MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
            Executive Director

DATE: November 27, 1996

SUBJECT: Research Priorities

ESTIMATED TIME
1 Hour

ACTION REQUIRED

Final review of research priorities for submission to NMFS.

BACKGROUND

In November the plan teams recommended the research priorities as listed in item C-3(a). After receiving any comments from NMFS and the SSC at this meeting, the Council needs to forward the priorities to NOAA for use in preparation of its annual budget.

GOA PLAN TEAM RESEARCH PRIORITIES

Excerpted from the January 1996 SSC Meeting Minutes
GOA Plan Team revisions noted as follows:
Deletions are struck out; additions are in bold print.

The SSC reviewed Plan Team recommendations for additional research and updated the January 1995 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.

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. ~~In particular there is a need for improved surveys and assessment of nearshore pelagic rockfish.~~

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. In particular, an age-structured analysis of the Aleutian Island and eastern Bering Sea stock should be done in 1996.

   The SSC believes that immediate 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.

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.

B.	Stock survey concerns

1.	The SSC was told that the NOAA Corps is in the process of being disbanded. This action has given rise to questions about what will happen to the NOAA fleet. One vessel in this fleet, the R/V Miller Freeman, is critical to the assessment of Gulf of Alaska and Bering Sea pollock stocks. The hydroacoustic equipment on this vessel cannot be easily transferred to a commercial fishing vessel. Major modifications to the vessel and extensive calibration would be necessary. The importance of the hydroacoustic survey to the assessment of pollock requires careful monitoring of actions being contemplated for this vessel.

2.	Explore ways for improving surveys to assess rockfish, pollock, and Atka mackerel.

3.	Expand bottom trawl surveys in the Gulf of Alaska and Bering Sea to 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.	Develop new trawl 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, as well as gear related habitat impacts.

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 ADFG crab surveys should be examined and their usefulness for assessing groundfish abundance in near-shore areas evaluated. Dialogue between ADFG and 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 should be explored between oceanographic conditions and feeding conditions in relation to animal condition and health. Research should be done on age-specific 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 (fall 1996) will examine current research on forage fishes.

3. Studies of the effects of harvesting and processing activities on the ecosystem should be instituted.

4. Trophic dynamics research should be undertaken on the relationships among critical species, e.g., Pacific cod and its prey (including shrimp and crabs).

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? Assemblage management has to be evaluated to determine its ecological validity.

6. Studies are needed to identify critical habitat for groundfish and forage fish species in the Gulf of Alaska and Bering Sea.

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 operations,

    (b) the nature, magnitude and location of where goods and services are purchased,

    (c) the nature of markets for various fish products,

    (d) ownership of fishing and processing operations,

    (e) the nature of relationships between harvesting and processing sectors,

    (f) unemployment rates by community over time, and labor wage rates in alternative occupations (to fishing) by community over time,

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

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

    (i) restructure the Bering Sea bycatch allocation model to provide better predictions of how fishing effort will shift in response to time/area closures,

    (j) research to identify a comprehensive method for managing catch and bycatch,

    (k) assessment of the net economic benefits of commercial and recreational harvests of halibut,

    (l) assessment of the opportunity costs of labor,

    (m) identification of the sources of variability in actual and estimated bycatch rates.

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.**

E. Bycatch problems
    1. Gear research should be expanded on methods of reducing bycatch and fishing gear design that would make fishing methods more selective. Trawl mesh experiments are one area of promise, but gear design work should also be investigated.
    2. A better quantification of discard mortality rates is needed, especially for halibut and crab.
    3. Fisheries catch and effort data should be reviewed to determine the effectiveness of single and multiple time/area closures in reducing bycatch.

    4. An age/size class structured bycatch model is needed to appraise the level of crab bycatch relative to stock condition. Data on size/age and sex of bycatch is needed to assess the level of bycatch within and across fisheries.
    5. Develop methods for performing comprehensive evaluations of bycatch management measures.
    6. Develop better methods for assessing the social costs of bycatch.

F. Alaska Fishery Monitoring
    1. An analysis of the utility of fishery logbook information should be conducted.
    2. Observer data would be more credible in stock assessments if NMFS were authorized to specify the dates and localities for observer coverage of vessels in the 30% coverage category.
    3. Development of catch and bycatch sampling procedures for individual vessel accountability programs.

1996 BSAI Groundfish Research Priorities

1. Evaluate closure areas for their effectiveness of 1) stated purpose, 2) species composition changes, 3) secondary effects (e.g. shifts to other fisheries), 4) biological changes: recruitment, productivity (eg. trawl plowing the bottom and releasing nutrients).

2. Evaluate the choice of exploitable biomass as a measure of stock status. Is exploitable biomass appropriate? Is spawning biomass "better"? How should exploitable biomass be calculated if used as a measure? This discussion arose in the yellowfin discussion because they mature after entering the fishery.

3. Collect and analyze flatfish maturity data. The intent is to provide other information to estimate natural mortality. The intent also is to calculate B40% (spawning biomass). Arrowtooth flounder and flathead sole are pointed out as species where information should be relatively easy to collect since they spawn during the winter when the fishery occurs. Alaska plaice are summer spawners and information could be collected during a summer survey.

4. Tag pollock, Pacific cod, Atka mackerel, Greenland turbot, and thornyheads.

5. Evaluate fishing gear effects on seafloor habitat.

6. NMFS should form a group of scientists assigned full-time to evaluate ecosystem effects. The group should consist of at least a modeler to develop a multispecies model(s) and an anthropologist to collect historical information from coastal inhabitants and fishermen.

Others in attendance at the BSAI team meetings were:

Lauri Jansen	*Mike Szymanski*
Walty Pereyra	*Lowell Fritz*
John Roos	*Brent Paine*
Fran Bennis	*Dave Fraser*
Tamra Farris	*Vince Curry*
Ken Stump	*John Hendershedt*
Dan Waldeck	*Kim Dietrich*
Thorn Smith	*Paul McGregor*