MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
             Executive Director

DATE: March 25, 2003

SUBJECT: Groundfish Issues

ESTIMATED TIME 8 HOURS (all D items)

ACTION REQUIRED

(a)   Discuss future actions resulting from F40 Report
(b)   Receive progress report on rockfish/non-target species management

BACKGROUND

(a)   <u>F40 Report</u>

In October 2001, in conjunction with the actions taken to address Steller sea lion issues, the Council also approved a motion to conduct an independent scientific review of our basic F40 harvest policy relative to National Standards. The intent of this review was to determine whether changes need to be made to account for individual species needs or ecosystem needs. In December 2002, the Chair of the panel, Dr. Dan Goodman, provided the Council with a final report (available on our web site). In summary, the review panel found that the current harvest strategies were sufficiently conservative for most stocks. However, the panel recommended that alternative harvest strategies be explored for some species, notably rockfish. The panel also recommended well designed monitoring programs be implemented as an approach to ecosystem-based management. The Council requested that NMFS scientists review the review panel's report, and provide recommendations to on how to incorporate the findings into our management process. NMFS staff will provide a report at this meeting.

(b)   <u>Rockfish/non-target species management</u>

Over the past few meetings, the Council has received progress reports from NMFS on research and management of BSAI red rockfish. Dr. Anne Hollowed, AFSC, will brief the Council on the Center's rockfish research plans (Item D-1(b)(1)). Council staff will report on the recommendations from the second meeting of the non-target ad hoc committee, which is developing a general framework for separating non-target and target species.

Rockfish Research Plan

Rockfish Working Group
Alaska Fisheries Science Center
March 24, 2003

Introduction

In January 2003, the Alaska Fisheries Science Center (AFSC) submitted a report to the North Pacific Fishery Management Council that described the scientific information necessary to improve management of Alaskan rockfish. The document focused on the issues of stock structure, the adequacy of existing surveys, and the availability of life-history information. The Council requested an update on the Center's research plans for the April meeting. This update provides a description of research activities planned for 2003 and a preliminary long-range plan for improving rockfish research. Research activities planned for 2003 are constrained by current funding levels. Scientists plan to conduct exploratory studies to improve our understanding of the distribution of higher density concentrations ("patches") of semi-pelagic rockfish in the Eastern Bering Sea. Long-term research activities would require an increase in funding of approximately $3 million dollars (Table 1).

The activities described under the long-range plan are consistent with the objectives of the National Oceanic and Atmospheric Administration (NOAA) Fisheries, Stock Assessment Improvement Plan (SAIP).

- *To develop sustainable harvest policies that minimize the risks of overfishing both target species and associated species.*
- *To implement ecosystem-based stock assessment and management.*

The SAIP outlines the programmatic funds needed for each regional Science Center to achieve these objectives and outlines the data collection and assessment needs required to improve assessments nationwide. In 2003, AFSC targeted improving stock assessment of "other species". In 2004, AFSC requested funds to improve rockfish assessments.

2003 planned activities: the distribution of semi-pelagic rockfish patches on the eastern Bering Sea slope

Rockfish biomass estimates in the eastern Bering Sea (EBS) management area have received increased attention in recent years. For example, northern rockfish are currently managed as a single stock across the Bering Sea/Aleutian Islands (BSAI) area, but interest exists in assessing whether this species should be managed as a separate stock in the EBS. Under this scenario, the EBS harvest regulations would be dependant upon survey information in this area, and recent

survey estimates of northern rockfish have been small with considerable uncertainty. For example, the estimate from the 2002 EBS slope survey was 33 t with a coefficient of variation of 38%. Northern rockfish in this area are obtained as bycatch, and low biomass estimates and catch limits may restrict various target fisheries.

Examination of fishery bycatch data (non-pelagic trawls) reveals that northern rockfish bycatch in the eastern Bering Sea occurs in depths not well sampled by either the EBS shelf or slope surveys. For example, approximately 95% of the non-pelagic trawls containing northern rockfish from 1999-2002 were between 75 m and 275 m deep, whereas the 86% of the 2002 shelf survey station were in waters less than 120 m and 83% of the 2002 EBS slope survey station were in waters greater than 280 m. The fishery bycatch data also indicates that a fairly small percentage of all non-pelagic trawls obtain northern rockfish, and when northern rockfish bycatch does occur it is generally located southwest of the Pribilof Islands or in the Unimak area.

The purpose of this project is to conduct some exploratory field work near the Pribilof Islands that would guide the design of future surveys for patchily distributed species. Survey designs that use echosign information to identify high-density concentrations, or "patches", that can then be used to efficiently allocate trawl survey sampling, such as Trawl-Acoustic Presence-Absence Sampling (TAPAS) and double sampling for stratification, have not been evaluated for rockfish in field experiments. The proposed field work for 2003 is intended to provide background information on the nature of patches of semi-pelagic rockfish, such as northern rockfish and Pacific ocean perch, on the EBS slope near the Pribilof Islands. Specifically, five days of reconnaissance work in late July would be conducted to characterize the distribution and size of rockfish patches, gain some information on the gross habitat features (slope, bottom roughness), and evaluate diurnal patterns of any rockfish patches observed.

Long-range Spending Plans for Improving Rockfish Management

The long-range plan for rockfish working group focuses on four research areas: a) improving knowledge of rockfish stock structure, b) reducing uncertainty in survey biomass estimates, c) improving the availability of life-history information, and d) expanding the number of stocks assessed. The total cost for all projects is $2.9 million dollars, 19% of which would be grants or contracts (Table 1). The plan calls for an addition of 10 FTEs who would assist in performing age determinations, stock assessments, and annual surveys. A brief description of each project follows. Projects 1 and 8 would improve our knowledge of rockfish stock structure. Projects 2, 4 and 5 would develop and implement protocols to improve the collection and analysis of rockfish life history information. Project 3 seeks funds to hire additional staff to perform stock assessments. Projects 6, 7, and 11 propose improvements to existing surveys or new surveys to improve biomass estimates of adult and juvenile rockfish. Collectively the staff, days at sea, and research funds would form the foundation for a core rockfish research team.

Table 1. Project list and estimated cost for activities designed to address the information needed to improve the assessment and management of Alaskan rockfish.

Project title	FTE's	Days at Sea	Grants or Contracts	Total Cost
SAIP 1. Improve knowledge of rockfish stock structure	0	0	$80,000	$90,000
SAIP 2. Estimate key life history parameters for selected species/stocks of rockfish	0	20	$0	$167,000
SAIP 3. Develop quantitative assessments of rockfish	2			$166,268
SAIP 4. Implementation of observer protocols that improve the species identification of bycatch of rockfish			$67,500	$86,000
SAIP 5. Improve age determinations for selected rockfish species	1			$60,441
SAIP 6. Design and evaluate sampling protocols to assess rockfish during biennial summer surveys in the GOA and Aleutian Islands	4	50	$170,000	$882,373
SAIP 7. Evaluation of the catchability of selected rockfish to the groundfish trawl survey and their habitat associations		24		$217,200
SAIP 8. Investigate the genetics and spatial distribution of young-of-the year rockfish	1		$223,009	$316,398
SAIP 9. Investigate the spatial component of rockfish assessments	1			$90,294
SAIP 10. Rockfish Assessment Mapping	1	15		$531,857
SAIP 11. Develop methods to assess nursery area requirements age 1+ slope rockfish.		30		$301,500
Total	**10**	**139**	**$540,509.00**	**$2,909,331.00**

AFSC SAIP 1. Improve knowledge of rockfish stock structure

Identification of stock structure is an essential part of examining whether a particular management scheme is providing conservation of rockfish resources. It is unlikely that the spatial boundaries of individual rockfish stocks will correspond to our current management boundaries that were established for management of groundfish stocks in aggregate. The establishment of spatial management systems for individual species will be dependent, in part, on information such as the identification of areas where reproduction occurs. Evidence of the potential for differences between rockfish species is provided by initial genetic studies. These studies indicate that little stock structure is seen for northern rockfish across wide areas, whereas, weak structure has been identified for shortraker rockfish at broad scales and strong structure has been identified for Pacific ocean perch (POP) at fine spatial scales. In the case of northern rockfish, these findings are based on small sample sizes and the results are considered preliminary. This project seeks funds to improve the spatial and temporal coverage of rockfish genetic samples. AFSC has genetics laboratories where some of this work can occur. AFSC staff and University collaborators will collect and process genetic samples from three regions of the Aleutian Islands, two regions in the Eastern Bering Sea and four regions in the Gulf of Alaska. Samples will be collected during the late winter early spring to maximize the probability that genetically isolated stocks will be present as this is the period when parturition is likely to occur.

Aleutian Islands	Bering Sea	GOA
543 – Western	517, 521 - Pribilof Canyon	680 - Southeast
542 – Central	518, 519 – Unimak	640 - PWS
541 – Eastern		630 – Kodiak Island
		610 – Shumagin Islands

The project will require charter costs to collect samples at peak periods of parturition, laboratory supplies, and 1 grant for continuation of research on rockfish genetics. The project is linked to two other projects, AFSC SAIP 2 and AFSC SAIP 3.

Expected outcomes of this project include:
- Increased knowledge of the stock structure of northern rockfish, POP, and shortraker rockfish in the Gulf of Alaska.
- Identification of regional partitions for stock assessment and management.

Performance Measure: Upgrade the level of stock assessment data for at least 3 stocks

AFSC SAIP 2.
Estimate key life history parameters for selected species/stocks of rockfish

Maturity studies are required for most rockfish species in the BSAI and some rockfish species in the GOA. The project seeks funds to collect and perform baseline maturity studies using a chartered vessel in the Aleutian Islands in March of 2004. Specific tasks funded by this project include: 1) an evaluation of the accuracy of RACE visual scans for evaluation of rockfish maturity stages; 2) an evaluation of regional differences in the maturity schedule; 3) evaluation of regional differences in GSI.

The principal investigator for this project will be Elizabeth Chilton. The study design will sample a representative size range each species in order obtain reliable estimates of the proportion mature in each size group. Ms. Chilton will be responsible for collection and transport of samples, reading of otoliths, and analyzing rockfish ovaries. Slide preparation will be accomplished by contracting independent laboratories. The revised maturity schedules will be incorporated into BSAI stock assessments.

Field expenses cover travel, equipment and charter costs to cover cruises identified in project SAIP 1.

Expected outcomes of this project include:

- *Improved biological information for POP, northern, dusky, rougheye, and shortraker rockfish*
- *Reduced chance of inadvertently overfishing rockfish species*

Performance Measure: Upgrade the level of stock assessment input data (i.e., catch, abundance, or life history) for at least 4 stocks

AFSC SAIP 3
Develop quantitative assessments of BSAI northern rockfish, BSAI shortraker rockfish, BSAI thornyhead, GOA light dusky rockfish, GOA shortraker rockfish, GOA rougheye rockfish. (2 FTEs).

Stock assessment personnel are needed to conduct methods research, to conduct stock assessments and to communicate the results to the NPFMC and other management entities. These individuals would conduct retrospective studies of existing data for selected species of rockfish in the Gulf of Alaska, Aleutian Islands and Bering Sea. Analysts would research methods for establishing stock assessments in data - poor situations. Preliminary stock assessments would be conducted and presented to NPFMC for review at its December Council meeting. Assessment authors are expected to work in conjunction with survey staff to identify key parameters that require refinement.

The project will require 2 FTEs. The FTEs will perform stock assessments for Aleutian Islands northern rockfish, AI thornyheads, AI shortraker rockfish, GOA light dusky rockfish, GOA shortraker rockfish and GOA rougheye rockfish. The FTEs also will improve existing assessments by Bayesian estimation of variability from age-structured models and application of adaptive sampling results. Staff will assist in production of Stock Assessment Fishery Evaluation reports to the North Pacific Fisheries Management Council. We anticipate that the FTEs will be hired in sometime during the summer of 2004.

The incumbents will join the staff at the Alaska Fisheries Science Center and will be introduced to methods used in current assessments. Drs. Jon Heifetz and Paul Spencer will work closely with the incumbents to ensure that assessments meet the standards expected by the NPFMC. Once trained, the incumbents will be expected to contribute scientific publications that improve our knowledge of rockfish stock assessment and management. The incumbents will offer advice regarding impacts of alternative harvest policies as required by NEPA.

Expected outcomes of this project include:

- *Improved stock assessments for rockfish*
- *Improved stock assessment methodology*
- *Support for impacts analysis as required under NEPA.*

Performance Measure: Upgrade the assessment level of 4 stocks

AFSC SAIP 4.
Implementation of observer protocols that improve the species identification of bycatch of rockfish

Despite recent changes in fishery observer sampling procedures designed to sample more otoliths and increase length measurements of bycatch species, these data remain low for non-POP rockfish species. This proposal seeks funds to increase the collection of catch and life history information for rockfish species take as bycatch. The incumbent supported by this project would review recommendations for improved sampling and to conduct field experiments to evaluate the feasibility of implementing revised procedures.

The Aleutian Islands Atka mackerel fishery captures rockfish as bycatch, and each vessel is required to have two observers. Preliminary discussion with Observer program personnel suggests that these observers have the capacity to collect additional biological samples, and this resource will be utilized. In the Gulf of Alaska, little biological data is obtained on shortraker and rougheye. Funds would support the training and deployment of experienced observers in fisheries that take these species as bycatch, such as the sablefish fisheries. These individuals will be selected from a pool of observers who have successfully completed at least one deployment as a rockfish fishery observer. The incumbents will be assigned tasks above and beyond those of first time observers. Funds will be used to compensate the observers for time spent collecting lengths and otoliths for rockfish species taken as bycatch. Super observers will be deployed on vessels where rockfish are the primary target or fisheries that incur high rockfish bycatch.

Expected outcomes of this project include:

- *Improve the collection of rockfish length frequency*
- *Expand the collection of rockfish age compositions*
- *Conduct field experiments to evaluate efficacy of revised sampling protocols*

Performance Measure: Upgrade the level of stock assessment input data (i.e., catch, abundance, or life history) for at least 4 stocks

SAIP 5.
Improve age determinations for selected rockfish species (1 FTE)

AFSC's Resource Assessment and Conservation Engineering program has collected biological samples for selected rockfish species. This project seeks funding to initiate age determinations

for three species. This project is relevant to the development of new and enhanced assessments and training and human resource development.

The project will require 1 FTE. The FTE will perform age determinations on rockfish species (rougheye, dusky rockfish, northern rockfish, and POP), and explore the development of age reading methodology of shortspine thornyheads and shortraker rockfish. We anticipate that the FTE will be hired in sometime in the summer of 2004.

Expected outcomes of this project include:

- Production ages for BSAI northern rockfish, BSAI dusky rockfish, BSAI and GOA rougheye rockfish
- Develop aging criteria for shortraker rockfish and , BSAI and GOA thornyheads
- Estimate of maximum age for selected minor rockfish species. This estimate could be used as a baseline estimate of the natural mortality rate.

Performance Measure: Upgrade the quality of data for at least 4 stocks

SAIP 6.
Design and evaluate sampling protocols to assess rockfish during biennial summer surveys in the GOA and Aleutian Islands (4 FTEs)

A major source of uncertainty in rockfish stock assessments is the imprecision of area-swept survey biomass estimates. The uncertainty in these estimates can be attributed to two primary inadequacies in survey design: 1) inadequate sampling of rockfish habitat; and 2) A disproportionate sampling of patchily distributed rockfish concentrations. These problems may not be mutually exclusive. Strategies for addressing the first problem involve evaluating the CPUE of rockfish using more rugged sampling gear, whereas, strategies for the second problem involve developing survey designs that produce more representative sampling of rockfish patches within the time and cost constraints of our resource surveys. The Rockfish Working Group (RWG) has conducted and/or supported research to develop sampling gear that is suitable for trawling rugged habitats. The RWG in conjunction with Sea Grant Fellowships and existing RACE research activities has also supported research to evaluate methods to collect bottom type classifications during routine fishery independent surveys and the utility of using underway acoustic backscatter to identify rockfish patches. These coordinated research efforts provide the foundation for the design and implementation of rockfish targeted augmentation of RACE groundfish trawl surveys.

For rockfish species where inadequate sampling of rockfish habitat may be the dominant issue,

the uncertainty in area-swept biomass estimates may be addressed through longline surveys. For example, previous submersible work has revealed that rougheye and shortraker are typically found very close to the sea floor near cobble and bounders, often in rough habitats that are difficult to trawl. Longline gear may be appropriate for these species due to its ability to be fished in rough benthic habitat. Relative population abundance of sablefish in Alaskan waters is currently assessed in a longline survey, and this survey also catches rougheye and shortraker rockfish. The variability of rougheye and shortraker rockfish in this survey needs to be addressed and preliminary field experiments that augment the existing longline survey will need to be evaluated.

This project calls for additional staff and ship time to augment existing resource assessment surveys with a chartered research vessel that would be dedicated to reducing uncertainty in rockfish biomass estimates. Staff will be responsible for conducting experiments to evaluate the most cost effective method for reducing uncertainty in existing trawl survey biomass estimates. These surveys will probably follow either the Trawl and Acoustic Presence/Absence Survey (TAPAS) design, double sampling for stratification, or adaptive cluster sampling. Any design will need to be integrated into the existing survey plan. Under the TAPAS design, ships would collect underway acoustics, when rockfish acoustic sign was encountered, the survey vessel would stop and sample the surrounding region to delineate the boundaries of the rockfish school. If an adaptive cluster sampling design were selected, the additional ship time would be used to allow for a greater number of regions where high CPUE of POP is encountered. In subsequent years, the charter vessel costs will support the continuation of routine assessments to improve rockfish abundance estimation.

The project will require 4 FTEs. The FTEs will be responsible for the design, preparation and implementation of rockfish surveys in the BSAI and GOA. The FTEs will comprise a single survey group, with personnel located in Auke Bay and Seattle. Additionally, six contract biologists will be hired annually to provide additional field support for the surveys. The development and implementation of augmenting existing longline surveys to obtain better indices of rougheye and shortraker abundance will require an external contract.

Expected outcomes of this project include:

- Improved precision in rockfish biomass estimation and indices
- Design and implementation of rockfish dedicated surveys that augment existing groundfish trawl survey efforts in the GOA and BSAI.
- Design and implementation of preliminary rockfish longline surveys that augment existing groundfish longline survey efforts in the GOA and BSAI.

Performance Measure: Upgrade the quality of data for at least 2 stocks; decrease the interval between reassessments of at least 5 stocks by one or more years

SAIP 7.
Evaluation of the catchability of selected rockfish to the groundfish trawl survey and their habitat associations

A major source of uncertainty in rockfish stock assessments is the uncertainty in the estimates of rockfish catchability to standard trawl survey nets. Additionally, little is known of the early life-history and habitat use of rockfish, as young rockfish are rarely seen in the trawl surveys or fisheries data. Information on rockfish habitat use by life-history stage is required to define essential fish habitat, but such information has not been obtained from trawl surveys alone. This project seeks funds to use a submersible vessel to compare two types of survey techniques for rockfish in the Aleutian Islands and Gulf of Alaska, and to evaluate the habitat associations of selected rockfish species. Rockfish densities in the two regions will be estimated using area swept and line transect abundance estimation methods. Area swept density estimates would be conducted from a chartered commercial trawler equipped with a reinforced net capable of trawling in rough terrain. The area swept vessel would conduct tows in rough terrain to detect the presence or absence of rockfish in habitats that are typically missed by standard groundfish trawl surveys. Line transect methods would be conducted using a chartered submersible. The two sampling methods would be coordinated to ensure sampling at identical locations with minimal time lags. The investigators will compare rockfish density derived from the two techniques to evaluate the relative vulnerability of rockfish to each type of gear. Data on the benthic habitat features observed on the line transects will be recorded, and abundance estimates will be associated with various habitat types.

The project will require 12 scientists to conduct the surveys. ABL staff will be responsible for surveys in the GOA surveys while RACE/REFM staff will be responsible for augmenting surveys in the AI. In either case, staff are expected to work closely with individuals responsible for the stock assessment.

Expected outcomes of this project include:

- Improved precision in rockfish biomass estimation
- Design and implementation of rockfish dedicated surveys that augment existing groundfish trawl survey efforts in the GOA and BSAI.

Performance Measure: *Upgrade the quality of data for at least 2 stocks*

SAIP 8.
Investigate the genetics and spatial distribution of young-of-the year rockfish (1 FTE)

Young-of-the-year (YOY) rockfish were collected during Auke Bay Laboratory Ocean Carrying Capacity surveys of juvenile salmon in the Gulf of Alaska (GOA) in 1998, 2000, 2001, and 2002 and are expected again in 2003 and 2004. These captures are the first time that such large concentrations of juvenile rockfish have been observed in the GOA. YOY rockfish were caught along several different transects in the GOA in the same year and there is some coincidence in sample locations between years. From preliminary genetic studies supplemented by morphological analysis, we identified seven different species, the most abundant (40 of 55) of which was Pacific ocean perch (POP), the largest contributor to Alaska's rockfish fishery. We propose: 1) to assess spatial and interannual variation in species abundance, including recruitment strength estimation and interpretation in terms of environmental variation, 2) to examine genetic variation in known-age (YOY) rockfish originating from a single cohort, rather than multiple cohorts typical of marine fish genetic samples, and 3) to explore development of morphological methods for species identification, and 4) to estimate the probable location of parturition using PMEL's three dimensional flow models of the Gulf of Alaska and Bering Sea Aleutian Islands. The abundance of YOY POP provides an opportunity to address questions about the population genetic structure of POP. We will determine the extent of genetic divergence between year-classes and between geographic locations. The answers to those and similar population genetics questions are extensible to other rockfish species and are vital to interpreting genetic divergences among rockfish. Estimation of probable locations of parturition will provide information on the source of rockfish larvae and guide spatial fishery management measures.

This research is proposed as cooperative research between the University of Alaska Fairbanks, the Auke Bay Laboratory, and the Pacific Marine Environemental Laboratory (PMEL). The majority of this work will be done at the University of Alaska Fairbanks (UAF). We anticipate that an expert in larval and juvenile systematics will also collaborate in this project. All the genetic analysis will be carried out in the UAF laboratory at the Juneau Center (SFOS) or the NMFS Auke Bay Laboratory (ABL). A grant established with PMEL will be used to identify the source regions of the rockfish. Once the source regions are located, REFM scientists will collaborate with RACE and PMEL to evaluate the efficacy of using marine protected areas for management of rockfish in the GOA or BSAI.

Performance Measure: *Upgrade the quality of data for 4 stocks*

SAIP 9.
Investigate the spatial component of rockfish assessments (1 FTE)

A major source of uncertainty in rockfish stock assessments is the patchy distribution of rockfish concentrations. Their patchy nature makes surveys by traditional stratified random surveys challenging and often yields abundance estimates with high variance. Although patchy, rockfish appear to be associated with particular habitat types. We can use this characteristic to our advantage investigating the spatial distribution of rockfish to characterize areas of high rockfish abundance and fishery catches. This information then can be used to stratify existing data and to plan future surveys, such as SAIP 6.

The project calls for one FTE to conduct a spatial analysis of rockfish data and apply the results to existing assessments. Data to be analyzed includes Pacific ocean perch, rougheye rockfish, shortraker rockfish, and northern rockfish.

Expected outcomes of this project include:

•   Improved precision in rockfish abundance estimates
•   Apply results to rockfish dedicated surveys such as SAIP 6.

Performance Measure: *Upgrade the quality of data for 4 stocks*

SAIP 10.
Rockfish Assessment Mapping (RAM)

Adult rockfish assessment component:

Very little is known about the distribution and abundance of juvenile and adult slope rockfish. Different species and life stages seem to prefer specific habitat some of which is more or less amenable to survey sampling than others. This results in increased survey inefficiency and uncertainty. Mapping of bottom topography with multibeam bathymetry, and mapping the bottom characteristics with multibeam backscatter will allow quantification of habitat type and allow for more efficient and accurate sampling stratification and evaluation of uncertainty in rockfish survey biomass estimates.

Juvenile rockfish assessment component:

Juvenile rockfish are largely unsampled in current surveys probably because of inaccessibility of present survey gear and require development of alternate methods of samlpling. Detailed bottom topography maps will enable specific sampling for juvenile rockfish and improve assessment of

juvenile slope rockfish recruitment.

General SAIP Benefits:

In general, more accurate maps of bottom topography will also show the location of trawlable and untrawlable bottom, resulting in improved survey coverage and efficiency in the deployment of survey hauls. Detailed maps of bottom topography will add habitat and bottom type to survey sample attributes, enabling analyses of habitat association of fish species and complexes.

Expected outcomes of this project include:

* *Improved understanding of recruitment dynamics for slope rockfish*
* *Improvement of morphological methods for species identification*
* *Support for impacts analysis as required under NEPA.*

Performance Measure: Upgrade stock recruitment assessments for slope rockfish

SAIP 11.
Develop methods to assess nursery area requirements age 1+ slope rockfish. (0 FTE).

Little is known about the juvenile stages of slope and pelagic rockfish life histories. Some postlarval POP are collected in the offshore pelagic environment and juvenile slope rockfish (age 2 and up) are collected during NMFS bottom trawl surveys of the continental shelf and upper slope. In nearshore habitat of Southeastern Alaska young juvenile rockfish have been collected and studied by ABL biologists using specialized nets and ROV's, however, few age 1+ juvenile slope rockfish are collected prior to their appearance on the outer shelf and slope as adults or late pre-adults. To better understand and estimate recruitment, the location of pre-recruit slope and pelagic rockfish should be determined.

We propose to develop methods to locate age 1+ slope rockfish and identify their nursery habitat during the critical life stage when rockfish settle into demersal habitat. The goal of this work is to provide better estimates of rockfish stock recruitment strength through understanding of pre-recruit distribution and abundance. This work will develop methods to collect age 1+ slope rockfish and describe their spatial distribution, environmental requirements, and interannual abundance. To improve assessment of environmental requirements and begin development of a geo-referenced baseline for spatial analysis, sampling would be done in areas that have been previously mapped by multibeam sonar.

Expected outcomes of this project include:

* *Improved understanding of recruitment dynamics for slope rockfish*
* *Improvement of morphological methods for species identification*
* *Improved stock assessment methodology*
* *Support for impacts analysis as required under NEPA.*

Performance Measure: Upgrade stock recruitment assessments for slope rockfish

National Marine Fisheries Service

ALASKA REGIONAL OFFICE

AGENDA D-1(b)
APRIL 2003
Supplemental

Home | Sustainable Fisheries | 2003 Information Bulletins

INFORMATION BULLETIN 03-29
Sustainable Fisheries Division
907-586-7228

March 18, 2003
4:00 p.m.

NMFS NEEDS INDUSTRY ASSISTANCE DISTINGUISHING SHORTRAKER AND ROUGHEYE ROCKFISH

The National Marine Fisheries Service (NMFS) requests industry assistance in distinctly identifying shortraker and rougheye rockfish according to James W. Balsiger, Administrator, Alaska Region, NMFS.

The NMFS is requesting that crews on fishing vessels retain rockfish when asked to by observers. On hook-and-line vessels this will occur while the observers are conducting samples to determine species composition. Observers are not able to accurately identify shortraker and rougheye to species for fish that are not brought on board the vessel.

While observers can use group and complex codes to account for shortraker and rougheye mortality, a crucial first step in improving accurate inseason management and stock assessment of these rockfish species is to accurately identify them. Observers have been directed by NMFS to coordinate with fishers on when to retain rockfish for species identification.

Vessel operators are reminded that regulations under 50 CFR 679.50 (g)(1)(viii) require "An operator of a vessel ...must provide all... reasonable assistance to enable observers to carry out their duties."

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REPORT
AD HOC WORKING GROUP ON GROUNDFISH MANAGEMENT
MARCH 4-5, 2003

The Scientific and Statistical Committee/Plan Team/Alaska Fisheries Science Center ad hoc working group met on March 4-5, 2003 to continue its discussions of revising management of BSAI and GOA target and non-target species. Sue Hills, Steven Hare, and Pat Livingston represented the SSC; Grant Thompson, Sarah Gaichas, and Jane DiCosimo represented the Plan Teams; Galen Tromble represented the NMFS Regional Office; and Paul Spencer, Rebecca Reuter, Doug Limpinsel, and Joe Terry represented the NMFS AFSC. The group made significant progress in identifying goals and an overall approach to modifying the existing management categories. This report summarizes the progress made by the working group to date. It should be emphasized that this report is neither a complete nor a final description of the modifications to the existing management categories that might result from the approach currently envisioned by the working group. Several issues remain to be addressed and the working group's thinking continues to evolve as the approach is developed. Some informal notes on such issues are included in the appendix to this report. Material contained in the appendix should be viewed as a preliminary discussion of possible future directions rather than a final recommendation.

At its March meeting, the working group reviewed the current groundfish categories in the North Pacific and reached two general conclusions.

1. Some stocks/species are true targets of groundfish fisheries, in the sense that groundfish fishermen actively seek to catch and market fish from these stocks/species in significant quantities. The groundfish FMPs need to insure that these stocks/species are managed on the basis of National Standard 1, where both optimum yield and overfishing are defined relative to maximum sustainable yield.

2. Some stocks/species are not true targets of groundfish fisheries, in the sense that groundfish fishermen do not actively seek to catch and market fish from these stocks/species in significant quantities. The groundfish FMPs need to insure that these stocks/species are adequately protected, but such protection need not always be based on criteria related to maximization of yield from these stocks/species.

GOALS

- Provide appropriate protection for all species in the ecosystem impacted by the groundfish fisheries, including species for which little biological information is available.
- Provide appropriate opportunities for all groundfish fisheries, including those which might be impacted by measures designed to protect species for which little biological information is available.

APPROACH

- Divide the BSAI and GOA groundfish species into two categories:
    (1) species intended to be caught ("target" species)
    (2) species not intended to be caught ("non-target" species)
- Clarify that the fisheries being managed under the groundfish FMPs are the fisheries for the target groundfish species.
- Manage the target groundfish fisheries accordingly, for example by:
    (1) specifying optimum yield and overfishing definitions for the target species relative to MSY and
    (2) establishing additional management measures such that all species in the ecosystem receive appropriate protection from potential impacts of the target groundfish fisheries.
- Establish a mechanism for transitioning species between the categories.

Overview: Target Species (Those for Which Fisheries are Designed)

All target species will be listed individually in the groundfish fishery management plans. They will be managed under OFLs, ABCs, and TACs with the objective of optimizing yield while preventing overfishing, as defined under the Magnuson-Stevens Act. Complex-wide OFL, ABC, and TAC specifications will exist only in those cases where identification to the species level is not practical or as a temporary measure during transition to the new approach. For the most part, these species are already being managed under Tiers 1-3. For those few cases in which *de facto* target species are not already managed under Tiers 1-3, a high priority will be placed on obtaining the data necessary to manage them under Tiers 1-3 as soon as possible. For all future transitions between categories, Tier 3 management will be a minimum condition of becoming a target species.

Broadly speaking, management of target species in the new approach will be similar to the current approach. Clear priorities for management and research will typically arise from the objectives for in-season management and stock assessment preparation, which then filter down to the observer program and AFSC survey designers to collect appropriate data on these species, etc.

Overview: Non-Target Species (Those We Don't Mean to Catch)

Non-target species will not necessarily be listed individually in the FMPs, but will be monitored at the lowest practical taxonomic level. This category would include most species currently in a target category management complex but not specifically assessed, and all those currently in the nonspecified category. The target groundfish fisheries will be managed such that the non-target species are provided appropriate protection from potential impacts of the groundfish fisheries. This protection will be based on criteria such as maintaining healthy populations of the non-target species and maintaining the non-target species' roles in the overall functioning of the ecosystem. Such protection will typically *not* be related to maximizing the sustainable yield from the non-target groundfish species. Therefore, if stock assessments for non-target species are conducted, they will not include OFL and ABC recommendations, and TAC specifications will not be set.

Catch of species in this category would continue to be monitored and managed (at incidental levels) with Maximum Retainable Allowances (MRAs) or other mechanisms. Additional management measures may be applied to increase protection of particularly sensitive non-target species. While some level of retention and utilization will be permitted to avoid waste, target fisheries (intentional exploitation) would not be allowed to develop on these species without the information necessary to conduct stock assessments and set quotas using at least Tier 3 criteria.

These species will be monitored using fishery-independent information (abundance/biomass estimates, planned schedule for research, rotating through species, collecting life history data for major bycatch species), and annual total catches. Species complexes will be allowed in this category if the species are actually caught together and share some form of life history or habitat characteristics, or if species are currently indistinguishable to fishery observers.

One objective of AFSC research would be to increase the amount of information available for species in this category. Such new information could be used to allow development of future target fisheries, but its primary purpose would be to provide a basis for evaluating the appropriate level of protection and both the adequacy and efficacy of existing or potential protective measures. It is likely that such research would require the observer program and surveys to collect baseline and monitoring data on these species—but not necessarily annual age collections or other stock assessment data on the same scale as would be expected for target species.

Process and criteria for distinguishing intended target species from non-target species

Intended target species:
- Are already target species with fully developed fisheries (e.g., pollock, Pacific cod)
- Have market value and are currently marketed
- Are species fishermen say they want to catch (because they have market value)
- Would be the targets of fisheries if we allowed them (currently on bycatch only status)??
- Are caught and retained over threshold levels (set by NMFS)??

If it is not defined as an intended target species, it is automatically a non-target species.

Transition between categories

Transition between categories can happen two ways:
1. Fishermen request that the Council/NMFS create a target fishery on species that is not currently listed as a target species. NMFS may initiate an experimental fishing permit regulatory analysis to collect appropriate data to manage the species at Tier 3 (minimum criteria for target fishery) or
2. NMFS staff or Council Plan Teams may identify an increasing trend in capture and retention of a non-target species (e.g., at or above the MRA) that is not currently on the target list. The Council or NMFS may initiate an EFP to get collect data to manage the species at Tier 3.

In either case, additional protection measures (unspecified as yet) will go into effect for the transitional species until data are adequate to set quotas. The transitional management objective is to protect species from fishing effects until NMFS has appropriate information to responsibly optimize yield. Transitional fisheries may take one to two years to become fully open with a quota, depending on time needed to collect necessary data.

Note on Tier 3 level data quality

The transition procedure described above requires data quality standards that are recognized to provide quality stock assessments at Tier 3. The working group noted that determining when the appropriate level of data quality has been achieved for Tier 3 assessment is at the discretion of the SSC. These criteria can be used to move new target category species to Tier 3 management and to improve target species to a higher tier level. The working group requests that the SSC provide guidelines for the collection of data necessary to meet Tier 3 data quality requirements.

Process and criteria for determining sensitivity and additional management measures for non-target species and complexes

All species not listed as targets will continue to be monitored. Targeting will be discouraged by the use of MRAs or other management measures. Monitoring will include both fishery dependent and fishery independent elements. NMFS staff will monitor survey biomass and or abundance trends, fishery catch-per-unit-effort trends, and fishery retention rates at the lowest practical taxonomic level (although bycatch MRAs might be set at higher, complex levels). In addition, "representative species" from each major taxon will be monitored for changes in length composition or age composition if ageing methods exist. Representative species would be most useful indicators for a group if they were the most commonly encountered in the fishery. Improvements to fishery species identification, which are already in progress in the observer program, will be required for this program to succeed.

Non-target species will be divided into two general categories: (1) those unlikely to suffer negative population effects from fishing and (2) those more likely to suffer negative population effects even as bycatch. The latter category is termed "sensitive" non-target species. The only management measure proposed for non-sensitive non-target species will be monitoring and an MRA. Sensitive non-target species may require additional management measures to ensure protection from fishing effects.

The working group identified four possible criteria for defining non-target species as sensitive (formerly known as "vulnerable" in previous reports):
(1) rapidly declining abundance trend,
(2) sensitive life history traits,
(3) restricted range and or specific habitat, and
(4) crucial role in ecosystem (predator prey or other dependent association).

The working group attempted to outline methods for assessing species sensitivity within each of these broad criteria. It is possible to specify criteria for *rapid decline in an abundance trend* (x% per year) although the working group did not do so at this meeting.

Sensitive life history traits were identified as those contributing to the overall potential for a population to increase (the "r" parameter in the logistic growth equation or its equivalent). A spectrum of life history patterns were identified which ranged from "high resilience" to "very low resilience" categories. In general, "high resilience" species with high potential rates of population increase have one or more of the following traits: fast growth rates, low age at maturity, high fecundity, and are relatively short lived. At the other end of the spectrum, "very low resilience" species with low potential rates of population increase may have slow growth rates, late age at maturity, low fecundity, and / or very long lives. Two intermediate categories were identified, such that species could be classified generally as high resilience, average resilience, moderate to low resilience, and very low resilience. Perhaps non-target species could be classified as having sensitive life history traits if they were classified as moderate to low resilience or very low resilience species. No strict boundaries were drawn between these categories at this meeting, nor was it clear to all working group members that strict boundaries are necessary.

The working group discussed definitions for *restricted range* and *habitat specificity*. The working group agreed that these characteristics should be examined, but it was difficult to establish criteria for the amount of range restriction that would cause concern. However, because we know so little about the specific habitat associations of most current target species, let alone non-target species, the working group agreed that observed restricted range or occurrence in specific locations over time might indicate a habitat association and be evidence enough for additional management measures (likely spatial) to protect the species from fishing effects.

Crucial role in the ecosystem also remains undefined at this time. The main questions that can be answered with current data are who eats the species, and who is eaten by the species? The working group suggested that simply gathering adequate data to address this would be useful and would likely identify which non-target species were candidates for special management under this criterion. One example would be the already existing Forage Species FMP category where multiple families were placed off limits as target species because of their collective importance as prey for marine mammals, birds, and target groundfish. It may be possible to assign other non-target taxa to this existing category as it becomes clear that they are essential forage species (e.g., squid, octopus, and eelpouts).

Additional management measures would be designed to apply to the criterion of highest concern. For example, a non-target species with an extremely restricted range would receive additional protection from fishing effects by closing part or all of the range to fishing (with certain gear types, during certain seasons, as appropriate). Alternatively, a more evenly distributed species with sensitive life history traits and a severely declining abundance trend might be managed with a bycatch cap to limit take to a known amount each year.

Real life details:

Current intended target species are pollock, Pacific cod, sablefish, Atka mackerel, rock sole*, yellowfin sole, flathead sole, rex sole, Dover sole, Greenland turbot, Pacific ocean perch, shortraker rockfish, rougheye rockfish*, shortspine thornyheads, northern rockfish, yelloweye rockfish (perhaps Arrowtooth flounder and dusky rockfish). All these would be managed under single species TACs at Tier 3 or above. Species with asterisks include more than one species (e.g., rock sole and a newly identified sister species). Management agencies would have to decide whether to separate the rock sole species (can be distinguished in observer data, but not by industry), and what to do about species that can only be distinguished genetically at present.

Some of the species identified above as intended targets are not currently assessed at Tier 3 or above. It might be prudent to recommend that within one year of implementation of the proposed management regime, NMFS would be required to implement a plan to improve data quality to the level established by the SSC for Tier 3 assessment (getting the appropriate data may take longer than one year, but the plan must be done within a year). If NMFS and the SSC determine that it is not cost effective to improve data quality to Tier 3 for any intended target species, then no target fishery would be allowed on that species and it would be moved to the non-target species category and protective measures would be implemented for it

All current rockfish and flatfish complexes would be eliminated in the following manner. An intended target species (or multiple species if appropriate) from each complex would be split out to the individual species level. The remainder of the complex will go into the non-target category and be managed under MRAs or other management measures. It appears that some complexes, like GOA Other Slope Rockfish, are entirely non-target species. This resulted from a long history of splitting out target species. These complexes would be moved to the non-target species category. If the remaining non-target species are caught together in real life then the MRA may be set at the complex level; if they are not then non-target catch complexes should be reorganized based on which species are actually caught together as bycatch of target fisheries to determine what MRA(s) should be by target fishery.

The working group may determine that some species currently managed with a single species TAC are not in fact the intended target of any fishery. BSAI Alaska plaice is one example. The working group would not recommend that a TAC be set for these species, and annual stock assessments would not be necessary. AFSC staff may continue to prepare full age structured stock assessment for non-target species, but highest priority would be given to improving stock assessments for intended target species (e.g., shortraker and rougheye rockfishes), for those non-target species proposed for target fishing, or for those non-target species whose ecosystem role is deemed important to assess annually (e.g., Arrowtooth flounder).

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Grant Thompson

Alaska Fisheries Science Center

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  - October 2001
- "To critically review the current harvest strategies applied to our FMP fisheries with an emphasis on accounting for ecosystem needs"
  - February 2002

Charges to the Panel

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  - Develop an "educational primer"
- Is the CHS consistent with MSFCMA?
  - Is $F_{40\%}$ an appropriate F_{MSY} surrogate?
  - If not, is there a better alternative?
- Is the CHS considerate of ecosystem needs?
  - If not, how should it be changed?
  - Are data sufficient to implement new approach?
  - How would transition be handled?

My general impressions

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- Report contains wealth of good information
- Report is mostly positive about CHS
- Contains very little new analysis
  - many recommendations for new analysis
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  - statements should be viewed in that context

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- The CHS performs adequately with respect to most target stocks
- The CHS does not perform adequately with respect to rockfish
- The performance of the CHS with respect to the ecosystem is unclear

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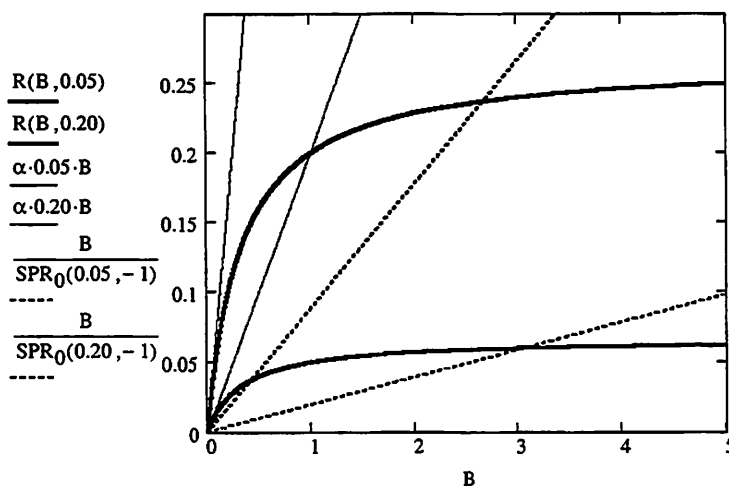# The CHS does not perform adequately with respect to rockfish

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- Low M and high age of maturity necessarily imply low resilience

Some problems with Report's conclusions about rockfish

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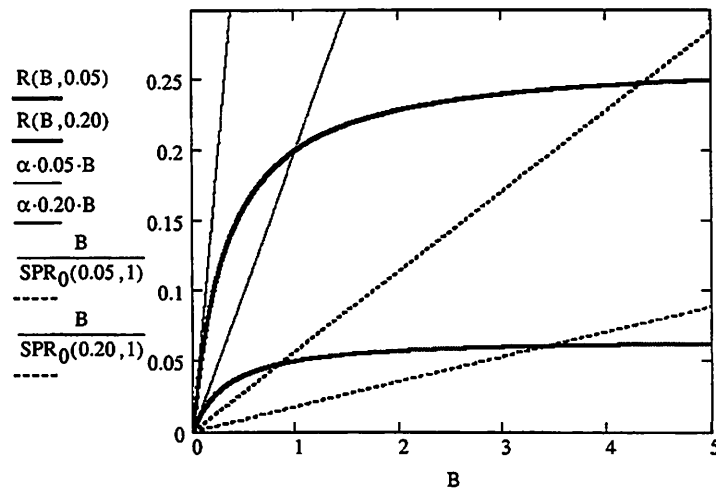- Apparent misunderstanding about the role of life history in resilience and SPR rates

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$R(B,0.05)$ ——
$R(B,0.20)$ ——
$\alpha \cdot 0.05 \cdot B$ ——
$\alpha \cdot 0.20 \cdot B$ ——
$\dfrac{B}{SPR_0(0.05,1)}$ -----
$\dfrac{B}{SPR_0(0.20,1)}$ -----

B

The performance of the CHS with respect to the ecosystem is unclear

- Current knowledge and policy are not sufficient to tell whether CHS is "considerate"
  - It is not even possible to define "ecosystem needs"
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Some things we could try

- Management strategy evaluation
- Risk analysis
- Ecosystem modeling
- Adaptive management
- Continued and expanded monitoring
- Marine reserves

Comments on things we could try

- Previous and new PSEIS drafts already contain management strategy evaluations
  - in some ways more advanced than recommendation
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- We should not rush to try a new idea without some reason to believe it will make things better

Rockfish Research Plan

Rockfish Working Group
Alaska Fisheries Science Center
2003/2004

Outline

- January 2003 report to the NPFMC
- Request for an update on research planned for 2003 and long-range research plans
  - Description new research activities funded for 2003 (3 projects)
  - Description of Stock Assessment Improvement Plan research initiatives for 2004 (11 projects)

2003 Survey Activities

- Problem: In EBS northern rockfish occur in depths not well sampled by either the EBS shelf or slope surveys.
- Objective: Conduct exploratory field work near the Pribilof Islands to evaluate feasibility of rockfish survey.
- Method: Five day supplement to trawl survey
  - characterize the distribution and size of rockfish patches
  - gain some information on the gross habitat features (slope, bottom roughness)
  - evaluate diurnal patterns of any rockfish patches observed.

2003 Pilot studies to improve SR/RE sampling on longliners

- Problem: Shortraker and rougheye rockfish are classified using a complex code
- Objective: Improve species identification and life history collections of SR/RE rockfish in commercial fisheries
  - Collect SR/RE on Pacific cod and sablefish longliners
  - Randomly collect 30 SR/RE specimen, ID to species
  - Weigh and measure each specimen
  - Collect 1 pair of otoliths for every 10 rockfish collected

2003 Pilot studies to improve SR/RE sampling on Trawl Catcher Processors and Catcher Vessels

- Problem: Shortraker and rougheye rockfish classified using a complex code
- Objective: Improve species identification and life history collections of SR/RE rockfish in commercial fisheries
  - Reserve rockfish during tally period
  - ID to species
  - Weigh and measure 30 specimen
  - Collect otoliths

Rockfish Long-Range Research Plan

- 11 projects, responding to issues outlined in January report to NPFMC
- Goal 1: Improve our knowledge of rockfish stock structure
- Goal 2: Develop and implement protocols to improve the collection and analysis of rockfish life history information.
- Goal 3: Improve existing surveys or implement new surveys to improve biomass estimates of adult and juvenile rockfish.
- Goal 4: Expand and improve stock assessments.
- Goal 5: Improve understanding of the spatial distribution and habitat associations of rockfish

Goal 1: Improve our knowledge of rockfish stock structure – Project 1

- Objective: Identification of regional partitions for stock assessment and management.

- Methods: Collect and process genetic samples from Aleutian Islands, Eastern Bering Sea and Gulf of Alaska.
- Target species: northern rockfish, POP, and shortraker rockfish.

Goal 1: Juvenile rockfish stock identification and interannual variability – Project 8

- Objectives:
  - Assess spatial and interannual variation in juvenile species abundance
  - Examine genetic variation in YOY rockfish
  - Develop morphological methods for species identification
  - Estimate source of YOY rockfish
- Methods:
  - Field sampling from OCC surveys and laboratory analysis
  - Estimate probable location of parturition using PMEL's three dimensional flow models of the Gulf of Alaska and Bering Sea Aleutian Islands

Goal 2: Improve the collection and analysis of rockfish maturity information – Project 2

- Objectives:
  - Evaluate of the accuracy of RACE visual scans for evaluation of rockfish maturity stages
  - Evaluate regional differences in the maturity schedule
  - Evaluation of regional differences in GSI.
- Methods: Field collections and laboratory analysis

Goal 2: Improve the collection of rockfish length, weight, and age data – Project 4

- Objectives:
  - Improve the collection of rockfish length frequency
  - Expand the collection of rockfish age compositions
- Methods:
  - Collect additional biological samples on AI Atka mackerel vessels
  - Train and deploy experienced observers in fisheries with high rockfish bycatch

Goal 2: Improve rockfish aging – Project 5

- Objectives:
  - Production ages for BSAI northern rockfish, BSAI dusky rockfish, BSAI and GOA rougheye rockfish
  - Develop aging criteria for shortraker rockfish and , BSAI and GOA thornyheads
  - Estimate of maximum age for selected minor rockfish species. This estimate could be used as a baseline estimate of the natural mortality rate.
- Methods:
  - Laboratory analysis

Goal 3: Improve rockfish surveys – Project 6

- Objectives:
  - Improved precision in rockfish biomass estimation and indices.
- Methods:
  - Design and implement rockfish dedicated surveys that augment existing groundfish trawl survey efforts in the GOA and BSAI.
  - Design and implement rockfish longline surveys that augment existing groundfish longline survey efforts in the GOA and BSAI.

Goal 3: Evaluate rockfish trawl catchability – Project 7

- Objectives:
  - Improved precision in rockfish biomass estimation

- Methods:
  - Compare rockfish densities in the two regions using area swept and line transect abundance estimation methods.
  - Evaluate the habitat associations of selected rockfish species.

Goal 3: Juvenile rockfish surveys – Project 11

- Objectives:
  - Improved understanding of recruitment dynamics for slope rockfish
  - Improvement of morphological methods for species identification
  - Improved stock assessment methodology
- Methods:
  - Develop methods to locate age 1+ slope rockfish
  - Describe characteristics of nursery habitat
  - Monitor the spatial distribution and abundance of post settlement juvenile rockfish

Goal 4: Expand and improve rockfish assessments – Project 3

- Objectives:
  - Improved stock assessments for rockfish
  - Improved stock assessment methodology
  - Support for impacts analysis as required under NEPA.
- Methods:
  - Retrospective data analysis
  - Model development
  - Model evaluation and testing

Goal 5: Examine spatial distribution of GOA rockfish assessments – Project 9

- Objectives:
  - Identify areas of high rockfish abundance and fishery and survey catches for design of rockfish surveys.
- Methods:
  - Retrospective data analysis
  - GIS mapping

**Goal 5: Rockfish habitat mapping –
Project 11**

- Objectives:
  - Identify habitat associations of juvenile and adult rockfish in the GOA
- Methods:
  - Map bottom topography with multibeam bathymetry
  - Mapping the bottom characteristics with multibeam backscatter that allow quantification of habitat type

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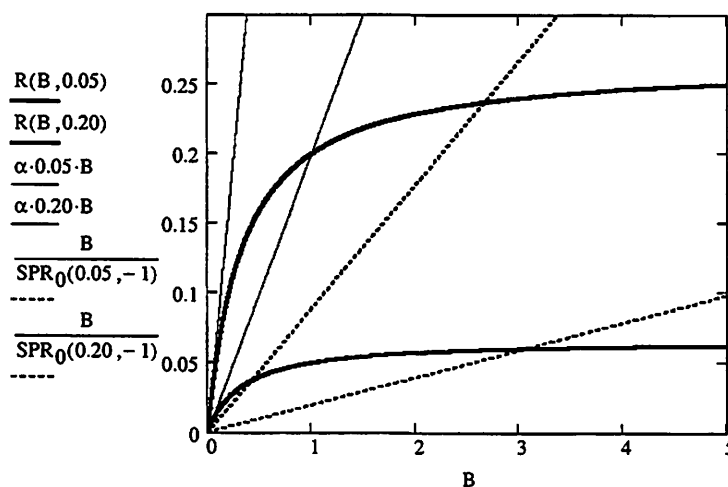## The CHS does not perform adequately with respect to rockfish

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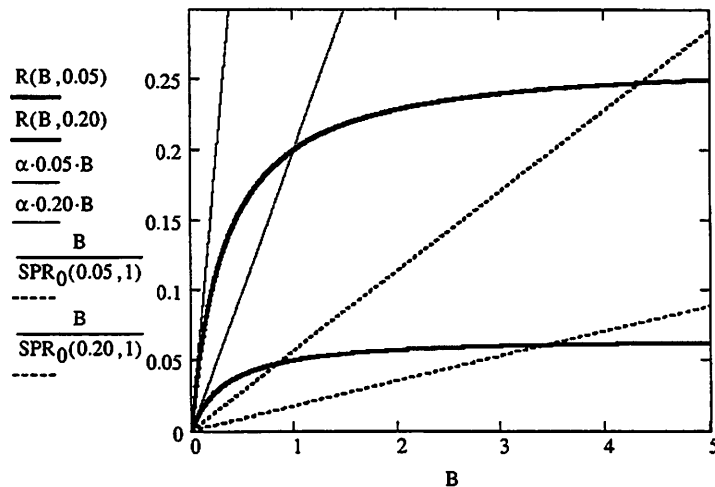- Apparent misunderstanding about the role of life history in resilience and SPR rates

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The issues for discussion

Which species and species-groups get managed?

At what level should management be applied?

- Aggregate complex (non-taxonomic relationship)
- Taxonomic groupings above species level
- Individual species level

We outline a *process* for answering these questions

3. Handling species complexes

- Ultimate goal is a decision matrix based on data quality and vulnerability criteria

Data Quality (tier-specific)	Vulnerability	
	high	low
good survey coverage	single species	complex if needed for management or single species
poor survey coverage	single species	complex or single species
	start high quality data collection interim quality, precautionary	collect additional data if possible
	no directed fishery alternative management strategies	
	under alternative management schemes, low MRB, area/time closures, creative thinking.	

- How we are getting there?
  - Assemble a list of data quality for all current complexes
  - Evaluate vulnerability of species within complexes

The goal—a decision making tool

	High vulnerability	Low vulnerability
Good data	Single species management necessary	Species complex management OK
Poor data		

The goal—a decision making tool

	High vulnerability	Low vulnerability
Good data	Lower priority to improve data, Optimize sustainable yields	
Poor data	High priority to improve data, Minimize risk of overfishing	

Management priorities fall out

	High vulnerability	Low vulnerability
Good data	2	4
Poor data	1	3

Defining "data quality"

- Survey data
  - Cover entire range of species (temporally and spatially)?
  - Survey cv within desired range (suggestion: 0.3 or less?)
  - Biological collections (age, length, maturity, fecundity)
- Fishery data
  - Adequate species identification in fishery catch?
  - Adequate observer coverage of fishery catching species?
  - Biological collections (age, length, maturity, fecundity)
- Life history data
  - Estimates of vital parameters exist? Based on what?
    - M, maximum age, age and size at maturity, fecundity
    - Estimated from the population(s) in the FMP area? Recently?

Survey CVs as estimated for the 2001 Draft PSEIS

Flatfish and demersal roundfish top the list
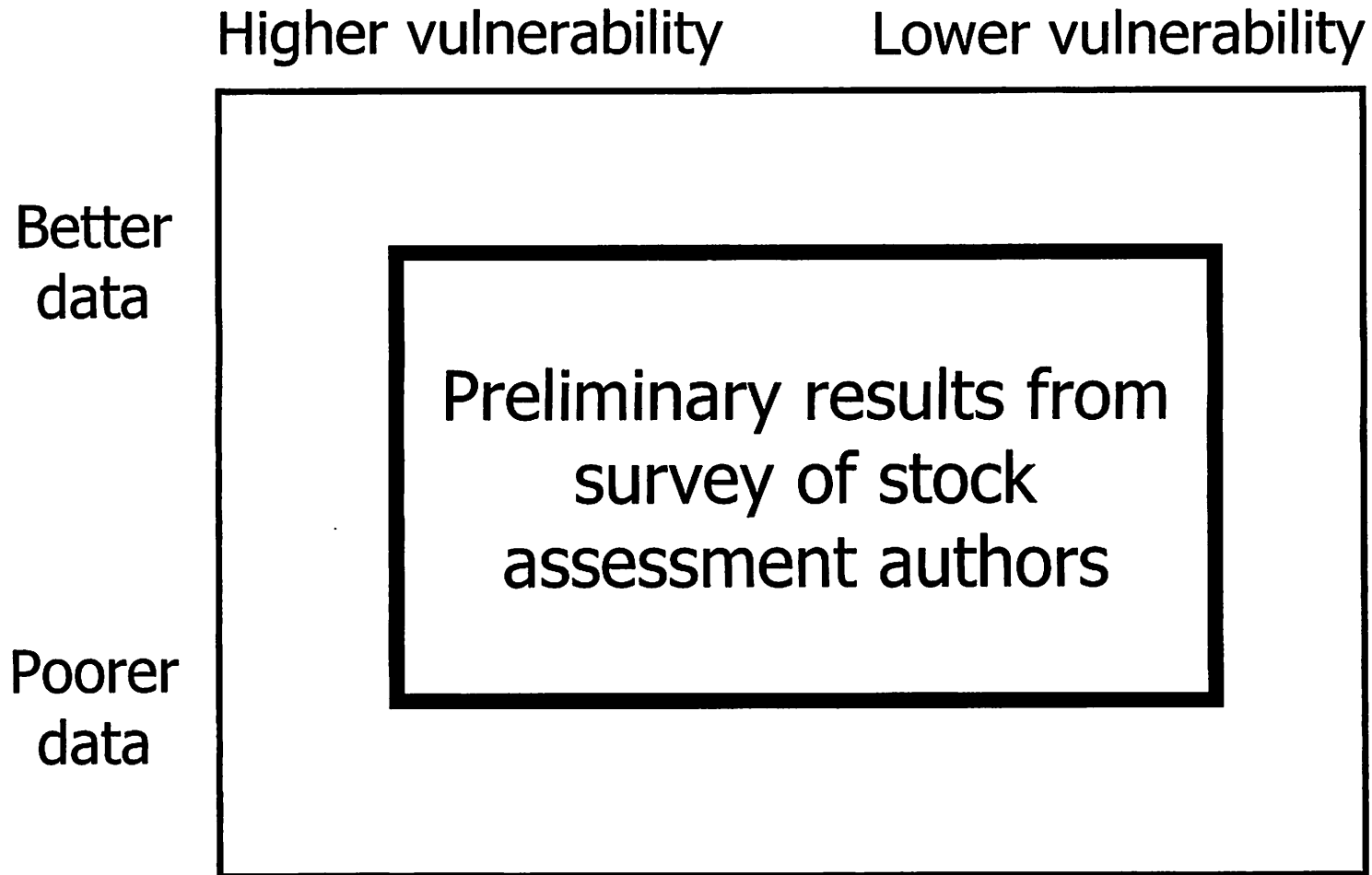
Rockfish, Other species lower

Pelagics, Stocks in small areas lower

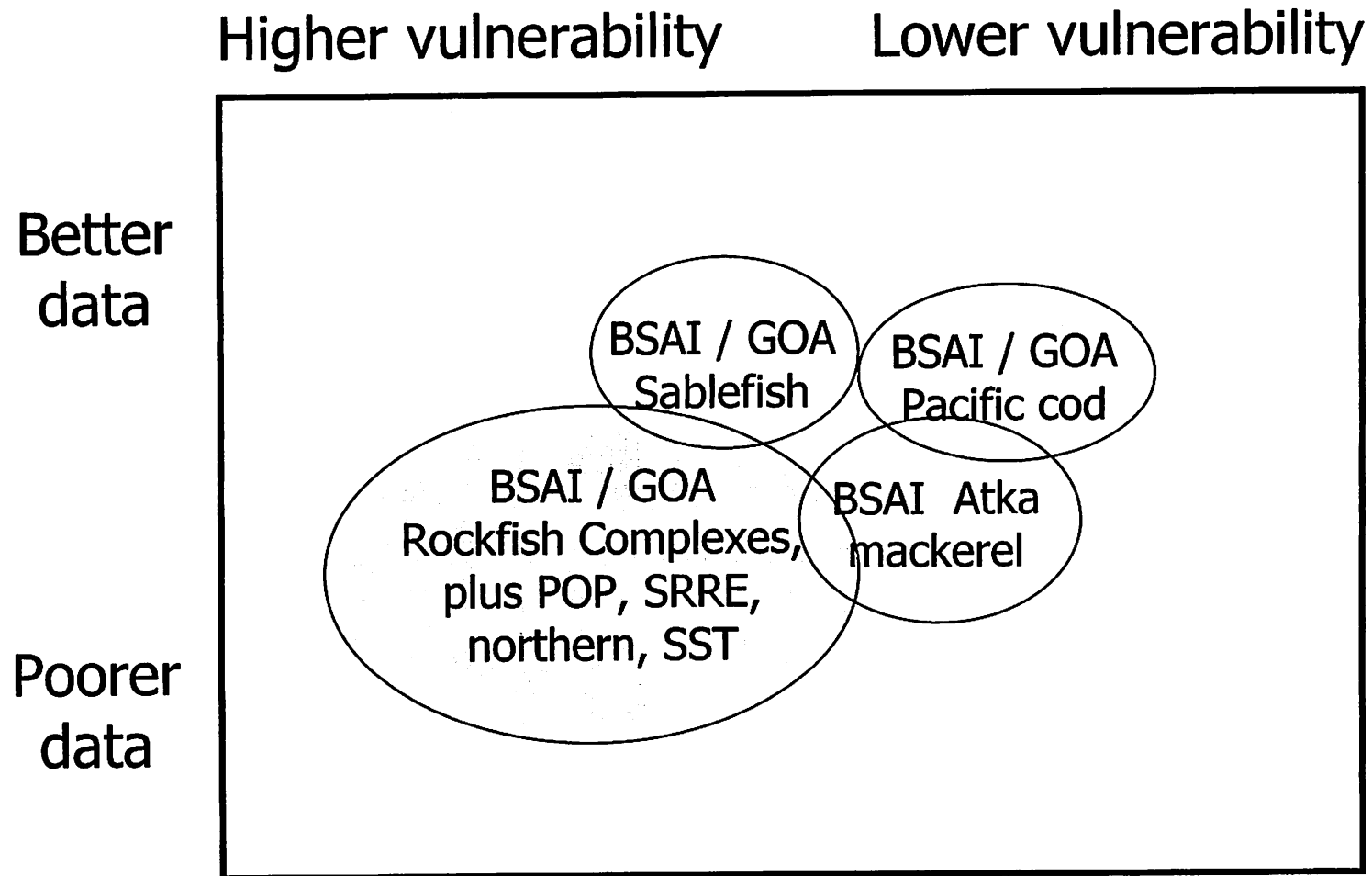| Species/Species group	Species Type	Area	Survey CV	Survey type
Rock sole	Flatfish	EBS	8%	BT
Pacific cod	Roundfish	EBS	9%	BT
Sablefish	Roundfish	GOA	10%	LL
Yellowfin sole	Flatfish	EBS	10%	BT
Arrowtooth flounder	Flatfish	GOA	9%	BT
Deepwater flatfish	Flatfish	GOA	9%	BT
Flathead sole	Flatfish	EBS	11%	BT
Alaska Plaice	Flatfish	EBS	12%	BT
Rex sole	Flatfish	GOA	9%	BT
Arrowtooth flounder	Flatfish	EBS	12%	BT
Flathead sole	Flatfish	GOA	12%	BT
Walleye pollock	Roundfish	GOA	19%	BT/EIT
Other rockfish	Rockfish	EBS	15%	BT
Shortspine thornyhead	Rockfish	GOA	13%	BT
Skates	Other species	GOA	13%	BT
Smelts	Other species	GOA	14%	BT
Shortraker/Rougheye	Rockfish	GOA	15%	BT
Shallow flatfish	Flatfish	GOA	15%	BT
Sculpins	Other species	GOA	15%	BT
Pacific cod	Roundfish	GOA	15%	BT
Walleye pollock	Roundfish	EBS	23%	BT/EIT
Squid	Other species	GOA	17%	BT
Other rockfish	Rockfish	AI	18%	BT
Walleye pollock	Roundfish	AI	19%	BT
Pacific Ocean perch	Rockfish	AI	21%	BT
Other flatfish	Flatfish	EBS	26%	BT
Other slope rockfish	Rockfish	GOA	21%	BT
Greenland turbot	Flatfish	EBS	31%	BT
Sharks	Other species	GOA	26%	BT
Other red rockfish	Rockfish	EBS	33%	BT
Sharpchin/Northern	Rockfish	AI	28%	BT
Pacific Ocean perch	Rockfish	EBS	35%	BT
Pacific Ocean perch	Rockfish	GOA	30%	BT
Shortraker/Rougheye	Rockfish	AI	32%	BT
Southeast Pollock	Roundfish	GOA	33%	BT
Atka mackerel	Roundfish	AI	38%	BT
Pelagic rockfish	Rockfish	GOA	39%	BT
Northern rockfish	Rockfish	GOA	41%	BT
Octopus	Other species	GOA	48%	BT

Defining "vulnerability"

- Defined by the ad hoc group as follows
  - Long lived, slow growing / maturing, low fecundity species
  - Specific habitat association and / or restricted range
  - Present or potential future economic value
  - Consistently associated / caught with abundant target species
- Evaluating data quality (life history data) for currently managed species allows relative vulnerability ranking
- Quantitative methods for ranking vulnerability introduced by Jennings et al 1998, 1999; used by Frisk et al 2001 for elasmobranchs to guide management
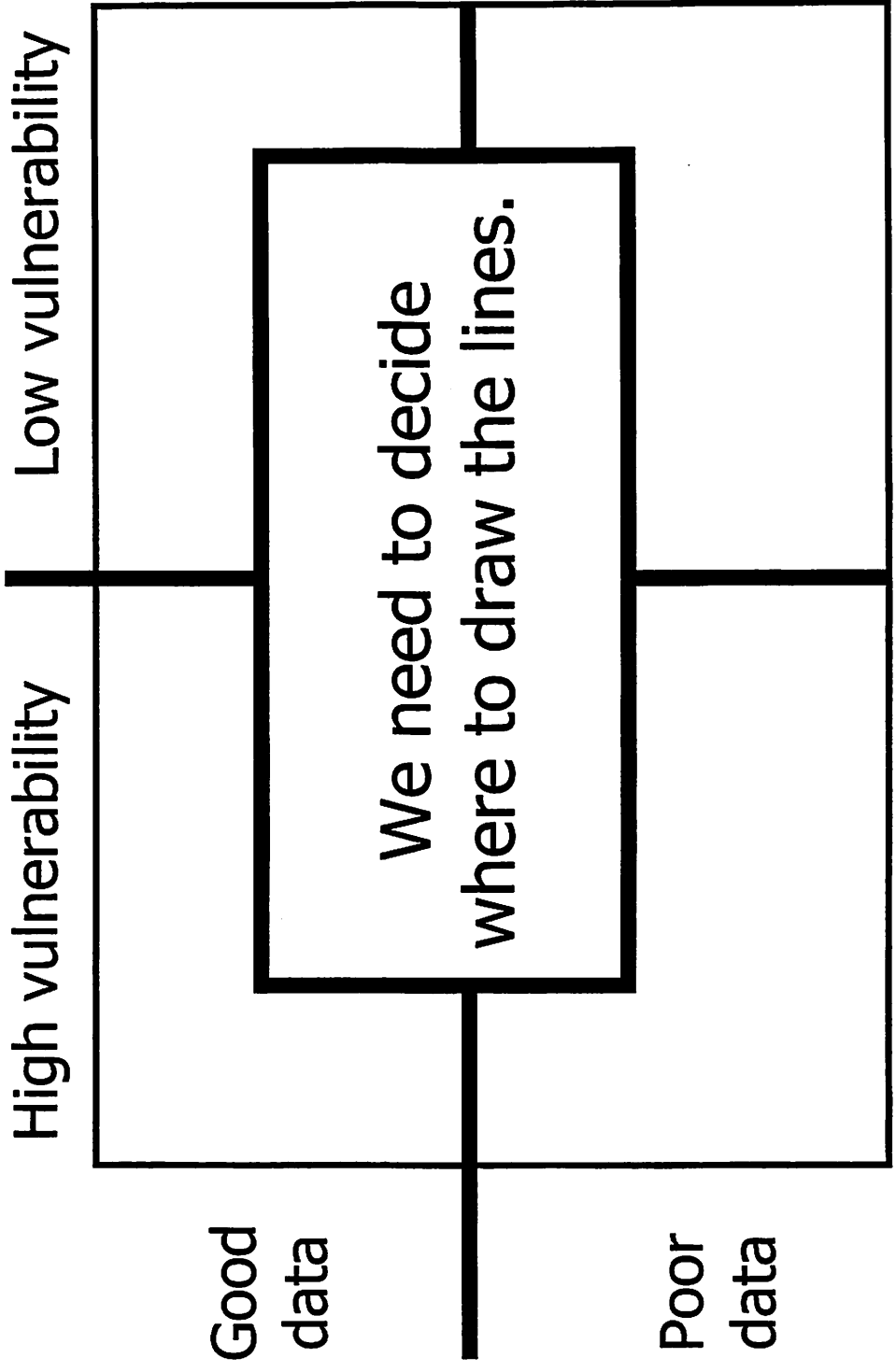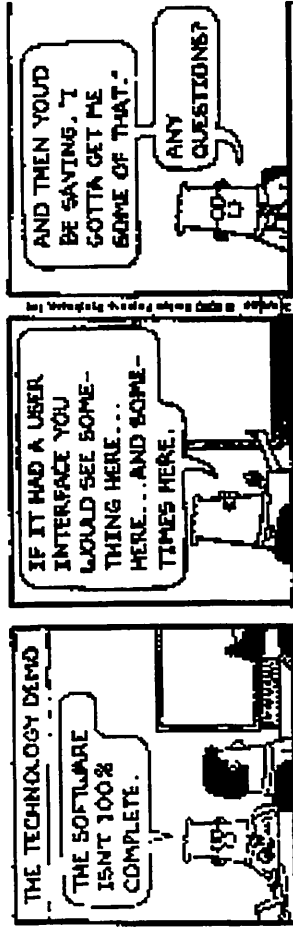
Empirical data—no lines drawn yet!

Higher vulnerability   Lower vulnerability

Better
data

Poorer
data

Preliminary results from
survey of stock
assessment authors

Preliminary qualitative review—not done...

The next step for the committee...

	Low vulnerability	High vulnerability
Good data		
	We need to decide where to draw the lines.	
Poor data		

A work in progress

The committee lumped...

All species we mean to catch	All species we DON'T mean to catch (but still do)

Because there are different management objectives within these categories,
We apply different management tools

First name them to distinguish from what we have now

The committee lumped...

Intended targets	Incidental species

Management objective:

Optimize sustainable yields

Management objective:

Protect from fishing effects

Then the committee split...
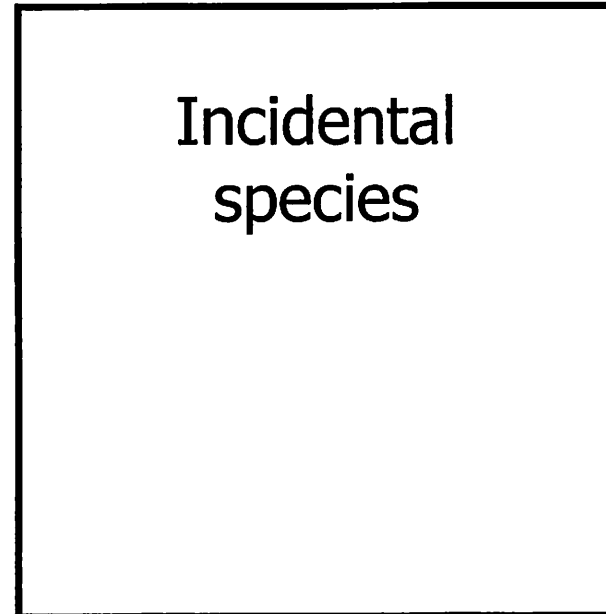
Intended targets

- Managed with *single species* ABC, TAC, OFL

- Data quality allows assessment at Tier 3 or above (Tiers 4-6 phased out)

- No complexes allowed in this category (except*)

Who is in this category?

Pollock, Pacific cod, Sablefish, Atka mackerel,
Rock sole*, Yellowfin sole, Flathead sole, Dover sole, Rex sole, Greenland turbot,
Pacific Ocean perch, Shortraker rf, Rougheye rf*, SS Thornyheads, Yelloweye rf,

Then the committee split...

- No directed fishing allowed
- Managed with Maximum Retainable Allowance (MRA)

- Divided into two further categories:
  - Monitor only
  - Monitor with additional management measures

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┌─────────────────────┐
│                     │
│     Incidental      │
│      species        │
│                     │
│                     │
│                     │
│                     │
│                     │
└─────────────────────┘
```

Who is in this category?

Everything not listed as a target...
Real bycatch complexes (observed to be caught together) are allowed

Criteria for the major division:

- Is it actually caught in the groundfish fishery?
  - Threshold of x% of observed catch to get on the radar
  - Monitoring will allow us to add species for consideration
- Is it retained and landed (as other than fishmeal)?
  - Threshold of y% retention and landing
  - Market currently exists
- Do people want to catch it?
  - If we did not restrict fishing would they target it?

- Things people want to catch are on the list.
- Things people keep but are secondary are not considered targets till they reach the retention/landings threshold. Unless they say they want to keep little bitty amounts of something.

Request to SSC

- provide guidelines for the collection of data necessary to meet Tier 3 data quality requirements

PUBLIC TESTIMONY SIGN-UP SHEET FOR
AGENDA ITEM _____ D-1(a,b) 140/ Rockfish Non-Targ. Species mgmt

PLEASE SIGN ON THE NEXT BLANK LINE.
LINES LEFT BLANK WILL BE DELETED.

	NAME	AFFILIATION
1.	Chuck Peterson	City of New Stuyahok
2.	Destiny Childers	AMYCC
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