

MEMORANDUM

TO: Council, AP, and SSC Members

FROM: Chris Oliver 
Executive Director

DATE: September 26, 2005

SUBJECT: Rockfish Management

ESTIMATED TIME 8 HOURS (all D-1 items)
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ACTION REQUIRED

Receive report on rockfish management

BACKGROUND

In April 2004, the Council adopted a revised policy for the BSAI and GOA Groundfish FMPs. During its first review of that policy in June 2004, the Council noted that many of its objectives directly or indirectly address rockfish management and requested that: "Staff draft a discussion paper addressing rockfish management alternatives. The end product after this first step will provide guidance in conjunction with the Programmatic EIS to address appropriate elements in future FMP actions: 1. No action; 2. Harvest rates and management measures; 3. Habitat consideration."

In February 2005, the Council expanded the role of the Non-Target Species Committee and requested that it expand its development of potential revisions to management of non-target groundfishes by addressing target and non-target rockfish species. In response, the committee convened twice to provide guidance in development of the discussion paper.

In March 2005, the committee recommended that staff apply a proposed alternative to revise management of non-target groundfish, under proposed revisions to the National Standard guidelines (Alternative 4b), to Bering Sea rockfish species. This case study would aid in the committee's determination of whether the alternative could be used as basis for rockfish management. Due to time constraints, staff examined Alternative 4b only for Bering Sea northern rockfish. In its May 2005 review of the case study, the committee recommended that staff expand the case study in the discussion paper. The committee recognized that including all North Pacific rockfish would be a challenge to complete by its next meeting in August 2005. Therefore, it recommended that the paper include GOA and BSAI Pacific Ocean perch, northern rockfish, roughey rockfish, and dusky rockfish as the highest priority; noting that an analysis would address all rockfish species. In August 2005, the committee reviewed a draft and provided feedback to the authors.

A revised draft discussion paper, which incorporated changes recommended by the Non-Target Species Committee, was released prior to the joint meeting of the BSAI and GOA groundfish plan teams. The Teams also suggested some corrections to the draft but primarily cautioned against using the preliminary "sensitivity" analysis, which was conducted by AFSC staff and included in the discussion paper, for management purposes until it is further refined. The Council may wish to request that the ad hoc working group and Non-target

Species Committee continue to work on identifying rockfish species of concern and developing potential management alternatives for revising their management.

The rockfish discussion paper and a supplement containing additional background information by species were distributed on September 20, 2005. The Executive summary is attached as Item D-1(c)(1). An addendum, which addresses Groundfish Plan Team comments is attached as Item D-1(c)(2). Non-Target Species Committee minutes are included as Items D-1(c)(3) and D-1(c)(4).

**BERING SEA/ALEUTIAN ISLANDS AND GULF OF ALASKA ROCKFISHES,
THEIR FISHERIES AND MANAGEMENT:
FOCUS ON PACIFIC OCEAN PERCH, NORTHERN, ROUGHEYE, AND DUSKY ROCKFISHES**
from
NPFMC and NOAA Fisheries Service source documents
and original material from
Jane DiCosimo, Dr. Paul Spencer, Dana Hanselman, Rebecca Reuter, Buck Stockhausen, and others

EXECUTIVE SUMMARY

This paper identifies and discusses the inherent vulnerability of North Pacific rockfishes and assesses the North Pacific Fishery Management Council's current harvest strategy (CHS) for them. Long-lived marine species, such as rockfishes, may be unable to respond as strongly or as rapidly to compensate for reductions in population densities. As described by Musick (1999), long-lived species decline more rapidly and recover more slowly than species with higher productivity. Although lower economic value occurs with many long-lived species, the economic impact of stock collapse mirrors that of more productive, economically valuable species because population recovery time and economic loss last longer. The greatest threats to long-lived marine animals result from mixed-species fisheries where long-lived species comprise the directed catch or bycatch. Such fisheries contribute to economic viability driven by the more productive species, while the long-lived populations risk depletion or extirpation.

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| <p>North Pacific rockfish management issues</p> <ul style="list-style-type: none"> • life history (slow growing, long lived, low reproduction) • insufficient stock and species identification • insufficient abundance and life history information • unknown larval dispersal patterns • unknown habitat-specific associations • limited movement and migration of adults • multiple species within an assessment group • localized fishing pressure • prior history of overexploitation by Russian and Japanese trawlers in the 1960s • limited ability to rebuild (only Gulf Pacific Ocean perch) • management of small quotas |
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After identifying numerous unique management difficulties related to rockfish management (see box), the Council's Scientific and Statistical Committee recommended intensive data collection and alternate, but unspecified, management measures. Four rockfish species in the Bering Sea/Aleutian Islands (BSAI) and Gulf of Alaska (GOA) are highlighted because they provide a wide range of available biological information with which to evaluate potential management problems and effectiveness of proposed revisions to their management. These may include measures to: reduce quotas, reduce maximum retainable allowances, revise assemblages, restrict areas or seasons to reduce target or non-target bycatch, or create refugia to protect their habitat. Such recommendations, however, may be premature without first identifying which, if any, species are considered sensitive or whether current rockfish management policy is inadequate.

Preliminary results of a sensitivity analysis of four test species in two management areas suggest that seven stocks may not be sensitive and that one (BSAI dusky rockfish) may be sensitive (see below). Next steps include: 1) evaluating the sensitivity key and its results; 2) identifying specific management problems; 3) reevaluating a proposed general rockfish management alternative ("Alternative 4b"); 4) identifying specific alternatives for revising rockfish management by species and FMP area; and 5) research and survey improvements.

Test Rockfish Species	Quota Category	Preliminary Sensitivity Analysis	Possible Management
GOA Pacific ocean perch	Core (Target)	Non-sensitive	Status quo
GOA Northern rockfish	Core (Target)	Non-sensitive	Status quo
GOA Roughey rockfish	Core (Target)	Non-sensitive	Status quo
GOA Dusky rockfish	Assemblage (Target)	Non-sensitive	Status quo
BSAI Pacific ocean perch	Core (Target)	Non-sensitive	Status quo
BSAI Northern rockfish	Core (Non-Target)	Non-sensitive	Status quo
BSAI Roughey rockfish	Core (Non-Target)	Non-sensitive	Status quo
BSAI Dusky rockfish	Assemblage (Non-Target)	?	Not yet identified

ADDENDUM TO THE ROCKFISH DISCUSSION PAPER

AGENDA D-1(c)(2)
OCTOBER 2005

Prepared by Jane DiCosimo

Council staff identified a number of issues that were presented in the rockfish discussion paper that require correction or clarification. A few corrections were made to the draft released on September 12, 2005, and are included in the draft released on September 28, 2005 and included in the Council briefing book and posted on the web. These corrections were deemed necessary for public distribution and were limited to identifying the following. Two substantive issues that were not included in the revised discussion paper are presented below.

- GOA northern, rougheye, and dusky rockfishes as target fisheries in the GOA (p. i, and p. 53);
- positive evidence of stock structure for Type I rougheye rockfish (p. 7);
- GOA rougheye rockfish as managed under Tier 4 (p. 16)

“Sensitivity analysis” The Joint Groundfish Plan Teams strongly recommended that the Council not use the *Worksheet to Determine Non-target Species Sensitivity*, which was included in the rockfish discussion paper under Appendix 4, for management purposes. The teams cautioned against using the terminology “sensitive” and “vulnerable” in the management context because of their biological application. “Sensitivity” relates to a statistical analysis that is part of a stock assessment. Any fish is sensitive to exploitation if exploitation is left unchecked. “Vulnerable” describes the susceptibility of a species to overfishing. The following is an excerpt from the joint groundfish plan team minutes. In response to these recommendations, the author revised the draft worksheet (Attachment).

The Teams expressed a number of concerns with regards to the use of the terms “sensitivity” and “vulnerability.” “Sensitivity” relates to a statistical analysis that is part of a stock assessment. “Vulnerability” describes the susceptibility of a species to overfishing. The Teams suggested “overall level of concern” to rank the potential vulnerability of the species for management purposes. Species might be “sensitive” according to their life-history characteristics, but not currently vulnerable to fishing pressure and/or of management concern. Likewise, other species might not have sensitive life-history characteristics as such, yet it is possible that a high harvest rate may increase their relative “level of concern.” The Teams found it useful to vet these ideas as they could advise on the potential pitfalls and possibilities of the management implications of the tables. The Teams suggested clearly displaying a column on relative risk or “concern,” in addition to a column on species sensitivity. They also suggested that this key be updated to better characterize these species as information becomes available. The Teams expressed great concern that the public may infer that long-lived species are not sensitive, whereas it may be that some or all of these species are just not candidates for additional management actions at this time.

Other specific recommendations for the authors:

- *Possibly use economic information and market-driven data as well in characterizing the relative vulnerability of species*
- *Fishery Interactions: Need to consider additional fisheries for incidental catch in characterizing the potential interactions*
- *Abundance trend: survey selectivity should be changed to catchability in this section (if that is what is being approximated); important to note when using the survey versus the model for results.*

This information might eventually be summarized in the introductory section of the SAFE reports (e.g., similar to trends that are summarized in the GOA SAFE introductory Table 2)

The Teams discussed the possibility of expanding this sort of characterization to target species as well as non-target species. Concerns were noted that this might prove repetitive with current summaries of assessments. The Teams suggested that one approach might be to review existing

September 29, 2005

information in assessments in order to ensure that this type of information is already available in each assessment.

Jane DiCosimo explained that the Non-Target Species Committee needs the results of this sensitivity analysis in order to move forward with refining management alternatives for analysis. The timeline for this analysis is indeterminate at this point. The next step is to assess vulnerability/sensitivity of various species and evaluate revising management regimes for those deemed "at-risk." Anne Hollowed noted that this work also responds to pending revisions for proposed assemblage management under the National Standard 1 guidelines. Jane suggested re-starting the "Ad Hoc" working group to review this information with the committee but the Teams did not comment on to what extent that was necessary. . .

The Teams further recommended that the definitions of sensitivity and vulnerability should be clearly defined in the paper. Concerns were expressed regarding the classifications of sensitive and non-sensitive in the paper (and relating back to the discussion of the non-target species key)."

Lists of Rockfish Species The Joint Plan Teams identified discrepancies between the lists of GOA rockfish species included in the GOA Groundfish FMP (Table 1) and rockfish discussion paper, which was based on the list of species used in the 2005 Report to Congress. Table 2 reflects recent¹ consensus between the authors of the GOA rockfish assemblage stock assessments and the annual Report to Congress on a species list for GOA rockfish assemblages. Consistency across the GOA FMP, stock assessment chapter, and Report to Congress should also be achieved for "thornyheads," which is listed as a single species in the GOA FMP, two species (shortspine thornyhead and longspine thornyhead) in the Report to Congress, and inferred to be an assemblage in the SAFE Report (the assessment is based predominantly on shortspine thornyhead, but references two congeners, longspine thornyhead and a species common off Japan *S. macrochir*, that infrequently occur in the GOA).

Note that four species in bold are currently managed under single species specifications, but are listed in the GOA FMP as part of the slope rockfish assemblage. The GOA FMP stipulates that, "*Notwithstanding designated stocks or stock complexes listed by category in Table 3-1, the Council may recommend splitting or combining stocks or stock complexes in the "target species" category for purposes of establishing a new TAC if such action is desirable based on commercial importance of a stock or stock complex and whether sufficient biological information is available to manage a stock or stock complex on its own merits.*" This means that it is not necessary to split out species from assemblages to set single species specifications. The Council may wish to consider whether the current FMP is adequate or those stocks should be listed separately from the slope rockfish assemblage by amending the FMP to identify Council policy. Plan amendments would be necessary to identify core and assemblage species if proposed revisions to the National Standard 1 guidelines are implemented.

Also, note that the BSAI Groundfish FMP refers to the major rockfish species in Sections 4.1.2.5 and 4.1.2.6, by noting that Pacific Ocean perch, northern, shortraker, and roughey rockfishes have been managed separately since 2001. It also reports that the "other rockfish category" contains eight *Sebastes* and *Sebastolobus* species, but only identifies two (dusky and shortspine thornyhead). The BSAI rockfish species identified in the SAFE Report stock assessment chapters and 2005 Report to Congress are consistent.

The Council may wish to consider whether to take a uniform approach to identifying assemblage species in the groundfish FMPs. Amending either of the Groundfish FMPs would result. The BSAI FMP approach allows greater flexibility for stock assessments and would necessitate plan amendments to add or remove species. Lastly, clarification that the BSAI FMP does not contain a list of rockfish species nullifies the need for a plan amendment to remove dark rockfish from the list; instead the stock assessment author would address this issue in the chapter after the Council has set policy on whether to defer management of dark rockfish to the State of Alaska.

¹ September 28, 2005

Table 1. Assemblages listed in the GOA Groundfish FMP (January 2005)

Slope Assemblage (20)	Demersal Shelf Assemblage (8)	Pelagic Shelf Assemblage (4)
² Aurora rockfish (<i>S. aurora</i>)	Canary rockfish (<i>S. pinniger</i>)	Dusky rockfish (<i>S. variabilis</i>)
² Blackgill rockfish (<i>S. melanostomus</i>)	China rockfish (<i>S. nebulosus</i>)	Dark rockfish (<i>S. ciliatus</i>)
Boccacio (<i>S. paucispinus</i>)	Copper rockfish (<i>S. caurinus</i>)	Widow rockfish (<i>S. entomelas</i>)
Chilipepper rockfish (<i>S. goodei</i>)	Quillback rockfish (<i>S. maliger</i>)	Yellowtail rockfish (<i>S. flavidus</i>)
Darkblotch rockfish (<i>S. crameri</i>)	³ Redbanded rockfish (<i>S. babcocki</i>)	
Greenstriped rockfish (<i>S. elongatus</i>)	Rosethorn rockfish (<i>S. helvomaculatus</i>)	
Harlequin rockfish (<i>S. variegatus</i>)	Tiger rockfish (<i>S. nigrocinctus</i>)	
Northern rockfish (<i>S. polyspinus</i>)	Yelloweye rockfish (<i>S. ruberrimus</i>)	
Pacific Ocean Perch (<i>S. alutus</i>)		
Pygmy rockfish (<i>S. wilsoni</i>)		
Redstripe rockfish (<i>S. proriger</i>)		
Rougheye rockfish (<i>S. aleutianus</i>)		
Sharpchin rockfish (<i>S. zacentrus</i>)		
² Shortbelly rockfish (<i>S. jordani</i>)		
Shortraker rockfish (<i>S. borealis</i>)		
Silvergray rockfish (<i>S. brevispinus</i>)		
Splitnose rockfish (<i>S. diploproa</i>)		
Stripetail rockfish (<i>S. saxicola</i>)		
Vermilion rockfish (<i>S. miniatus</i>)		
Yellowmouth rockfish (<i>S. reedi</i>)		

Table 2. Assemblages as recommended by GOA rockfish assessment authors

Slope Assemblage (15)	Demersal Shelf Assemblage (9)	Pelagic Shelf Assemblage (4)
Blackgill rockfish (<i>S. melanostomus</i>)	Canary rockfish (<i>S. pinniger</i>)	Dusky rockfish (<i>S. variabilis</i>)
Boccacio (<i>S. paucispinus</i>)	China rockfish (<i>S. nebulosus</i>)	Dark rockfish (<i>S. ciliatus</i>)
Chilipepper rockfish (<i>S. goodei</i>)	Copper rockfish (<i>S. caurinus</i>)	Widow rockfish (<i>S. entomelas</i>)
Darkblotch rockfish (<i>S. crameri</i>)	Quillback rockfish (<i>S. maliger</i>)	Yellowtail rockfish (<i>S. flavidus</i>)
Greenstriped rockfish (<i>S. elongatus</i>)	Rosethorn rockfish (<i>S. helvomaculatus</i>)	
Harlequin rockfish (<i>S. variegatus</i>)	Tiger rockfish (<i>S. nigrocinctus</i>)	
Pygmy rockfish (<i>S. wilsoni</i>)	Yelloweye rockfish (<i>S. ruberrimus</i>)	
³ Redbanded rockfish (<i>S. babcocki</i>)	⁴ Brown rockfish (<i>S. auriculatus</i>)	
Redstripe rockfish (<i>S. proriger</i>)	⁴ Puget Sound rockfish (<i>S. emphaeus</i>)	
Sharpchin rockfish (<i>S. zacentrus</i>)		
Silvergray rockfish (<i>S. brevispinus</i>)		
Splitnose rockfish (<i>S. diploproa</i>)		
Stripetail rockfish (<i>S. saxicola</i>)		
Vermilion rockfish (<i>S. miniatus</i>)		
Yellowmouth rockfish (<i>S. reedi</i>)		

² listed in the FMP, but not listed in the 2005 Report to Congress

³ will be moved from DSR in GOA FMP to slope assemblage in next Report to Congress

⁴ added to the 2005 Report to Congress

Species Assessment of Concern for the BSAI and GOA FMP

NOAA/NMFS/AFSC
Version 6.0**Introduction**

In May 2005, staff scientists at the Alaska Fisheries Science Center (AFSC) met to discuss techniques for assessing criteria for evaluating the level of concern of non-target species. A series of meetings subsequently followed that led to the identification of criteria using a combination of information for each candidate species. These meetings were the result of earlier work on rockfish by the Non-Target Species Committee to determine whether revising management measures were necessary to enhance the protection of non-target species. AFSC scientists expanded these criteria and incorporated them in the form of a worksheet called the Species Assessment of Concern (SAC). The following SAC provides an objective method for identifying those species that may be of immediate concern.

The goal in the development of the SAC was to identify which species or complex may be in most need of management action. The SAC does not provide recommendations for the mitigation of those species most impacted by fishing, nor does it provide research priorities for those species whose life histories are poorly known. Each SAC, however, does provide critical information that might aid in future decision-making processes. Further information can be found in each species or species complex respective stock assessments.

The criteria in the SAC are based on sets of key information that best illustrate a species or species complex level of concern to fishery impact: Fishery Interactions, Abundance Trend, and Catch Trend. The first step of the SAC is to determine the productivity of the species or species complex. The level of productivity is determined using key life history traits adapted from Musick (1999). The second step is to determine the fishery impact level of concern (FILC), in this part of the SAC, fishery interactions, fishery data and survey data are used to gather information that suggests whether a species or species complex interaction with any fishing activities is of concern. Those species that are found to be at a high level of concern from fishing impacts are those whose exploitation rate (catch/biomass) is higher than the tier 5 OFL level of 0.75 of the natural mortality (M). Each section, except Fishery Interactions, is qualified with a data quality section. For Abundance Trend, the data quality is based on the AFSC RACE survey coefficient of variation (CV); Catch Trend data quality is determined by data reliability (which is based on how the catch data were obtained); Life History data quality is based on whether the parameters are from the same species for the appropriate area or from the same or similar species in another area.

Further information to determine species assessment of concern that is not discussed in this worksheet are the role of the species in the ecosystem, habitat restrictions and ideas for mitigating those species found to be most impacted by fishing effort.

Productivity

Life History traits to assess productivity

Using the Reference Productivity Table 1 as a guide, fill in the Species Table 1 below, value of parameter, the respective productivity level for each parameter (except natural mortality), and the data source (using the terms below). The level of productivity that is the most conservative is the overall level that is then carried over to Summary Table 4.

Possible data sources to use for following parameters (list primary data source in Table 4):

1. Species-same area: Parameter was determined with data from same species from the area of concern.
2. Species- different area: Parameter was determined with data from same species outside the area of concern, but from an area within Alaskan waters.
3. Proxy species: Parameter was determined with data from either the same species in an area outside of Alaskan waters or a similar species from any area.

Species Table 1

	Value	Data source	Level of Productivity*
Natural Mortality			
Maximum age			
Growth parameter (k)			
Age 50% maturity			

Reference table 1:

Productivity				
Parameter	High	Medium	Low	Very Low
von Bertalanffy k	>0.30	0.16-0.30	0.05-0.15	< 0.05
Tmat – 50% maturity	1-2 yr	3-9 yr	10-15 yr	>15 yr
Tmax	1-5 yr	6-15 yr	16-30 yr	>30

Notes: This table ranking indices of productivity has been adapted from Musick 1999 for Alaskan species (cold water, high latitude).

Fishery Impact Assessment of Concern (FIAC)

Fishery Interactions:

This section determines whether a non-target species interacts with fisheries in Alaskan waters.

Using the Reference Table 2 below, please fill out Species Table 2 for your assigned species or species complex. Rank is the numerical value for each designation: Good = 1; Moderate = 2; Poor = 3. The average of all ranks determines the level of fishery interaction which is then documented in Summary Table 4 "Fishery Interactions".

Reference Table 2:

Fishery Interaction	No	Yes
Distribution		
Is center of abundance for species in this FMP area?	Good (1)	Bad (3)
Is there high fishing effort in this FMP area where species occurs?	Good (1)	Bad (3)
Restricted Range		
Is stock endemic or restricted in range to a relatively small, contiguous geographic entity?	Good (1)	Bad (3)

Species Table 2:

Species interaction with fishery	Information	Rank
Distribution		
Is center of abundance for species in this FMP area?		
Is there high fishing effort in this FMP area where species occurs?		
Restricted Range		
Is species endemic or restricted in range to a relatively small, contiguous geographic entity?		
	Total	
Add value to Summary Table 4.	Average	

Fishery Catch

Fill out the following information using the best available data .

Occurrence within fishery

1. List in descending order the main fishery(s) and gear type(s) that catch this species or species complex, and % of total catch of this species or species complex in these fisheries.

Fishery	Gear type	% of total catch

Trend analysis

1. Number of years in time series _____
2. Assess historical trend using a regression, is the trend significant? _____
Document p-value: _____

3. Assess recent trend (last 5 years) using a regression, is the trend significant? _____
Document p-value: _____

4. Categorize the historical trend using one of the following terms (Outburst, Increasing, Variable, Stable, Decreasing, Stock Collapse) Note to author: If trend is not significant, determine whether the population is variable or stable (recommend using R² value to evaluate this.) _____ (place categorization in summary table: "Catch Trend – Historical")

5. Categorize the recent trend using one of the following terms (Outburst, Increasing, Variable, Stable, Decreasing, Stock Collapse) Note to author: If trend is not significant, determine whether the population is variable or stable (recommend using coefficient of variation to evaluate this.) _____ (place categorization in summary table: "Catch Trend – Recent")

Method of acquiring catch data:

Catch data for non-target species may not be readily available. Therefore, here are a few suggestions on reconstructing the catch data.

1. Species: Observers record catch data to species.
2. Survey species composition: The catch is reconstructed by applying survey species composition of complex to fishery complex catch.
3. Assemblage: If species is managed as a complex, is the complex adequately defined using the following definition: “a group of stocks that ... typically co-occur geographically, and that tend to have similar productivity but for some or all of which the available data are insufficient to specify individual Status Determination Criteria or control rules”?
 - a. If so, use current complex/assemblage for catch estimation.

If not, recommend an alternative assemblage that would conform to the above definition and report the catch for the recommended assemblage .

1. Please discuss the method used for determining catch data, if catch is reported for a complex, please describe how assemblage was determined. Method: _____
_____ (place in Summary Table 4: “Source of Data”)

Abundance Trend

Can abundance be calculated using AFSC/RACE or ABL survey biomass estimates?

Survey catchability

Does the survey provide an accurate first approximation of the abundance of this species? Discuss.

Trend analysis

1. Number of years in time series? _____
2. Assess historical trend using a regression, is the trend significant? _____
Document p-value _____
3. Assess recent trend (last 5 years) using a regression, is the trend significant? _____
Document p-value: _____
4. Categorize the trend using one of the following terms (Outburst, Increasing, Variable, Stable, Decreasing, Stock Collapse) Note to author: If trend is not significant, determine whether the population is variable or stable (recommend using R^2 value to evaluate this.) _____ (place categorization in Summary Table 4: "Abundance Trend - Historical")
5. Categorize the recent trend (last 5 years) using one of the following terms (Outburst, Increasing, Variable, Stable, Decreasing, Stock Collapse) Note to author: If trend is not significant, determine whether the population is variable or stable (recommend using coefficient of variation to evaluate this.) _____ (place categorization in Summary Table 4: "Abundance Trend - Recent")

Uncertainty of Abundance estimates

Fill in the Species Information Table 3 with your best available data, placing the category of uncertainty from the reference table:

Reference Table 3

Uncertainty	Good	Moderate	Poor
Level of uncertainty of abundance estimates	CV < 0.30	CV between 0.30 and 0.60	CV > 0.60

Species information Table 3

Uncertainty	Level
Level of uncertainty of abundance estimates over entire time series (average of all years - historical)	
Recent level of uncertainty of abundance estimates (from most recent survey)	

Enter this information into Summary Table 4 under "Uncertainty of Abundance - Historical or Recent".

Catch/Biomass

1. What is the Catch/Biomass relative to M for the most recent year? _____
(add to Summary Table 4: "Catch/Biomass Relative to M – Recent")
2. What is the average Catch/Average Biomass relative to M for the last 5 years? _____
_____ (Add to Summary Table 4: "Catch/Biomass Relative to M – Historical")

Summary

The information documented in this SAC is intended to be used as a first step to highlight those species that may be of immediate concern based on their productivity and the impact of fishing on their populations. The following summary table compiles the information in this worksheet and then can be used to rank species based on productivity and level of concern due to impacts by the fishery.

Summary Table 4:

Fill in the table below with the rankings obtained from the tables above.

Species	Productivity	Data source of Productivity	Fishery Interaction	Catch/Biomass Relative to M	
				Historical	Recent

Catch Trend		Source of Catch	Abundance Trend		Uncertainty of Abundance (CV)	
Historical	Recent		Historical	Recent	Historical	Recent

REFERENCES

Musick, J.A. 1999. Criteria to define extinction risk in marine fishes. Fisheries 24(12): 6-12.

Non-target Species Committee Meeting
Seattle, WA
March 14-15, 2005

Committee members Dave Benson (chair), Lori Swanson, Julie Bonney, Paul Spencer, Eric Olson, Dave Wood attended. Ed Richardson attended for Karl Haflinger and Lisa Butzner and Thorn Smith attended for Janet Smoker. Whit Sheard and Michelle Ridgway were absent. Jane DiCosimo and Sarah Gaichas provided staff support. Approximately ten agency staff and two members of the public also attended. The meeting convened at approximately 10:30 am on March 14, 2005 at the Alaska Fisheries Science Center (AFSC) and adjourned at noon, March 15. The committee approved the agenda, with the addition of a presentation on localized depletion of rockfish.

In February 2005, the Council requested that the committee address two management issues at this meeting and report its conclusion to the Council in April 2005. The Council expanded the charge to the committee to also address management of target rockfish species. The Council requested that the committee develop an outline for the rockfish paper that organizes material in the following manner: (a) by FMP area and (b) by species; and then by: (i) harvest rates, (ii) spatial and temporal bycatch information, and (iii) habitat considerations/refugia. The Council also requested that the committee review the other species category discussion paper prepared by Council staff in February 2005 and provide recommendations on a proposal to break the complex into groups for setting catch specifications.

National Standard 1 No update on proposed revisions to agency guidelines for National Standard 1 was available since the proposed rule has not been published. At issue is whether all FMP species must have overfishing status determinations. The Council and staff have communicated directly with NOAA-Fisheries headquarters staff on the Council's interest in using alternative management methods to catch specifications for non-target groundfish, which may require modification of proposed draft guidelines released in February 2003.

Rockfish discussion paper Jane DiCosimo reported that she and Paul Spencer met briefly with five members of the AFSC rockfish working group immediately prior to the committee meeting. Group members suggested that the proposed rockfish discussion paper should address localized depletion studies and summaries of research to be presented at the Lowell Wakefield Symposium, "Biology, Assessment, and Management of North Pacific Rockfishes" on September 12-14, 2005 [<http://www.uaf.edu/seagrant/Conferences/rockfish/info.html>].

Paul Spencer presented a paper on localized depletion of Pacific ocean perch (POP) in the Aleutian Islands (AI) during the 2000-2004 fisheries, which he and Rebecca Reuter prepared in February 2005 at the request of the SSC. Localized depletion is defined as a reduction in population size over a relatively small spatial area as a result of intensive fishing. Local depletion is a potential conservation issue for rockfish because their stock structure could occur at relatively small spatial scales and thus local depletions could affect local aggregations to a greater degree than the overall population. For example, genetic information indicates that Pacific ocean perch (POP) have fine spatial structure (smaller than management areas), while other rockfish species exhibit stock structure consistent with our management areas. Three study areas, approximately half a degree square each, near Buldir and Atka islands were examined. These areas represented approximately half the western AI POP commercial catch, so was deemed representative of the 5-6 day fisheries, comprised of 3-5 vessels. The short fisheries and few participants resulted in only a few data points to determine whether catch-per-unit-effort (CPUE) was significantly reduced during the course of the fishery, which is taken as an indicator of localized depletion. Only two of ten datasets exhibited significant declines in CPUE.

The committee discussed the paper in detail and offered a number of comments on the POP fishery and our ability to detect depletion from this fishery. These include: (1) the short duration of the fishing season reduces the number of data points from which we can determine depletion; (2) the fleet may top off on different species at the end of a reporting week; (3) high CPUE at the start of the season may be due to naïve behavior and the fish may become hook smart; (4) there may vessel specific effects; (5) the last day is often not a full day of fishing. Further investigation could explore: (1) age structure of the population; (2) how to separate fishing effects from strong

recruitment; (3) hierarchical analysis which would treat each data point as a random sample of where fishing could occur; and (4) potential changes to behavior of the population once it is fished.

The Council's June 2004 request for a discussion paper on rockfish occurred in the context of the Programmatic Groundfish SEIS. It is difficult, however, to identify a management solution until a problem in the fishery has been identified. While the AFSC has responded to the "F₄₀ review" by Goodman et al. (2002) that current harvest rate policies are appropriate for rockfishes, other management issues have been raised: (1) harvest rate studies have been explored only for a few species (e.g., POP and northern rockfish); (2) high discard rates (e.g., northern rockfish); (3) whether the occurrence of species at the edge of its range should lead to more or less protection; (4) managing small TACs; and (5) stock identification .

The committee identified two management issues for Council consideration: (1) the need to enhance rockfish management for data poor species; and (2) the need to build a research framework to gather sufficient data to determine whether a management problem for data poor rockfish species exists. Therefore, rockfish biology makes these species different from other managed groundfish species and managers should identify short term and long term research plans to gather the information needed to identify and address management problems.

The committee identified the following management priorities for the BSAI and GOA rockfishes. Major management issues in the BSAI include: (1) bycatch and discards; (2) area splits of catch specifications between BS and AI; (3) small TACs; (4) genetic stock structure for POP in AI, northern rockfish in BSAI; and (5) the need for refugia. Major management issues in the GOA include: (1) disproportionate fecundity in adult female rockfishes (i.e., do older spawners produce more viable larvae (do "mothers matter"?)?); and (2) appropriate harvest rates for target species and bycatch assemblages [these two issues could be examined for the AI as well].

The committee recommended that the discussion paper should be structured by applying the proposed alternative to all rockfish species in a given management area and focus on management issues related to target and non-target rockfishes separately. The paper would address appropriate harvest rates for target rockfish species, and spatial refugia for non-target rockfish species. Under Alternative 4a, the first step is to define target vs. non-target rockfish species. Target species would remain under the current catch specification system. Non-target species would not. Under the second step, non-target rockfishes would be characterized as sensitive or non-sensitive. Sensitive species would be managed; non-sensitive species would be monitored. How sensitive species would be managed would be based on individual life history and management needs to be identified by the Council. Lastly, a process for moving species between the target and non-target category would be developed.

If the proposed NS1 guidelines require that all species be managed under an OFL, then a different procedure would be analyzed. Under the first step, all target species, and stocks considered sensitive or important with sufficient information to set species-specific status determination criteria, would be identified as core stocks. Any species not to be managed under quotas may have to be removed from the FMU(s) as defined in the FMPs. All remaining single species and complexes that are not intentionally caught would be managed as assemblages. Both core stocks and assemblages would be managed under the specification process.

For instance, the other rockfish category includes: dark dusky, light dusky, harlequin, red banded, redstripe, yelloweye, shortspine thornyhead, and aurora rockfishes. It also includes the following 20 rockfish species, which individually comprise <1 percent of the fishery and would not be managed under quotas under the proposed management regime: blackgill, blue, bocaccio, canary, chillipepper, copper, dark blotched, greenstriped, pygmy, rosethorn, silvergray, splitnose, stripetail, tiger, vermilion, widow, yellowmouth, yellowtail, and longspine thornyhead. Currently, the specifications are set based on the first 8 species, although catches of the remaining 20 species also count against the quota. More importantly, catches of these 20 species could be taken up to the total quota for the 8 species.

Research review The committee discussed scientific and policy needs that may be conflicted, or how to better link science to specific management goals. Defining different management goals for target species vs. non-target species may guide scientific research. Harvest strategies and whether "mothers matter" could be focused for target species. If mothers matter, for instance, refugia or other innovative approaches may be identified as an alternative

management measure. Setting quotas for EBS northern rockfish is an example of a management problem that could become a research priority.

The committee reviewed a summary on proposed rockfish research for 2005 that was presented by Paul Spencer (see Appendix). The committee addressed the need for more information on stock structure (e.g., rougheye rockfish; northern rockfish stock identification is being researched by Tony Gharrett), improved survey techniques for estimating rockfish biomass (e.g., longline survey), gear modification to reduce northern rockfish in the Atka mackerel fishery (what accounts for difference in selectivity of northern rockfish in the trawl survey vs. fishery?). Buck Stockhausen, AFSC, reported that he is developing an analysis of potential rockfish refugia. Within a year, he plans to use physical oceanographic models which use larval dispersion to look at potential locations for marine reserves/refugia. Ideally, these areas would be a source of larvae for the overall population, but also within the refugia itself. Ideally, some retention would occur within refuges but larvae also would flow out and not be dependent on recruitment from fished areas.

Other rockfish management initiatives The Council has also tasked staff with preparing an FMP amendment to separate light and dark dusky rockfish (in the GOA only) and defer management of GOA dark dusky rockfish to the State of Alaska. The Council may expand this analysis to separate black, blue, and dark rockfish in the BSAI and defer management to the State, for parity. The Council is scheduled to take final action on a pilot program to rationalize the rockfish fishery in central GOA. And the committee discussed how the Council's February 2005 preferred alternative on essential fish habitat (EFH) and habitat areas of particular concern (HAPC) in the GOA and AI may relate to possible closed areas/refugia for non-target groundfish species. It discussed how to reconcile EFH (e.g., leave some areas pristine and fish already fished areas) with rockfish depletion (e.g., do not fish the same area all the time). The committee noted that the BS was not included in the preferred alternative, but was recommended for future action. It considered whether such recommendations would occur under the non-target initiative or a separate call for proposals under EFH/HAPC.

Other species complex The committee reviewed the suite of alternatives for other species management. It noted that Alternative 2 (to revise the TAC-setting formula for GOA other species) was scheduled for action by the Council for implementation for 2006. It recommended that the Council proceed with a revised Alternative 3 to break out some of the groups from the other species category in the GOA and BSAI. It recommended separate alternatives to break out: (1) skates in the BSAI (already separated in the GOA); or (2) skates in the BSAI and sculpins in the GOA and BSAI (and leave sharks, octopus and squid (in the GOA) in the other species category). The rationale for these alternatives is: (1) TACs for high biomass species (skates and sculpins) could overwhelm smaller groups; (2) only BSAI skates might become a target fishery and is the dominant biomass in the BSAI; (3) grenadiers should not be added as a catch specification category at this time. The committee discussed but did not recommend that octopus be re-categorized as a forage fish.

The committee scheduled its next meeting for May 31st in Anchorage/Girdwood to review staff progress on an annotated outline of the proposed rockfish discussion paper that is described above. The committee would not report to the Council in June. It would reconvene in the latter part of Summer 2005 to review the draft rockfish discussion paper, which would be presented to the Council at its October 2005 meeting.

Appendix. Proposed AFSC rockfish research projects, FY 2005

- 1) **Rockfish stock structure.** Improve knowledge of northern and rougheye rockfish genetics and stock structure.
- 2) **Estimation of key life-history parameters.** Determine maturity at age for northern rockfish and Pacific ocean perch in the Aleutian Islands, and evaluate the effects of spawner age on reproductive output and larval mortality rates.
- 3) **Improve age determinations for selected species.** Upgrade equipment, provide support to prepare otoliths for reading.
- 4) **Design and evaluate survey sampling protocols to improve rockfish biomass estimates.** Hire worker to compare rockfish signal observed in echosounder on hydroacoustic surveys to signal on echosounder on trawl survey. This research will be used to evaluate the utility of using trawl-based echosign data in survey designs that reduce the variance of biomass estimates.
- 5) **Evaluation of the catchability of selected rockfish to the groundfish trawl survey and their habitat associations.** Compare density estimates of the trawl to those made from a submersible – used to assess how well our research survey trawl nets sample rockfish. Also, collect observations on habitat and the rockfish densities in various habitats.
- 6) **Investigate the genetics and spatial distribution of young of the year rockfish.** Examine the interannual variation and genetic stock structure over small spatial scales using fish from the same cohort – these samples are pelagic young of the year POP collected opportunistically in salmon surveys.
- 7) **Assessment of nursery area requirements of age 1+ slope rockfish.** Locate age 1+ slope rockfish and identify their nursery habitat during the critical life stage when rockfish settle into demersal habitat
- 8) **Evaluate potential sites for rockfish marine reserves based on patterns of larval dispersal.** Conduct computer simulation studies of dispersal of rockfish larvae from natant sites in the Aleutian Islands, eastern Bering Sea and Gulf of Alaska.

**Non-target Species Committee Meeting
Girdwood, AK
Draft Minutes
May 31, 2005**

Committee members Dave Benson (chair), Lori Swanson, Julie Bonney, Paul Spencer, Eric Olson, Dave Wood, Janet Smoker, Karl Haflinger, and Whit Sheard attended. Michelle Ridgway was absent. Jane DiCosimo provided staff support. Andy Smoker and Tom Pearson attended for NMFS. Jon Warrenchuk and Ben Enticknap also attended. The meeting convened from approximately 2 - 6 pm on May 1, 2005. Agenda items included: (1) a review on the status of efforts by AFSC scientists to define sensitivity and vulnerability to identify which groundfish species could be so identified and (2) a review on the draft Bering Sea rockfish case study.

Paul Spencer reviewed a draft spreadsheet that listed life history parameters and available data for four BSAI rockfish which will be used to identify which rockfish species are sensitive. That information will be reviewed further by AFSC scientists in the near future to aid in the development of the rockfish discussion paper; however the timeline for the determination by AFSC of sensitive species was unknown. Staff noted that that such information is needed prior to the completion of the paper, which is scheduled for review in August and presentation to the Council in October.

Jane DiCosimo briefed the committee on its two charges by the Council: (1) recommend a structure for the development of a discussion paper on target and non-target rockfish and (2) develop alternatives for revising management of non-target groundfish species. She reviewed several proposed actions to revise management of the "other species" category that are scheduled for final action in 2005 and 2006, which address item (2).

In its March 2005 discussion on the content and structure of the rockfish discussion paper, the committee recommended that staff apply Bering Sea rockfish to Alternative 4b as a case study to determine whether it could be expanded to include all rockfish and serve as a template for the paper. Ms. DiCosimo briefed the committee on the structure of the draft case study, noting that, due to time constraints, it was limited to BS northern rockfish, which she recognized as only a minor component of the BS rockfish assemblage. She identified some possible changes to the language of Alternative 4b that may better match the expected final revised guidelines for National Standard 1.

The committee discussed the merits of using Alternative 4b for structuring the paper compared with the draft outline that staff submitted to the Council in February 2005 that was prepared in case there was no additional guidance on the discussion paper. Staff noted that the same information would be provided using either as a model for the paper. The committee noted that using Alternative 4b provided a good format for conveying a lot of complicated, technical information on rockfish life history and research needs by species. The committee concluded that Alternative 4b should be used as the template for the paper because it is designed to result in an action by the Council.

The committee provided additional guidance for the development of the paper. The committee recognized that including all North Pacific rockfish in the discussion paper, while recommended, would be a challenge to complete by its next meeting, given other staff tasking. Therefore, it recommended that the paper include GOA and BSAI Pacific Ocean perch, northern rockfish, rougheyeye rockfish, and dusky rockfish (including issues related to assemblage management) as the highest priority. Staff should include the remaining species if time permits. The paper could discuss general issues up front and then again under each species section. The paper could include a spreadsheet noting where information is available for each rockfish species and a spreadsheet of ongoing rockfish research. The paper could include the abstracts of papers and posters to be presented at the Lowell Wakefield symposium on North Pacific Rockfishes that is scheduled for September 13-15, 2005.

The committee revised the language of Alternative 4b for rockfish as follows. The Step 1 and Step 3 options were deleted because there are no non-specified rockfish species¹. Concern that core stocks could be identified as sensitive, which may lead to additional management measures, led the committee to strike a limitation under Step 2 and Step 3.

Alternative 4(b). Revise the BSAI and GOA groundfish FMPs to:

Part 1. Identify a *policy* to outline a *process* based on scientific *criteria* to determine core stock or assemblage management

Step 1. Separate species that are currently in the target and non-target category into:

- (a) Core stocks, if there is an intent by the commercial fishery to catch and market it or if sufficient information exists to set species-specific status determination criteria and the stock is considered sensitive or important (see draft NS 1 guidelines); (OFL, ABC, and TAC would be set for each species)
- (b) Stock assemblages for all remaining single species and all species assemblages with no fishery intent to catch or market it but that are caught by the fishery; (OFL, ABC, and TAC would be set for each assemblage)
- (c) Non-specified species for all remaining species or assemblages that are not caught in the fishery and remove them from the FMP

~~Option. Revise the forage fish category to include species from the current target and revised non-specified species categories, as appropriate~~

Step 2. Characterize species in ~~stock assemblage group~~ as:

- (a) sensitive
- (b) non-sensitive

Step 3. Manage:

- ~~(a) Core stocks and stock assemblages under status quo management;~~
- ~~(b) Species within stock assemblages: protecting them from negative fishing effects of target fisheries:~~
 - (1) sensitive species: **using protection measures (e.g., TACs, buffers between OFLs and ABCs, buffers between ABCs and TACs, maximum retainable allowances, closed areas, seasonal apportionments, etc.);**
 - (2) non-sensitive species: **monitor only (details to be decided) using more limited suite of measures (e.g., TACs, buffers between OFLs and ABCs, buffers between ABCs and TACs, maximum retainable allowances, closed areas, seasonal apportionments, etc.)**
- ~~(c) Non-specified species: monitor only~~

Part 2. Identify a *policy* to outline a *process* based on scientific *criteria* to determine when sufficient data are available to move species between the core stock and stock assemblage categories (*yet to be drafted subject of future ad hoc group meetings*)

The committee further recommended that the following outline of issues should be included in the discussion paper using the Alternative 4b template.

- 1) Description of current management practices and associated practical difficulties
 - a) Bycatch and discards (e.g., northern rockfish)
 - b) Management of species at the end of their range (BS slope)
 - c) Management of small quotas
- 2) Management actions taken to improve rockfish management, and management initiatives under development
 - a) Change in rockfish MRA ratios (white paper from Sue Salvesson and Andy Smoker)
 - b) Movement to break species assemblages into component species for conservation and management purposes (however, can lead to practical difficulties with small quotas)
 - c) Ongoing management initiatives (GOA rockfish pilot project and GOA groundfish rationalization, HAPC management, full retention of shorttraker and rougheye rockfishes, Plan Team

¹ After the meeting, staff noted that Step 1(c) also could be deleted.

recommendations to remove dark, black, and blue rockfishes from the BSAI FMP and dark rockfish from the GOA FMP).

3) Criticisms of rockfish management

- a) Based upon west coast experience, F40 policies may not be sufficiently conservative (Goodman report)
- b) The very principle of quota management is not sufficiently conservative because it does not recognize demographic, spatial, and temporal differences in spawner productivity (Berkeley's 2004 papers). What are required, Berkeley says, are protected areas.

4) Responses to criticisms of current management

- a) Analyses assessing stock productivity for Alaska rockfish (papers by Dorn, Ianelli; Thompson's response to the Goodman report, Spencer's analysis of BSAI POP stock productivity presented to the SSC and plan team)
- b) Refugia management would require information on dispersal in the early life-history phase, and any potential movements as adults, in order to make informative decisions regarding the size and location of closed areas.

5) Local depletion studies

6) Summary of current data on rockfish population biology

- a) genetics/stock structure/species ID (could update information on Tony Gharrett's work)
- b) early life history (Give and update of where Art Kendall is in his studies)
- c) habitat issues/associations (Heifetz)
- d) problems of surveying patchily distributed populations (Fujioka/Spencer/Hanselman)
- e) inadequate survey coverage for some rockfish species

7) Data needs for improved science and management.

The committee tentatively identified August 31, 2005 in Anchorage as their next meeting date and location.

FOR PUBLICATION
UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

NATURAL RESOURCES DEFENSE
COUNCIL, INC.; OCEANA, INC.,
Plaintiffs-Appellants,

v.

NATIONAL MARINE FISHERIES
SERVICE; DONALD EVANS, Secretary
of Commerce; NATIONAL
OCEANIC AND ATMOSPHERIC
ADMINISTRATION,
Defendants-Appellees,

and

WEST COAST SEAFOOD PROCESSORS
ASSOCIATION; FISHERMEN'S
MARKETING ASSOCIATION,
*Defendants-intervenors-
Appellees.*

No. 03-16842
D.C. No.
CV-02-01650-CRB
OPINION

Appeal from the United States District Court
for the Northern District of California
Charles R. Breyer, District Judge, Presiding

Argued and Submitted
February 15, 2005—San Francisco, California

Filed August 24, 2005

Before: Dorothy W. Nelson, William A. Fletcher and
Raymond C. Fisher, Circuit Judges.

Opinion by Judge Fisher

COUNSEL

Andrew P. Caputo, Natural Resources Defense Counsel, San Francisco, California; Sylvia F. Liu, Oceana, Washington, D.C., and Janis Searles, Oceana, Portland, Oregon, for the plaintiffs-appellants.

David C. Shilton, Environment and Natural Resources Division, United States Department of Justice, Washington, D.C., for the defendants-appellees.

James P. Walsh, Davis Wright Tremaine, LLP, San Francisco, California, for the defendants-intervenors-appellees.

OPINION

FISHER, Circuit Judge:

Appellee National Marine Fisheries Service ("the Agency") set 2002 fishing limits for four species of Pacific groundfish that are commonly sold as "red snapper." Appellant Natural Resources Defense Council ("NRDC"), an environmental organization, brought suit in federal district court challenging the four limits as violating the Magnuson-Stevens Fishery Conservation and Management Act ("the Magnuson Act" or "the Act"), 16 U.S.C. §§ 1801 *et seq.*, which directs that the Agency prevent overfishing; the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 501 *et seq.*, which directs agencies

to consider relevant factors in setting such limits; and the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321 *et seq.*, which directs agencies to prepare adequate environmental analyses when undertaking such actions. The district court granted summary judgment to the Agency and intervenor-appellees Fishermen's Marketing Association and West Coast Seafood Processors Association ("Intervenors"). Because we conclude that the 2002 darkblotched rockfish limit was based on an impermissible construction of the Act, we reverse and remand; we affirm the limits as to the other three species.

I. Background

A. The National Marine Fisheries Service, the Magnuson Act, Section 1854 and the National Standards Guidelines

Congress enacted the Magnuson Act to "conserve and manage the fishery resources found off the coasts of the United States." 16 U.S.C. § 1801(b)(1).¹ The Agency is charged with developing and implementing rebuilding plans for overfished fish species. § 1854.² In 1996, Congress amended the Act by passing the Sustainable Fisheries Act ("SFA"). Pub. L. No. 104-297, 110 Stat. 3559 (1996). The SFA added new requirements to the Act to accelerate the rebuilding of overfished species.

The Act, as amended by the SFA, contains a provision the proper interpretation of which is the main subject of this

¹Hereinafter, all statutory citations are to 16 U.S.C. unless otherwise indicated.

²The Act vests this responsibility with the Secretary of Commerce, but "[t]he Secretary carries out his management and conservation duties through the [Agency] and eight Regional Fishery Management Councils established by the [Act]." *Yakutat, Inc. v. Gutierrez*, 407 F.3d 1054, 1058 (9th Cir. 2005); *see* § 1852(a).

appeal. Section 1854 of the Act provides in part that when any species is found to be overfished, the Agency must approve a rebuilding plan that:

(A) specif[ies] a time period for ending overfishing and rebuilding the fishery that shall —

(i) be as short as possible, taking into account the status and biology of any overfished stock of fish, the needs of fishing communities, . . . and the interaction of the overfished stock of fish within the marine ecosystem; and

(ii) not exceed 10 years, except in cases where the biology of the stock of fish, [or] other environmental conditions . . . dictate otherwise.

§ 1854(e)(4).

The Act also sets forth a series of “national standards” with which any rebuilding plans must be “consistent,” and provides for the establishment of National Standards Guidelines (“NSGs”) that must be “based on the national standards” for use in “assist[ing] in the development of fishery management plans.” §§ 1851(a), (b). The Act provides that NSGs “shall not have the force and effect of law.” *Id.*

There is some ambiguity to § 1854(e)(4). Section 1854(e)(4)(i) specifies that the rebuilding time period be as “short as possible,” but also directs that the Agency “tak[e] into account the status and biology of [the] . . . overfished stock” and “the needs of fishing communities.” Section 1854(e)(4)(ii) in turn plainly mandates that the rebuilding plan be no longer than 10 years, so long as biologically or environmentally possible.³ However, if it is not possible to rebuild

³A separate provision allowing for a longer period if necessary to comply with the terms of an international agreement is not relevant here. See § 1854(e)(4)(A)(ii).

within 10 years, the Act is not clear as to the exact limits on the length of the rebuilding period.

Seeking to clarify the proper interpretation of § 1854(e)(4), the Agency in 1997 sought “comment on whether or not it is correct in its interpretation that the duration of rebuilding programs should not be unspecified and, if so, what factors should be considered in determining that duration.” *See* 62 Fed. Reg. 67,610 (Dec. 29, 1997). The Agency propounded two alternate interpretations for public comment: that whenever it would take longer than 10 years to rebuild an overfished species, either (1) all fishing of that species would be banned until the rebuilding was complete or (2) the Agency would set a ceiling on the rebuilding duration that would be reached by adding the shortest possible time to rebuild plus “one mean generation time . . . based on the species’ life-history characteristics.” *Id.* at 67,609-10. A “mean generation time” is a scientific term, not mentioned in the Act itself, measuring how long it will take for an average mature fish to be replaced by its offspring. After notice and comment, the Agency adopted the second interpretation in a NSG (“the 1998 NSG”). *See* 50 C.F.R. § 600.310(e)(4)(ii)(B). The Agency reasoned that:

[f]or stocks that will take more than 10 years to rebuild, the guidelines [adopted] impose an outside limit that is objective, measurable, and linked to the biology of the particular species The guidelines strike a balance between the Congressional directive to rebuild stocks as quickly as possible, and the desire . . . to minimize adverse economic effects on fishing communities. For stocks that cannot be rebuilt within 10 years, the guideline allows flexibility in setting the rebuilding schedule beyond the no-fishing mortality period, but places a reasonable, species-specific cap on that flexibility by limiting the extension to one mean generation time.

63 Fed. Reg. 24,217 (May 1, 1998).

B. The 2001 and 2002 Limits for Darkblotched Rockfish

The Pacific Coast Groundfish Fishery is one of the fisheries the Agency oversees, covering the bottom-feeding fish species dwelling in the waters off the coasts of California, Oregon and Washington. In 2000, the Agency assessed the status of one species of Pacific groundfish within the fishery — darkblotched rockfish. It found that the species was at 22% of its unfished population level (its predicted level absent any fishing), and therefore concluded that the species was “overfished” within the meaning of the Act. 66 Fed. Reg. 2,347, 2349-50 (Jan. 11, 2001). The Agency further concluded that the species could be rebuilt in 10 years or less, triggering § 1854(e)(4)(ii)’s mandatory requirement that the rebuilding take place within 10 years. The Agency then set a 130 metric ton “fishing harvest level,” or quota, i.e., a set limit of darkblotched rockfish that could be fished in 2001.

In 2001, the Agency updated its assessment of darkblotched rockfish and concluded that it had significantly overestimated the health of the species. The Agency now estimated that the species was almost twice as depleted as previously thought — it was at only 12% of its unfished population level. In the Agency’s calculations, rebuilding therefore could not be accomplished within 10 years; the minimum period for rebuilding was now 14 years.

This increased rebuilding time meant, by necessity, that the rebuilding plan was no longer limited by § 1854(e)(4)(ii)’s mandatory 10-year cap; instead, the only applicable statutory time limit was § 1854(e)(4)(i)’s command that the rebuilding period be “as short as possible.” Further, according to the interpretation of the Act set forth in the 1998 NSG, the revised minimum rebuilding period triggered a new ceiling that was the 14-year period *plus* “one mean generation time,”

which in the case of the long-lived darkblotched rockfish was 33 years. The Agency, in short, switched from operating under the statutory constraint of *10 years* rebuilding time to a new constraint, dictated by the 1998 NSG, of *47 years*. The Agency then set a “target” rebuilding time of 34 years, and in accordance with this target, *raised* the fishing level harvest for 2002 from the previous year’s 130 metric tons to 168 metric tons.⁴

NRDC brought suit alleging that the new quota violated the Act, the Administrative Procedure Act and the National Environmental Policy Act. The district court concluded that the quota violated none of these statutes and granted summary judgment for the Agency. *Natural Res. Def. Council, Inc. v. Nat'l Marine Fisheries Serv.*, 280 F.Supp. 2d 1007, 1014-15 (N.D. Cal. 2003).

C. The Agency’s 2002 Specifications for Three Other Groundfish Species

The Agency also set 2002 quotas for three other overfished groundfish species — bocaccio, cowcod and canary rockfish — that were identical to the levels set in 2001, despite evidence that fishing of these overfished species in the prior two years had been significantly higher than that allowed by the previous year’s quotas. The Agency reasoned that because it did not have newly available data as to the status of these species (owing to its policy of conducting stock assessments every three years), its response to the evidence of overfishing would be to put in place interim measures (such as establishing no-fishing zones in certain areas), and then to set new quotas once the next assessment was completed.

NRDC charged that the Agency’s failure to adjust the quo-

⁴The new quota meant only that the “target rebuilding time” had even odds of being reached; it had a 70% chance of being reached within the outer limit of 47 years. 67 Fed. Reg. 10,491 (Mar. 7, 2002).

tas violated the Act, APA and NEPA. The district court also granted the Agency summary judgment on these claims. 280 F.Supp. 2d at 1017-1018.

II. Standard of Review

We review de novo the district court's grant of summary judgment. *Turtle Island Restoration Network v. Nat'l Marine Fisheries Serv.*, 340 F.3d 969, 973 (9th Cir. 2003). "De novo review of a district court's judgment concerning a decision of an administrative agency means the court views the case from the same position as the district court." *Id.*

The Administrative Procedure Act dictates that we should "hold unlawful and set aside agency action . . . [that is] arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A); *see also* § 1855(f)(1)(B); *Midwater Trawlers Co-op v. Dep't of Commerce*, 282 F.3d 710, 716 (9th Cir. 2002) (recognizing that the Magnuson Act adopts APA's standard of review). We must also "determine whether the agency articulated a rational connection between the facts found and the choice made." *Ariz. Cattle Growers' Ass'n v. United States Fish & Wildlife Serv.*, 273 F.3d 1229, 1236 (9th Cir. 2001) (citation omitted).

We should not defer to an agency's interpretation of a statute if Congress' intent can be clearly ascertained through analysis of the language, purpose and structure of the statute. *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842-43 (1984). If, however, Congress' intent is not clear, and if "Congress delegated authority to the agency generally to make rules carrying the force of law, and [] the agency interpretation claiming deference was promulgated in the exercise of that authority," *United States v. Mead Corp.*, 533 U.S. 218, 226-27 (2001), then we must defer to the agency's construction of the statute so long as "the agency's answer is based on a permissible construction of the statute." *Chevron*, 467 U.S. at 843. If the *Mead* requirements for *Chev-*

ron deference are not met, we review the agency's interpretation under the *Skidmore* standard, whereby the interpretation is "entitled not to deference but to a lesser 'respect' based on the persuasiveness of the agency decision." *Wilderness Soc'y v. U.S. Fish & Wildlife Serv.*, 353 F.3d 1051, 1067 (9th Cir. 2003); *Skidmore v. Swift & Co.*, 323 U.S. 134 (1944).

III. Discussion

A. The 2002 Darkblotched Rockfish Quota

1. Chevron Deference

The Agency arrived at its increased 2002 darkblotched rockfish quota by applying its interpretation of § 1854(e)(4) of the Magnuson Act as set forth in the 1998 NSG. NRDC argues that this interpretation of the Act is not entitled to *Chevron* deference for two separate reasons.

First, NRDC argues that Congress' intent in this section of the Act is clear, thereby precluding the need for any deference to the Agency's interpretation of the statute. We disagree. As we noted above, § 1854(e)(4)(ii) is explicit that *if* a species can be rebuilt within 10 years, it must be. But § 1854(e)(4)(i), which states that the rebuilding period must be as "short as possible, taking into account the status and biology of any overfished stock of fish [and] the needs of fishing communities," introduces an ambiguity into the calculus. When it is not biologically possible to rebuild within 10 years, may the Agency extend the rebuilding period beyond the shortest possible rebuilding time to account for the needs of fishing communities? It would be possible to resolve the ambiguity by concluding that the Act as a whole makes it clear that the needs of fishing communities are perfectly aligned with the environmental goal of rebuilding fish stocks in as short a time as possible. But if this were the case, the language "the needs of fishing communities" would be redundant (as these needs would be no different than the need to rebuild stocks in as

short a time as possible). *But see Natural Res. Def. Council, Inc. v. Daley*, 209 F.3d 747, 753 (D.C. Cir. 2000) (“[W]e reject the District Court’s suggestion that there is a conflict between the [Act’s] expressed commitments to conservation and to mitigating adverse economic impacts.”).⁵ There is therefore an ambiguity in this part of the statute, requiring interpretation. *See Chevron*, 467 U.S. at 843 (holding that “[if] Congress has not directly addressed the precise question at issue,” it is necessary to move to the second step of the *Chevron* analysis).

NRDC next argues that because the Act explicitly provides that NSGs do not have the force of law, *Chevron* deference is not appropriate. *See Mead*, 533 U.S. at 226-27 (holding *Chevron* deference to be appropriate only if “Congress delegated authority to the agency generally to make rules carrying the force of law, and [] the agency interpretation claiming deference was promulgated in the exercise of that authority”). The Agency responds that although the 1998 NSG does not have the force of law, the 2002 darkblotched rockfish quota itself — which is what is actually being challenged here — is a binding regulation that does have the force of law, requiring *Chevron* deference, and that to hold otherwise would mean punishing the Agency for taking the additional step of setting out the interpretation in an NSG.

We need not resolve this question here, because even under the *Chevron* standard of review, the 2002 quota was based on an impermissible construction of the Act. We therefore will assume that *Chevron* review is appropriate even as to the 1998 NSG’s statutory interpretation that was applied to reach the quota, without deciding the issue.

⁵*Daley* may be correct as to the long-term needs of fishing communities, but undoubtedly the short-term economic interests of fishing communities diverge in some respects from the needs of fish species.

2. The 2002 Quota Is Based on an Impermissible Construction of the Act

Under *Chevron*, we must determine whether “the agency’s [quota] is based on a permissible construction of the statute.” *Chevron*, 467 U.S. at 843. *Chevron* review is also described as determining whether the quota reflects “a reasonable interpretation” of the statute. *Id.* at 844.

The interpretation of § 1854(e)(4) stated in the 1998 NSG, as applied in the 2002 quota, is not a permissible (or reasonable) construction of the statute; it is directly at odds with the text and purpose of the Act.⁶ Section 1801 of the Act contains its “Findings, purposes and policy.” The “Findings” section states that the nation’s fishery resources “constitute valuable and renewable natural resources,” that many of these species’ “survival is threatened” and that others’ survival will soon be threatened by “increased fishing pressure, . . . the inadequacy of fishery resource conservation and management practices and controls.” §§ 1801(a)(1), (2). The next subsection recognizes “commercial and recreational fishing” as a “major source of employment” that “contributes significantly to the economy of the Nation.” § 1801(a)(3). But even here, the Act urges that the economies of many coastal areas “have been badly damaged by the overfishing of fishery resources at an ever-increasing rate over the past decade.” *Id.* The Act goes on to explain that “[i]f placed under sound management before overfishing has caused irreversible effects, the fisheries can be conserved and maintained so as to provide optimum yields on a continuing basis.” § 1801(a)(5). These observations lead to the conclusion that “[a] national program for the

⁶NRDC counsel confirmed at oral argument that its appeal is as applied; it challenges only this particular application of the Act. We also note that because the Act explicitly states that NSGs do not have the force of law, there would be no way for us to review the 1998 NSG facially; as discussed above, it gains the force of law (and hence becomes reviewable) only through specific applications, such as the 2002 darkblotched rockfish quota.

conservation and management of the fishery resources of the United States is necessary to prevent overfishing, to rebuild overfished stocks, to insure conservation, to facilitate long-term protection of essential fish habitats, and to realize the full potential of the Nation's fishery resources." § 1801(a)(6). The "purposes" section adds that "[i]t is therefore declared to be the purposes of the Congress in this chapter . . . to take immediate action to conserve and manage the fishery resources" § 1801(b)(1).

[1] The purpose of the Act is clearly to give conservation of fisheries priority over short-term economic interests. *See Daley*, 209 F.3d at 753 ("[U]nder the [Act], the [Agency] must give priority to conservation measures."). The Act sets this priority in part because the longer-term economic interests of fishing communities are aligned with the conservation goals set forth in the Act. Without immediate efforts at rebuilding depleted fisheries, the very long-term survival of those fishing communities is in doubt. *See id.* This background provides helpful context for interpreting § 1854. However, even if we turn to the plain language of § 1854(e)(4) and, without such context, ask how its two subsections interact, we still must reject the interpretation of the Act contained in the 1998 NSG as it was applied to this species.

[2] Section 1854 contains two significant mandates that constrain the Agency's options in adopting a rebuilding plan for an overfished species. First, the time period must be "*as short as possible*," although the Agency may take into account the status and biology of the overfished species and the needs of fishing communities. *See* § 1854(e)(4)(i). Subsection (i)'s commands apply to *all* rebuilding periods, whatever their length. Second, Congress specified a presumptive *cap of 10 years* on any rebuilding period, subject to exceptional circumstances beyond the Agency's control — such as an international treaty or, relevant here, "the biology of the stock of fish." *See* § 1854(e)(4)(ii).

[3] We have noted some ambiguity in subsection (i)'s mandate to rebuild a species in "as short [a time period] as possible" while giving consideration to "the needs of fishing communities." The natural reading of this language, however, is that Congress intended to ensure that overfished species were rebuilt as quickly as possible, but wanted to leave some leeway to avoid disastrous short-term consequences for fishing communities. To use an example relevant here, even if a fishing community is actively seeking not to fish for a certain species, it will inevitably catch some of the overfished species in the process of fishing for other, more plentiful fish — what is known as "bycatch." Because almost no groundfish that are caught as bycatch survive even if they are thrown back into the ocean, an absolute ban on catching any of a species of groundfish could mean a total moratorium on all fishing in the parts of the fishery containing groundfish, with obvious adverse consequences for fishing communities. Section 1854(e)(4)(i), then, allows the Agency to set limited quotas that would account for the short-term needs of fishing communities (for example, to allow for some fishing of plentiful species despite the inevitability of bycatch), even though this would mean that the rebuilding period would take longer than it would under a total fishing ban.⁷

[4] Reading subsection (i) in this light, it is apparent that Congress intended subsection (ii) as a limit on the Agency's discretion. The Agency may consider the short-term economic needs of fishing communities in establishing rebuilding periods, but may not use those needs to go beyond the 10-year cap set by subsection (ii). To breach this cap, the Agency may only consider circumstances that "dictate" doing so. One such circumstance, albeit not relevant here, would be an international agreement. Another that *is* relevant is "the biology of

⁷This appears to explain the 2001 quota. The Agency determined that the darkblotched rockfish stock could be rebuilt within 10 years, but it still had the flexibility under the statute to set a fishing quota of 130 million tons for 2001 rather than ban fishing entirely.

the stock of fish” — that is, when the current number of fish in the fishery and the amount of time required for the species to regenerate make it impossible to rebuild the stock within 10 years, even with a total moratorium on fishing. In such cases, subsection (ii) recognizes that the presumptive 10-year cap cannot apply. That said, it is manifestly unreasonable to conclude, as the Agency apparently has, that Congress intended in such circumstances to relieve the Agency of its continuing obligation to rebuild the species in a time frame that is “as short as possible.”

[5] The 2002 quota was not based on a permissible construction of the Act, because the Agency altered dramatically the balance between the needs of a species and of fishing communities with no statutorily grounded justification.⁸ NRDC argues that if the rebuilding period must exceed 10 years, the Act mandates a total moratorium on all fishing — the alternative interpretation of § 1854 that the Agency rejected when it adopted the 1998 NSG. Although NRDC’s interpretation of the statute is reasonable, it is not the only reasonable one. It is also reasonable to conclude that the needs of fishing communities may still be taken into account even when the biology of the fish dictates exceeding the 10-year cap — so long as the weight given is proportionate to the weight the Agency might give to such needs in rebuilding periods under 10 years. This interpretation would allow the Agency’s rebuilding periods to account for short-term concerns such as bycatch in the same manner whether the rebuilding period exceeds 10 years or not.

⁸In cases of species with much shorter mean generation times, the 1998 NSG might dictate a quota that limits the Agency’s discretion in a way that appropriately reflects congressional intent. It is no answer to the irrationality of the interpretation as applied to this species, however, that it may be rational as applied to some other species. As the Agency itself has noted, it is the 2002 darkblotched rockfish quota that is being challenged here.

[6] The 2002 darkblotched rockfish quota is patently unreasonable, however, and reflects no such measured proportionality. Freed from the 10-year cap because of the biology of the rockfish (its long regeneration time and its dire condition), the Agency simply applied the 1998 NSG's formulaic approach and *increased* the annual take. In 2001, the Agency set a quota of 130 million tons of darkblotched rockfish because it believed the species had been reduced to only 22% of its un-fished population. When its revised estimate revealed that the species was doing much worse, the Agency expanded the fishing of the species from 130 million tons to 168 million tons, a 29% increase. Whatever the outer limits of the range of permissible constructions of the Act, we are certain that what lies beyond them is an interpretation allowing the Agency, upon discovering that a species is in significantly worse shape than previously thought, to increase dramatically the fishing pressure on that species. Increasing the annual take in these circumstances is simply incompatible with making the rebuilding period as short as possible.

We are not prepared to accept NRDC's argument that once the 10-year cap is lifted because the biology of the fish dictates it, the Act in turn dictates that the Agency can no longer consider the short-term economic needs of fishing communities at all. Such an argument, although plausible, does not appear to give due consideration to the continuing operation of subsection (i)'s command to take the needs of fishing communities into account. But neither are we prepared to accept the Agency's interpretation, which would ignore the primary mandate of subsection (i) — that the rebuilding period be “as short as possible.” At least as applied here, the Agency's interpretation not only increased the fishing take by almost 30% but extended the maximum rebuilding period from less than 10 years to 47 years. Plainly, the Act does not contemplate that the Agency grant the least protection to the fish species in the worst shape.

The arguments of the Agency and Intervenors regarding potentially dire consequences for fishing communities seem

persuasive at all only because they assume that the sole alternative is NRDC's strict moratorium. The district court made this same flawed assumption:

Faced with a choice between an interpretation of the [Act] that requires a moratorium on harvesting of fish species that take more than ten years to regenerate naturally, and an interpretation that permits limited harvesting over the course of a longer rebuilding period, [the Agency] selected . . . the latter interpretation. In light of [the Act's] dual conservationist and commercial objectives, an interpretation that accommodates both objectives, rather than selecting one to the exclusion of the other, is permissible.

280 F.Supp. 2d at 1014. The Agency was "faced with [this] choice" only because it proposed these two extreme interpretations, and no others.⁹

[7] Our rejection of the Agency's interpretation is compelled by the language of § 1854, which requires that rebuilding take place in "as short [a time] as possible" and, if biologically possible, in less than 10 years. § 1854(e)(4). That simple command cannot be reconciled with a rebuilding period that is from 20 to 33 years longer than the biologically shortest possible rebuilding period (and that increases the annual take in the meanwhile). We hold that even granting the Agency some leeway in extending rebuilding periods when the 10-year cap is not applicable, the 2002 darkblotched rockfish quota was based on an impermissible construction of the Act.¹⁰

⁹The closest any party came to explaining the Agency's justification for its decision to increase the quota was Intervenor's counsel's assertion that the Act was "not written by biologists," apparently a criticism of the stringency of its rebuilding commands, and in particular of the presumptive 10-year cap.

¹⁰We therefore do not reach NRDC's alternative arguments that the Agency violated the APA by failing to consider relevant biological factors and the NEPA by failing to do the required environmental analysis.

B. The 2002 Limits for Three Other Groundfish Species Do Not Violate the APA or the NEPA

NRDC additionally argues that the 2002 levels for three other groundfish species violate the APA and the NEPA. The Administrative Procedure Act requires that courts determine if agency actions are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). The National Environmental Policy Act requires agencies to consider the environmental consequences of an action before taking it. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). A reviewing court's ultimate NEPA inquiry is whether an agency has taken the required "hard look" at the environmental consequences of its action. *See Greenpeace Action v. Franklin*, 14 F.3d 1324, 1332 (9th Cir. 1993).

Bocaccio, cowcod and canary rockfish are three additional Pacific groundfish species that have been found to be overfished. When it set 2002 levels for these fish, the Agency simply carried over the levels from the previous year. The Agency concluded that there was no new information on these stocks to warrant changing the quotas. NRDC argues that because the Agency was aware that the actual amount of these fish that had been caught in previous years far exceeded the set quotas, the Agency should have reduced the 2002 quotas to compensate — and that its failure to do so was arbitrary and capricious in violation of the APA, and reflected a failure to take the NEPA's "hard look." The Agency argues that over- or under-harvests for a single year are accounted for through alternate mechanisms. Assessments are conducted only every three years because of budgetary constraints, so quota revisions likewise take place every three years. In the meantime, however, additional "management measures" are undertaken, such as restrictions on fishing in specific areas within the fishery, or on fishing during certain parts of the year when there is a greater chance of bycatch.

The district court concluded that:

[The Agency's] decision to maintain harvest limits at their 2001 levels was reasonably connected to — indeed, was dictated by — the agency's policy of resetting harvest limits only after conducting a stock reassessment. In turn, that policy, which is a product of limited resources available to the agency to manage eighty-two different fish species, was neither an abuse of discretion nor contrary to law [T]he Court [also] finds that the EA's analysis was adequate to permit informed decision-making under the circumstances.

280 F.Supp. 2d at 1017 & n.4.

[8] We agree. Even if there are other reasonable approaches to dealing with the problem of exceeding quotas, we cannot say that the Agency's actions were "arbitrary, capricious," "contrary to law" or that they did not reflect a sufficiently "hard look." We therefore affirm the district court on these claims.

IV. Conclusion

We reverse the district court's holding that the Agency did not violate the Magnuson Act in setting its 2002 fishing quota for darkblotched rockfish. We remand to the district court for any further proceedings consistent with this opinion. *See Ocean Advocates v. United States Army Corps of Engineers*, 402 F.3d 846, 871 (9th Cir. 2005) (remanding to district court to consider remedy in first instance).

We affirm the district court's holding as to the 2002 limits for the other three species of groundfish. The parties shall bear their own costs.

AFFIRMED in part, REVERSED in part and REMANDED.



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September 28, 2005

DELIVERED VIA facsimile (907)-271-2817

Ms. Stephanie Madsen, Chair
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252

RE: Agenda Item D-1(c): Rockfish Management

Dear Madame Chair:

In June 2004 the North Pacific Fishery Management Council initiated an internal review of the current harvest strategy as it pertains to rockfish, with specific direction to focus on bycatch reduction, alternative harvest rates and refugia. While the recent rockfish discussion paper prepared by Council and NOAA Fisheries staff highlights the inherent vulnerability of North Pacific rockfishes to localized depletion and overfishing, the document only further confounds how and whether or not to proceed with the development of conservation measures. In our view it is absolutely clear that improved conservation measures are needed to ensure the long-term sustainability of rockfish stocks. We urge the Council to move forward with efforts to reduce rockfish bycatch, implement risk-averse harvest rates and design rockfish refugia.

The August 2005 rockfish report by the Alaska Marine Conservation Council clearly articulates the unique characteristics of North Pacific rockfishes and the need to improve management.¹ The AMCC report describes the diversity of rockfish species found in the North Pacific region and the life history characteristics that elevate their susceptibility to over-harvest. Rockfishes exhibit distinct habitat preferences; and many are late to mature, long-lived, and have population structures that do not coincide with current management boundaries. Compared to other marine fishes managed by the Council, rockfishes exhibit an increased vulnerability to overfishing and they are managed with incomplete if not inadequate information.

Last year important scientific findings were made by Dr. Steve Berkeley et al., which indicate that management must account for the complex population and age structure of rockfish populations.² This research contradicts long-standing assumptions that each mature fish contributes equally to recruitment and that the total spawning biomass is the only factor necessary to ensure sustainability. The work by Berkeley et al. demonstrates that only a fraction of the fish that spawn each year are responsible for recruitment and moreover, large old female rockfish produce more offspring that are more likely to survive compared to the offspring from young female rockfish. Further, it is suggested that to maintain the complex age and population structure of rockfish populations, appropriately designed refugia are essential.



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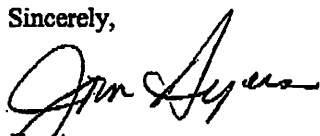
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Other work indicates that more conservative harvest rates are needed for North Pacific rockfishes. In a review of the North Pacific harvest strategy, Goodman et al. advised lower fishing rates on the order of $F_{50\%}$ to $F_{60\%}$ for long-lived and slow growing rockfish species.³ This recommendation is echoed in research by Alaska Fisheries Science Center scientist Dr. Martin Dorn, who determined that with the exception of Gulf of Alaska and Aleutian Islands Pacific ocean perch, an $F_{55\%}$ to $F_{65\%}$ harvest rate would be risk averse for North Pacific rockfishes.⁴ It is important to note, however, that this research does not consider the greater contribution made by older fish in the replenishment and stability of rockfish populations or emerging evidence of finer scale stock structure.⁵ Preliminary research of Gulf of Alaska Pacific ocean perch indicates that the proportion of old fish has been in decline over the last two decades.⁶

While information is limited for many North Pacific rockfishes, scientists are noting trends of age truncation, localized depletion and possible overfishing. Yet for most rockfish stocks in the North Pacific, which are managed in Tiers 4-5, information is not even available to evaluate whether the stocks are stable, overfished or approaching an overfished condition. Uncertain biomass estimates and insufficient biological and genetic information are reasons to both improve research and importantly for these long-lived and sensitive fishes, to take management precautions.

It is imperative that the Council and agency exercise their management responsibility by moving forward with strategies to reduce bycatch, implement risk averse harvest rates and design refugia for North Pacific rockfishes. It is becoming increasingly clear that the unique life history characteristics of rockfishes necessitate a unique management approach. It is unreasonable to wait for perfect information or to wait for signs of distress from each species before implementing a management plan that comprehensively addresses rockfish. We request the Council move forward with strategies to reduce bycatch, implement risk averse harvest rates and design refugia for North Pacific rockfishes. In the process, we hope to work with the Council's Scientific and Statistical Committee and others in the development and appropriate design of improved rockfish conservation measures.

Sincerely,



Jim Ayers
Director, Pacific

¹ AMCC 2005. Conservation and Management of North Pacific Rockfishes. Alaska Marine Conservation Council, Anchorage, AK.

² Berkeley, S.A., M.A. Hixon, R.J. Larson, and M.S. Love. 2004. Fisheries Sustainability via Protection of Age Structure and Spatial Distribution of Fish Populations. *Fisheries* 29(8): 23-32.

³ Goodman et al. 2002. Scientific Review of the Harvest Strategy Currently Used in the BSAI and GOA Groundfish Fishery Management Plans. Prepared for the North Pacific Fishery Management Council. November 21, 2002.

⁴ Dorn, M.W. 2002. Advice on West Coast Rockfish Harvest Rates from a Bayesian-meta-analysis of Stock-recruitment Relationships. *North American Journal of Fisheries Management* 22:280-300.

⁵ Palof, K.J., A.J. Gharrett, and J. Heifetz. 2005. Population Structure of Alaska Pacific Ocean Perch. Presented at the 23rd Wakefield Fisheries Symposium. Anchorage, AK. September 2005.

⁶ NPFMC 2004. GOA SAFE, at 399-400.