North Pacific Fishery Management Council

Richard B. Lauber, Chairman
Clarence G. Pautzke, Executive Director

Telephone: (907) 271-2809

605 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Fax: (907) 271-2817

Certified: Gail Bendixen
Date: 4/9/97

MINUTES
Scientific and Statistical Committee
February 3-4, 1997

The Scientific and Statistical Committee of the North Pacific Fishery Management Council met February 3-4, 1997 at the Anchorage Hilton Hotel. All members were present:

Keith Criddle, Chair	Jack Tagart, Vice-Chair	Al Tyler
Rich Marasco	Harold Weeks	Jim Balsiger
Phil Rigby (Alt.)	Sue Hills	Marc Miller
Doug Larson	Terry Quinn	Seth Macinko
Steve Klosiewski		

B-5 Ecosystem Committee Report

Dave Witherell provided a staff report on the recent and planned activities of the Council's Ecosystem Committee. Chris Blackburn provided public testimony. The SSC supports and encourages the Committee's continued efforts. The Alaska Fishery Science Center workshop on January 23-24 provided the Committee with a good overview of the ecosystem related research being conducted. More importantly, the workshop educated the Committee on the limits of our knowledge and understanding. The SSC thanks Dave Witherell for his timely and concise summary of the meeting. We would especially like to encourage incorporation of predation and climatic effects into stock assessments and incorporating ecological information into stock assessments and management advice.

For ecosystem management to truly become a reality, it is important that all participants in the Council process (broadly defined) come to a common understanding of our ecological questions and interpretations. We encourage the Committee to identify key ecological questions, incorporating industry and other public concerns. We suspect that many of the questions of concern to the public and the fishing industry are being addressed by ongoing research programs. For example, the Alaska Fishery Science Center is conducting research on effects of trawls on benthic habitat and predator/prey interactions. The Alaska Department of Fish and Game is increasing its efforts to understand crab recruitment and population dynamics. The U.S. Fish and Wildlife Service and University of Alaska are also addressing walrus issues in Bristol bay near haul-out sites.

Dr. A. Tyler discussed the possibility of using marine fish assemblage analysis as the basis for ecosystem-based management. Harvest strategies that focus on the most productive species will sometimes bring about decreases in biomasses of less productive species. Although fully developed quantitative assessments of the less productive species are neither currently possible, nor perhaps warranted, assemblage analysis could form a basis for better incorporation of ecological linkages into catch management of groundfish species. The SSC encourages

examination of assemblage based and other multiple species management approaches. (See agenda item C-5, section C(8).

Several ecosystem-related needs are identified in the SSC's recommended research priorities under C-5.

C-2 Halibut Charterboat Management

The SSC received a report on the draft EA/RIR from Council staff and Dr. Scott Goldsmith (University of Alaska Anchorage, Institute of Social and Economic Research). The SSC also heard public testimony from Robert Ward, Bert Stromgquist, Shari Gross, and Barry Bracken. Bob Trumble (IPHC) offered some comments on IPHC experiences with recreational quotas in area 2A.

The SSC recommends against releasing the draft EA/RIR for public review. The draft document presented for our review is incomplete. Still to be incorporated for example, is an economic impact analysis for the commercial industry. The document lacks justification and documentation for data and models used to represent the profitability and economic impacts of the recreation sector. In addition, the document lacks a discussion of how the alternatives under consideration will affect net economic benefits. Finally, the document does not consider the social impacts of management alternatives on both the commercial and recreational industries.

Numerous data deficiencies are acknowledged in the document. The SSC's review indicated that data deficiencies prevent the estimation of net economic benefits of management alternatives relative to the recreational industry. In addition, data limitations (such as data on expenditures of recreational fishermen) suggest that there is considerable uncertainty associated with estimates of economic impacts. Data availability will also complicate any attempt to implement a moratorium. **The SSC recommends that the Council address the data collection issues which will need to be resolved in order to credibly analyze the allocation issues the Council must inevitably confront.**

The charter boat analysis relies on unspecified methodologies and undocumented data to infer insupportable conclusions regarding economic impacts. These chapters (3 and 4) are plagued by a lack of specific references to data sources. Literature is referred to but not cited, numeric data are misrepresented (e.g., informed hunches are presented as "averages," partial economic impacts are labeled "total economic impacts"), and unsubstantiated data are curiously defended:

> "Data from Alaska visitor surveys and surveys of sport angler spending is not reported in a way to allow us to make estimates of charter related spending for this study, but there is nothing in this data which suggests that non-resident anglers do not typically spend $100 to $200 per day. . ." (p. 3-9)

The SSC commends the Council staff for continuing to advance their analytical treatment of net benefits in the commercial industry. While there are methodological problems with the estimation of CPUE that may affect the estimates of net economic benefits to the commercial industry, the SSC provided the analyst with recommendations that will address the problems.

Three additional areas of concern identified by the SSC involve the analyses of economic impacts presented in the document.

a) A consistent set of economic measures must be used. Currently, the charter boat analysis presents expenditure changes whereas the commercial industry analysis focuses on changes in net economic benefits.

b) The treatment of regional and national accounting stances must be consistent. Currently, the halibut charter impact analysis considers expenditure changes solely in Alaska. In contrast, the planned commercial industry impact study will identify benefits to Alaska and other U.S. interests.

c) A consistent economic impact methodology (input-output model) should be used to evaluate both the recreational and commercial industries.

Review of the document also prompted SSC discussion of a number of forward-looking aspects of this issue:

a) The context of the problem facing the Council appears to have changed considerably since initial formulation of the Council's problem statement. Growth in recreational harvests has slowed while halibut abundance estimates have been revised dramatically upwards. However, these changes do not imply that the allocation aspect of the Council's problem statement has been resolved.

b) Chapter 7 of the document underscores the mismatch between the current alternatives and much of the Council's problem statement concerning local depletion. The SSC notes that these aspects of the problem statement may be better addressed by development of local management initiatives involving the relevant user groups and traditional management tools to achieve temporal and spatial separation of fishing activities.

c) The interplay between guided and non-guided recreational harvests must be addressed. The SSC believes that conceptual separation of the guided and non-guided portions of the recreational sector reflected in the document is not appropriate. As noted in our April, 1996 minutes, although separation of the charter component might make the analysis more tractable, this separation for analytical purposes should not be confused with actual separability of the guided and non-guided components of the recreational industry.

C-5 Research Priorities

The SSC reviewed Plan Team recommendations for additional research and updated the January 1996 SSC research recommendations. The SSC emphasizes that this list is not inclusive of all needed research nor is it prioritized; rather it represents a compilation of research ideas recognized by the SSC as deserving attention by NMFS, ADF&G, IPHC, other agencies, and institutions of higher learning. The SSC chair will provide the executive director with a list of appropriate institutions. We request that this portion of the minutes be distributed appropriately. Finally, it would also be helpful if the Council solicited from these institutions a list of ongoing research activities which may be related to groundfish and crab management. In this way, these institutions and the Council can become aware of ongoing research as well as mutual interests and needs.

Given the potential expansion of state-water fisheries, the need for understanding the relationships between groundfish in state and federal managed waters, and limited programmatic resources, the SSC encourages close coordination of resource assessment and research efforts.

A. Critical Assessment Problems

1. Rockfish: There is a general need for better assessment data, particularly investigation of stock structure and biological variables. These activities are included in the AFSC Rockfish Research Plan.

2. Walleye pollock: There is a continuing need for research on stock structure as it relates to assessment. There is a critical need for a tagging study to focus on stock interactions. We

continue to emphasize the need for age-structured assessments of recognized stock units. As the Bering Sea pollock population has declined, the forecasts of future pollock recruitment have undergone greater scrutiny. Research on alternative forecasting methodologies is needed

The SSC believes that research should be undertaken to determine the magnitude of the catch, size and age structure of the EBS stock harvested in the Russian zone in the vicinity of the transboundary area. It may be necessary to consider fishing removals from the Russian zone and their impact on EBS pollock mortality in the estimates of ABC and TAC.

Assessment of the status of the Gulf of Alaska resource is critically dependent upon results of resource surveys. Currently, these surveys are conducted every three years. Various ways of supplementing the triennial survey data should be evaluated. The relationship between fish in Prince William Sound to those in the Gulf of Alaska needs to be elucidated.

3. Crab research: Research should be expanded on handling mortality, stock structure and life history parameters.

4. Age- and length-structured assessments: These assessments integrate several data sources using some weighting scheme. Little research has gone into evaluation of different weighting schemes, although the weight can have a large effect on the assessment results. Research is needed on which weighting schemes are robust to uncertainties among the different data sources. Age structured assessments are incumbent upon age determination techniques, and ongoing age validation is needed. The Lowell-Wakefield Symposium in October 1997 will address the implementation and improvement of age-structured models.

   Correct model specification is critical to stock assessment. Further research is needed on model performance in terms of bias and variability. In particular, computer simulations, sensitivity studies, and retrospective analyses are needed. As models become more complex in terms of parameters, error structure, and data sources, there is a greater need to understand how well they perform.

5. There is incomplete life history information, e.g., growth and maturity data, for a number of stocks. This information is essential for determination of ABC, OFL and preferred fishing mortality rates. Maturity data are lacking on the following: Pacific cod, Dover sole, other flatfish, sablefish, and many species of rockfish. Life history and distributional patterns of Greenland turbot are lacking and require additional research. To better understand sablefish recruitment variability, additional information on the geographical distributional and movement of juvenile sablefish is needed.

6. Identification of the origin of chum and chinook salmon stocks captured incidentally in the groundfish fisheries is needed. The chum salmon stocks in particular are recognized as a mixture of Asian and North American origin. Resolution of stock origin is important in the consideration of bycatch management.

7. There is need for information about stock structure and movement of walleye pollock, Atka mackerel, Pacific cod, POP, and other rockfish. With such information, a combined BSAI/GOA assessment might provide better information, especially for Atka mackerel and Pacific cod.

8. Further research is needed about management strategies which provide for conservation of aquatic resources. Some topics which need attention include: which measure of biomass should

be used in biomass-based adjustment of ABC and OFL; what measure of average recruitment to use in $B_{40\%}$; the effect of seasonality in spawning, recruitment, and harvest on optimal harvest rate; adaptive management schemes which are designed to provide understanding of multispecies interactions and spatial population dynamics.

9. Presentation of uncertainty in stock assessments is often lacking or incomplete. Further research is needed into which methods are most appropriate for capturing uncertainty in the status of populations.

10. Management measures such as time-area closures and other restrictions are frequently imposed, but rarely rescinded. Studies are needed to evaluate the effectiveness of management measures on conserving populations, achieving management goals and assessing other ecosystem effects.

B. Stock survey concerns

1. Conservation of aquatic resources in the North Pacific is critically dependent on a consistent time series of trawl, hydroacoustic, and longline surveys. The continuity of this series must remain one of the highest priorities of NMFS and the Council.

2. Explore ways for inaugurating or improving surveys to assess rockfish (including nearshore pelagics), pollock, squid and Atka mackerel.

3. Expand bottom trawl surveys in the Gulf of Alaska and Bering Sea to include slope areas that encompass the population range of Greenland turbot, rockfish, thornyheads, and sablefish.

4. Conduct surveys of the Aleutian Islands management area to assist in the assessment of groundfish stocks found in this region.

5. Improve surveys for Bering Sea crab complimentary to the existing Bering Sea crab/groundfish survey (e.g. Norton Sound, Pribilof Islands, St. Matthew Island, and Bristol Bay).

6. Direct observation (e.g. submersible and dive surveys) offers unique opportunities to directly examine gear performance, fish behavior in the proximity of gear, gear related habitat impacts, and differences of fish density between trawlable and nontrawlable habitat.

7. There is a continuing need to perform gear calibration and fish observation studies to validate indices of abundance (e.g. fishing longline and trawl gear side-by-side, and fishing different baits on longline gear over the same stations).

8. Within the EEZ are seamounts which are unsampled for groundfish, halibut, and crab abundance. Surveys which sample these seamounts may improve estimates of total abundance in the EEZ, particularly for sablefish and rockfish stocks.

9. Data from annual ADF&G crab surveys should be examined and their usefulness for assessing groundfish abundance in near-shore areas should be evaluated. Dialogue between ADF&G and NMFS assessment scientists regarding ways of gaining more useful groundfish data from this survey should be encouraged.

C. Expanded Ecosystem Studies

1. Because of the importance of marine mammal and seabird considerations in fisheries management, further studies are needed on interactions among fisheries, marine mammals, and seabird populations. In particular relationships among oceanographic conditions, conditions and animal condition and health should be explored. Research should be done on sources of age-specific fish mortality.

2. Effort is needed on status of stocks and distribution of forage fishes, such as capelin, eulachon, and sand lance. Forage fish are an important part of the ecosystem , yet little is known about these stocks. The Lowell-Wakefield Symposium (October 1996) presented current research on forage fishes.

3. Studies of the effects of harvesting and processing activities on the ecosystem and habitat should be instituted. For example, studies contrasting species diversity and abundance in the red king crab savings area with that in adjacent regions.

4. Trophic dynamics research should be undertaken on the relationships among critical species, e.g., Pacific cod and its prey (including shrimp and crabs). The feasibility of constructing multispecies models using ongoing collection of gut contents data should be investigated.

5. Groups of species in the rockfish and flatfish families are now managed as "species complexes." Research should be expanded on the question of biological linkages among the components of "species complexes" that justify this management approach. Further, are there other, unidentified groups of species that are ecologically related and could be managed as a unit?

6. Studies are needed to identify essential habitat for groundfish and forage fish species in the Gulf of Alaska and Bering Sea. This identification is required by the MSFCMA and would benefit from field studies conducted across a matrix of spatial temporal, and life history stages.

7. Expand studies of distribution, abundance, and productivity of seabird populations and ensure that data are collected in ways that provide for rigorous analyses of seabird/marine mammal/oceanographic/fisheries interactions. The majority of data on seabirds in Alaska was collected during the 1970s (through OCSEAP); the quantity of data collected afterwards has been insufficient to adequately examine these interactions.

8. Multivariate statistical analysis of the time series of annual survey data may identify which species regularly occur in assemblages. Mapping these assemblages through space and time may reveal changes in the distribution and abundance of the species of the Eastern Bering Sea. These mappings and trajectories may be applicable to adaptive management approaches suggested for exploring ecosystem concerns. Although related analyses were started by NMFS in the late 1970's , they have not been conducted in recent years. Recent advances in spatial statistics may prove fruitful tools for reexaming these existing data.

D. Socioeconomic research

1. There is a critical need for the development and continued maintenance of basic economic information databases on the fisheries of GOA and BS/AI. This information is required for establishing a baseline to be used in the evaluation of the impacts of alternative management measures. At a minimum there is a need for reliable information on:

a) the cost and revenues of fishing and processing operations,

b) the location where goods and services are purchased,

c) the characteristics of markets for fish products,

d) patterns of ownership in fishing and processing operations,

e) the relationships between harvesting and processing sectors,

f) unemployment rates by community over time, labor wage rates in alternative occupations (to fishing) by community over time, and assessment of the opportunity costs of labor,

g) the cumulative efficiency and equity consequences of management actions that apply time/area closures,

h) the transfer of halibut and sablefish IQ's (transactions price, volume, changes in distribution of ownership, etc.),

I) comprehensive method for managing catch and bycatch,

j) net economic benefits of commercial and recreational harvests, in particular, for halibut, and

k) needed to estimate regional and community impacts.

2. Research pertinent to assessment of the social impacts of actions contemplated by the Council include:

a) Social Assessments: Selected community and industry assessments should be conducted to establish baseline conditions underlying social problems identified by the Council and the Advisory Panel. As appropriate, these projects can be extended to generate time series information.

b) Social Impacts: Social impact and policy research should be conducted regarding the identification and potential effects of alternative management actions.

c) Develop better methods for determining the social costs and benefits of management actions (e.g. through the use of non-market valuation techniques).

3. Analysis of anticipated impacts of proposed management changes would benefit from improved understanding of fleet behavioral response to alternative fishing opportunities and restructure the Bering Sea bycatch allocation model to provide better predictions of how fishing effort will shift in response to time/area closures,

E. Bycatch problems

1. Research on gear modification and other methods for reducing bycatch should be expanded.

2. A better quantification of discard mortality rates is needed, especially for halibut and crab.

4. Data on size/age and sex of crabs taken as bycatch are needed to assess impacts.

5. Develop methods for performing comprehensive evaluations of single and multiple time/area closures and other bycatch management measures.

6. Develop better methods for assessing the social costs of bycatch.

7. Identify sources of variability in actual and estimated bycatch rates.

F. Alaska Fishery Monitoring

1. An analysis of the utility of fishery logbook information should be conducted. In particular, determine if it is possible to gain insight into fleet performance from such information. Examine feasibility for developing a representative CPUE index and determine if it is proportional to stock size

2. Evaluate sampling procedures used by observers and various catch estimation procedures.

3. Development of catch and bycatch sampling procedures for individual vessel accountability programs.

C-6 Essential Fish Habitat

The SSC reviewed and discussed the proposed secretarial guidelines for the identification of essential fish habitat (EFH). Cindy Hartman (NMFS-AKR) answered questions concerning the expected timeline for EFH guideline development. Public testimony was provided by Chris Blackburn and Tom Okey. We encourage the Council to take a broad-brush approach in identifying EFH, and to use the gaps identified in our understanding of fish-habitat relationships as the basis for continued research. We encourage the Council to work with the AFSC and others to prepare GIS presentations of important habitat features, particularly in relationship to the distribution of fish, shellfish and other resources from surveys. We also note that the Council has taken a number of past conservation actions to limit fishing activity based on habitat concerns; we encourage the Council to discuss these actions in identifying EFH.

Several habitat related items are included in our suggested research priorities under C-5.

D-2(b) Sablefish Rolling Closures

The SSC heard public testimony from Bob Alverson, Chris Blackburn, and John Gauvin. The three-page discussion paper provided in our briefing books includes a description of the location and timing of the proposed closures. The document does not discuss potential impacts of closures on longline or other fisheries. Nor does the document demonstrate that the closures will result in statistically superior estimates of sablefish abundance. Recent fishing patterns differ substantially from pre-ITQ patterns. Consequently, the longline surveys from before ITQ implementation may not be directly comparable with current surveys.

Other Issues

State Waters Catch Accounting

In its December 1996 minutes the SSC recommended that groundfish catches within state waters be reported. Although catches with the 0 to 3-mile zone have been regularly included in annual stock assessments, it has not always been clear whether internal waters (S.E. Alaska and Prince William Sound) catches were also included. Because stock relationships between internal waters and the 0 to 200-mile zone have not been well documented, the SSC asks that for future assessments the analysts report internal waters catches and discuss their reasons for including or excluding internal waters.

Sablefish Logbook Program

The SSC heard an informational report from Dan Falvey and Liz Cabrera describing volunteer efforts to develop a sablefish logbook program. The proposers have been working with Auke Bay staff on specific elements of the program.