

Environmental Assessment for:

Amendment 98 to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea/Aleutian Islands Area

Amendment 90 to the Fishery Management Plan for Groundfish of the Gulf of Alaska

Amendment 40 to the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs

Amendment 15 to the Fishery Management Plan for the Scallop Fishery off Alaska

Amendment 11 to the Fishery Management Plan for the Salmon Fisheries in the Exclusive Economic Zone off the Coast of Alaska

Amendment 1 to the Fishery Management Plan for Fish Resources of the Arctic Management Area

Essential Fish Habitat (EFH)

Omnibus Amendments

Public Review Draft

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Note, the appendices have not been mailed out with this initial review draft analysis. They are available online at www.alaskafisheries.noaa.gov/NPFMC, and there will be printed copies of the appendices available for reference at the March/April 2011 Council meeting.

1 Introduction and Purpose

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) includes provisions concerning the identification and conservation of Essential Fish Habitat (EFH). The Magnuson-Stevens Act defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The National Marine Fisheries Service (NMFS) and regional Fishery Management Councils (Councils) must describe and identify EFH in fishery management plans (FMP), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. Federal agencies that authorize, fund, or undertake actions that may adversely affect EFH must consult with NMFS, and NMFS must provide conservation recommendations to federal and state agencies regarding actions that would adversely affect EFH. Councils also have the authority to comment on federal or state agency actions that would adversely affect the habitat, including EFH, of managed species.

Each FMP contains the following EFH components:

1. EFH Descriptions and Identification;
2. Fishing activities that may adversely affect EFH;
3. Non-Magnuson-Stevens Act fishing activities that may adversely affect EFH;
4. Non-Fishing activities that may adversely affect EFH;
5. Cumulative impacts analysis;
6. EFH Conservation and Enhancement Recommendations;
7. Prey species list and any locations;
8. Habitat Areas of Particular Concern (HAPC) identification;
9. Research and Information needs; and
10. Requirement to review EFH every 5 years.

1.1 2010 EFH 5-year review

In 2009-2010, the most recent 5-year EFH review was conducted for the Council, and documented in the Final EFH 5-year Review Summary Report (April 2010). The report reviewed EFH descriptions in five of the Council’s six FMPs (Table 1): the Bering Sea/Aleutian Islands (BSAI) Groundfish FMP, Gulf of Alaska (GOA) Groundfish FMP, BSAI Crab FMP, Scallop FMP, and Salmon FMP. The Council also has a sixth FMP, a new FMP for Fish Resources of the Arctic, that was approved by the Secretary of Commerce in August 2009 (Table 1). As a thorough assessment of EFH was included in the Arctic FMP, it was not addressed in the 5-year review report.

The review evaluated new information on EFH, assessed information gaps and research needs, and identified whether any revisions to EFH are needed or suggested. The EFH 5-year Review Summary Report is incorporated by reference in this analysis.

Table 1 List of Council Fishery Management Plans, and status of EFH review

Fishery Management Plan	EFH Last Updated	Review Status
Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI Groundfish)	2005	NPFMC review in 2009-10 (including Plan Team)
Groundfish of the Gulf of Alaska (GOA Groundfish)	2005	NPFMC review in 2009-10 (including Plan Team)
Bering Sea/ Aleutian Islands King and Tanner Crabs (BSAI Crab)	2005	NPFMC review in 2010 (including Plan Team)
Scallop Fishery off Alaska (Scallop)	2005	NPFMC review in 2010 (including Plan Team)
Salmon Fisheries in the EEZ off the Coast of Alaska (Salmon)	2005	NPFMC review in 2010 No salmon plan team, so review was provided by NMFS salmon experts.
Fish Resources of the Arctic (Arctic)	FMP implemented in August 2009	NPFMC review completed in 2009 with adoption of FMP

Based on the review and the summary report, the Council identified various elements of the EFH descriptions that merit revision. Accordingly, the Council initiated an analysis to address recommendations arising from the 5-year review. The Council's motion from April 2010 is summarized in Table 2, which also pairs each recommendation with the corresponding action included in this analysis.

At initial review in February 2011, the Council chose to postpone amendments to EFH descriptions in the salmon FMP. NMFS is currently developing a new methodology which will allow the Council to refine area identified as EFH for marine life history stages of the Pacific salmon species. Once the methodology has been peer reviewed, changes to EFH descriptions in the salmon FMP will be initiated as a trailing amendment. Consequently, the action relating to changes to the salmon FMP has been removed from this omnibus amendment package.

Table 2 Summary of Council's recommended action resulting from the EFH 5-year review, April 2010

EFH component	Council FMP	Recommended change	Corresponding action in this analysis
EFH descriptions of individual species	BSAI Groundfish	Initiate amendments for all 24 species or complexes whose habitat is described in the FMP, to revise some aspect of the EFH description, as described in the summary report	Action 1
	GOA Groundfish	Initiate amendments for all 24 species or complexes whose habitat is described in the FMP, to revise some aspect of the EFH description, as described in the summary report	Action 2
	BSAI Crab	Initiate amendments for all 5 species or complexes in the FMP, to revise general EFH and fishery information for each species, as described in the summary report (amendments to revise the evaluation of fishing effects conclusions are not initiated at this time, rather see discussion under evaluation of fishing effects)	Action 3
	Scallop	Initiate amendment for the one species whose habitat is described in the FMP, to revise aspects of the EFH description, as described in the summary report	Action 4
	Salmon	Initiate amendments for all 5 species in the FMP, to revise some aspect of the EFH description, as described in the summary report, except that the recommendation to revise the conclusions of the effects of fishing on Chinook would not be forwarded for analysis	<i>(delayed until salmon EFH methodology is ready)</i>
Fishing activities that may adversely affect EFH	All Council FMPs	<p>A general re-evaluation of the effects of fishing activities on EFH, including re-running the model, should not be initiated at this time. Recent research results are consistent with the habitat sensitivity and recovery parameters and distributions of habitat types used in the prior analysis of fishing effects for the EFH EIS. Fishing intensity has decreased overall, gear regulations have been designated to reduce habitat damage, and area closures have limited the expansion of effort into areas of concern.</p> <p>For crab species, request a discussion paper to look at how the effects of fishing are considered for crab stocks. The paper should include the Plan Team's comments about considering the pelagic environment and transport mechanisms and their importance for spawning and breeding populations, and should also evaluate existing closures for crab habitat to see if habitat usage by crab species has changed since the mid-1990s when these closures were put into effect. Based on this discussion paper, the Council can then decide whether further analysis of this issue should be incorporated into the overall EFH analysis and amendments.</p>	<p>--</p> <p><i>(separate discussion paper)</i></p>
Non-fishing activities that may adversely affect EFH	All Council FMPs	Initiate amendments to update EFH conservation recommendations for 14 of 27 non-fishing activities.	Action 5
HAPC	All FMPs	<p>Initiate amendment to revise the timeline associated with the HAPC process to coincide with the EFH 5-year review.</p> <p>Note, the Council also set skate nurseries as a habitat priority, and initiated a call for proposals for candidate HAPC sites. Any amendments resulting from the call for proposals will be, however, implemented through a separate process.</p>	Action 6
Research and information needs	All FMPs	Initiate amendments to revise research priority objectives in the FMP. The Council's research priority objectives from 2005 have largely been met, however many of the research questions are still valid and remain to be investigated. The Council preliminarily identified new objectives to guide EFH research over the next 5 years.	Action 7

1.2 Purpose and Need Statement

The purpose of this analysis is to determine whether and how to amend the Council's FMPs pursuant to Section 303(a)(7) of the Magnuson-Stevens Act, which requires NMFS and the Council to (1) describe and identify EFH for the fishery, (2) minimize to the extent practicable the adverse effects of fishing on EFH, and (3) identify other actions to encourage the conservation and enhancement of EFH. Depending on the preferred alternatives identified in this analysis, one or more of the Council's FMPs could be amended. The analysis contained in this document is based upon the best scientific information available and the guidelines articulated in the Final Rule to implement the EFH provisions of the Magnuson-Stevens Act (see 50 CFR Part 600, Subpart J).

1.3 Problem Statement

At initial review, the Council adopted the following problem statement for this action:

The EFH Final Rule and each of the Council's FMPs state that a review of EFH components should be completed every 5 years and the EFH provisions should be revised or amended, as warranted, based on the best available information. The 5-year review of EFH was completed in April 2010, and synthesized in a Summary Report presented to the Council. Based on the review, the Council has determined that new habitat and life history information is available to revise many of the EFH descriptions and recommendations in the Council FMPs. Additionally, the EFH review process has proven to be an appropriate vehicle for identifying HAPC priorities, and the Council intends to consider whether periodic calls for HAPC proposals should be synchronized with future 5-year reviews.

2 Description of Actions and Alternatives

This amendment package includes a series of actions for the various Council FMPs. The EFH 5-year review addressed all of the Council's FMPs except the Arctic FMP, which was only recently adopted. Actions 1-4, below, would amend the description of EFH in 4 of the 5 FMPs that were addressed in the 5 year review (see Section 2.8 for discussion of intended changes to the Salmon FMP). Action 5 updates the effects of nonfishing activities in Alaska on EFH, and is applicable to all of the Council FMPs. Action 6 synchronizes the HAPC identification timeline with the EFH review, and is also applicable to all of the Council FMPs. Therefore, both Actions 5 and 6 will also require amendment of the Arctic FMP as well. Under Action 7, the Council will adjust its EFH research objectives in the five Council FMPs that were addressed in the 5 year EFH review report.

More detail on the specific revisions proposed under Alternative 2 in Actions 1-7 is included in the sections that follow relating to the specific actions.

2.1 Action 1 – BSAI Groundfish

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for all twenty-four groundfish species or complexes

2.2 Action 2 – GOA Groundfish

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for all twenty-four groundfish species or complexes

2.3 Action 3 – BSAI King and Tanner Crab

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for all five crab species or complexes

2.4 Action 4 – Alaska Scallops

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for weathervane scallop

2.5 Action 5 – Non-fishing Activities

Alternative 1 – No Action; status quo

Alternative 2 – Amend EFH conservation recommendations for non-fishing activities in all Council FMPs

2.6 Action 6 – HAPC Timeline

Alternative 1 – No Action; status quo

Alternative 2 – Revise timeline for considering HAPCs from three to five years in all six Council FMPs

2.7 Action 7 – EFH Research Priorities

Alternative 1 – No Action; status quo

Alternative 2 – Revise research objectives for EFH in five Council FMPs

2.8 Relationship to other Council actions resulting from the 2010 EFH 5-year review

Salmon EFH descriptions

For Salmon FMP species, EFH is described in three parts: marine, nearshore, and freshwater. Marine and nearshore salmon EFH is generally described to include all marine waters from the mean higher tide line to the limits of the EEZ. However, a new methodology to refine the geographic scope of EFH for Pacific salmon in marine waters off Alaska has been developed by the AFSC. AFSC salmon experts have finalized their methodology, which will undergo peer review in 2011 and be published as a NOAA Technical Memorandum. Once the NOAA Tech Memo is complete, the methodology can be used as a mechanism to update marine salmon EFH. The preliminary findings indicate that habitat preferences exist by salmon species and life stage, and that the methodology will be very useful to refine EFH for the different life stages of each Pacific salmon using oceanic variables (i.e. depth, temperature, salinity).

The omnibus amendment originally included an action to make technical or housekeeping changes to the EFH description language, pending the completion of the comprehensive refinement of EFH descriptions that would result from the application of the new methodology. At initial review in February 2011, the Council chose to postpone any amendments to EFH descriptions in the salmon FMP until the new methodology is ready to be utilized. Once the methodology has been peer reviewed, changes to EFH descriptions in the salmon FMP will be initiated as a trailing amendment. Consequently, the action relating to changes to the salmon FMP has been removed from this omnibus amendment package.

Other discussion papers resulting from the 5-year EFH review

The Council requested two additional discussion papers during the April 2010 review of the final EFH 5-year review summary report. The summary report for the 5-year review contained a recommendation by the groundfish Plan Teams that the Council consider establishing measures conserve EFH from fishing threats to sablefish recruitment. In April 2010, the Council considered the Teams' recommendation, and asked for further information with which to evaluate how it should be addressed. The Council was specifically interested in understanding whether the problems with sablefish recruitment are habitat-driven, or is poor recruitment attributable to other factors. At initial review of the omnibus amendment package, in February 2011, the Council reviewed a discussion paper on factors affecting sablefish recruitment in Alaska, which was prepared by the Alaska Fisheries Science Center. The conclusions in the discussion paper indicate that adopting specific conservation measures for juvenile sablefish is premature given ongoing research about the relationship between habitat and recruitment. Consequently, the Council took no further action with regard to EFH conservation recommendations for sablefish.

The 5-year review also included recommendations by the BSAI Crab Plan Team that EFH for crab species should include the pelagic environment and transport mechanisms and their importance for spawning and breeding populations. A particular area of southwestern Bristol Bay, which is also an area of intensive trawl fishing, was newly identified as particularly important spawning grounds for Bristol Bay red king crab. The Council requested a discussion paper to look at how the effects of fishing are considered for crab stocks, both to address the Plan Team's comments, and also to evaluate existing closures for crab habitat to see if habitat usage by crab species has changed since the mid-1990s when these closures were put into effect. Given the timing of the discussion paper, which will be available for review in April 2011, the Council determined that any action that may result from this discussion paper will be moved forward as a trailing amendment to the omnibus package.

3 Methodology

3.1 Revisions to the EFH description for each species

The EFH description in the FMPs for each species includes several components, all of which were re-evaluated in the 2010 EFH 5-year review.

The EFH description by life history stage, in text and in maps, is included in the FMP, as well as an indicator for how much habitat information is known about each life history stage. This is the legal description of EFH, based on which EFH consultations for fishing and non-fishing effects on EFH are held as directed by the Magnuson-Stevens Act. It is on the basis of these descriptions that evaluations are made by the agency about whether an activity is likely to impact EFH.

The EFH descriptions were developed as part of the 2005 EFH EIS. In developing the text descriptions and maps used to describe EFH for individual species for the 2005 analysis, the analysts focused on two significant fishery geographic information data resources: survey (Resource Assessment and Conservation Engineering Division [RACE]) and observer (NORPAC). For adult and late juvenile life stages, each data set was analyzed for 95 percent of the total accumulated population for the species using GIS. For eggs and larvae, the EFH description is based on presence/absence data from surveys. EFH is identified as the areas where eggs and larvae are most commonly encountered in those surveys, which is the best available information regarding habitat use for those life stages. EFH shape files were developed based on these data sets.

For adult and late juvenile life stages of BSAI Groundfish, GOA Groundfish, BSAI Crab, and Scallop FMP species, fishery catch per unit of effort (CPUE) data from the NMFS Observer database (NORPAC, 1990 to 2001) and NMFS trawl survey data from RACE, 1987 to 2002 and, where appropriate, ADF&G survey data were analyzed to estimate the population distribution of each species. Where this information exists, the area described by these data is identified as EFH. The analyzed EFH data and areas were further reviewed by scientific stock assessment authors for accuracy. This review ensures that any outlying areas not considered were included, and errors in the data or described EFH area were removed.

Additionally, the FMP includes general information about the life history and distribution of the species/complex, the fishery, relevant trophic information, and habitat and biological associations. This information is primarily descriptive; it is, however, an important basis for identifying the geographic scope of EFH for each species. A literature section is also included in the FMP, which cites references of where habitat information on the species/complex can be found. Currently in the groundfish FMPs, a section listing contact people for more information on the species is included, however it has been suggested as part of the proposed actions analyzed in this amendment package that this section be removed, as it is difficult to keep this contact information up to date in the FMP, and the information is available more readily in the annual stock assessment and fishery evaluation (SAFE) reports. Finally, the FMP summarizes conclusions from the evaluation of fishing effects on EFH for the species conducted during the 2005 EFH EIS.

In this amendment analysis, a table is provided summarizing which components of the description are being proposed for revision for each species in each FMP, and a series of bullets provides further detail. The complete EFH revisions are included in Appendices 1-5 of this document, by FMP. These appendices represent the changes that would be made to the FMPs under Alternative 2 in Actions 1-5.

3.2 Impacts assessment incorporated by reference from 2005 EFH EIS

The Council last amended five of its FMPs (Bering Sea/Aleutian Islands [BSAI] Groundfish FMP, Gulf of Alaska [GOA] Groundfish FMP, BSAI Crab FMP, Scallop FMP, and Salmon FMP) in 2005, to address EFH requirements. The Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) evaluating alternatives and environmental consequences for three actions: (1) describing and identifying EFH for fisheries managed by the Council; (2) adopting an approach for the Council to identify Habitat Areas of Particular Concern within EFH; and (3) minimizing to the extent practicable the adverse effects of Council-managed fishing on EFH.

The Council used an extensive public process to develop the alternatives for the EIS, including numerous public meetings of the Council and its EFH Committee. With respect to the description and identification of EFH, it was identified that the action could have indirect negative effects for the industries and other entities that may face requirements (for federally managed fishing activities) or recommendations (for non-fishing activities) that are designed to protect fish habitats. Such negative effects could be short-term for the fishing industry; longer-term effects are less certain, especially for sectors that may benefit from enhanced habitat productivity resulting from EFH description and identification. The action identified that there would likely be indirect positive effects for the habitats and species that could be protected by measures resulting indirectly from EFH description and identification. Such measures would include either required measures to minimize adverse effects of fishing on EFH or recommended measures to minimize effects of non-fishing activities on EFH.

With respect to the effects of fishing on EFH, the analysis indicated that there are long-term effects of fishing on benthic habitat features off Alaska, and acknowledged that considerable scientific uncertainty remains regarding the consequences of such habitat changes for the sustained productivity of managed species. Nevertheless, based on the best available scientific information, the EIS concluded that the effects on EFH are minimal because the analysis found no indication that continued fishing activities at the current rate and intensity would alter the capacity of EFH to support healthy populations of managed species over the long term. The analysis concluded that no Council-managed fishing activities have more than minimal and temporary adverse effects on EFH, which is the regulatory standard requiring action to minimize adverse effects under the Magnuson-Stevens Act. Importantly, the Council initiated a variety of practicable management actions and precautionary measures to conserve and protect EFH.

Fishing effects on EFH were reconsidered in the 2010 EFH 5-year review. The various factors that input to the fishing effects model used for the 2005 EFH EIS were considered and compared against new information available in 2010. The footprint of fishing, and changes in the overall location of fishing since 2005 were evaluated in aggregate, and also specifically considered by each of the stock assessment authors to determine whether there would be any change in impact for their assessed species. The 5-year EFH review concludes that recent research results are consistent with the habitat sensitivity and recovery parameters and distributions of habitat types used in the prior analysis of fishing effects for the EFH EIS. Fishing intensity has decreased overall, gear regulations have been designated to reduce habitat damage, and area closures have limited the expansion of effort into areas of concern. Consequently, the Council did not initiate a general re-evaluation of the effects of fishing activities on EFH, including re-running the model, based on the information synthesized in the EFH 5-year review summary report.

The fishing impacts analysis from NMFS 2005 is incorporated by reference into this analysis. The amendments that would result should Alternative 2 be adopted in Actions 1-5 would result in relatively minor changes to the existing EFH description and identification, to incorporate more recent information, improve mapping, and identify new EFH descriptions for a few species which have been separated out from a complex since the existing description and identification were compiled. None of the proposed changes would require regulatory action, and the 2010 EFH 5-year review concluded that no change to

the 2005 conclusions on the evaluation of fishing effects on EFH was warranted based on new information from the last 5 years¹. Consequently, the proposed actions contemplated in this amendment package differ very little from the actions that were comprehensively analyzed in the EFH EIS. This impact analysis is incorporated by reference, including the discussions of uncertainty that were fully disclosed and analyzed in that document.

In many cases, the proposed revisions to the EFH description are solely to update new information, and as such are largely technical or housekeeping changes. For those species for which an EFH text or map description has been proposed for a particular life history stage, the amendment is substantive. A change in the designation of EFH has no direct impact, as there are no management measures or regulations associated with the designation of EFH, nor are such conservation measures required. There may, however, be indirect impacts arising from the changes to the designation of EFH, as those text and map descriptions represent the legal description of EFH which are used by NMFS to provide EFH consultations for fishing and non-fishing effects on EFH as directed by the Magnuson-Stevens Act.

The changes to the species' text and map descriptions are addressed in more detail under each specific action. In all cases, however, the refinement to the text and maps is minor, and any new area that is identified has already been designated as EFH for one of the other Alaska marine species. The total aggregated area of EFH description and identification for all managed species is unchanged as a result of this amendment. As such, Federal actions (both fishing and non-fishing) in that area are already required to consult with NMFS on EFH in that area.

The impact of the changes proposed under these amendments is not substantively different from that analyzed in the EFH EIS (NMFS 2005).

¹ Note, as described in Table 2, a discussion of the effects of fishing evaluation did arise with respect to the BSAI Crab FMP, and fishing in the southwest Bristol Bay. This issue is being further evaluated by the Council in a separate discussion paper.

4 Action 1 – BSAI Groundfish FMP amendments for all twenty-four species or complexes

4.1 Background – BSAI groundfish species

For the EFH 5-year review, stock assessment authors were asked to evaluate EFH information on their assessed species based on best available information. In addition, the review compared the EFH descriptions of species and species complexes that are currently identified in the BSAI Groundfish FMP (Table 3) with the species or species complexes that were assessed in the 2009 SAFE report. In a few cases, there were discrepancies. For example, shortraker and roughey rockfish were managed as a complex in 2005, but are now managed separately (in fact, roughey rockfish is managed as a complex with blackspotted rockfish). In these cases, the EFH descriptions were updated to reflect the current way the species are being assessed.

4.2 Description of Alternatives

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for groundfish species or complexes

Table 3 lists the species and species complexes for which EFH is currently identified in the BSAI Groundfish FMP, and identifies what species will have EFH descriptions under the revisions proposed in Alternative 2.

Table 3 Species or species complexes for which EFH is currently identified in the FMP, compared to species or species complexes that will have EFH descriptions under Alternative 2

	Species or complexes for which EFH is identified in BSAI Groundfish FMP (Alternative 1)	Species or complexes for which EFH descriptions will be identified under the proposed amendment (Alternative 2)
Pollock	pollock	pollock
Pacific cod	pacific cod	pacific cod
Sablefish	Sablefish	Sablefish
Flatfish	yellowfin sole	yellowfin sole
	greenland turbot	greenland turbot
	arrowtooth flounder	arrowtooth flounder Kamchatka flounder
	rock sole	Northern rock sole
	flathead sole	flathead sole
	alaska plaice	alaska plaice
	rex sole dover sole	rex sole dover sole
Rockfish	Pacific ocean perch	Pacific ocean perch
	northern rockfish	northern rockfish
	shortraker/ roughey rockfish	shortraker rockfish blackspotted/ roughey rockfish
	yelloweye rockfish dusky rockfish thornyhead rockfish	yelloweye rockfish dusky rockfish thornyhead rockfish
Atka mackerel	atka mackerel	atka mackerel
Squid	Squid	Squid
Other species	Octopus	Octopus
	Sharks	Sharks
	Sculpins	Sculpins
	Skates	Skates
Forage fish	forage fish complex	forage fish complex

Table 4 provides an overall summary of the recommended changes to the EFH description under Alternative 2, for each species. “Yes” indicates that a substantive change to the text is being included for the identified section. To provide further detail on the summary table, the major changes recommended to the EFH text are detailed in bulleted form below the table.

Table 4 EFH review of BSAI Groundfish species, with recommended changes to the existing EFH FMP text

KEY: yes = author has recommended an update to the existing FMP text, based on new information
e/c = author has recommended editorial changes or clarifications to the existing FMP text
“–” = no changes to the existing text have been recommended

Species	Recommended changes to the FMP text										
	EFH description			General information							2005 evaluation of fishing effects on EFH
	text	map	available level of information	tables of associations	life history, gen. distribution	trophic information	biological/ habitat associations	literature	contact person	description of fishery	
pollock	e/c	–	–	yes	yes	–	–	yes	–	yes	–
pacific cod	e/c	–	–	–	yes	–	–	yes	yes	yes	–
sablefish	yes	–	–	yes	yes	yes	–	yes	–	yes	–
yellowfin sole	–	–	–	–	–	–	–	yes	–	–	e/c
greenland turbot	–	–	–	–	e/c	–	–	yes	–	–	–
arrowtooth flounder	–	–	–	–	yes	–	–	yes	–	–	e/c
northern rock sole	e/c	–	–	–	yes	–	–	yes	–	–	e/c
flathead sole	–	yes	–	yes	yes	–	Yes	yes	–	–	e/c
alaska plaice	–	–	–	–	–	–	–	yes	–	–	e/c
rex sole	–	–	–	yes	yes	–	Yes	yes	–	–	(not in FMP)
dover sole	–	–	–	–	–	–	–	–	–	–	–
Pacific ocean perch	–	–	–	yes	yes	–	Yes	yes	–	yes	–
northern rockfish	yes	–	yes	yes	yes	e/c	–	yes	–	yes	–
shortraker rockfish	yes	yes	yes	yes	yes	yes	Yes	yes	–	yes	yes
blackspotted/roughey rockfish	yes	yes	yes	yes	yes	yes	Yes	yes	–	yes	yes
yelloweye rockfish	This EFH description will be deleted from the BSAI FMP.										
dusky rockfish	–	–	–	–	e/c	e/c	–	–	e/c	e/c	–
thornyhead rockfish	–	–	–	–	e/c	e/c	–	–	–	yes	–
atka mackerel	yes	–	yes	yes	yes	yes	Yes	yes	–	yes	e/c
Squid	–	–	–	–	–	–	–	–	yes	–	–
Octopus	–	(not in FMP)	–	–	yes	yes	Yes	yes	yes	yes	e/c
Sharks	–	(not in FMP)	–	yes	yes	yes	Yes	–	–	yes	–
Sculpins	–	–	–	–	yes	–	–	yes	yes	yes	–
Skates	yes	–	yes	yes	–	–	–	yes	yes	–	yes
forage fish complex	–	(not in FMP)	–	–	–	–	–	yes	yes	–	–

4.2.1 Recommended revisions for individual species

A description of the recommendations that are captured in the summary table (Table 5) is provided below for each individual species or species complex for which EFH is defined in the BSAI Groundfish FMP. The complete review for each species may be found in Appendix 1 to this document (which is posted online at www.alaskafisheries.noaa.gov/npfmc).

Pollock

- clarifications but no substantive changes to EFH description
- update to age at 50% maturity, and general life history
- updated with recent fishery info
- new literature references added
- ongoing research: BSIERP should provide more information for future EFH reviews

Pacific cod

- editorial clarifications to the text in various places
- updates to natural mortality, maturity, and maximum age information
- update to description of the fishery
- updated literature section
- relevant ongoing studies identified: one EFH project and three NPRB projects, studying productivity, habitat utilization, and recruitment dynamics of Pacific cod; climate change and the match-mismatch hypothesis in terms of Pacific cod larval survival; spatio-temporal spawning patterns of Pacific cod; and spawning and migration through a mark-recapture experiment.

Sablefish

- information added to the EFH description for early juveniles, but no changes to the finding of no EFH description determined
- additions to the BSAI general information sections to make consistent with the more comprehensive GOA sections
- minor updates to the timing of the spawning season
- updates to reflect recent fishery information
- updated literature section
- ongoing studies identified: Tagging juvenile sablefish in southeast Alaska with time/depth recording tags to track movements from shallow inshore waters to deeper areas on the slope. Revisited lightly trawled shelf habitat in SE AK to estimate recovery rates of benthic habitat organisms. Mounted substrate nearby corals and sponges to examine recolonization of benthic organisms in SE AK. Examining the distribution of juvenile sablefish in AFSC trawl surveys (1977-present).

Yellowfin sole

- literature section updated
- fishing effects: change in trawling noted in recent period (increase in nearshore where spawning occurs and early juveniles reside, decrease in mid-shelf), although conclusion is same

Greenland turbot

- editorial clarifications to the text
- literature section updated

Arrowtooth flounder

- update to fecundity information
- literature section updated
- fishing effects: change in trawling noted in recent period (increase in nearshore where early juveniles reside, decrease in mid-shelf), although conclusion is same

Kamchatka flounder

- new EFH description and maps as Kamchatka flounder has been split out from arrowtooth flounder for stock assessment

Northern rock sole

- update to life history section and EFH description text to indicate northern rock sole (northern is over 95% of BS population)
- literature section updated
- fishing effects: change in trawling noted in recent period (increase in nearshore where early juveniles reside, decrease in mid-shelf), although conclusion is same

Flathead sole

- map of distribution of larvae has been updated with the latest information from the EcoFOCI Ichthyoplankton Information System (IIS)
- updates to age at 50% maturity, spawning behavior, size at metamorphosis
- literature section updated
- fishing effects: updated with SAFE reference, recent stock abundance trajectory

Alaska plaice

- literature section updated
- fishing effects: updated SAFE reference

Rex sole

- updated age and length at 50% maturity, larval timing
- literature section updated

Dover sole

- no update

Pacific ocean perch (POP)

- associations table: updated depth association, spawning season
- updates to natural mortality, maximum age

- recent fishery information added
- updated to note associations of juvenile POP with habitat structures
- literature section updated
- ongoing studies identified: EFH projects on juvenile POP habitat utilization, juvenile rockfish habitat utilization, juvenile slope rockfish habitat utilization, habitat specific production of POP in the AI, rockfish abundance and diurnal habitat associations in isolated rocky habitat in the EBS
- note included on fishing effects: that the POP fishery in the AI is spread out more throughout the year. It is not clear how this affects that spatial footprint of the fishery, or how it would affect the impact of fishing upon the habitat

Northern rockfish

- new information for late juvenile associations
- associations table: updated depth associations, spawning season
- updates to natural mortality, maximum age, upper size limit of juveniles
- recent fishery information added
- updated to note associations of juvenile POP with habitat structures
- literature section updated
- ongoing studies identified: EFH projects on juvenile rockfish habitat utilization, juvenile slope rockfish habitat utilization

Shortraker rockfish

- new EFH descriptions as shortraker split out from rougheye; new maps provided, information level on larval life history stage downgraded
- associations table: revised depth and substrate associations, spawning season
- new life history information, trophic information, and habitat / biological associations sections rewritten
- recent fishery information added
- literature section updated
- ongoing studies: several studies on rockfish, but none focused on shortraker
- fishing effects: the POP fishery in the AI is spread out more throughout the year, and this affects the manner in which shortraker are harvested as bycatch. It is not clear how this affects that spatial footprint of the fishery, or how it would affect the impact of fishing upon the habitat.

Blackspotted/rougheye rockfish

- new EFH descriptions as shortraker split out from rougheye; new maps provided, information level on larval life history stage downgraded
- associations table: revised depth and substrate associations, spawning season
- new life history information, trophic information, and habitat / biological associations sections rewritten
- recent fishery information added
- literature section updated
- ongoing studies: several studies on rockfish, but none focused on blackspotted/rougheye
- fishing effects: the POP fishery in the AI is spread out more throughout the year, and this affects the manner in which blackspotted/rougheye are harvested as bycatch. It is not clear how this affects that spatial footprint of the fishery, or how it would affect the impact of fishing upon the

habitat. If hard coral provides important habitat, damage to these corals may have negative impact on blackspotted/rougheye.

Yelloweye rockfish

- to be deleted from FMP; yelloweye rockfish is not a key species in the BSAI, there is no commercial targeting on this species, and the BSAI is not the center of its distribution

Dusky rockfish

- clarification to indicate was once called light dusky rockfish
- editorial clarifications to the text in various places

Thornyhead rockfish

- editorial clarifications to the text in various places
- recent fishery information added

Atka mackerel

- new information available on the distribution of eggs in the Aleutian Islands (limited, not general, distribution data)
- updates to habitat, biological, and prey associations for various life history stages (depths, substrate, location in water column, community and temperature associations, reproductive traits)
- update to age at 50% maturity, prey information
- recent fishery information added
- literature references added
- minor change to evaluation of fishing effects text to indicate that stock no longer at peak spawning biomass, although biomass is still relatively high

Squid

- no updates

Octopus

- new general distribution maps available for individual species, but the scale of these maps is not sufficient for determination of EFH
- updates to predator prey associations
- new life history information, trophic information, and habitat / biological associations sections rewritten
- recent fishery information added
- literature section updated
- ongoing studies identified: doctoral research with *E. dofleini* growth and development; NPRB project on field studies to document reproductive seasons of *E. dofleini* in Alaska and to develop octopus pot gear and tagging methods; ongoing observer program special project to collect individual weights and sex of octopus; for 2009, will also be testing vitality key for possible discard mortality; proposals for octopus discard mortality studies

Sharks

- updates to depth range, age at 50% maturity, maximum age, spawning season, and predator and prey species (in tables and sections)
- recent fishery information added
- ongoing studies identified: habitat use of spiny dogfish from satellite data

Sculpins

- deleted red irish lord and butterfly as part of complex, added warty sculpins – life history updated
- recent fishery information added
- literature section and contact person updated

Skates

- new information available on location of skate nurseries, affects level of information available on skate egg life history stage
- update to depth association for eggs in table
- recent fishery information added
- updates to literature section, contact person
- evaluation of the effects of fishing has not been done on skate nursery sites; fishing gear that touches the bottom has the potential to impact, but areas are small
- ongoing studies identified: NPRB project on habitat mapping and production estimate of skate nursery sites in the eastern Bering Sea; AFSC tagging of Alaska skates in the EBS to better understand their movement

Forage fish

- some progress on forage fish distribution and habitat, but not sufficient yet to formally describe EFH for forage fishes. One exception is that nearshore areas throughout the BSAI are almost certainly EFH for some forage species, but insufficient data as yet to support that.
- literature section and contact person updated
- ongoing studies identified: AFSC nearshore survey in northern Bristol Bay (capelin and rainbow smelt), but too limited in scope to provide comprehensive EFH information; UAF researchers in Dillingham also working on nearshore projects; BSIERP contains some forage components

4.3 Expected effects of Alternatives

4.3.1 Alternative 1 – No action; status quo

In 2005, the Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) evaluating alternatives and environmental consequences for describing and identifying EFH for fisheries managed by the Council. The impacts analysis in this EIS is incorporated by reference. A more complete description of the EIS and its conclusions is included in Section 3.2; with respect to the description and identification of EFH, however, it was identified that the action could have indirect negative effects for the industries and other entities that may face requirements (for federally managed fishing activities) or recommendations (for non-fishing activities) that are designed to protect fish habitats. The action identified that there would likely be indirect positive effects for the habitats and species that could be protected by measures resulting indirectly from EFH description and identification.

Such measures would include either measures to minimize adverse effects of fishing on EFH or recommendations to minimize effects of non-fishing activities on EFH.

4.3.2 Alternative 2 – Amend the BSAI Groundfish FMP for all twenty-four species or complexes

Alternative 2 would result in relatively minor changes to the existing EFH description and identification for BSAI groundfish stocks, to incorporate more recent information, improve mapping, and identify new EFH descriptions for a few species which have been separated out from a complex since the existing description and identification were compiled.

For sablefish, northern rockfish, flathead sole, atka mackerel and skate species, a revision to the EFH text or map description has been proposed for a particular life history stage. The geographic scope of the EFH designation for sablefish would remain unchanged. For northern rockfish, the depth identified for the adult life history stage has been refined. New information is available to refine EFH for larval flathead sole, as well as atka mackerel and skate eggs. In all cases, the refinement of the designated EFH area falls within the overall aggregated area already designated as EFH for BSAI groundfish species.

Shortraker and rougheye rockfish were managed as a complex in 2005, when the EFH descriptions were last revised, but are now managed separately (rougheye rockfish is managed as a complex with blackspotted rockfish). Revised EFH descriptions have been prepared specifically for each species/complex. Also, the EFH descriptions for rock sole have been updated to reflect the stock split between northern and southern rock sole species (both part of the shallow water flatfish complex).

Under this alternative, the EFH description for yelloweye rockfish would be deleted from the FMP. It is sporadically present in the BSAI, and at the edge of its range. The main center of distribution for this species is in the GOA.

For the remaining stocks, the proposed revisions update new information, or make editorial clarifications to existing text. These are technical or housekeeping changes, which have no impact. Additionally, for all stocks, the section identifying a contact person and phone number has been removed, as it is difficult to keep this contact information up to date in the FMP, and the information is available more readily in the annual stock assessment and fishery evaluation (SAFE) reports.

None of the proposed changes would require regulatory action, and the 2010 EFH 5-year review concluded that no change to the 2005 conclusions on the evaluation of fishing effects on EFH was warranted based on new information from the last 5 years. The proposed refinement to the text and maps is minor, and any new area that is identified has already been designated as EFH for one of the other Alaska marine species. The total aggregated area of EFH description and identification for all managed species is unchanged as a result of these revisions. As such, Federal actions (both fishing and non-fishing) in that area are already required to consult with NMFS on EFH in that area. The proposed actions contemplated under Alternative 2 differ very little from the status quo, which was comprehensively analyzed in the EFH EIS (NMFS 2005). As a result, the impact of adopting this alternative is insignificant.

5 Action 2 – GOA Groundfish FMP amendments for all twenty-four species or complexes

5.1 Background – GOA groundfish species

For the EFH 5-year review, stock assessment authors were asked to evaluate EFH information on their assessed species based on best available information. In addition, the review compared the EFH descriptions of species and species complexes that are currently identified in the GOA Groundfish FMP (Table 5) with the species or species complexes that were assessed in the 2009 SAFE report. In a few cases, there were discrepancies. For example, the habitat description currently in the FMP for rock sole is actually for southern rock sole, and in fact both northern and southern rock sole are the major species in the shallow water flatfish complex that is assessed in the SAFE report. In these cases, the EFH descriptions were updated to reflect the current way the species are being assessed.

5.2 Description of Alternatives

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for all twenty-four groundfish species or complexes

Table 5 lists the species and species complexes for which EFH is currently identified in the GOA Groundfish FMP, and identifies what species will have EFH descriptions under Alternative 2 revisions.

Table 5 Species or species complexes for which EFH is currently identified in the FMP, compared to species or species complexes that will have EFH descriptions under Alternative 2

	Species or complexes for which EFH is identified in GOA Groundfish FMP (Alternative 1)	Species or complexes for which EFH descriptions will be identified under the proposed amendment (Alternative 2)
Pollock	Pollock	Pollock
Pacific cod	pacific cod	pacific cod
Sablefish	Sablefish	Sablefish
Flatfish	yellowfin sole rock sole	yellowfin sole Northern rock sole Southern rock sole
	Alaska plaice	Alaska plaice
	dover sole greenland turbot	dover sole greenland turbot
	rex sole	rex sole
	arrowtooth flounder	arrowtooth flounder
	flathead sole	flathead sole
Rockfish	Pacific ocean perch	Pacific ocean perch
	northern rockfish	northern rockfish
	shortraker/ rougheye rockfish	shortraker/ other slope rockfish blackspotted and rougheye rockfish
	dusky rockfish	dusky rockfish
	yelloweye rockfish thornyhead rockfish	yelloweye rockfish thornyhead rockfish
Atka mackerel	atka mackerel	atka mackerel
Skates	Skates	Skates
Other species	Squid	Squid
	Octopus	Octopus
	Sharks	Sharks
	Sculpins	Sculpins
Forage fish	forage fish complex	forage fish complex

Table 6 provides an overall summary of the recommended changes to the EFH description under Alternative 2, for each species. “Yes” indicates that a substantive change to the text is being included for the identified section. To provide further detail on the summary table, the major changes recommended to the EFH text are detailed in bulleted form below the table.

Table 6 EFH review of GOA Groundfish species, with recommended changes to the existing EFH FMP text

KEY: yes = update recommended to the existing FMP text, based on new information
e/c = editorial changes or clarifications recommended to the existing FMP text
“-” = no changes to the existing text have been recommended

Species	Recommended changes to the FMP text											
	EFH description			General information								2005 evaluation of fishing effects on EFH
	Text	map	available level of information	tables of associations	life history, gen. distribution	trophic information	biological/habitat associations	literature	contact person	description of fishery		
pollock	e/c	-	-	no	e/c	-	-	yes	-	yes	-	
pacific cod	-	-	-	-	yes	-	-	yes	-	yes	-	
sablefish	Yes	-	-	yes	e/c	yes	-	yes	yes	yes	e/c	
yellowfin sole	-	-	-	-	yes	-	yes	-	(not in FMP)	yes	-	
Northern rock sole	e/c	-	-	-	yes	-	-	yes	(not in FMP)	yes	-	
Southern rock sole	e/c	-	-	-	yes	e/c	yes	yes	(not in FMP)	yes	-	
Alaska plaice	-	-	-	yes	yes	-	-	-	(not in FMP)	yes	-	
dover sole	-	yes	-	yes	yes	yes	yes	yes	-	-	-	
Greenland turbot	This EFH description to be deleted from the GOA Groundfish FMP.											
rex sole	-	yes	-	yes	yes	yes	yes	yes	-	-	-	
arrowtooth flounder	-	-	-	-	yes	-	-	yes	(not in FMP)	-	e/c	
flathead sole	-	yes	-	yes	yes	yes	yes	yes	-	yes	-	
Pacific ocean perch	-	-	-	yes	yes	-	yes	yes	-	yes	-	
northern rockfish	Yes	-	Yes	yes	yes	yes	yes	yes	e/c	yes	e/c	
shortraker rockfish	Yes	-	Yes	yes	yes	yes	yes	yes	-	yes	yes	
blackspotted/rougeye rockfish	Yes	yes	Yes	yes	yes	yes	yes	yes	-	yes	e/c	
dusky rockfish	-	-	-	e/c	e/c	-	-	yes	-	yes	-	
yelloweye rockfish	Yes	yes	Yes	yes	yes	-	yes	yes	-	e/c	(not in FMP)	
thornyhead rockfish	Yes	-	Yes	yes	yes	yes	yes	yes	-	yes	-	
atka mackerel	Yes	-	Yes	yes	yes	yes	yes	yes	-	yes	e/c	
skates	-	-	-	-	yes	-	e/c	yes	yes	yes	-	
octopus	-	(not in FMP)	-	yes	yes	yes	yes	yes	yes	yes	e/c	
sharks	-	(not in FMP)	-	yes	yes	yes	yes	yes	-	yes	-	
sculpins	-	-	-	-	-	-	-	yes	yes	yes	-	
squid	-	-	-	-	-	-	-	-	yes	-	-	
forage fish complex	-	(not in FMP)	-	-	-	-	-	yes	yes	yes	-	

5.2.1 Recommended revisions for individual species

A description of the recommendations that are captured in the summary table (Table 6) is provided below for each individual species or species complex for which EFH is defined in the GOA Groundfish FMP. The complete review for each species may be found in Appendix 2 to this document (which is posted online at www.alaskafisheries.noaa.gov/npfmc).

Pollock

- clarifications but no substantive changes to EFH description
- update to age at 50% maturity, and general life history
- updated with recent fishery info
- new literature references added

Pacific cod

- editorial clarifications to the text in various places
- updates to natural mortality, maturity, and maximum age information
- update to description of the fishery
- updated literature section
- relevant ongoing studies identified: one EFH project and three NPRB projects, studying productivity, habitat utilization, and recruitment dynamics of Pacific cod; climate change and the match-mismatch hypothesis in terms of Pacific cod larval survival; spatio-temporal spawning patterns of Pacific cod; and spawning and migration through a mark-recapture experiment.

Sablefish

- information added to the EFH description for early juveniles, but no changes to the finding of no EFH description determined
- additions to the BSAI general information sections to make consistent with the more comprehensive GOA sections
- minor updates to the timing of the spawning season
- updates to reflect recent fishery information
- updated literature section
- ongoing studies identified: Tagging juvenile sablefish in southeast Alaska with time/depth recording tags to track movements from shallow inshore waters to deeper areas on the slope. Revisited lightly trawled shelf habitat in SE AK to estimate recovery rates of benthic habitat organisms. Mounted substrate nearby corals and sponges to examine recolonization of benthic organisms in SE AK. Examining the distribution of juvenile sablefish in AFSC trawl surveys (1977-present).

Yellowfin sole

- updated general distribution and depth preferences, fishery information

Rock sole (northern and southern)

- EFH information currently written for rock sole generically; revision separates into two distinct EFH descriptions, to distinguish northern and southern rock sole

- EFH text descriptions referring to the combined rock sole species is still relevant for substrate preference by life history stage, also diet information
- updated life history information including distribution, spawning depth, age at 50% maturity
- updated fishery description to reflect GOA catch locations
- spawning information added for southern rock sole
- literature references updated
- editorial changes to the EFH text descriptions to distinguish northern or southern species

Alaska plaice

- updated predator information, distribution, and fishery information

Dover sole

- map of distribution of larvae has been updated with the latest information from the EcoFOCI Ichthyoplankton Information System (IIS)
- updates to biological and predator-prey associations for dover sole life history stages (female age at 50% and 100% maturity, spawning season, predators, prey) in tables and sections
- literature references updated

Greenland turbot

- to be deleted from FMP; Greenland turbot is not a key species in the GOA, it is not a direct target, main center of distribution is the Bering Sea. It is sporadically present in the GOA, and at the edge of its range

Rex sole

- map of distribution of larvae has been updated with the latest information from the EcoFOCI Ichthyoplankton Information System (IIS)
- updates to prey association table and revised trophic information section
- update to life history and general distribution information (spawning season, larval duration, female maturity, natural mortality rate)
- literature references updated

Arrowtooth flounder

- updates to natural mortality
- literature references updated (also in fishing effects section)

Flathead sole

- map of distribution of larvae has been updated with the latest information from the EcoFOCI Ichthyoplankton Information System (IIS)
- updates to habitat, biological, and predator-prey associations for flathead sole life history stages (substrate, female age at 50% maturity, spawning season, predators, prey) in tables and sections
- description of fishery updated
- literature references updated

- acknowledgment that more information on early juvenile distribution exists in the GOA than in the BSAI, but insufficient to change level of information for this life stage from "insufficient" to "sufficient"

Pacific ocean perch (POP)

- updates to depth, substrate, age at female 100% maturity, predator and prey species in tables and sections
- recent fishery information added
- literature references added
- fishing effects: no change required; the Central GOA Rockfish Pilot program has the potential effect of spreading effort in time and space and the increase in pelagic trawling will likely decrease effects of fishing
- ongoing studies identified: EFH habitat studies being conducted at Little Port Walter Field station on POP juveniles; several submarine dive studies that will be published in the future related to Pacific ocean perch habitat and catchability

Northern rockfish

- clarifications to EFH descriptions, and refinement of depths for adult life history stage
- updates to spawning season, predator in tables
- update to life history information, including size at 50% maturity, maximum age; trophic information; and larval and juvenile associations
- recent fishery information added
- literature references added
- fishing effects: editorial changes to reflect that the spatial distribution of the fishery has changed since the original analysis. When the original EFH EIS for GOA northern rockfish was prepared, fishery catches were described as being particularly concentrated in one relatively small area, the "Snakehead" south of Kodiak Island. More recent catch data show this area no longer produces large catches and that localized depletion likely occurred here as a result of the heavy fishing effort in the 1990s. Fishing is now more dispersed over other fishing grounds, which is probably beneficial to the habitat of these fish. In addition, the Central GOA Rockfish Pilot Program, which includes northern rockfish, has the potential effect of spreading effort in space and time and also will likely decrease the effects of fishing.

Shortraker rockfish

- new EFH descriptions as shortraker split out from rougheye; new maps needed, information level on larval life history stage downgraded as, in comparison with rougheye, much less is known about juvenile shortrakers
- associations table: rewritten for depth, water column, substrate associations, spawning season
- new life history information, trophic information, and habitat / biological associations sections rewritten
- recent fishery information added
- literature references added
- fishing effects: the Rockfish Pilot Program appears to have spread fishery effort in space and time, and this will likely decrease the effects of fishing on the bottom. Section edited to excise rougheye.

Rougheye/blackspotted rockfish

- new EFH descriptions as shortraker removed and two distinct species of rougheye identified; maps for larvae ok, but new adult map needed; information level on larval life history stage downgraded as, in comparison with rougheye, much less is known about juvenile shortrakers
- associations table: rewritten for depth, water column, substrate associations, age at 50% maturity, spawning season, predator and prey
- new life history information, trophic information, and habitat / biological associations sections rewritten
- recent fishery information added
- literature references added
- ongoing studies: larval rougheye rockfish identification; 2009 NMFS trawl survey collected data on both rougheye and blackspotted rockfish to evaluate new identification techniques and potential population distribution differences
- fishing effects: the Rockfish Pilot Program has the potential effect of spreading fishery effort in space and time, and the increase in pelagic trawling will likely decrease the effects of fishing. Section edited to excise shortraker and add blackspotted.

Dusky rockfish

- update to life history information, including size at 50% maturity, maximum age; tropic information; and larval and juvenile associations
- editorial clarifications in table to remove 'light' before dusky; implementation date of dark rockfish removal corrected
- recent fishery information added
- literature references added
- fishing effects: the Rockfish Pilot Program has the potential effect of spreading fishery effort in space and time, and the increase in pelagic trawling will likely decrease the effects of fishing.

Yelloweye rockfish

- EFH description for early juveniles added, and information level updated
- update to larval map recommended to indicate presence of larval rockfish in 640 and 650
- updates to depth, substrate, structure, community associations; age at 50% maturity, maximum age, egg development, prey in tables and sections
- editorial clarifications to fishery text
- literature references added
- ongoing studies identified: ADFG research for collecting density information for the DSR stock assessment; also NMFS studies on rockfish larvae

Thornyhead rockfish

- EFH description for early juveniles added, and information level updated
- update to substrate, age at 50% maturity, fertilization, spawning season, predator and prey in tables and sections
- recent fishery information added
- literature references added

Atka mackerel

- new information included on the distribution of eggs in the GOA (limited, not general, distribution data)
- updates to habitat, biological, and prey associations for various life history stages (depths, substrate, location in water column, community and temperature associations, reproductive traits)
- update to age at 50% maturity, prey information
- recent fishery information added
- literature references added
- minor change to evaluation of fishing effects text to indicate that stock no longer at peak spawning biomass, although biomass is still relatively high

Skates

- added depth distribution information for skate species in life history section
- recent fishery information added
- updated SAFE reference

Octopus

- new general distribution maps available for individual species, but the scale of these maps is not sufficient for determination of EFH
- updates to predator prey associations
- new life history information, trophic information, and habitat / biological associations sections rewritten
- recent fishery information added
- literature section updated
- ongoing studies identified: doctoral research with *E. dofleini* growth and development; NPRB project on field studies to document reproductive seasons of *E dofleini* in Alaska and to develop octopus pot gear and tagging methods; ongoing observer program special project to collect individual weights and sex of octopus; for 2009, will also be testing vitality key for possible discard mortality; proposals for octopus discard mortality studies

Sharks

- updates to depth range, age at 50% maturity, maximum age, spawning season, and predator and prey species (in tables and sections)
- recent fishery information added
- ongoing studies identified: habitat use of spiny dogfish from satellite data

Sculpins

- recent fishery information added
- literature section updated

Squid

- no updates

Forage fish

- some progress on forage fish distribution and habitat (more than in the BSAI), but not sufficient yet to formally describe EFH for forage fishes. Nearshore areas in general are likely to be EFH for some forage species for at least part of the year.
- Recent fishery information for eulachon added
- literature section and contact person updated
- ongoing studies identified: there is a lot of interest in GOA forage fishes. The NPRB is currently creating a GOA integrated ecosystem research project, and forage species will be a primary focus of this work. The project is slated to run from 2010-2014 and will probably yield some useful results for the next 5-year review

5.3 Expected effects of Alternatives

5.3.1 Alternative 1 – No action; status quo

In 2005, the Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) evaluating alternatives and environmental consequences for describing and identifying EFH for fisheries managed by the Council. The impacts analysis in this EIS is incorporated by reference. A more complete description of the EIS and its conclusions is included in Section 3.2, however with respect to the description and identification of EFH, it was identified that the action could have indirect negative effects for the industries and other entities that may face requirements (for federally managed fishing activities) or recommendations (for non-fishing activities) that are designed to protect fish habitats. The action identified that there would likely be indirect positive effects for the habitats and species that could be protected by measures resulting indirectly from EFH description and identification. Such measures would include either measures to minimize adverse effects of fishing on EFH or recommendations to minimize effects of non-fishing activities on EFH.

5.3.2 Alternative 2 – Amend the GOA Groundfish FMP for all twenty-four species or complexes

Alternative 2 would result in relatively minor changes to the existing EFH description and identification for BSAI groundfish stocks, to incorporate more recent information, improve mapping, and identify new EFH descriptions for a few species which have been separated out from a complex since the existing description and identification were compiled.

For sablefish, flathead sole, rex sole, dover sole, northern rockfish, yelloweye rockfish, thornyhead rockfish, and atka mackerel species, a revision to the EFH text or map description has been proposed for a particular life history stage. The geographic scope of the EFH designation for sablefish would remain unchanged. For northern rockfish, the depth identified for the adult life history stage has been refined. New information is available to define EFH for early juvenile yelloweye and thornyhead rockfish, larval flathead, rex, and dover sole, as well as atka mackerel eggs. In all cases, the refinement of the designated EFH area falls within the overall aggregated area already designated as EFH for GOA groundfish species.

Shortraker and rougheye rockfish were managed as a complex in 2005, when the EFH descriptions were last revised, but are now managed separately (rougheye rockfish is managed as a complex with blackspotted rockfish). Revised EFH descriptions have been prepared specifically for each species/complex. Also, the EFH descriptions for rock sole have been updated to reflect the stock split between northern and southern rock sole species (both part of the shallow water flatfish complex).

Under this alternative, the EFH description for Greenland turbot would be deleted from the FMP. It is sporadically present in the GOA, and at the edge of its range. The main center of distribution for this species is in the BSAI.

For the remaining stocks, the proposed revisions update new information, or make editorial clarifications to existing text. These are technical or housekeeping changes, which have no impact. Additionally, for all stocks, the section identifying a contact person and phone number has been removed, as it is difficult to keep this contact information up to date in the FMP, and the information is available more readily in the annual stock assessment and fishery evaluation (SAFE) reports.

None of the proposed changes would require regulatory action, and the 2010 EFH 5-year review concluded that no change to the 2005 conclusions on the evaluation of fishing effects on EFH was warranted based on new information from the last 5 years. The proposed refinement to the text and maps is minor, and any new area that is identified has already been designated as EFH for one of the other Alaska marine species. The total aggregated area of EFH description and identification for all managed species is unchanged as a result of these revisions. As such, Federal actions (both fishing and non-fishing) in that area are already required to consult with NMFS on EFH in that area. The proposed actions contemplated under Alternative 2 differ very little from the status quo, which was comprehensively analyzed in the EFH EIS (NMFS 2005). As a result, the impact of adopting this alternative is insignificant.

6 Action 3 – BSAI King and Tanner Crab FMP

6.1 Background – BSAI king and Tanner crab species

Since the 2005 EFH EIS, FMP amendment 24 has removed certain crab species from the BSAI Crab FMP. The managed species currently identified in the BSAI Crab FMP, and which were reviewed as part of this process, are the following:

- red king crab
- blue king crab
- golden king crab
- Tanner crab
- Snow crab

6.2 Description of Alternatives

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for all five crab species or complexes, and ensure that EFH descriptions for other non-FMP species are no longer in the FMP

There is some discrepancy as to whether EFH text relating to scarlet king crab, Grooved tanner crab, and Triangle tanner crab is still intended to be in the FMP, even though these species were clearly removed under Amendment 24. The removal of this EFH text is a housekeeping amendment to the FMP, and is included under Alternative 2.

Table 7 provides an overall summary of the recommended changes to the EFH description under Alternative 2, for the managed individual species. “Yes” indicates that a substantive change to the text is being included for the identified section. To provide further detail on the summary table, the major changes recommended to the EFH text are detailed in bulleted form below the table.

Table 7 EFH review of BSAI crab species, with recommended changes to the existing EFH FMP text

KEY: yes = updates recommended to the existing FMP text, based on new information
e/c = editorial changes or clarifications recommended to the existing FMP text
“-“ = no changes to the existing text have been recommended

Species	Recommended changes to the FMP text									2005 evaluation of fishing effects on EFH
	EFH description			General information						
	Text	map	available level of information	tables of associations	life history, gen. distribution	trophic information	biological/ habitat associations	literature	description of fishery	
Red king crab	-	-	-	Yes	yes	yes	-	-	yes	-
Blue king crab	-	-	-	Yes	e/c	yes	e/c	-	e/c	yes
Golden king crab	-	-	-	Yes	yes	yes	yes	yes	yes	-
Tanner crab	-	-	-	Yes	yes	yes	yes	yes	yes	yes
Snow crab	-	-	-	Yes	yes	yes	yes	yes	yes	yes

6.2.1 Recommended revisions for individual species

A description of the recommendations that are captured in the summary table are provided below for each individual species or species complex for which EFH is defined in the BSAI Crab FMP. The complete review for each species may be found in Appendix 3 to this document (which is posted online at www.alaskafisheries.noaa.gov/npfmc).

Red king crab

- updates to prey associations, natural mortality, recent fishery information
- a discussion of the effects of fishing on spawning and breeding in southern Bristol Bay, specifically, has been deferred to a separate discussion paper

Blue king crab

- updates to age at maturity, editorial clarifications
- recommendation to change determination of effect of fishing on growth to maturity to “unknown”

Golden king crab

- updates to size at sexual maturity, reproductive cycle, depth associations by life history stage
- recent fishery information updated
- literature references added

Tanner crab

- editorial clarifications to evaluation of fishing effects summary
- updates to size and age at maturity, natural mortality, fecundity, reproduction, and predator and prey associations
- substantial clarifications and additions to life history and general distribution, and fishery description
- literature references added
- recommendation to change determination of effect of fishing on growth to maturity to “unknown”

Snow crab

- updates to prey associations, natural mortality, molting and mating cycle, recent fishery information
- literature reference added
- recommendation to change determination of effect of fishing on growth to maturity to “unknown”

6.3 Expected effects of Alternatives

6.3.1 Alternative 1 – No action; status quo

In 2005, the Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) evaluating alternatives and environmental consequences for describing and identifying EFH for fisheries managed by the Council. The impacts analysis in this EIS is incorporated by reference. A more

complete description of the EIS and its conclusions is included in Section 3.2, however with respect to the description and identification of EFH, it was identified that the action could have indirect negative effects for the industries and other entities that may face requirements (for federally managed fishing activities) or recommendations (for non-fishing activities) that are designed to protect fish habitats. The action identified that there would likely be indirect positive effects for the habitats and species that could be protected by measures resulting indirectly from EFH description and identification. Such measures would include either measures to minimize adverse effects of fishing on EFH or recommendations to minimize effects of non-fishing activities on EFH.

6.3.2 Alternative 2 – Amend the EFH description for all five crab species or complexes, and ensure that EFH descriptions for other non-FMP species are no longer in the FMP

Alternative 2 would result in relatively minor changes to the existing EFH description and identification for BSAI crab stocks, to incorporate more recent information. A discussion of the effects of fishing evaluation did arise during the 2010 5-year review of EFH, with respect to the BSAI Crab FMP, and fishing in the southwest Bristol Bay. The Council requested that more information be compiled on this issue, and it is being further evaluated by the Council in a separate discussion paper. Should any revision be proposed as a result of this discussion, it will be advanced in as a separate amendment analysis.

None of the proposed changes would require regulatory action, and the 2010 EFH 5-year review concluded that no change to the 2005 conclusions on the evaluation of fishing effects on EFH was warranted based on new information from the last 5 years. Entities taking action (both fishing and non-fishing) in that area are already required to consult with NMFS on EFH in the areas identified. For all salmon stocks, the proposed revisions in Alternative 2 update new information, or make editorial clarifications to existing text. These are technical or housekeeping changes, which have no impact.

Alternative 2 also includes another housekeeping action, to remove the EFH descriptions of any species that are no longer managed under the FMP. Again, there is no impact to this proposed action.

7 Action 4 – Alaska Scallops FMP amendment for weathervane scallop

7.1 Background – Alaska Scallop species description

All scallop stocks off the coast of Alaska are covered under the Scallop FMP, including weathervane scallops (*Patinopecten caurinus*), rock scallops (*Crassadoma gigantean*), pink scallops (*Chlamys rubida*), and spiny scallops (*C. hastata*, *C. behringiana*, and *C. albida*). Only weathervane scallops are currently commercially harvested in Alaska, and it is the only scallop species for which EFH is described.

7.2 Description of alternatives

Alternative 1 – No Action; status quo

Alternative 2 – Amend the EFH description for weathervane scallop

Table 8 provides an overall summary of the recommended changes to the EFH description under Alternative 2, for weathervane scallop. “Yes” indicates that a substantive change to the text is being included for the identified section. To provide further detail on the summary table, the major changes recommended to the EFH text are detailed in bulleted form below the table.

Table 8 EFH review of Weathervane Scallop, with recommended changes to the existing EFH FMP text

KEY: yes = updates recommended to the existing FMP text, based on new information
e/c = editorial changes or clarifications recommended to the existing FMP text
“-“ = no changes to the existing text have been recommended

Species	Recommended changes to the FMP text									
	EFH description			General information						2005 evaluation of fishing effects on EFH
	Text	map	available level of information	tables of associations	life history, gen. distribution	trophic information	biological/ habitat associations	literature	description of fishery	
Weathervane Scallop	yes	yes	-	e/c	e/c	-	e/c	yes	-	-

7.2.1 Recommended revisions for individual species

A description of the recommendations that are captured in the summary table is provided below for weathervane scallop. The complete review for this species may be found in Appendix 4 to this document (which is posted online at www.alaskafisheries.noaa.gov/npfmc):

- Maps of weathervane scallop EFH distribution have been updated to include bays and inshore areas that are important scallop habitat, based on NMFS and ADF&G trawl survey data. These include, but may not be limited to, bays on the east side of Kodiak Island and south of the Alaska Peninsula between Chignik and Unimak Pass; also Kachemak Bay, and bays in Prince William Sound such as Orca Bay. The EFH distribution should also be reviewed against areas where

scallops are no longer fished commercially, but may still constitute important scallop habitat (although any such changes should be based on reliable and fairly recent data).

- The scallop EFH text description has been updated to include inner shelf waters (<50m) where scallops are generally distributed.

7.3 Expected effects of Alternatives

7.3.1 Alternative 1 – No action taken; remain at status quo

In 2005, the Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) evaluating alternatives and environmental consequences for describing and identifying EFH for fisheries managed by the Council. The impacts analysis in this EIS is incorporated by reference. A more complete description of the EIS and its conclusions is included in Section 3.2, however with respect to the description and identification of EFH, it was identified that the action could have indirect negative effects for the industries and other entities that may face requirements (for federally managed fishing activities) or recommendations (for non-fishing activities) that are designed to protect fish habitats. The action identified that there would likely be indirect positive effects for the habitats and species that could be protected by measures resulting indirectly from EFH description and identification. Such measures would include either measures to minimize adverse effects of fishing on EFH or recommendations to minimize effects of non-fishing activities on EFH.

7.3.2 Alternative 2 – Amend the EFH description for weathervane scallop

Alternative 2 would result in relatively minor changes to the existing EFH description and identification for weathervane scallop, to incorporate more recent information and improve the text description and mapping. Revisions to the mapping of weathervane scallop would update the EFH description to include nearshore bays and inshore areas where important scallop beds may exist. These areas are very small and discrete.

None of the proposed changes would require regulatory action, and the 2010 EFH 5-year review concluded that no change to the 2005 conclusions on the evaluation of fishing effects on EFH was warranted based on new information from the last 5 years². The proposed refinement to the text and maps is minor, and any new area that is identified has already been designated as EFH for one of the other Alaska marine species (such as Alaska stocks of Pacific salmon). The total aggregated area of EFH description and identification for all managed species is unchanged as a result of these revisions. As such, Federal actions (both fishing and non-fishing) in that area are already required to consult with NMFS on EFH in that area. The proposed actions contemplated under Alternative 2 differ very little from the status quo, which was comprehensively analyzed in the EFH EIS (NMFS 2005). As a result, the impact of adopting this alternative is insignificant.

² Note, as described in Table 2, a discussion of the effects of fishing evaluation did arise with respect to the BSAI Crab FMP, and fishing in the southwest Bristol Bay. This issue is being further evaluated by the Council in a separate discussion paper.

8 Action 5 – EFH conservation recommendations for non-fishing activities

8.1 Background

Non-fishing activities that may adversely affect EFH are diverse and have the have the potential to reduce the quantity and/or quality of EFH. Such activities may include dredging, filling, discharges and actions that contribute to non-point source pollution. The EFH regulations at 50CFR 600.815(a)(4) specify that “FMPs must identify activities other than fishing that may adversely affect EFH.” The regulations also specify that FMPs must identify actions to encourage the conservation and enhancement of EFH, including recommended options to avoid, minimize, or compensate for the adverse effects identified...especially in habitat areas of particular concern (50 CFR part 600, Subpart K). In 2005, Appendix G of the EFH EIS fulfilled the requirement to describe non-fishing activities that may have adverse effects on EFH and identify actions to encourage the conservation and enhancement of EFH.

In 2010, NMFS Habitat Conservation Division staff reviewed the original non-fishing activities evaluation (Appendix G of the EFH EIS and as abbreviated in the FMPs) and based on more recent scientific literature and the best available information specific to Alaska, updated the analysis of each activity’s potential to result in adverse impacts on EFH and recommended conservation measures to avoid, minimize, or compensate for adverse effects on EFH, as needed. The updated review provides an introductory description of each activity, identifies potential adverse impacts, and revises existing general conservation measures by deleting some that were found to be not current and suggesting clarifications as appropriate. The potential for effects from larger, less readily managed processes associated with human activity also exists, such as climate change and ocean acidification. These larger, ecosystem level effects are discussed in the updated document where applicable within each activity type.

Non-fishing activities are already subject to a variety of regulations and restrictions under federal, state and local laws that would help minimize and avoid adverse effects of non-fishing activities on EFH. Therefore, the recommendations are general in nature and may overlap with certain existing standards for specific development activities. They are meant to highlight options to avoid, minimize, or compensate for adverse impacts and promote the conservation and enhancement of EFH. All of the suggested measures are not necessarily applicable to any one project or activity and are not binding on any action agency or permit applicant. Subject-specific recommendations are advisory and serve as proactive conservation measures that would help minimize and avoid adverse effects of these non-fishing activities on EFH. Site-specific EFH Conservation Recommendations will be prepared per activity and as necessary during EFH Consultation [see: CFR 50 Part 600 Subpart K].

The following is an example of existing and new EFH recommendations for flood and shoreline protection in coastal estuarine areas (*= *new EFH Conservation Recommendations*):

Recommendations from 2005 EFH FEIS Appendix G

- Do not dike or drain tidal marshlands or estuaries.
- Wherever possible, use soft approaches (such as beach nourishment, vegetative plantings, and placement of Large Woody Debris to shoreline modifications.
- Include efforts to preserve and enhance EFH by providing new gravel for spawning areas, removing barriers to natural fish passage, and using weirs, grade control structures, and low-flow channels to provide the proper depth and velocity for fish.

- Offset unavoidable impacts to in-stream fish habitat by providing rootwads, deflector logs, boulders, and rock weirs and by planting shaded riverine aquatic cover vegetation.
- Use an adaptive management plan with ecological indicators to oversee monitoring and to ensure that mitigation objectives are met. Take corrective action as needed

Updated recommendations from new analysis

- * *Avoid or minimize the loss of coastal wetlands as much as possible, including encouraging coastal wetland habitat preservation.*
- * *Ensure that the hydrodynamics and sedimentation patterns are properly modeled and that the design avoids erosion to adjacent properties when “hard” shoreline stabilization is deemed necessary.*
- * *Avoid installing new water control structures in tidal marshes and freshwater streams. If the installation of new structures cannot be avoided, ensure that they are designed to allow optimal fish passage and natural water circulation.*
- * *Ensure water control structures are monitored for potential alteration of water temperature, dissolved oxygen concentration, and other parameters.*
- * *Use seasonal restrictions to avoid impacts to habitat during species critical life history stages (e.g., spawning, egg, and larval development periods). Recommended seasonal work windows are generally specific to regional or watershed-level environmental conditions and species requirements.*
- * *Address the cumulative impacts of past, present and foreseeable future development activities on aquatic habitats by considering them in the review process for flood control and shoreline protection projects.*

8.2 Description of Alternatives – New EFH Conservation Recommendations

Alternative 1 – No Action; status quo

Alternative 2 – Amend EFH conservation recommendations for non-fishing activities in all six Council FMPs

For each of the non-fishing activities, staff reviewed each activity’s potential to result in adverse impacts on EFH. Conservation measures are recommended to avoid, minimize, or compensate for adverse effects on EFH, if needed. The complete review may be found in Appendix 6 to this document (which is posted online at www.alaskafisheries.noaa.gov/npfmc). Table 9 identifies new EFH conservation recommendations that resulted from the review. The Council may wish to consider initiating FMP amendments to add these conservation recommendations to each of the FMPs.

Table 9 New EFH Recommendations for Non-fishing Activities

Activity	New EFH Conservation Recommendations (bullets) <i>Other recommended changes to non-fishing FMP text (italics)</i>
Silverculture / Timber Harvest	<p><i>Existing recommendations have been updated to reflect agreement on the adequacy of Forest-Wide Standards and Guidance in protecting EFH.</i></p> <p><i>Minor editorial comments.</i></p> <p><i>New subject references and information provided.</i></p>
Pesticide Application	<ul style="list-style-type: none"> • Carefully review labels and ensure that application is consistent with the product's directions. Follow local, supplemental instructions such as state-use bulletins where they are available. • Incorporate integrated pest management and BMPs as part of the authorization or permitting process to ensure the reduction of pesticide contamination in EFH (Scott et al. 1999). If pesticides must be applied consider several factors including: why application is necessary (such as to eradicate an invasive plant species), area, terrain, weather, droplet size, pesticide characteristics, and other conditions to avoid or reduce effects to EFH. • Avoid the use of pesticides within 500 lineal feet and/or 1000 aerial feet of anadromous fish bearing streams. • For forestry vegetation management projects, NMFS recommends to follow the Alaska Department of Environmental Conservation measures that establish a 35 foot pesticide-free buffer area from any surface or marine water body and that pesticides not be applied within 200 feet of a public water source (http://www.dec.state.ak.us/regulations/pdfs/18%20AAC%2090.pdf). • Consider immediate weather events, as rainfall events may increase pesticide runoff into adjacent water bodies or ground conditions may inhibit intended application. This includes application when soil moisture content is at its field capacity; where soils are saturated as not to allow pesticide penetration, as applicable. • Do not apply pesticides when wind speeds exceed 10 mph, as measured with an anemometer immediately prior to application. • When applying pesticide products, begin nearest to the aquatic habitat boundary and proceed away from the aquatic habitat; do not apply towards a water body. <p><i>Re-write of recommendations to include knowledge of pesticide use near anadromous fish streams.</i></p> <p><i>Other minor editorial comments.</i></p> <p><i>New subject references and information provided.</i></p>
Urban / Suburban Development	<ul style="list-style-type: none"> • Where vegetated swales are not feasible, install oil/water separators to treat runoff from impervious surfaces in areas adjacent to marine or anadromous waters. Ensure that oil/water separators are regularly maintained such that they do not become clogged and function properly on a continuing basis. • Where feasible, remove impervious surfaces such as abandoned parking lots and buildings from hyporheic, riparian and shoreline areas; re-establish water regime, wetlands, and native vegetation. <p><i>Minor editorial comments.</i></p> <p><i>New subject references and information provided.</i></p>
Road Building and Maintenance	<ul style="list-style-type: none"> • After creating disturbance to the riparian area, re-vegetate with native vegetation to avoid colonization by non-native plant species. • Avoid storage or disposal of snow directly into waters. Snow laden with salt and ice melt chemical should not be placed in anadromous fish streams. Snow-melt disposal areas should be silt-fenced and include a collection basin. • Use Stream simulation techniques to design watered crossing structures (bridges or culverts); maintain flow, slope, and natural alignment. <p><i>Additional information regarding the impacts of non-point source pollution from transportation infrastructure and the effects of bio accumulation and magnification on EFH as well as new subject references provided.</i></p>

Activity	New EFH Conservation Recommendations (bullets) <i>Other recommended changes to non-fishing FMP text (italics)</i>
Mining	<ul style="list-style-type: none"> • To the extent practicable, avoid mineral mining in waters, water sources and watersheds, riparian areas, hyporheic zones and floodplains providing habitat for federally managed species. • Incorporate stochastic water models and include predictions to illustrate uncertainty. <p><i>Additional information regarding the impacts of mining on EFH and new subject references provided.</i></p>
Sand and Gravel Mining	<ul style="list-style-type: none"> • To the extent practicable, avoid sand/gravel mining in waters, water sources and watersheds, riparian areas, hyporheic zones and floodplains providing habitat for federally managed species. • Implement seasonal restrictions to avoid impacts to habitat during species critical life history stages (e.g., spawning season, egg, and larval development period). Recommended seasonal work windows are generally specific to regional or watershed-level environmental conditions and species requirements. <p><i>New subject matter references</i></p>
Organic Debris	<ul style="list-style-type: none"> • Advise gardeners to only harvest dislodged, dead kelp and leave live, growing kelp (whether dislodged or not). (See Alaska Department of Fish and Game brochure, "Harvesting Kelp and other Aquatic Plants in Southcentral Alaska, www.sf.adfg.state.ak.us). <p><i>New subject matter references</i></p>
Organic Debris	<ul style="list-style-type: none"> • Advocate for local, state and national legislation that rewards proper disposal of debris (e.g. implementation of a deposit on all plastic bottles). • Educate the public on the impact of marine debris and provide guidance on how to reduce or eliminate the problem. • Require all existing and new commercial construction projects near the coast (e.g., marinas and ferry terminals, recreational facilities, boat building and repair facilities) to develop and implement refuse disposal plans. <p><i>Additional information regarding marine debris and new legislation, and new subject matter references</i></p>
Dam Operation	<ul style="list-style-type: none"> • Operate dams to create flow conditions that provide for passage, water quality, proper timing of life history stages, and properly functioning channel conditions to avoid strandings and redd dewatering. • Provide mitigation (including monitoring and evaluation) for unavoidable adverse effects on EFH. • Develop and implement monitoring protocols for fish passage. <p><i>Minor rewrites and editorial comments</i> <i>New subject matter references</i></p>

Activity	New EFH Conservation Recommendations (bullets) <i>Other recommended changes to non-fishing FMP text (italics)</i>
Commercial and Domestic Water Use	<ul style="list-style-type: none"> • Design water diversion and impoundment projects to create flow conditions that provide for adequate fish passage, particularly during critical life history stages. Avoid low water levels that strand juveniles and dewater redds. Incorporate juvenile and adult fish passage facilities on all water diversion projects (e.g., fish bypass systems). Install screens at water diversions on fish-bearing streams, as needed • Maintain water quality necessary to support fish populations by monitoring and adjusting water temperature, sediment loads, and pollution levels. Water temperatures should not vary or alter native fish populations. • Maintain appropriate flow velocity and water levels to support continued stream functions. • Where practicable, mitigate for unavoidable impacts to fish and their habitat. Mitigation can include water conservation measures that reduce the volume of water diverted or impounded. <p><i>Re-write of recommendations. Minor editorial comments. New subject references and information provided.</i></p>
Dredging	<ul style="list-style-type: none"> • Avoid new dredging in sensitive habitat areas to the maximum extent practicable. Activities that would likely require dredging (such as placement of piers, docks, marinas, etc.) should instead be located in deep water or designed to alleviate the need for maintenance dredging. • Reduce the area and volume of material to be dredged to the maximum extent practicable. • Avoid dredging and placement of equipment used in conjunction with dredging operations in special aquatic sites and other high value habitat areas, (e.g. kelp beds, eelgrass beds, salt marshes). • Implement seasonal restrictions to avoid impacts to habitat during species critical life history stages (e.g., spawning season, egg, and larval development period). Recommended seasonal work windows are generally specific to regional or watershed-level environmental conditions and species requirements • Utilize best management practices (BMPs) to limit and control the amount and extent of turbidity and sedimentation. Standard BMPs may include constructing silt fences, coffer dams, and operational modification (e.g., hydraulic dredge rather than mechanical dredge). • For new dredging projects, undertake multi-season, pre-, and post-dredging biological surveys to assess the cumulative impacts to EFH and allow for implementation of adaptive management techniques. • Prior to dredging, test sediments to be dredged for contaminants as per EPA and USACE requirements. • Provide appropriate compensation for significant impacts (short-term, long-term, and cumulative) to benthic environments resulting from dredging.. • Identify excess sedimentation in the watershed that prompts excessive maintenance dredging activities, and implement appropriate management actions, if possible, to curtail those causes. <p><i>Re-write of recommendations to provide clarity and recognize existing requirements. New subject references and information provided.</i></p>

Activity	<p align="center">New EFH Conservation Recommendations (bullets) <i>Other recommended changes to non-fishing FMP text (italics)</i></p>
Disposal of Dredged Material	<ul style="list-style-type: none"> • Avoid disposing dredged material in wetlands, SAV and other special aquatic sites whenever possible. Study all options for disposal of dredged materials, including upland disposal sites, and select disposal sites that minimize adverse effects to EFH. • Test sediment compatibility for open-water disposal per EPA and USACE requirements for inshore and offshore, unconfined disposal. • Ensure that disposal sites are properly managed (e.g., disposal site marking buoys, inspectors, the use of sediment capping and dredge sequencing) and monitored (e.g., chemical and toxicity testing, benthic recovery) to minimize impacts associated with dredge material. • Where long-term maintenance dredging is anticipated, acquire and maintain disposal sites for the entire project life. <p><i>Re-write of recommendations to provide clarity and recognize existing requirements. New subject references and information provided.</i></p>
Discharge of Fill Material	<ul style="list-style-type: none"> • Fill should be sloped to maintain shallow water photic zone productivity; allow for unrestricted fish migration; and provide refugia for juvenile fish. • In marine areas of kelp and other aquatic vegetation, fill (including artificial structure fill reefs) should be designed to maximize kelp colonization and provide areas for juvenile fish to find shelter from higher currents and exposure to predators. <p><i>New subject references and information provided.</i></p>
Vessel Operations / Transportation / Navigation	<ul style="list-style-type: none"> • To facilitate movement of fish around breakwaters, breach gaps and construct shallow shelves to serve as “fish benches”, as appropriate. Often benches are expanded shelf features used in common toe-slope stabilization transitions within the breakwater design. Benches need to provide for unrestricted fish movement throughout all tidal stages. <p>Error! Hyperlink reference not valid. <i>Minor editorial comments. New subject references and information provided.</i></p>
Introduction of Exotic Species	<ul style="list-style-type: none"> • Undertake a thorough scientific review and risk assessment before any non-native species are introduced. <p><i>Editorial comments. New subject references and information provided.</i></p>
Pile Driving	<p><i>Existing recommendations are adequate. Minor editorial comments. New subject references and information provided.</i></p>
Pile Removal	<p><i>Existing recommendations are adequate. Minor editorial comments. New subject references and information provided.</i></p>
Overwater Structures	<p><i>Existing recommendations are adequate. Minor editorial comments. New subject references and information provided.</i></p>

Activity	<p align="center">New EFH Conservation Recommendations (bullets) <i>Other recommended changes to non-fishing FMP text (italics)</i></p>
Flood Control / Shoreline Protection	<ul style="list-style-type: none"> • Avoid or minimize the loss of coastal wetlands as much as possible, including encouraging coastal wetland habitat preservation. • Ensure that the hydrodynamics and sedimentation patterns are properly modeled and that the design avoids erosion to adjacent properties when “hard” shoreline stabilization is deemed necessary. • Avoid installing new water control structures in tidal marshes and freshwater streams. If the installation of new structures cannot be avoided, ensure that they are designed to allow optimal fish passage and natural water circulation. • Ensure water control structures are monitored for potential alteration of water temperature, dissolved oxygen concentration, and other parameters. • Use seasonal restrictions to avoid impacts to habitat during species critical life history stages (e.g., spawning, egg, and larval development periods). Recommended seasonal work windows are generally specific to regional or watershed-level environmental conditions and species requirements. • Address the cumulative impacts of past, present and foreseeable future development activities on aquatic habitats by considering them in the review process for flood control and shoreline protection projects. <p><i>Re-write of recommendations to provide clarity and recognize existing requirements. New subject references and information provided.</i></p>
Log Transfer Facilities / In-water Log Storage	<ul style="list-style-type: none"> • The physical chemical and biological impacts of LTF operations can be substantially reduced by adherence to appropriate siting and operational constraints. In 1985, the Alaska Timber Task Force (ATTF) developed guidelines to “delineate the physical requirements necessary to construct a log transfer and associated facilities, and in context with requirements of applicable law and regulations, methods to avoid or control potential impacts from these facilities on water quality, aquatic and other resources.” Since 1985, the ATTF guidelines have been applied to new LTFs through the requirements of NPDES permits and other state and federal programs (USEPA 1996). Adherence to the ATTF operational and siting guidelines and BMPs in the NPDES General Permit will reduce (1) the amount of bark and wood debris that enters the marine and coastal environment, (2) the potential for displacement or harm to aquatic species, and (3) the accumulation of bark and wood debris on the ocean floor. <p><i>Re-write of recommendations to provide clarity and recognize existing requirements. New subject references and information provided.</i></p>
Utility Line / Cables / Pipeline Installation	<p><i>Existing recommendations are adequate.</i> <i>Minor editorial comments.</i> <i>New subject references and information provided.</i></p>
<p>Mariculture*</p> <p><i>*Section title changed for clarity.</i></p>	<ul style="list-style-type: none"> • Ensure that mariculture facilities spat, and related items transported from other areas are free of nonindigenous species. For control of <i>Didemnum</i> tunicates, remove nets, floats, and other structures from salt water periodically and allow them to dry thoroughly, and/or soak them in fresh water. <p><i>Existing section title changed for clarity.</i> <i>Minor editorial comments.</i> <i>New subject references and information provided.</i></p>
Point Source Discharge	<p><i>Existing recommendations are adequate.</i> <i>Minor editorial comments.</i> <i>New subject references and information provided.</i></p>
Fish Processing Waste – Shoreside and Vessel Operation	<ul style="list-style-type: none"> • Encourage the use of secondary or wastewater treatment systems where possible. • Monitor biological and chemical changes to the site of seafood processing waste discharges. <p><i>Clarification of recommendations to recognize existing requirements.</i> <i>New subject references and information provided.</i></p>

Activity	New EFH Conservation Recommendations (bullets) <i>Other recommended changes to non-fishing FMP text (italics)</i>
Water Intake Structures / Discharge Plumes	<i>Existing recommendations are adequate.</i> <i>Minor editorial comments.</i> <i>New subject references and information provided.</i>
Oil and Gas Exploration / Development / Production	<ul style="list-style-type: none"> • Evaluate potential impacts that may result to EFH from activities carried out during the decommissioning phase of oil and gas facilities. Minimize such impacts to the extent practicable. • Vessel operations and shipping activities should be familiar with Alaska Geographic Response Strategies (GRS) which detail environmentally sensitive areas of Alaska's coastline. Currently, GRSs exist for the many different regions and areas including Southeast Alaska, Southcentral Alaska, Kodiak Island, Prince William Sound, Cook Inlet, Bristol Bay, Northwest Arctic, North Slope, and the Aleutian Islands (see http://www.dec.state.ak.us/spar/perp/grs/home.htm). <i>Clarification of recommendations to recognize existing requirements.</i> <i>New subject references and information provided.</i>
Habitat Restoration and Enhancement	<i>Existing recommendations are adequate.</i> <i>Minor editorial comments.</i> <i>New subject references and information provided.</i>

8.3 Expected effects of Alternatives

8.3.1 Alternative 1 – No action; status quo

In 2005, the Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) evaluating alternatives and environmental consequences for describing and identifying EFH for all the fisheries managed by the Council except the Arctic FMP (EFH in the Arctic FMP was analyzed in the EA adopting the FMP, NMFS 2009). The impacts analysis in the EFH EIS is incorporated by reference. A more complete description of the EIS and its conclusions is included in Section 3.2, however with respect to the description and identification of EFH, it was identified that the action could have indirect negative effects for the non-fishing industries and other entities that may face recommendations that are designed to protect fish habitats. The action identified that there would likely be indirect positive effects for the habitats and species that could be protected by measures to minimize effects of non-fishing activities on EFH resulting indirectly from EFH description and identification.

8.3.2 Alternative 2 – Amend EFH conservation recommendations for non-fishing activities in all Council FMPs

Under Alternative 2, the recommendations for entities conducting non-fishing activities in areas that are considered EFH have been updated. Entities taking action (both fishing and non-fishing) in areas designated as EFH are already required to consult with NMFS on EFH in areas identified as EFH. There are no regulations that will result from this alternative; the recommendations are guidelines only, and do not have the force of law. The proposed action contemplated under Alternative 2 differs very little from the status quo, which was comprehensively analyzed in the EFH EIS (NMFS 2005) and the EA implementing the Arctic FMP (NMFS 2009). As a result, the impact of adopting this alternative is insignificant.

8.4 Outreach efforts for informing stakeholders of changes to the EFH conservation recommendations for non-fishing activities

NMFS Habitat Conservation Division routinely informs stakeholders and the public of EFH consultation requirements through specific EFH Consultation training sessions, posting of NMFS official comment letters, and by making information readily accessible on the NMFS Website at www.alaskafisheries.noaa.gov.

EFH training occurs every couple of years or as specifically requested. Specifically, NMFS invites federal, state, tribal, academic, and any interested consulting firms to attend EFH workshops. Discussion addresses how the Magnuson-Stevens Act, and associated EFH provisions, are applied to federal agencies, including NMFS, and their actions that may adversely affect EFH. A summary of fisheries management explains NMFS's role to manage healthy, sustainable fish stocks using a rigorous, public management process through the North Pacific Fishery Management Council. The training further details what is required of a federal action agency should they determine their activity may adversely affect EFH resources.

NMFS posts correspondence for actions where NMFS has offered comment to conserve EFH. NMFS' official comment letters give the public and natural resource developers, working with EFH, an idea as to what NMFS may specifically offer as EFH Conservation Recommendations. Posting occurs at: <http://www.fakr.noaa.gov/index/habitat/correspondence.asp>

Finally, NMFS makes EFH information readily available online at: <http://www.fakr.noaa.gov/habitat/efh.htm>. The website includes: Frequently Asked Questions; EFH Regulations, EFH Descriptions and Identification, Analyses, and EFH Species Habitat Assessment Reports, and much more. These many sources facilitate public access to use NMFS information for their decision making.

Additionally, with respect to the proposed changes anticipated in this amendment, NMFS has contacted several of the resource development groups that provided comment on the non-fishing EFH conservation recommendations in the past (i.e., during the process culminating in the 2005 EFH EIS), to inform them that changes to the recommendations are being proposed. The organizations that have been contacted are the Resource Development Council, Alaska Miners Association, Alaska Oil and Gas Association, and Alaska Forest Association. Comments from these and other stakeholders will be considered by the Council and NMFS prior to final action on this amendment.

9 Action 6 – Amendment to revise the HAPC process timeline to coincide with the EFH five-year review

9.1 Background

Habitat areas of particular concern (HAPCs) are areas within EFH that may require additional protection from adverse effects. The Council has a formalized process identified in its FMPs for selecting HAPCs. Under this process, the Council periodically considers whether to set priority habitat type. If so, the Council initiates a call for proposals for HAPC candidate areas that meet the specific priority habitat type. Members of the public, organizations, Federal, and other agencies may submit HAPC proposals. Sites proposed under this process are reviewed, and the Council may choose to select HAPC proposals for analysis and implementation. As identified in the Council's FMPs, HAPC proposals may be solicited every 3 years or on a schedule established by the Council.

9.1.1 Council policy statement on the HAPC process

In conjunction with this action and also the ongoing HAPC proposal process on skate nurseries, the Council has identified that there is some ambiguity in the Council's HAPC process with respect to whether Council HAPC priorities are considered to be valid in perpetuity, or whether they are specific to a particular HAPC cycle, and in effect, expire at the conclusion of a particular call for proposals and subsequent Council action. At the February 2011 Council meeting, the Council considered this ambiguity, and made a policy statement with respect to how the Council's HAPC process should be interpreted. The Council has indicated that a HAPC priority exists exclusively for the duration of a Council HAPC proposal cycle. This means that HAPC site proposals for a previously-designated HAPC priority may not be submitted on a continuing basis. No HAPC proposals responding to a given HAPC priority need be accepted after the conclusion of the HAPC proposal cycle, unless (a), the Council re-designates that particular HAPC priority, and initiates another HAPC proposal cycle; or (b), NMFS brings forward compelling information to suggest that the Council should re-designate the HAPC priority.

During the development of the Council's HAPC process (as outlined in the 2005 EFH EIS), it was understood that there would be two primary avenues for alerting the Council to habitat priorities that may need consideration as HAPCs. The first is the Council's periodic consideration of habitat priorities, at which time staff, the Plan Teams, or members of the public may bring up habitat issues for Council consideration. Under the current program, this periodic review occurs every three years, however the proposed amendment would change this review period to five years so that the gathering of information for the 5-year EFH review can provide the basis of the Council's HAPC consideration.

At the same time, it was understood that NMFS would be reviewing habitat information on a continuous basis. When warranted, NMFS is able to bring proposed habitat concerns, or suggested HAPC priorities, to the Council, and the Council may act upon them. The HAPC process language in the FMP, which would remain unchanged under the proposed amendment, allows the Council to initiate a HAPC process and solicit HAPC proposals "on a schedule established by the Council".

9.2 Description of Alternatives

Alternative 1 – No Action; status quo

Alternative 2 – Revise timeline for considering HAPCs from three to five years in all six Council FMPs

Under Alternative 2, the default timeline for considering HAPC priorities and calling for HAPC proposals would be extended from three to five years, although the Council retains the flexibility to initiate a HAPC

process at any time of its choosing. The change to the default timeline was initially recommended by the Council's SSC and Ecosystem Committee in order to synchronize the HAPC process with the regulatory 5-year EFH review. During the course of the EFH review, habitat issues are fully vetted by the Council, the Council's Plan Teams, and stock assessment authors, and habitat scientists. The SSC suggested, and the Council agreed, that this is an appropriate process that may be used to identify HAPC priorities.

The recommendation to change the HAPC timeframe was discussed in the EFH 5-year review, which addressed five of the Council's FMPs. The change in timing, however, is also applicable to the Council's sixth and newest FMP, the Arctic FMP. Consequently, the Council has indicated that this action will also apply to the Arctic FMP.

9.3 Expected effects of Alternatives

In 2005, the Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) evaluating alternatives and environmental consequences for identifying a process for identifying HAPC. The process adopted in the FMPs provides a default 3-year timeline for considering whether to initiate HAPC proposals, although the Council may always identify a HAPC priority and call for proposals at any time of their choosing.

Under Alternative 2, the default timeline for considering whether to initiate the HAPC process would be extended to 5 years. Under this alternative, the Council would benefit from results of the EFH 5-year review in considering whether to identify HAPC priorities. The Council would still retain the flexibility to identify HAPC priorities mid-cycle, if appropriate. There is no requirement that the HAPC process be considered on a prescribed timeline, therefore the change in proposed timing is solely a matter of Council discretion, and public policy for the Council in signaling to the public the default timeline for considering HAPC sites. The updating of the timeframe in the FMPs is a housekeeping action, and will have no impact.

10 Action 7 – Revise FMP Research Objectives

10.1 Background – EFH research approach

One of the required components of the EFH provisions of each FMP is to include research and information needs. The Council's five FMPs (all except the Arctic FMP) include EFH research objectives, questions, activities, and a time frame, which were developed during the 2005 EFH EIS.

The following is currently included as the research approach in the Council's FMPs:

Objectives

Reduce impacts. (1) Limit bottom trawling in the AI to areas historically fished and prevent expansion into new areas. (2) Limit bottom contact gear in specified coral garden habitat areas. (3) Restrict higher impact trawl fisheries from a portion of the GOA slope. (4) Increase monitoring for enforcement. (5) Establish a scientific research program.

Benthic habitat recovery. Allow recovery of habitat in a large area with relatively low historic effort.

Research Questions

Reduce impacts. Does the closure effectively restrict higher-impact trawl fisheries from a portion of the GOA slope? Is there increased use of alternative gears in the GOA closed areas? Does total bottom trawl effort in adjacent open areas increase as a result of effort displaced from closed areas? Do bottom trawls affect these benthic habitats more than the alternative gear types? What are the research priorities? Are fragile habitats in the AI affected by any fisheries that are not covered by the new EFH closures? Are sponge and coral essential components of the habitat supporting FMP species?

Benthic habitat recovery. Did the habitat within closed areas recover or remain unfished because of these closures? Do recovered habitats support more abundant and healthier FMP species? If FMP species are more abundant in the EFH protection areas, is there any benefit in yield for areas that are still fished without EFH protection?

Research Activities

Reduce impacts. Fishing effort data from observers and remote sensing would be used to study changes in bottom trawl and other fishing gear activity in the closed (and open) areas. First, the recent gear-specific fishing pattern must be characterized to establish a baseline for comparison with observed changes in effort after closures occur. An effective analysis of change requires comprehensive effort data with high spatial resolution, including accurate information about the tow path or setting location, as well as complete gear specifications. Effects of displaced fishing effort would have to be considered. The relative effects of bottom trawl and alternative gear/footrope designs and, thus, the efficacy of the measure should be investigated experimentally in a relatively undisturbed area that is representative of the closed areas. The basis of comparison would be changes in the structure and function of benthic communities and populations, as well as important physical features of the seabed, after comparable harvests of target species are taken with each gear type. Ultimately, there should be detectable increases in FMP species that are directly attributable to the reduced impacts on sponge and coral habitat.

Benthic habitat recovery. Monitor the structure and function of benthic communities and populations in the newly closed areas, as well as important physical features of the seabed, for changes that may indicate recovery of benthic habitat. Whether these changes constitute recovery from fishing or just natural variability/shifts requires comparison with an area that is undisturbed by

fishing and otherwise comparable. A reference site would have to remain undisturbed by fishing during the entire course of the recovery experiment. Such a reference site may or may not exist, and the essential elements of comparability for identifying this area are presently unknown. Without proper reference sites, it may still be possible to deduce recovery dynamics based on changes observed in comparable newly closed areas with different histories of fishing disturbance.

Research Time Frame

Changes in fishing effort and gear types should be readily detectable. Biological recovery monitoring may require an extended period if undisturbed habitats of this type typically include large or long-lived organisms and/or high species diversity. Recovery of smaller, shorter-lived components should be apparent much sooner.

The research objectives that are defined under this approach have largely been met by the Council in the time period since the EFH EIS was developed. A discussion of the Council's actions with respect to EFH is included in the 2010 EFH 5-year review Summary Report.

In addition, as part of the EFH 5-year review, each stock assessment author provided a stock-specific evaluation of EFH research needs. Although it is not proposed that this list of information should be included in the FMPs, it is being used by the Council in the development of the overall annual research priorities. The Council also recommends both the overall research approach and the stock-specific research needs be used in EFH research planning.

10.2 Description of Alternatives

Alternative 1 – No Action; status quo

Alternative 2 – Revise research objectives and research activities for EFH in five Council FMPs

At initial review in February 2011, the SSC suggested minor edits to the way the revisions to the research approach were formulated. The following text was provided by the SSC, with a restated research objective, and the research activities section edited and expanded to include additional activities identified during the 5-year EFH review.

Under Alternative 2, the research objectives currently in the FMP (see above) would be replaced with the following overarching objective:

Establish a scientific research and monitoring program to understand the degree to which impacts have been reduced within habitat closure areas, and to understand how benthic habitat recovery of key species is occurring.

Additionally, the section on research activities would be replaced with the following:

- Fishing effort data from observers and remote sensing would be used to study changes in bottom trawl and other fishing gear activity in the closed (and open) areas. Effects of displaced fishing effort would have to be considered. The basis of comparison would be changes in the structure and function of benthic communities and populations, as well as important physical features of the seabed, after comparable harvests of target species are taken with each gear type.
- Monitor the structure and function of benthic communities and populations in the newly closed areas, as well as important physical features of the seabed, for changes that may indicate recovery of benthic habitat. Whether these changes constitute recovery from fishing or just natural

variability/shifts requires comparison with an area that is undisturbed by fishing and otherwise comparable.

- Validate the LEI model and improve estimates of recovery rates, particularly for the more sensitive habitats, including coral and sponge habitats in the Aleutian Islands region, possibly addressed through comparisons of benthic communities in trawled and untrawled areas.
- Obtain high resolution mapping of benthic habitats, particularly in the on-shelf regions of the Aleutian Islands.
- Time series of maturity at age should be collected to facilitate the assessment of whether habitat conditions are suitable for growth to maturity.
- In the case of red king crab spawning habitat in southern Bristol Bay, research the current impacts of trawling on habitat in spawning areas and the relationship of female crab distribution with respect to bottom temperature.

The remainder of the research approach (research questions and research time frame) remains valid, and will be kept unchanged in the FMPs.

10.3 Expected effects of Alternatives

In 2005, the Council and NMFS developed a comprehensive environmental impact statement (NMFS 2005) which identified a research approach for EFH. The research approach is identified in the section above. The research objectives included under that research approach have largely been met over last five years.

Under Alternative 2, the Council has proposed new objectives and activities for EFH research, which would replace or revise the objectives and activities currently listed in all of the Council's FMPs except the Arctic FMP (research objectives specifically for the Arctic were developed when that FMP was adopted in 2009). The updating of these objectives is a housekeeping action, and has no impact.

11 Preparation of Document

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12 References

- Boldt, J. ed. 2008. Ecosystem Considerations for 2009. North Pacific Fishery Management Council. Anchorage, AK 99501.
- Boldt, J and S. Zador. ed. 2009. Ecosystem Considerations for 2010. North Pacific Fishery Management Council. Anchorage, AK 99501.
- Echave, K., E. Farley, and J. Orsi. 2010. *In: Alaska Marine Science Symposium Book of Abstracts*. 18-22 January, 2010, p.37. Accessed March 9, 2010 at www.alaskamarinescience.org.
- Freese, L., Auster, P.J., Heifetz, J., and Wing, B.L. 1999. Effects of trawling on seafloor habitat and associated invertebrate taxa in the Gulf of Alaska. *Mar. Ecol. Prog. Ser.* 182: 119–126.
- Freese, J., 2001. Trawl-induced Damage to Sponges Observed From a Research Submersible. *Mar. Fish. Rev.* Vol. 63, no. 3, pp. 7-13.
- Fujioka, J.T. 2006. A model for evaluating fishing impacts on habitat and comparing fishing closure strategies. *Can. J. Fish. Aquat. Sci.* 63:2330-2342.
- Henry, LA., Kenchington, E.L.R., Silvaggio, A. 2003. Effects of mechanical Experimental disturbance on aspects of colony response, reproduction, and regeneration in the cold-water octocoral *Gersemia rubiformis*. *Can. J. Zool.* 81:1691-1701.
- Heifetz J, Woodby D, Reynolds J, Stone RP 2007. Deep sea coral distribution and habitat in the Aleutian Archipelago. North Pacific Research Board Final Report 304, 303p. Accessed 20 Feb 2009 http://doc.nprb.org/web/03_prjs/r0304_final.pdf.
- Heifetz J, Stone, R.P., Shotwell, S.K., 2009. Damage and disturbance to coral and sponge habitat of the Aleutian Archipelago. *Mar Ecol Prog Ser* 397:295-303.
- Henry, LA., Kenchington, E.L.R., Kenchington, T.J., MacIsaac, K.G., Bourbonnais- Boyce, C., Gordon Jr., D.C. 2006. Impacts of otter trawling on colonial epifaunal assemblages on a cobble bottom ecosystem on Western Bank (northwest Atlantic). *Mar. Ecol. Prog. Ser.* 306: 63-78.
- Hiddink, J.G., Jennings, S., Kaiser, M.J., Queiros, A.M., Duplisea, D.E., Piet, G.J. 2006. Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats. *Can. J. Fish. Aquat. Sci.* 63:721-736.
- Hiddink, J.G., Jennings, S., and Kaiser, M.J. 2007. Assessing and predicting the relative ecological impacts of disturbance on habitats with different sensitivities. *Journal of Applied Ecology.* 44:405-413.
- Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J. & Karakassis, I. 2006. Global analysis and prediction of the response of benthic biota to fishing. *Mar. Ecol. Prog. Ser.* 311:1–14.
- Løkkeborg, S. Impacts of trawling and scallop dredging on benthic habitats and communities. *FAO Fisheries Technical Paper*. No. 472. Rome, FAO. 2005. 58p. Malecha, P.W., and Stone, R.P., 2009. Response of the sea whip *Halipiteris willemoesi* to simulated trawl disturbance and its vulnerability to subsequent predation. *Mar. Ecol. Prog. Ser.* 388:197–206.
- McConnaughey, R. A., J. V. Olson, and M. F. Sigler. 2009. Alaska Fisheries Science Center essential fish habitat data inventory. AFSC Processed Rep. 2009-01, 40 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.

- McConnaughey, R.A., Syrjala, S.E., Dew, C.B., 2005. Effects of Chronic Bottom Trawling on the Size Structure of Soft-Bottom Benthic Invertebrates. Pages 425-427 in P.W. Barnes and J.P. Thomas, editors. Benthic habitats and the effects of fishing. American Fisheries Society, Symposium 41, Bethesda, Maryland.
- [NMFS] National Marine Fisheries Service. 2005. Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska. March 2005. NMFS, P.O. Box 21668, Juneau, AK 99801.
- Pitcher C.R., Austin M., Burrridge C.Y., Bustamante R.H., Cheers S.J., Ellis N., Jones P.N., Koutsoukos A.G., Moeseneder C.H., Smith G.P., Venables W., Wassenberg T.J., 2008. Recovery of Seabed Habitat from the Impact of Prawn Trawling in the Far Northern Section of the Great Barrier Reef Marine Park. CSIRO Final Report to GBRMPA, pp. 189
- Pitcher, C.R., Burrridge, C.Y., Wassenberg, T.J., Hill, B.J., Poiner, I.R. 2009. A large scale BACI experiment to test the effects of prawn trawling on seabed biota in a closed area of the Great Barrier Reef Marine Park, Australia. Fisheries Research. 99:168-183.
- Stone, R.P., 2006. Coral habitat in the Aleutian Islands of Alaska: depth disturbance, fine-scale species associations, and fisheries interactions. Coral Reefs Vol. 25, No. 2, pp. 229-238.
- Yueng, C., and McConnaughey, R.A., 2006. Community structure of eastern Bering Sea epibenthic invertebrates from summer bottom-trawl surveys 1982 to 2002. Mar. Ecol. Prog. Ser. 318: 47-62.
- Woodby D, Carlile D, Hulbert L 2009. Predictive modeling of coral and sponge distribution in the central Aleutian Islands, USA. Mar Ecol Prog Series 397:227-240.

Appendices

Appendix 1	BSAI Groundfish FMP Amendment Text
Appendix 2	GOA Groundfish FMP Amendment Text
Appendix 3	BSAI King and Tanner Crab FMP Amendment Text
Appendix 4	Scallop FMP Amendment Text
Appendix 5	Non-fishing Effects EFH Amendment Text
Appendix 6	FMP HAPC Process Timeline Amendment Text
Appendix 7	FMP Research Objectives Amendment Text

Note, the appendices have not been mailed out with this initial review draft analysis. They are available online at www.alaskafisheries.noaa.gov/NPFMC, and there will be printed copies of the appendices available for reference at the March/April 2011 Council meeting.