

# North Pacific Fishery Management Council

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## MINUTES Scientific and Statistical Committee October 5-7, 1998

The Scientific and Statistical Committee of the North Pacific Fishery Management Council met October 5-7, 1998 at the Double Tree Hotel in Seattle, WA. All members were present except Steve Kloiewski:

Richard Marasco, Chair  
Harold Weeks  
Sue Hills  
Doug Eggers

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

Doug Larson  
Seth Macinko  
Al Tyler

### C-1 LICENSE LIMITATION

The SSC received a staff presentation from Darrell Brannan with Marcus Hartley (Northern Economics). Public testimony was received from Thorn Smith, NPLA; John Gauvin, Groundfish Forum; David Little, Clipper Seafoods; Arni Thompson, Alaska Crab Coalition; Ed Poulsen, Chris Poulsen and Associates; and Lenny Herzog, Homer.

The revised analysis addressed critical concerns expressed by the SSC in June. The document provides a substantial amount of descriptive information about the nature of the fleets affected by the different action items. The SSC believes that caution is warranted regarding many of the conclusions contained in the document because they are speculative. For example, the summary statement for Action 6, allow limited processing for catcher vessels, states that:

“The fact that relatively few vessels have made these conversions in the past, and the potentially negative catch capacity consequences, suggest that there will be minimal impact on fishery resources.”

No data are presented in the document to support this assumption. Further, public testimony indicate that there might be considerable interest in adding processing capacity.

### C-3 SOCIAL/ECONOMIC DATA

The SSC heard a staff presentation describing progress towards developing occasional and routine collection of economic data series. The SSC is encouraged by progress to date. These efforts begin to address longstanding research priorities.

## C-5 OBSERVER PROGRAM

The SSC discussed the Observer Program with Chris Oliver (NPFMC) and Bill Karp (AFSC). The SSC believes that conducting a review of the program will be helpful in identifying approaches to problems that led to development of the JPA. Possible changes in program structure and costs should be part of the review panel's terms of reference. The review panel should include experts in sampling methodology and data collection systems. We encourage the program review to develop specific recommendations that will enhance unbiased data collection and improve precision and efficiency.

Regardless of any future program structure or funding mechanism, there are several elements essential to an effective program (from SSC minutes, September 1995):

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

The status quo seems likely to endure indefinitely. The SSC believes that departure from the status quo is unlikely given current industry attitudes. Debate over coverage levels can continue to delay serious considerations of alternatives to the status quo. If alternatives are to be seriously pursued, the SSC suggests that the current level of observer coverage be used as a default in the initial design and cost estimation stages.

## D-1(a) CHINOOK SALMON BYCATCH

Dave Ackley (ADF&G) presented the draft EA/RIR for proposed amendment to minimize chinook salmon bycatch in Groundfish Trawl Fisheries of the Bering Sea and Aleutian Islands. Tom Krone and Dan Bergstrom (both ADF&G) provided information on in-river salmon management; Dan Senecal-Albrecht (Bering Sea Fishermen's Association) provided public testimony. Current chinook salmon bycatch measures (Amendment 21b implemented during the 1996 fishery) include prohibition of trawling in the chinook salmon savings areas (CHSSA) through April 15 upon attainment of a bycatch limit of 48,000 chinook salmon. The amendment proposes various combinations of measures which include extension of the area of the CHSSA, extend the time to year-round prohibition of trawling in CHSSA, reduction in the bycatch limit, annual closure of specific "hot-spot" blocks and targeting closures specifically to pollock fisheries.

The chinook salmon bycatch occurs on immature fish (mixed ages 1.2 and 1.3) primarily during the fall through the late winter period and mostly in the pollock fishery. Because historic bycatch levels have been low relative to the catch in directed western Alaska salmon fisheries, the proposed bycatch management measures allocate the catch and conservation burden among groundfish and directed salmon fisheries. The document provides a thorough analysis of estimated reductions of chinook salmon bycatch, and changes in bycatch of other PSC species, under the alternatives. The analysis was restricted to years 1994 – 1997, and did not estimate catch of

target groundfish species forgone. The SSC recommends that the document be revised to address the following issues, prior to being sent out for public review.

1. Estimates of the number chinook salmon returning to western Alaska river systems resulting from bycatch reductions should be expressed in adult equivalent (i.e., the fraction of the bycatch savings surviving to maturity) passage of chinook salmon using available age composition data and age specific survival. The SSC notes the survival rate assumed in the analysis, is much lower than survival rates assumed for chinook salmon during the second and third year of ocean residence in the Pacific Salmon Commission's chinook salmon model.
2. The proposed chinook bycatch measures will result in spatial and temporal changes in the catch of pollock within identified sea lion critical habitat. The SSC recommends that the model be used to identify changes in catch relative to status quo, within the northern sea lion critical habitat area under the alternatives.
3. The document does not analyze the economic impact of the alternatives on directed groundfish fisheries. The SSC recommends that changes in fishing effort required to maintain directed groundfish catches (1994-1997) could be used as a relative measure of economic impact.

#### **D-1(b) TOTAL CATCH MEASUREMENT**

The SSC received an information report from Sally Bibb and Mary Furuness regarding progress in the implementation of the at-sea scales program and the adequacy of catch accounting for groundfish and prohibited species. Public comment was provided by John Gauvin.

Total catch measurement is a topic of interest to the SSC. During the February 1998 SSC meeting the committee spent considerable time reviewing catch estimation algorithms, with explicit plans to continue this review annually. Consequently, during the February 1999 meeting, the SSC intends to address total catch measurement with particular attention to the extrapolation of observer data from sampled to un-sampled hauls. Additionally, the SSC anticipates a review of species composition sampling methods and estimation procedures.

With respect to the information reports provided, the SSC notes that the tabular presentation of the proportion of species catch accounted for by particular elements of the blend estimation algorithm provides fresh insight into the operational impact of this catch estimation method. Nevertheless, the table is a little confusing, particularly regarding the characterization of observed and unobserved catch. A more detailed explanation of column headings, and an expanded discussion of how to interpret the table is warranted.

#### **D-1(c) SABLEFISH ROLLING CLOSURES**

NMFS has requested that this amendment not be pursued at this time. Consequently, the SSC did not address the EA/RIR.

#### **D-1(d) GOA FULL RETENTION OF DEMERSAL SHELF ROCKFISH (DSR) IN THE FIXED GEAR FISHERIES**

The SSC recommends that the document go forward for public review. The Committee notes that if adopted the DSR landings and bycatch may increase since it would be legal to retain DSR equivalent to more than 10% of

weight of halibut or sablefish catch in the IFQ fisheries. DSR bycatch landings could increase to the point where a DSR directed fishery could be precluded.

On the positive side the proposed measure would improve total mortality estimates for DSR by accounting for a significant portion of catch that is now unrecorded. The proposed measure would reduce discard and waste.

#### **D-1(f) IR/IU CHANGES**

Kent Lind (NMFS-AKR) discussed the four proposed changes to the IR/IU program. The SSC recommends that this document be released for public review and comment.

#### **D-2 GROUND FISH SAFE**

There are two important developments in the preliminary SAFEs. First, only those assessments with major changes in methodology or results are presented with no specification of ABCs as requested. Accordingly, the Team and SSC are commenting on methodological issues raised. The SSC commends the Teams for following this streamlined approach; we limit our comment to those stocks for which new analysis are presented. For other stocks, we ask the Plan Teams and assessment authors to refer to the SSC's December 1997 minutes for other issues.

Second, there is a trend in the assessments to convert from stock synthesis to automatic differentiation model builder (ADMB) modeling and software. This conversion is taking place because of greater flexibility and additional features found in ADMB.

##### BS/AI - Walleye Pollock

The SSC endorses the statistical age structure modeling (SAM) approach using ADMB. A preliminary reanalysis of MSY is contained in the SAFE, which will be enhanced for December. The SSC suggests a fuller treatment of the effects of selectivity on estimates of MSY and  $B_{msy}$ . At least two options should be considered for this as well as for forecasting: (1) Use the current estimate of selectivity, and (2) use the long-term average (as is currently done).

Further use of environmental information should be made for the purposes of explaining the time series of recruitment estimates, obtaining better forecasts, and refining current understanding of MSY.

Forecasting results will be particularly sensitive to the strength of the 1996 yearclass. Risk assessment to this factor should be undertaken so that uncertainty is clearly reflected in the forecasting. Any information related to Russian interceptions of this yearclass should also be provided.

Finally, the SSC notes that the Plan Team made additional suggestions that should be considered. In particular, the relationship among stock components (EBS, AI, Bogoslof) should continue to be discussed, and in the long-term, consideration should be given to a unified assessment including the three stock components.

##### GOA - Walleye Pollock

The methodology is the same that the SSC has supported in the past, with additional model configurations presented and compared. The SSC suggests that the December SAFE contain the stock synthesis model configuration A (base case) along with a configuration that increases age 2 natural mortality (like Models D-F),

one that adjusts the number of echo-integrated trawl series (like Model C, E) and one that uses 3-year selectivity blocks similar to the Bering Sea. An ADMB model (like Model H) but more similar in configuration to the stock synthesis model should also be include. The SSC also suggests that the authors provide an update on the summary of the predation model.

In addition, the SSC would like a comparison of previous FOCI forecasts of recruitment and the understanding of recruitment strength from the best current model. It would also be helpful to have a 4-year retrospective of the time series of estimated biomass to see the sensitivity of the assessment to each year's additional data.

#### Pacific cod

The SSC was impressed by the thought and effort that went into the Bayesian analyses used in the Pacific cod assessment last year. However, some members of the SSC felt that the resolution of a divergent likelihood and prior into a narrow posterior distribution was non-intuitive though theoretically correct. The result is that uncertainty appears to be understated. The SSC asks the assessment scientist to consider alternative resolutions to the divergence between the prior and likelihood. For example, the ABC calculated under the prior and likelihood model might be calculated separately then averaged, with the separate estimates providing a range

In particular the SSC would suggest a plan for analysis of the length- frequency samples used in the catch-at-age calculations be developed. Age compositions of the catches are determined through the length-frequency samples, and as a consequence, the catch-age modeling is strongly influenced by that sampling program. The sampling might be looked at with respect to a number of factors, in particular the influence of sample size, stratification by fleet sector (gear), time of year and fishing location (statistical area). The sizes of samples, and the distributions of the samples through the data stratifications influence the values produced by the assessment model. Is the sampling program adequate? If more fish cannot be measured, should more but smaller samples be taken? Does the spread of samples among the gear-month-area strata lead to biasing the results of the model? What distinctions between the GOA and BS/AI suggest different sampling needs for the two areas? How are State of Alaska samples in the GOA entered into the model?

#### GOA - Arrowtooth Flounder

The SSC was comfortable with the structure and application of stock synthesis to arrowtooth flounder. In addition, the SSC reviewed the initial draft of the reformulation of the stock synthesis in the ADMB model builder. The SSC notes that the more general model formulation allows sex specific selectivity and results in better fit to the catch by sex and size, which tend to be dominated by females.

#### BS/AI - Atka Mackerel

The SSC heard a report from Sandra Lowe regarding revisions to the atka mackerel model. The model has been changed to begin in 1977 rather than 1972 since the earlier time interval was without age data. Additionally, size composition data from the 1997 fishery and age composition data from the 1998 fishery have been added to the model. The trend in estimated biomass changed marginally as result of the change in start date. The stock continues to display a declining trend in abundance, but absolute abundances estimates for recent years are higher in the revised model than in the 1997 model. The 1992 year-class is now estimated to be 43% larger than estimated last year. The SSC requested a retrospective analysis, sequentially deleting the most recent years data and re-running the model. This analysis should shed light on the effect of the 1998 age data and 1997 size data in the estimation of the strength of the 1992 year-class, and separate the role of recent data from the effects of changing the time series start date. The SSC also asked for an expanded discussion of the rationale for dome shaped selectivity in the model. Finally, the SSC encouraged the authors to explore the available data for

evidence of site fidelity for segments of the atka mackerel population. For example, persistent patterns of size or age composition over years differing among specific locales may be signs that local populations inhabit a limited geographical space.

#### Pacific Ocean Perch

In 1997, the Pacific ocean perch stock assessment was conducted using an updated 32-bit version of the stock synthesis model. Comparison of model runs, where data and model structure were unchanged, between the older 16-bit version of the SS software and the newer 32-bit version resulted in substantially different estimates of population size. The SSC requested that the authors explore the cause for this change in estimated abundance. Comparison of parameter values, recruitment trends, and biomass trace between the two applications of the model would be informative as to the cause of the differences in performance.

#### Ecosystem Considerations

Dave Witherell discussed Plan Teams' expectations for future evolution of this important chapter. The December SAFE is expected to have an updated chapter similar to last year's. Simultaneously, the Teams are discussing an outline for a completely revamped ecosystems chapter to more clearly highlight the status and trends of various parts of the Gulf of Alaska and Bering Sea ecosystems and the status of ecosystem-based management efforts. This new approach is expected to address goals laid out by the Council's ecosystem management Committee and to develop into a accessible reference document of ecosystem-level trends and status.

The SSC commends this initiative, and we encourage the Council family and fishing industry to provide suggestions and comments to the Plan Teams to help guide chapter development into an accessible and useful document. A continuous longer term goal will be to investigate linkages between the indices measured and the Council's specification setting process.

The SSC also calls the Council's attention to the recent Lowell-Wakefield symposium in Anchorage addressing ecosystem considerations in fisheries management. There is a significant level of creative and insightful research in this field to which AFSC and Council staff have contributed. We particularly commend Dave Witherell for his contributions to these efforts.

#### **D-4 SCALLOP FISHERY LICENSE LIMITATION**

The SSC heard a presentation from Dave Witherell of the Council staff on the draft EA/RIR for license limitation for the scallop fishery. The SSC also heard public testimony from Mark and Theresa Kandianis.

The SSC believes the draft amendment is ready for public review with the following considerations:

1. The SSC asks that data and arguments regarding the absolute magnitude of the scallop resource be expanded and clarified.
2. Caution should be exercised in interpreting the reported break-even analyses. The conclusions drawn from these analyses are contingent on the assumption that the operating cost structure and the annual round of activity are identical for all current or potential participants. Break-even analyses should not be confused with an assessment of changes in net benefits to the nation. These benefits should be qualitatively addressed where the data will not support a quantitative analysis.

3. The Council may wish to re-examine the problem statement to ensure that it reflects concern for the economic hardship occasioned by the threat of additional entry to this fishery. Economic hardship is a theme that dominates the current document.
4. The SSC noted that confidentiality laws may constrain public access to data relevant to a host of management concerns given the small number of participants in the scallop fishery and potential further consolidation. The SSC wonders if it would be possible for scallop fishery participants to waive confidentiality rights as a requirement under the License Limitation Program so that data could be more widely accessible for management purposes.

#### **D-5(a) REVIEW THE BSAI CRAB SAFE**

The SSC was guided through a review of the crab SAFE by Peggy Murphy (ADF&G). Public testimony was given by Tom Casey, Ron Briggs, and Keith Colburn.

The SSC agrees that the 1998 Crab SAFE represents an improvement over past SAFE documents, but believes that significant improvements can still be made. The SSC had difficulty extracting summary information on the basic elements of stock condition, e.g, current stock size, estimated abundance and their confidence intervals, MSY exploitation rates, and minimum spawning stock biomass threshold levels. The SSC encouraged the Plan Team to produce a summary of stock condition as a preface for their next SAFE document. In addition, within the summary, the SSC recommends a brief overview of the abundance estimation methods (LBA, CSA) and the procedures for setting guideline harvest rates. The Plan Team is encouraged to examine the groundfish SAFE for an illustration of the types of elements placed in the summary.

The SSC identified some concerns with respect to crab stock conditions and harvest strategies. First, there was concern that existing procedures maintained a 58% exploitation rate for *C. opilio* despite declining stock abundance. It was explained that this species experiences a terminal molt and that there is little contribution to reproduction from male crab once this molt has occurred. The SSC would like to see an expanded discussion of the reproductive role of old shell male crab with particular attention to their potential contribution to reproduction in a depleted stock. Next, given the cyclic nature of the stock and current declining trend, the SSC requests a projection of *C. opilio* stock abundance. Such a projection should allow the Council to anticipate necessary management actions to ameliorate the decline.

Next, the king crab fishery is regulated with a step function for allowable exploitation rates, 10% when the stock is below effective spawning biomass threshold, 15% when above. The SSC asks for an explanation for the choice of a step function rather than a continuous function. With a step function small increments or decrements in stock size can provoke a significant change in allowable harvest, whereas a continuous function would adjust the change in allowable harvest rates proportionate to the change in stock condition.

Public testimony raised questions regarding the applicability of the length based analysis (LBA) model used in the king crab fishery. In particular, it was asserted that there was a disagreement between survey data and the model forecasts. It was also asserted that the stock rebuilding schedule which relied in part on the LBA was disproved by recent changes in stock condition. The SSC notes that forecasting is a notoriously difficult task in fisheries, and we do not believe that the king crab rebuilding forecast errors invalidate the use of the LBA model. This model has undergone peer review and has been published in the fisheries literature; it is a fundamentally sound analytical approach to stock assessment. The SSC recommends that the Plan Team conducts a public workshop to explain the LBA model and its data inputs.

**D-5(b) DEVELOP ALTERNATIVES FOR *C. BAIRDI* REBUILDING PLAN**

The SSC supports the Plan Team's recommendations with respect to *C. bairdi* rebuilding.