council staff characterizes potential distributional consequences of alternative license allocations, but does not quantify the net benefits of the license limitation program. The SSC does not consider the lack of net benefit assessment to be a critical shortcoming in the analytical package because experience with license limitation programs indicates that they are unlikely to provide significant longrun net economic benefits.

If license limitation is combined with Community Development Quotas (CDQs), some attempt should be made to examine the net benefits associated with the existing program.

C-5 FULL RETENTION/FULL UTILIZATION AND HARVEST PRIORITY

The SSC reviewed the Harvest Priority and Full Retention/Full Utilization Committee report and heard public testimony from Scott Highleyman, John Gauvin, Fran Bennis, and Paul Seaton.

The September 1994 SSC Minutes identify several issues that need to be resolved by the Council before analysis of Full Retention/Full Utilization and Harvest Priority can proceed. These issues remain to be addressed. To proceed with further analysis, the ten basic questions from Joe Terry's discussion paper need to be addressed. For example, tradeoffs in reductions of bycatch of different species may need to be made. Some objective function will be necessary to compare, say, a vessel with a low bycatch rate of crab to a vessel with a lower bycatch rate of halibut and a higher bycatch rate for crab.

One tool that could be used to help the Council and industry identify fisheries that are good candidates for bycatch/discard reduction through standards or incentives is a statistical analysis of the components of the variance in past bycatch/discard rates. Observed differences in bycatch rates could be due to the fishing practices of the individual vessel operator or to unpredictable variations in the distribution of bycatch species. Fisheries that are characterized by high variability in bycatch rates between vessels relative to the magnitude of variability within season and through time for individual vessels offer higher potential for bycatch reductions than fisheries where individual vessels have highly variable bycatch rates. A multifactorial analysis of variance/covariance could be conducted on existing data to identify the significance of these alternative sources of bycatch variance.

C-6 INSHORE-OFFSHORE

The SSC considered the likely analytical needs in support of an amendment to continue the inshore-offshore and CDQ fishery allocations. The first issue is one of problem statement. If the problem addressed by a continuation is that Comprehensive Rationalization Planning has taken longer than originally intended and that an extension of existing interim measures is needed to maintain management stability pending completion of CRP, then a relatively simple qualitative impact assessment analysis may be adequate. Such an analysis would include a description and characterization of various segments of the industry for 1994. This part of the analysis could also be supplemented with a similar description for 1991. The second part of the analysis would be a qualitative assessment of impacts that might arise as a result of termination of current inshore/offshore splits. Addressed in the qualitative assessment would be the effects of alternatives under consideration on efficiency, equity and management stability indicators.

If the problem is stated in more ambitious terms, i.e. modification of the inshore/offshore split, change in the CDQ allocation or permanently establishing splits, it is likely that a more complex evaluation,

including possibly a quantitative retrospective analysis, would be needed to satisfy analytical requirements.

D-2 GROUNDFISH AMENDMENTS

1. Red King Crab Emergency Action Request

The SSC received a staff report on the Council's November request for emergency closure to trawling of the area from 164° to 162° W longitude and 55°45' to 57° N latitude to reduce red king crab bycatch. Public testimony from Dave Fraser, John Gauvin, Laura Jensen and Mark Kandianis expressed substantial concern that the closure may not measurably benefit red king crab, yet could impose substantial impacts on other PSC species.

Measures to protect rebuilding red king crab stocks principally involve issues of allocating the burden of conservation among the various crab and groundfish fisheries; this will be a long-term problem. We re-iterate our September suggestion that the crab and BS/AI Groundfish Plan Teams examine bycatch issues jointly and report to the Council on the following:

a) conservation benefits to red king crab of bycatch control measures,

b) the impacts on groundfish fisheries which may be affected by additional time/area closures, and

c) the impacts on bycatch of other species by potentially displaced groundfish fisheries.

2. Opilio Crab Bycatch

The SSC considered the discussion paper on opilio bycatch at its September meeting and suggests that a joint crab - BS/AI Groundfish Plan Team meeting be held to address the issues raised in that paper.

3. Other Trawl Category VIP Standards

The SSC had no comment.

D-3 GENERAL GROUNDFISH SAFE CONCERNS

The SSC thanks the Teams for considering the three general concerns itemized in the September SSC minutes.

1. The SSC agrees with the Team that further evaluation of the conservatism of F=M is needed. Perhaps this can be done within the general evaluation of the overfishing definition described in the next section.

2. The SSC believes that Grant Thompson's "A Brief History of ABC and OFL Definitions in the North Pacific Groundfish FMP's" prepared for the Plan Teams (Attachment 1) provides a convenient summary of the various attempts to provide alternatives to the Council's current procedures. In particular, NMFS's Overfishing Definition Review Panel prepared a report (Rosenberg et al., 1994) that recommends three changes to the Council's overfishing definition:

(1) provide a buffer between ABC and OFL,

(2) clarify the reference level $F_{30\%}$, and

(3) elaborate on the acceptability of parameter estimates.

The SSC recommends that the Council proceed with a Plan Amendment to consider these changes and has submitted a proposal to initiate such action. The proposal is attached (Attachment 2) and provides further justification. Although neither the Plan Team nor the PAAG had the opportunity to review this proposal, the issue is of sufficient importance to the Council's credibility that we recommend it go forward.

3. The SSC notes that its request that information about the take and status of marine mammals be included in the Ecosystem chapter has been satisfied.

4. At its January 1995 meeting, the SSC will consider goals for next year's SAFE documents. Issues related to the expression of uncertainty about parameter estimates, ecosystem considerations, and types of needed information among others need attention.

D-3 FINAL GROUNDFISH SPECIFICATIONS FOR 1995

D-3 (b) GULF OF ALASKA

GOA - Pollock

Sandra Lowe described revisions to pollock stock assessment since our September meeting. Pollock stock abundance is estimated using the stock synthesis model. New elements considered in the assessment included pollock abundance estimates from Alaska Department of Fish & Game coastal crab surveys, updated estimates of discard and catch and FOCI predictions of upcoming year class strength. Additionally, stock assessment authors provided a third model (Model C) which used 1993 bottom trawl age composition data, 1992 egg production estimate and a revised estimate of 1992 recruitment.

The effect of these revisions was a modest increase in the stock assessment authors estimate of ABC (91,000 mt for W-C GOA, up from 90,000 mt in September) and no change in the Plan Team's ABC recommendation of 62,000 mt for W-C GOA and 3,360 mt for the Eastern GOA. The SSC concurs with the Plan Team's recommendation. The overfishing level for this ABC is 266,000 mt in the W-C GOA and 14,400 mt in the Eastern Gulf.

The SSC wishes to commend the stock assessment authors for their incorporation of FOCI predictions of year class strength. When presented in conjunction with available data from the surveys and fishery, these data strengthened our inference on projected stock biomass.

GOA - Pacific Cod

The SSC reviewed the application of a length-based stock synthesis model for GOA Pacific cod. There was substantial discussion of the estimates of key parameters affecting natural mortality and fishery selectivity. At the center of these concerns were various hypotheses regarding the larger (older) Pacific cod.

A lengthy discussion was held over this assessment. We are concerned that the Plan Team recommended ABC increased by a factor of two (50,400 mt from 1994 to a new 108,000 t for 1995) even though the stock has been declining since 1987. However, the biomass is still above the management target stock size. Yet with an average recruitment rate the stock is projected to decline under any catch rate.

The jump to the higher ABC level came partly from the new Stock Synthesis model application that no longer used knife edge recruitment, and that had fitted survey selectivity of catch along with natural mortality rate. There was a long discussion on the resulting survey selection curve for the range of fish sizes versus the estimates of natural mortality that change as gear selectivity estimates change. Also discussed was the level of uncertainty in the survey estimates of biomass for Pacific cod due to patchiness in their distribution. In addition the SSC noted the possible influence of age determination error, since age classification is based on length distributions. It was decided the model was the best that could be developed given the levels of uncertainty in the data.

The SSC accepted the stock assessment author's estimate of natural mortality, M=0.37, but not the author's choice of fishery selectivity. Both parameters were fixed in the assessment. The SSC recommends a terminal selectivity value of 1.0 (asymptotic selectivity), rather than the 0.5 (dome shaped selectivity) that was chosen by the author. The assumption of asymptotic selectivity is consistent with the Bering Sea survey and is a more conservative assumption than dome shaped selectivity, which results in higher abundance. Recent stock assessment literature indicates that when recruitment is less certain or variable, $F_{40\%}$ is more suitable that $F_{35\%}$. The SSC advises using the more conservative $F_{40\%}$ exploitation rate. The resulting ABC is 69,300 mt with overfishing level of approximately 80,800 mt. This ABC is estimated from the ratio of the $F_{35\%}$ ABCs at $S_{term} = 1.0$ and $S_{term} = 0.5$, (80,200/108,000), multiplied by the $F_{40\%}$ ABC for $S_{term}=0.5$ (93,300), which gives the value 69,283. The OFL is estimated similarly.

Other model runs and models that would be instructive are (1) a lower constant value of M, (2) a lower value for M for younger ages, but higher for older ages (increasing M with age), both with terminal selection value of 1.0 (asymptotic), and (3) models stratified by gear type.

GOA - Flatfish

The SSC recommends that the ABCs for species in this complex be set at levels proposed by the Team (flatfish -deepwater- 14,590 mt, Rex sole - 11,210 mt, flatfish - shallowwater - 52,270 mt, flathead sole - 28,790 mt, and arrowtooth flounder - 198,130 mt). The SSC concurs with the Plan Team's recommendation that ABCs for species in this group be apportioned among the three regulatory areas in proportion to the biomass distributions in the 1993 trawl survey.

With the exception of Greenland turbot and Dover sole, the best estimates of current exploitable biomass were assumed to be the same as the 1993 survey biomass, since the non-exploitable component is small and because of the partial selectivity of the non-exploitable sizes. The complete bathymetric range of Dover sole was not sampled in 1990 or 1993, as sampling included depths only to 500m. The exploitable biomass of Dover sole is calculated using the 1993 estimate for 1-500m and the 1987 trawl survey estimate from 501-1,000m discounted by the rate of decline observed between 1987 and 1993 in the 1-500m depth interval (for a total of 116,574 mt). For Greenland turbot, the 1987 exploitable biomass is used in this year's assessment. Exploitable biomass estimates used to calculate ABCs were deepwater - 116,710 mt, Rex sole - 89,660 mt, shallow water 355,590 mt, arrowtooth - 1,585,040 mt, and flathead sole - 198,470 mt.

Fishing mortality rates used to calculate ABCs were: deepwater (0.125), Rex sole (0.125), rock sole (0.147), yellowfin sole (0.149), shallow water (0.145), flathead sole (0.145) and arrowtooth (0.125). Overfishing mortality rates used were Deep water (0.146), Rex sole (0.146), rock sole (0.172), yellowfin sole (0.175), other shallow water (0.159), arrowtooth (0.146), and flathead sole (0.159). Overfishing catch levels are deep water - 17,040 mt, Rex sole - 13,090 mt, shallow water - 60,260 mt, arrowtooth - 231,420 mt, and flathead sole - 31,560 mt.

GOA - Sablefish

The SSC concurs with the Plan Team's recommendations for ABC (21,500 mt) and OFL (28,040 mt). We support the Plan Team's adoption of a 5-year exponential weighting scheme to apportion ABC to management regions and areas. This method provides consistency across areas and captures the geographic distribution of the resource while buffering changes which may result from survey error.

The SSC discussed the potential for sablefish fishery-survey interference with implementation of ITQ management. The SSC believes that this issue warrants further consideration, but we do not have a basis for making a recommendation to the Council at this time.

ROCKFISH

The SSC received an overview of rockfish stock status from members of the Gulf Team. Analytical methods are similar to those applied last year, except that a new length-based synthesis model was applied to thornyhead rockfish. The 1984, 1987, and 1990 trawl survey population estimates have been revised, and substantially increased rockfish catches in the 1993 trawl survey resulted in increased estimates of biomass and yield for most species compared to the prior year. Survey and catch data were updated, resulting in minor changes to some rockfish specifications from the September document. After substantive discussion with the Plan Team, the SSC agreed with the Team's ABC determinations, except for POP and black rockfish.

GOA - Pacific Ocean Perch

For the second year, a stock synthesis model was used and results in an estimates of current exploitable biomass of 142,470 mt, which is an increase above last year's estimate of 101,800 mt. The model incorporated revised 1987, 1990, and 1993 triennial trawl survey data and updated fishery length catch data. The 1993 survey biomass of 453,605 mt was a large increase compared to the 1990 survey estimate. The survey age composition is composed of a majority of young (ages 6 through 9 years) POP in the Western and Central Areas. In September the SSC expressed concern over the unexpectedly large increase in survey biomass and the potential harvest of young fish. The SSC requested that the Team look more closely at the age of maturity and changes in reproductive capacity with fish size. The application of the model considerably dampened the influence of the most recent survey (see Figure 5-4). Additional maturity data were provided in December by the analysts (see Table 5-12). The ABC was calculated using the optimal fishing mortality (F_{msy}) of 0.078 adjusted by the ratio of the current (116,334 mt) to target (150,000 mt females) spawning biomass to provide for rebuilding (see Figure 5-9), which results in an ABC of 8,230 mt. Because this ABC is equal to the overfishing level the plan team further reduced this number by $F_{35\%}/F_{30\%}$ to provide a buffer between the ABC and OFL. As in September the SSC did not agree with the latter adjustment and, as it did last year, recommended that ABC equal OFL. Some discussion occurred regarding ways to increase the OFL rather than reduce the ABC; however, at this time the Council is prohibited from doing so without a plan amendment. As mentioned earlier, the SSC is proposing a Plan Amendment to alter the definition of overfishing.

Because of the high degree of uncertainty associated with the survey and the disproportionately increased biomass estimated in the Central area, the Team modified the ABC apportionment. Therefore, the ABC was apportioned by management area based on the area biomass estimates from the 1987, 1990, and 1993 trawl surveys and weighting each previous survey at 2/3 of the next later survey. The SSC concurred with the ABC area allocations for the Western, Central, and Eastern Areas respectively for the SSC are 1,480 mt; 3,950 mt; and 2,800 mt and for the Team are 1,180 mt; 3,130 mt; and 2,220 mt. Under the POP rebuilding plan, TAC is calculated from the average of the optimal F and the fishing mortality rate sufficient to provide for unavoidable bycatch (based on 1992 rates). For 1995 this fishing mortality is 0.054 and corresponds to $F_{55\%}$. This rate is further reduced by the ratio of current biomass to optimal biomass, which gives F=0.041 and a TAC of 5,631 mt.

In public testimony Fran Bennis of Alaska Marine Conservation Council questioned allowing a directed fishery on a rebuilding species, particularly with an average discard of over 60% for 1993 and 1994. She also requested that observers collect age structures from POP.

The SSC discussed some management issues such as potential disproportionate harvests of older age POP and potential increased bycatch of shortraker, rougheye, thornyhead and rockfish. The SSC expressed its intent that the ABC was a target ceiling and its expectation that catches will not be allowed to exceed the ABC, which should alleviate these management problems.

The SSC received a report on GOA rockfish from Barry Bracken (ADF&G). Issues included the high discard of POP, potential disproportionate harvest of older POP, and possible increased bycatch of other rockfish species. The SSC views most of the issues presented as those which might be accommodated by TAC adjustment, however, the TAC is specified by formula in the FMP and cannot be changed without a Plan Amendment.

GOA - Northern Rockfish

The exploitable biomass estimate of 87,845 mt was based on the average 1987, 1990, and 1993 trawl surveys. An F=M (0.06) strategy provided an ABC of 5,270 mt allocated as 640 mt - Western, 4,610 mt - Central, and 20 mt - Eastern based on averaged 1987-1993 survey biomass proportions. OFL = $F_{30\%}$ = 9,930 mt.

GOA - Other Slope Rockfish

Species specific natural mortality rates range between 0.04 and 0.01. Using F=M and averaged trawl survey biomass estimates by species provided a combined ABC of 7,100 mt (180 mt-western 1,170 mt-central, and 5,760 mt-eastern). Redbanded rockfish were removed from the demersal shelf category and added for this assessment, increasing the ABC by 166 mt. For OFL, $F_{30\%}$ (0.08) for sharpchin and M for the other species were used, resulting in OFL = 8,400 mt.

GOA -Shortraker/rougheye

The recommended ABC for the shortraker/rougheye group is 1,914 mt (173 mt-Western, 1,213 mt-Central, and 528 mt-Eastern). The ABC was obtained by applying an F=M strategy and allocated to regulatory areas based on the averaged 1987, 1990 and 1993 trawl survey estimates of exploitable biomass. Natural mortality (shortraker 0.03 and rougheye, 0.025) times the estimated biomass from the averaged trawl surveys (shortraker 23,689 mt and rougheye 48,123 mt) yielded the combined ABC. For rougheye $F_{30\%}$ (0.046) and F=M (0.03) for shortraker were applied to the respective biomass estimates for a combined Gulf-wide OFL of 2,925 mt.

GOA - Pelagic Shelf Rockfish

The exploitable biomass (57,644 mt) for this complex was derived by averaging the biomass estimates from the 1987, 1990, and 1993 surveys. An exception, this ABC is a decrease from last year's biomass (76,500 mt). An F=M strategy using the natural mortality for dusky rockfish (0.09) was used to calculate a combined ABC of 5,190 mt (910 mt-Western, 3,200 mt-Central, and 1080 mt-Eastern). Apportionment was based on the average percent biomass in each area for the 1987, 1990, and 1993 surveys. $F_{30\%}$ (0.151) provides an OFL of 8,704 mt.

The SSC discussed the Plan Team's recommendations to separate black rockfish from these groups in the Central Area and create an ABC based on average commercial catch for 1991, 1992, and 1993 (335 mt). Reasons for separation include some targeting on this species, its relatively separate near-shore distribution, the lack of assessment information collected by the NMFS trawl survey, and the potential for localized depletion. The SSC sympathized with the Plan Team's recommendation and suggested that if separated, catches used to calculate ABC should include bycatch as well as directed catches. However, if a separate ABC is established, unanticipated management problems might occur. For example, the directed jig fishery or the trawl fishery could preempt the other, because an overfishing level would be created for this species. Recent harvests are below ABC for the complex, and ADF&G manages the harvest of black rockfish in state waters of the Central area. The SSC recommends that the Team provide more information on present management programs and look at a means of preventing the potential preemption discussed above.

GOA - Demersal Shelf Rockfish

The SSC accepts the Plan Team recommendations for ABC and OFL based on F=M and $F_{30\%}$, respectively. The SSC notes that new line transect surveys were completed in 1994. The resulting biomass estimate is lower, which is most likely due to better survey coverage and methodological improvements.

GOA - Thornyheads

In September the SSC recommended phasing in the ABC derived from a new synthesis model because the ABC was much greater than for the prior year and because the synthesis model used a domed shaped selectivity curve without presenting evidence in the assessment for the existence of the larger fish. A revised assessment presented in December was expanded to include longline survey size and biomass data, revised trawl survey estimates, and gear specific selectivities, and a more conservative $F_{40\%}$ (0.063 rate), rather than $F_{35\%}$, was used for this long lived species. The exploitable biomass and Gulfwide ABC derived were 30,341 mt and 1,900 mt, respectively. OFL = $F_{30\%}$ = 0.088. The analysts and Plan Team accounted for the SSC's previous concerns, so the SSC agreed with the Team's recommendations.

GOA - Atka Mackerel

Atka mackerel was separated from the "other species" category, and the ABC, OFL, and TAC set for the species during the 1994 fishing year. For the 1994 fishing year the calculated ABC was reduced by 3/6 and subsequent annual reductions were to be decreased by 1/6 (stair stepping). This conservative approach was recommended because of uncertainty in the abundance of Atka mackerel and concerns for marine mammals. Atka mackerel is an important prey species for sea lions and occurs in abundance near important sea lion rookeries. The SSC recommends that the stairstepping procedure be frozen at the 1994 level, consistent with the approach for calculating ABC for Bering

Sea/Aleutian Islands Atka mackerel. The SSC notes that stock status of GOA Atka mackerel is closely related to that of BSAI area.

Following this procedure, the ABC is 3,240 mt (M/2=0.15 times the projected 1995 biomass of 21,600 mt). The SSC agrees with the Team's overfishing level of 11,700 mt.

The SSC notes that biomass has declined substantially from the 32,100 mt in 1990 to 21,600 mt in 1993. This decline was due in part to the very high harvest (13,834 mt) in 1992. The 1994 fishery occurred in the Davidson Bank area in close proximity to a sea lion rookery with a 10 nm buffer zone in place. Although the reductions in ABC due to the stair-stepping procedure provide some protection to marine mammals, the Council should consider additional management measures to reduce potential impacts on marine mammals in view of the estimated decline in abundance of Atka mackerel. These measures include: seasonal closures (November through March), hot spot closure or delayed seasonal opening, setting a limited (1-2 day) fishing season, expanding the buffer zone around sea lion rookeries, and setting other fishing zones to limit impinging on sea lion habitat.

D-3(d) BERING SEA/ALEUTIAN ISLANDS

BS/AI - Pollock

Eastern Bering Sea

The SSC was presented with revised assessment of the EBS pollock resource and received a presentation from Rick Methot. Analytical methods for assessment of pollock abundance are based on age-structured VPA, CAGEAN and stock synthesis models, using hydroacoustic and bottom trawl survey data to tune the models. Although biomass trends are similar in each model, there are modest differences in estimates of recent abundance. ABC and overfishing levels are computed based on abundance estimates from the VPA model. While the recent trend in biomass shows a decline, the projected population appears to be increasing, in numbers if not biomass, and the stock is regarded as healthy. Projected 1995 stock biomass is 8.08 million mt and exceeds estimates of B_{MSY} (6 million mt). The fishery is supported by a strong 1989 year class, and early indications suggest the 1992 year class will be above average.

The Plan Team has recommended and the SSC concurs with an ABC of 1.250 million mt based on a $F_{0.1}$ exploitation strategy. The overfishing level is estimated to be 1.5 million mt based on F_{MSY} harvest strategy.

The Plan Team report contains a minority report that expresses concern that the proposed ABC is not sufficiently conservative. The SSC discussed the nature of exploitation on EBS pollock noting that historically rates have varied from 6% to more than 20%. The proposed ABC would result in a 15% exploitation rate and is regarded as conservative. Additionally, concerns were raised in the minority report related to the accuracy of year class strength projections. The SSC believes that the $F_{0.1}$ harvest strategy provides a low enough exploitation rate to allow analysts time to validate projected year class strength without compromising conservation of the stock.

The SSC did express concern about the potential exploitation of EBS stock in the US/Russia transboundary area, NW of the Pribilof Islands. We would like to see available data on Russian removals from this area and the size and/or age composition of these catches. Public testimony from Wally Pereyra noted that there may be a long history of Russian catches in this zone.

Finally, the SSC received public testimony from John Gauvin, AFTA, regarding economic impacts of a 5% change in the distribution of pollock TACs between the A and B seasons. The SSC had inadequate time to review Mr. Gauvin's analysis.

Aleutian Islands

The SSC accepted the Plan Team's recommendations for the Aleutian Islands pollock ABC, 56,600 mt. This ABC is based on a projection of 1991 survey biomass to 1994 and an assumption of no change since that time. The overfishing level is 60,400 mt.

While the SSC accepts this ABC estimate, we feel strongly that future estimates of stock status should incorporate age structured modeling to more thoroughly assess this important resource. We expect that with the recently completed bottom trawl survey, that this would be an opportune time to extract available size and age data and evaluate them with an age-structured model. We look forward to such an analysis in the next status of stocks cycle.

Bogoslof Area

The Plan Team, using their standard process as represented in the SAFE summary, has recommended a Bogoslof ABC of 115,000 mt. This value is based on an estimated stock abundance of 442,000 mt and an $F_{35\%}$ exploitation rate (26%).

The SSC continues to believe that the Bogoslof stock, a part of the Aleutian basin stock, is severely depleted. Following principles to reduce exploitation rates in proportion to the ratio of current stock size to B_{msy}, the SSC has previously advised using an exploitation rate of M/4 (0.05) which results in an ABC of 22,100 mt. We continue to support this more conservative ABC.

BS/AI - Pacific cod

The SSC concurs with the Plan Team's recommendations for ABC (328,000 mt for the BS/AI) and OFL (390,000 mt for the BS/AI). The SSC notes that the considerably higher biomass estimate (because the 1994 trawl survey biomass estimate was nearly twice that of 1993) is understandable given the patchy distribution of Pacific cod and the series of above average year classes (1989-1992).

The SSC believes that the natural mortality rate of 0.37 and the asymptotic selection curve are reasonable but again point out that, as in the GOA, age determination errors could affect estimates. The effect of the new mesh size restrictions and of area closures are not known.

With an increasing population and the ecosystem consideration that Pacific cod are top fish predators, an overly conservative harvesting strategy may not be warranted.

The only public testimony was from Thorn Smith of the Longliners Association. They will ask for a TAC of 260,000 mt which is the maximum they expect to be able to take under ideal conditions due to halibut bycatch. Mr. Smith also detailed several steps the Association is taking to reduce halibut bycatch mortality; the SSC supports such efforts.

BS/AI - Flatfish

The SSC recommends that the ABCs for species in this complex, with the exception of Greenland turbot, be set at levels proposed by the Team.

BS/AI - Yellowfin sole

The Team's recommended ABC (277,000 mt) for this species was developed by applying an $F_{35\%}$=0.13 to the estimated exploitable biomass of 2,127,300 mt obtained from the stock synthesis model. The overfishing level (319,000 mt) was determined by applying $F_{30\%}$=0.15 to the exploitable biomass estimate.

BS/AI - Greenland Turbot

The SSC continues to recommend an ABC of 7,000 mt. Information presented in the SAFE indicates that the total biomass has decreased annually from a high in 1972 of 944,092 mt to 163,091 in 1994. The 1995 projection is 150,122 mt. Numbers at age data presented indicate that the 1994 year class is stronger than the 1991, 1992, and 1993 year classes. However, it is well below levels experienced during the 1970s. Given the absence of evidence of strong recruitment and the downward biomass trend, the SSC concluded that the ABC should remain unchanged.

BS/AI - Arrowtooth Flounder

The recommended ABC (113,000 mt) for this species was developed by applying $F_{35\%}$=0.18 to the estimated 1995 exploitable biomass (625,000 mt). This biomass was estimated by adding 1991 survey biomass estimates for the slope (28,000 mt) and the Aleutian Islands (43,500 mt) to the 1994 survey biomass estimate for fish at least 28cm in length (553,600 mt). The overfishing level (138,000 mt) was calculated by applying the $F_{30\%}$= 0.22 to the exploitable biomass estimate.

BS/AI - Rock sole

The Team's recommended ABC (347,000 mt) for this species was developed by applying a $F_{35\%}$=0.18 to the estimated exploitable biomass of 1,940,100 mt obtained from the stock synthesis model. The overfishing level (388,000 mt) was calculated by applying the $F_{30\%}$= 0.20 to the exploitable biomass estimate.

BS/AI - Other Flatfish

As in the case of flathead sole, 1994 trawl survey biomass estimates were used to calculate ABC for this group of species. The $F_{35\%}$ (0.17 for Alaska Plaice and 0.19 for miscellaneous species) and $F_{30\%}$ (0.20 for Alaska Plaice and 0.23 for miscellaneous species) were used to calculate ABC (117,000 mt) and OFL (137,000 mt), respectively.

BS/AI - Flathead Sole

The 1994 trawl survey biomass estimate was used along with a $F_{35\%}$= 0.19 to calculate the 1995 ABC, 138,000 mt. The overfishing level for flathead sole is 167,000 mt ($F_{30\%}$= 0.23).

BS/AI - Sablefish

The SSC concurs with the Plan Team's recommendations for ABC (1,600 mt in the EBS, 2,200 mt in the AI) and OFL (4,900 mt for the EBS and AI combined). We support the Plan Team's adoption of a 5-year exponential weighting scheme to apportion ABC to management regions and areas. This method provides consistency across areas and captures the geographic distribution of the resource while buffering changes which may result from survey error. The SSC notes that alternate weighting schemes have been proposed and requests the Plan Team to consider alternative schemes next year.

The SSC heard a report at the September meeting that the Japanese cooperative longline survey would be discontinued. The SSC's principal concern is that there is adequate information to standardize the more recent domestic survey with the older cooperative survey. The loss of Greenland turbot, rockfish, and sablefish stock assessment information from the cooperative survey in the Bering Sea/Aleutian Islands is also a concern. We request a report at a future meeting discussing how past domestic and cooperative survey information will be calibrated to ensure an uninterrupted series of comparable assessments.

BS/AI - POP Complex

For the Eastern Bering Sea the complex is split into POP (Sebastes alutus) and four other red rockfish (ORR) species. For the Aleutian area the ORR are separated into two groups, northern plus sharpchin and rougheye plus shortraker. The assessment methods are essentially the same as last year, except that $F_{44\%}$ rather than $F_{35\%}$ was applied to determine ABC for POP. The resulting ABCs are essentially the same as for 1994. The SSC agreed with the Team's recommendations. The SSC recommends that the Plan Team analyze Aleutian survey and catch data with regard to creating harvest subareas similar to those for Atka mackerel.

BS/AI - Other Rockfish

As with the POP complex, the SSC agreed with the Team recommendations.

BS/AI - Atka mackerel

For the 1992 fishing year the SSC recommended reducing the calculated ABC by 5/6 with subsequent annual decreases of 1/6 (stairstepping), because of uncertainty in the abundance of Atka mackerel and concerns for marine mammals. Atka mackerel is an important prey species for sea lions and occurs in abundance near important sea lion rookeries. In addition, Atka mackerel is highly aggregating species, occurs in shallow water, and is difficult to survey.

Because data from the 1994 trawl survey and age composition of the 1993 fishery were not available, the Team was not able to assess the current stock level and the magnitude of the incoming year class. Because of the further uncertainty about stock status, the SSC recommends the stairstep be frozen at the level used to reduce the calculated ABC for 1994 (reducing the calculated ABC by 1/2). Following this procedure, the ABC is 125,000 mt (M/2=0.15 times the projected 1995 biomass of 832,000 mt). The ABC should be distributed among subareas based on the biomass distribution and should be 13,500, 55,900, and 55,600 for the Eastern, Central, and Western subareas, respectively. The SSC agrees with the team's overfishing level of 335,000 mt.

BS/AI - Squid and Other Species

The SSC supports the Plan Team's recommendations for ABC (squid - 3,100 mt; other species - 27,600 mt) and OFL (squid - 3,100 mt; other species 136,000 mt). In September, we supported the Plan Team's recommendation to combine these two categories; however, we now understand that a plan amendment would be required to accomplish this.

ECOSYSTEM CONSIDERATIONS

The SSC commends the Plan Teams and additional contributors for beginning the effort toward expanded consideration of ecosystem concerns. The section discussing objectives and definitions of ecosystem management generated much discussion on appropriate goals and the feasibility of ecosystem management. The SSC will discuss the subject more extensively at the January meeting.

PLAN TEAM MEMBERSHIP

The SSC notes that the Council relies heavily on the staff of the AFSC for membership on its Plan Teams and that such participation is critical for maintenance of the Plans. In this light, the SSC notes that AFSC scientists Jon Heifetz and Jim Ianelli, who have been nominated for Plan Team membership, have impressive credentials and would be suitable for either Team.

HALIBUT PSC LIMITS

The SSC heard a report from Bob Trumble. The SSC concurs with the Plan Teams that the rates listed in Appendix C are appropriate for use in 1995.