

## **Appendix L**

# **Responses to Public Comments on the Draft Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska**

National Marine Fisheries Service  
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## **Introduction**

The National Marine Fisheries Service (NMFS) received approximately 33,304 written comments on the Draft Environmental Impact Statement (EIS) for Essential Fish Habitat (EFH) Identification and Conservation in Alaska, and held public meetings in Seattle, Anchorage, and Juneau to provide opportunities for verbal testimony. Commenters included fishing and seafood industry groups, individual fishermen, environmental groups, non-fishing industry groups, federal agencies, state agencies, and numerous private citizens. The comments and responses discussed below are arranged by topic, with summaries of the comments followed by the applicable responses. Comments are paraphrased and similar comments are combined in some cases to facilitate concise and consistent responses.

### **Comments in Favor of Habitat Conservation**

Comments: A number of commenters expressed general support for habitat conservation. Some environmental groups and individuals stated that the loss of corals and other sensitive habitats due to bottom trawling could be irreversible. Many commenters made the general recommendation that NMFS and the Council should take action to conserve EFH before long term damage occurs, and many specifically called for action to reduce the effects of fishing on EFH.

Response: NMFS agrees that habitat conservation is an essential component of sustainable fishery management. NMFS also agrees that bottom trawling and other fishing activities can have lasting effects to fragile habitats that are slow to recover, such as cold water corals. The analysis of the effects of fishing on EFH in Appendix B acknowledges considerable scientific uncertainty regarding the consequences of habitat alteration for the sustained productivity of managed species. Nevertheless, the analysis finds no indication that current fishing activities alter the capacity of EFH to support healthy populations of managed species over the long term. Despite this conclusion, NMFS recommended and the Council agreed that specific additional management measures may be warranted as a precaution to avoid additional disturbance to certain sensitive sea floor habitats. The preferred alternative for Action 3 (minimizing the effects of fishing on EFH) includes extensive new bottom trawl closures designed to protect relatively undisturbed habitats in the Aleutian Islands; new closures to all bottom contact fishing in six areas of the Aleutian Islands to protect coral garden habitats, which are especially diverse and vulnerable; and new closures to bottom trawling in ten areas on the Gulf of Alaska slope to reduce the effects of fishing on rocky areas that may support coral. Additionally, the Council adopted a process to consider identifying and managing Habitat Areas of Particular Concern (HAPCs), and the Council intends to adopt specific new HAPCs and management measures using that process.

### **Comments on the Description and Identification of EFH**

Comment: Two fishing industry associations commented that the draft EIS presents an adequate range of options for describing and identifying EFH.

Response: NMFS agrees.

Comment: Many commenters supported the Council's preliminary preferred alternative, Alternative 3 - Revised General Distribution. Several non-fishing industry commenters and a state agency preferred Alternative 6 - EEZ Only because, in their view, nearshore and freshwater habitats are already protected under other authorities. One commenter endorsed Alternative 5 - Ecoregion Strategy to ensure holistic management.

Response: NMFS does not agree that EFH descriptions should be limited to the EEZ. The Magnuson-Stevens Act requires every fishery management plan to describe and identify EFH for the fishery, and defines EFH to include “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Many species of fish managed by the Council rely upon nearshore habitats, such as adult and juvenile Atka mackerel, Pacific cod, and numerous sole species. Pacific salmon depend upon freshwater habitats for migration, spawning, and rearing. Limiting EFH descriptions to the EEZ would not comply with the Magnuson-Stevens Act.

As discussed in Section 4.5.1, Alternative 5 would result in larger EFH designations but may be less beneficial for managed species because it would be harder to distinguish EFH from all potential habitats. Also, NMFS does not have sufficient scientific data regarding the relationships between species and their habitats to manage North Pacific Ocean fisheries effectively using a pure ecosystem approach.

Comment: A conservation group stated that a broad interpretation of “essential” is appropriate given the high degree of scientific uncertainty regarding fish populations and their habitat requirements.

Response: Based on the statutory definition of EFH, NMFS agrees that a broad interpretation is appropriate. Nevertheless, some of the EIS alternatives would narrow the existing EFH descriptions based upon more recent scientific information and improved analytical techniques for identifying the habitats most commonly used by managed species.

Comment: One commenter stated that NMFS should clarify whether each alternative is consistent with the final EFH regulations, and specifically whether EFH should be described when information is not available.

Response: Section 4.5.1.3 discusses the consistency of the alternatives with the EFH regulations. The regulations at 50 CFR 600.815(a)(1)(iii)(B) state that EFH should not be designated if there is no information on a given species or life stage and habitat usage cannot be inferred from other means. In the alternatives for describing EFH, where information is not available for a particular species or life stage, and cannot reasonably be inferred from other sources, EFH was not described.

Comment: Two fishing industry commenters suggested that NMFS include seamounts in the EFH descriptions to facilitate their identification as HAPCs.

Response: NMFS agrees and has modified the final EIS accordingly. Seamounts are unique habitat features that support managed species in isolated areas of the abyssal plain, and scientific information is available to describe seamount habitats in waters off Alaska. The revised EFH descriptions in Alternatives 3 and 6 identify 16 specific seamounts in the EEZ as EFH for shortraker/rougheye rockfish, thornyhead, sablefish, sculpin, squid, and chum, pink, and sockeye salmon. Alternatives 3 and 6 also identify one of these seamounts, Bowers, as EFH for golden king crab and tanner crab.

Comment: A federal agency suggested that Chapter 2 use coho salmon rather than Chinook as an example for illustrating the difference between the alternatives for describing and identifying EFH.

Response: NMFS disagrees. In Chapter 2, NMFS chose a single representative species from each FMP to illustrate the different alternatives for describing and identifying EFH. NMFS used Chinook salmon as the example for the salmon FMP due to their distribution within marine, estuarine, and freshwater habitats as well as their importance to the fishery. EFH descriptions by alternative for all FMP species by life stage, including coho salmon, are presented in Appendix D.

Comment: A federal agency asked NMFS to indicate whether the Chukchi and Beaufort Seas are within the scope of EFH under the alternatives.

Response: The Chukchi and Beaufort Seas are listed in the West Area within the fishery management unit description in the FMP for the Salmon Fisheries in the EEZ Off the Coast of Alaska. Therefore, the EIS includes EFH descriptions for salmon in those areas for each alternative.

Comment: Several non-fishing industry commenters and a state agency expressed concern that the description and identification of EFH is overly broad, and that identifying EFH in state waters is an inappropriate expansion and does not acknowledge the state's sovereignty and regulatory authority. The commenters expressed concern that EFH designations may result in the loss of resource development opportunity and economic benefit without any additional gain in habitat protection.

Response: The identification of EFH in state waters does not supersede the regulations, rights, interests, or jurisdictions that pertain to the state. Many species targeted by federal fisheries spend part of their life cycle in state waters, and EFH for these species (e.g., salmon) may be affected by various human activities. The Magnuson-Stevens Act requires Councils to describe and identify EFH for all life stages of managed species, with no limitations placed on the geographic location of EFH. The habitat benefits afforded by EFH designation stem from the additional information made available to regulatory agencies and others regarding the habitat requirements of managed species and the techniques for reducing adverse effects.

Comments: A corporation involved in inland transportation commented that the draft EIS does not adequately address the effects of EFH description and identification on non-fishing activities.

Response: Section 4.1 of the EIS evaluates the effects of EFH description and identification on non-fishing industries or other proponents of activities that may be subject to interagency consultations or recommendations to avoid and minimize adverse effects to EFH. The analysis acknowledges that certain alternatives, including the preferred alternative, may have an indirect negative effect on costs for industries and other entities that sponsor non-fishing activities with the potential to harm fish habitats. The analysis notes that permitting or funding agencies may ask applicants to provide information about effects to EFH, and may condition or deny permits or funding to protect EFH based on recommendations from NMFS or the Council. Federal or state action agencies make such decisions at their discretion. Neither NMFS nor the Council have the authority to regulate or impose costs on non-fishing industries.

### **Comments on the Approach for Identifying HAPCs**

Comments: Numerous fishing and seafood industry commenters as well as a federal resource agency supported the Council's preliminary preferred alternative: the site-based approach for identifying HAPCs. These commenters noted that the site-based approach would enable the Council to focus habitat conservation measures on more specific locations with identified problems. Several non-fishing industries and related groups, as well as a state agency, supported the site-based approach but wanted NMFS to limit HAPCs to the Exclusive Economic Zone, arguing that state laws provide adequate habitat protection in state waters. Several marine conservation groups and a federal land management agency supported the type/site based approach, whereby the council would first identify the types of habitat within which HAPCs may be located, and then would identify specific sites as HAPCs. The commenters stated that the type/site based approach would provide more flexibility than other alternatives while enabling the Council to move toward management of more specific HAPCs. One of these groups recommended that the Council adopt a new alternative that would retain the existing broad HAPCs based

on habitat types (living substrates in shallow and deep waters, and freshwater areas that support anadromous salmon), and also enable the Council to add new site-based HAPCs.

Response: NMFS and the Council determined that the existing HAPCs for all living substrates in shallow water, all living substrates in deep water, and all freshwater areas that support anadromous salmon are so broad and general that they are not particularly useful for management purposes. NMFS and the Council recognize that the habitat types included in the existing HAPCs are extremely important for Council managed species, but switching to a site-based approach for HAPCs would yield a more effective tool for habitat conservation and management. The Council therefore decided to select Alternative 3, the site-based approach for identifying HAPCs, as its preferred alternative.

The Council decided not to limit HAPCs to the Exclusive Economic Zone because many Council managed species rely on habitats in state waters for spawning, breeding, feeding, and growth to maturity, and some of those habitats meet the four regulatory considerations to be identified as HAPCs (50 CFR 600.815(a)(8)). Before identifying any HAPCs in state waters, the Council and NMFS will coordinate with applicable state agencies and the state Board of Fisheries to ensure that HAPC designations complement state management programs.

The Council elected not to add a new alternative that would retain the existing HAPCs plus allow the identification of site-based HAPCs, because the EIS already analyzes a wide range of alternative approaches for identifying HAPCs. Alternative 2 would retain the existing HAPCs, and Alternative 3 would move to a site-based approach, so the suggested new alternative would combine those two options. The environmental consequences of those two alternatives are evaluated in Section 4.2 of the EIS. Although the draft EIS did not specifically evaluate a hybrid alternative, the draft analysis provided sufficient information to enable the Council to consider the possibility, and the Council decided not to support such an alternative.

Comment: A federal land management agency commented that retaining the existing HAPCs would provide the greatest protection to salmon in freshwater areas.

Response: The existing HAPC for salmon encompasses a larger area of salmon EFH than HAPCs the Council might identify under other alternatives, but larger HAPCs do not necessarily equate to a higher degree of habitat protection. HAPCs offer a means for the Council to highlight priority areas within EFH for conservation and management. The existing salmon HAPC does not distinguish any portion of freshwater salmon EFH as being especially important or vulnerable. Also, HAPC designation does not convey any direct protections for the habitat. Any such protection in freshwater areas would stem from EFH consultations between NMFS and federal agencies regarding actions that may adversely affect salmon EFH.

Comment: A federal environmental agency expressed concern that Alternatives 3, 4, and 5 would rescind the existing HAPCs in favor of more discrete approaches, and hence certain habitats that are vulnerable to disturbance from fishing may not receive adequate attention until some future time when the Council may identify those specific areas as HAPCs. The commenter recommended that Alternatives 3, 4, and 5 include a mechanism for identifying current HAPC areas that are effective and protecting those areas from the adverse effects of fishing.

Response: The existing HAPCs have been in effect since January 1999 (64 FR 20216; April 26, 1999). Based on NMFS's experience, the existing HAPCs have not proven to be a very effective tool for distinguishing valuable and/or vulnerable portions of EFH due to their broad nature. Hence, the Council

favors rescinding the existing HAPC designations in favor of an approach that would more effectively prioritize portions of EFH for conservation and management.

The Magnuson-Stevens Act requires the Council and NMFS to minimize to the extent practicable the adverse effects of fishing on all of EFH, and not only within HAPCs. The EFH regulations at 50 CFR 600.815(a)(2)(ii) state that “Amendments to the FMP or to its implementing regulations must ensure that the FMP continues to minimize to the extent practicable adverse effects on EFH caused by fishing.” Thus, legal mechanisms already exist to ensure that the Council will consider and minimize the effects of fishing on EFH, even in the absence of HAPC designations. Nevertheless, the Council elected to proceed with a process for identifying new HAPC areas and associated management measures on a 3-year cycle (see Appendix J). The Council will use that process to determine which areas warrant designation as HAPCs and developing additional fishery management measures.

Comments: Several commenters addressed the process of identifying new HAPCs in the future. One of these commenters noted that proposed HAPCs could be rejected, presumably based on public comments or analyses of the effects of HAPC designation. Another commenter said that mitigation measures associated with HAPCs should be based upon a demonstrated need as well as demonstrated benefits. An association of non-fishing industries stated that HAPCs should not be identified based on recommendations from anti-development groups seeking to use HAPCs to stop specific projects. Other groups commented that the selection of site specific HAPCs should be based on peer reviewed science, and that proposals not meeting specific criteria for HAPCs should be rejected. Several commenters thought the EIS should clarify that the HAPC process described in Appendix J may need to be modified in the future.

Response: NMFS agrees with the commenters that proposed HAPCs should be evaluated based on information specific to each proposal. Proposed HAPCs should be rejected if they do not address one or more of the four regulatory considerations at 50 CFR 600.815(a)(8) or if the potential benefits of HAPC designation do not outweigh the negative effects. HAPC designation, like all fishery management measures, must be based upon the best available scientific information, although such information is not necessarily limited to peer reviewed literature. NMFS agrees that Appendix J should clarify that the HAPC process used by the Council may change over time, and has revised Appendix J accordingly.

Comment: A conservation group stated that measures to protect the Council’s current HAPC priorities, seamounts and relatively undisturbed corals, will not necessarily minimize bottom trawl impacts. The commenter stated that bottom trawls are the gear with the greatest impact on sensitive habitats, and that the Council is considering habitat protection measures for sites where bottom trawling does not occur.

Response: NMFS agrees that bottom trawling can disturb certain sensitive habitats. Through the EFH EIS the Council is considering the effects of fishing (including bottom trawling) on all EFH areas in Council jurisdiction, and determining which alternative is the preferred approach to minimize adverse effects to the extent practicable. The Council is considering additional habitat protection measures via the HAPC process and a separate Environmental Assessment, including measures to protect seamounts and corals. The Council’s emphasis on protecting relatively undisturbed seamounts and corals is based upon its desire to safeguard these undisturbed habitats from potential future impacts.

Comment: A conservation group objected to the Council’s decision to make rarity of the habitat a mandatory criterion for all HAPC proposals, and stated that all four regulatory considerations for HAPCs (50 CFR 600.815(a)(8)) are equally important.

Response: As NMFS stated in the preamble to the final EFH regulations, “Councils may designate HAPCs based on one or more of the four specified considerations, because any one of the considerations may provide sufficient basis for distinguishing a subset of EFH from the remainder of EFH” (67 FR 2358; January 17, 2002). However, Councils also have the flexibility to focus on one or more of the considerations, such as rarity.

Comment: A conservation group recommended modifying Appendix J so that after HAPC proposals are evaluated by the Council’s Plan Teams, the authors of a proposal have an opportunity to revise and resubmit the proposal before the Council selects proposals for analysis.

Response: The Council chose not to provide an explicit opportunity for the authors of an HAPC proposal to resubmit the proposal following Plan Team review. However, proposal authors and other members of the public may submit written comments or provide verbal testimony to the Council to influence the Council’s decision regarding which proposals warrant detailed analysis.

Comment: A federal agency with responsibility for mineral resources stated that it should be consulted regarding any HAPC proposals because HAPCs may fall within areas under its regulatory authority.

Response: NMFS disagrees that specific consultation is necessary, because HAPCs have no direct effect on other agencies. The Magnuson-Stevens Act requires federal agencies to consult with NMFS regarding any action that may adversely affect EFH. The identification of HAPCs does not alter that requirement nor establish any restrictions on mineral development or other non-fishing activities. However, the consequences of all HAPC proposals will be evaluated with ample opportunity for public comment under the Magnuson-Stevens Act and other applicable laws, so federal agencies and other interested parties may identify any concerns through those processes.

### **Comments on the Effects of Fishing on EFH**

Comments: Numerous commenters including conservation groups, private citizens, and some fishermen and fishing industry groups asserted that bottom trawling harms sea floor habitats. The commenters stated that bottom trawling reduces habitat complexity and species diversity, alters the benthic community structure, and causes lasting damage to sensitive habitats that are slow to recover, such as corals.

Response: NMFS agrees that bottom trawling and other fishing activities can have lasting effects on benthic habitats and communities. Although the analysis of effects of fishing on EFH in Appendix B acknowledges considerable scientific uncertainty regarding the consequences of habitat alteration for the sustained productivity of managed species, based on available information the analysis finds no indication that current fishing activities in waters off Alaska alter the capacity of EFH to support healthy populations of managed species over the long term.

Comment: Several commenters cited the benefits of area closures as a valuable habitat protection tool.

Response: NMFS agrees that area closures may serve as a valuable habitat protection tool. A number of existing year-round area closures exist in the BSAI and GOA to protect habitat from potential negative effects of fishing. Many of the alternatives described in the EIS for minimizing the effects of fishing on EFH include new trawl closure areas.

Comment: One commenter challenged the implication that Steller sea lion closures provide a significant benefit to EFH because they do not prohibit all bottom trawling from occurring inside protected areas.



Response: NMFS agrees that the Steller sea lion closures do not provide complete protection of EFH within their boundaries, but the closures do provide a significant benefit for the habitat. These closures constrain both fisheries that exert the vast majority of bottom trawl effort in the Aleutians (Pacific cod trawl and Atka mackerel trawl). Table B.2-9 shows that these fisheries account for 91 percent of the effects on living substrate in the Aleutian Islands shallow habitat. The Long Term Effects Index (LEI) charts in Appendix B show that effects in the closed areas, even for the ultra-slow recovering hard coral category, are essentially eliminated. However, given the potential for very slow recovery of the habitat features represented by the hard coral category, any shifting of these closures should consider the potential for long term effects on those features.

Comments: Numerous commenters including conservation groups, private citizens, and some fishermen and fishing industry groups asserted that NMFS and the Council have not implemented sufficient measures to mitigate the adverse effects of fishing on EFH. Many of these commenters cited the need for new precautionary management measures to avoid long lasting or irreparable harm to fragile habitats. Several commenters said the draft EIS did not sufficiently discuss the relevance of the scientific uncertainty that is acknowledged in the evaluation of the effects of fishing on EFH, and failed to incorporate that uncertainty into the decisions reached.

Response: Under the Magnuson-Stevens Act EFH regulations, Councils must act to prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable, if there is evidence that a fishing activity adversely affects EFH in a manner that is more than minimal and not temporary in nature, based on an evaluation of the effects of fishing on EFH (50 CFR 600.815(a)(2)(ii)). The evaluation contained in Appendix B notes that there are long-term effects of fishing on benthic habitat features off Alaska, and acknowledges that considerable scientific uncertainty remains regarding the consequences of such habitat changes for the sustained productivity of managed species. Nevertheless, the analysis concludes based on the best available information that the effects of fishing on EFH are minimal because the analysis finds no indication that continued fishing activities at the current rate and intensity alter the capacity of EFH to support healthy populations of managed species over the long term.

Subsequent to publication of the draft EIS, NMFS contracted with the Center for Independent Experts to conduct an independent peer review of the Appendix B evaluation of the effects of fishing on EFH. The review was conducted by a panel of six scientists with expertise in benthic ecology, fisheries oceanography, fishery biology, fisheries assessment, fishing gear technology, and biophysical modeling. The reviewers concluded that the model developed for Appendix B by the NMFS Alaska Fisheries Science Center is a reasonable approach to determine the effects of fishing on ocean habitat features, and recommended a number of improvements to the way agency scientists assessed the influence of habitat disturbance on fish stocks. In particular, the reviewers criticized the use of stock abundance in Appendix B to assess the possible influence of habitat degradation on fish stocks. They recommended supplementing the analysis with additional information to attempt to validate the model and provide other indicators of potential consequences of habitat alteration for managed species of fish. The reviewers also urged fishery managers to use a precautionary approach because of large uncertainties in scientific knowledge of the links between fish and their habitat.

For the final EIS, NMFS conducted additional analyses to verify model predictions and reevaluated the potential consequences of habitat disturbance for managed stocks. The additional information included in Appendix B for the final EIS documents stock distribution and abundance over time and discusses additional ways to help detect potential habitat-related changes in the successful reproduction, feeding, and growth to maturity of managed species. The additional information clarifies the reasons why analysts made their decisions. In several cases, analysts concluded that effects of habitat degradation were unknown because of the uncertainty regarding the effects of habitat disturbance on elements of the

life history of managed species. The commenters highlight a key policy issue for the Council: given the uncertain effects of fishing-induced habitat disturbance for the productivity of managed species, and the tangible economic and socioeconomic costs of new restrictions on fishing, how much precaution is warranted? Given the Council's overall precautionary management approach, including a variety of existing measures that protect large areas of habitat and limit harvests to very conservative levels, are additional restrictions appropriate?

Based upon the final EIS and the views of public commenters, the Council decided to support substantial new fishery restrictions in the Aleutian Islands and the Gulf of Alaska as precautionary measures to reduce the potential effects of fishing on EFH. The Council recognized the EIS conclusion that the effects of fishing on EFH are minimal based on the best available scientific information, yet the Council acknowledged the considerable scientific uncertainty embedded in that conclusion, as highlighted in Appendix B and echoed by the Center for Independent Experts review. The Council considered a wide range of management options for reducing the effects of fishing on EFH and selected a precautionary alternative that incorporates measures that enhance protection of the most vulnerable habitats while minimizing costs for the fishing industry.

Comments: A longline fishermen's association stated that NMFS should take additional steps to mitigate the effects of the Gulf of Alaska rockfish trawl fishery. The same commenter stated that protecting benthic habitat from the effects of bottom trawling would be a positive step to maintain and restore ecosystem health.

Response: The preferred alternative for Action 3 includes new closures to bottom trawling in ten specific areas of the Gulf of Alaska slope. The Council selected these closures specifically to reduce the potential effects of the rockfish trawl fishery on sensitive habitat features.

Comments: Several conservation groups commented that the draft EIS misleads the public about the real effects of fishing on EFH. These commenters thought the analysis was designed to ensure a conclusion that fishing has no adverse effects; justifies a decision already made by the Council; draws arbitrary conclusions; mischaracterizes other management actions; and contradicts previous agency findings about the effects of fishing on habitat. Some of the commenters stated that NMFS's conclusions about the effects of fishing ignore the results of NMFS's own model, contradict national and international scientific consensus and literature, substitute the Magnuson-Stevens Act's overfishing provisions for its EFH provisions, and reject a precautionary approach. In contrast, a fishing industry commenter stated that the Council used the best science available to measure fishing impacts. Another commenter stated that Appendix B uses a reasonable approach for determining whether fishing effects on EFH are more than minimal and not temporary.

Response: NMFS disagrees with the criticisms of the analysis. The Appendix B analysis constitutes a reasonable approach using the best available scientific information. The EIS evaluates the effects of fishing on habitat using a quantitative mathematical model developed for this analysis. After considering the available tools and methodologies for assessing effects of fishing on habitat, the Council and its Scientific and Statistical Committee concluded that the model incorporates the best available scientific information and provides a good approach to understanding the impacts of fishing activities on habitat. Although the model indicates that there are long-term effects of fishing on benthic habitat features, the effects on EFH are minimal because, based on past trends and current observations, NMFS finds no indication that continued fishing activities at the current rate and intensity alter the capacity of EFH to support healthy populations of managed species over the long term.

Appendix B evaluates impacts to habitat and impacts to managed fish species. The model results are an integral part of the analysis, providing a consistent estimation of the relative effects of fishing for different habitat features at a fine spatial scale. NMFS conducted three types of analyses to assess whether habitat impacts would be likely to lead to more than minimal and temporary impacts on growth to maturity, reproductive success, or distribution of managed fish species. First, analysts reviewed the available information on egg, larvae, juvenile, and adult life stages to describe associations between their assigned species and a particular habitat type (Table B.3-1 of Appendix B). Next, analysts reviewed the LEI scores within the intersection of species distributions and habitat types, and weighted habitat impacts by how much of the species distribution was associated with a given habitat type (Table B-3.3 of Appendix B). The third step was an evaluation of the likelihood that present levels of habitat impact would lead to more than minimal and temporary impacts on the spawning, breeding, feeding, or growth to maturity of managed species.

The Appendix B analysis acknowledges that Council-managed fishing affects habitat. Specifically, Council-managed fishing results in persistent reductions in the availability of certain benthic habitat features, including corals and other living structure. Nevertheless, the analysis finds no indication that these changes to portions of EFH alter the overall capacity of EFH to support sustainable fisheries. In that respect the analysis is consistent with the general consensus reflected in the national and international scientific literature: fishing can cause lasting adverse effects to certain types of habitat, but because the linkages between fish species and their habitat are so poorly understood, the consequences of those habitat changes for managed fish stocks are uncertain.

The analysis considered stock status as an indicator of whether habitat impacts are unsustainable, but did not substitute overfishing thresholds for an evaluation of effects on EFH. NMFS stock assessments attempt to track direct effects of fishing on population dynamics. If habitat impacts are contributing to natural mortality of fish, and the time trend in these impacts is constant, then they might go undetected as part of natural mortality in the model. However, if habitat impacts increase or decrease production, they would appear as anomalies in recruitment or growth. Likewise, if habitat impacts alter the distribution of fish, evidence might be apparent in fishery catch rates or surveys. The information added to Appendix B for the final EIS includes data that allow for an evaluation of the spatial and temporal pattern of commercial fishing, fish condition in various habitats, and the spatial and temporal pattern of fish distribution. This information was useful in detecting potential meso-scale responses of fish to habitat impacts. However, the scale of the available data is not sufficient to evaluate short term (e.g., over days or weeks) or localized (e.g., regions less than a kilometer) responses of fish stocks. Very little research has been focused on the linkages between habitat impacts and fish production, especially at early and juvenile life stages.

The EIS acknowledges considerable scientific uncertainty concerning the effects of fishing on EFH and the consequences of habitat alteration for managed species. As discussed above, an independent peer review supported the model underlying the analysis, and offered recommendations to improve the way agency scientists assessed the consequences of habitat disturbance on fish stocks. NMFS conducted several new analyses in response to these recommendations, including a validation exercise to compare model predictions to empirical data; an attempt to estimate length-weight anomalies by substrate type for species that use different habitats; a more explicit consideration of spatial distribution, recruitment trends, and biomass relative to biological reference points; a CPUE analysis to check for evidence of serial depletion that may be linked to areas with high LEIs; and an analysis of growth patterns in different habitat types for certain species. The final EIS incorporates the best available scientific information regarding the effects of fishing on EFH in waters off Alaska. As more information becomes available in the future, NMFS may be able to conduct additional analyses to improve understanding of

the effects of fishing on EFH in Alaska. The EFH regulations at 50 CFR 600.815(a)(10) note that NMFS and the Council should review the EFH components of FMPs at least once every 5 years.

Comment: One commenter stated that the EIS did not adequately consider the effects of fishing on sensitive habitat features, particularly living substrates such as corals and sponges. The commenter indicated that bottom trawling is having a significant adverse effect on key species that comprise EFH, most notably corals and sponges.

Response: The draft EIS considered the effects of fishing on animals that provide living structure as well as three other categories of habitat features considered potentially important to managed fish species. Particularly long-lived animals that provide habitat structure were considered separately as the “hard coral” feature. The effects of fishing model estimated the persistent effects on these features to the smallest spatial scale that was feasible. As envisioned by the EFH regulations, the analysis focused on the extent to which fishing affects the capacity of EFH to support managed species, as evidenced by the ability of a species to support a sustainable fishery and the species’ contribution to a healthy ecosystem. The areas used by each species and their habitat needs were provided in the EFH descriptions and supporting information in Appendices D and F. An expert on each managed species or species group considered these and other sources of information on species welfare to evaluate whether the habitat effects of fishing would alter EFH in a way that is more than minimal and temporary. None of the evaluators found habitat effects that exceeded this threshold.

Comment: One commenter provided a literature citation on the longevity of sponges, which indicated a slower recovery rate than was used in the model. The commenter also noted that the recovery rates for living substrates on the eastern Bering Sea shelf did not include values reflecting ultra-slow recovering organisms, such as hard corals.

Response: The citation provides information that was not considered in the recovery parameters for the effects of fishing model, indicating that sponges on hard substrates in a temperate fjord were very long lived. Considering this information, it may be more appropriate to consider such sponges as belonging to the class of ultra-slow recovering living structure, which was represented in the analysis by the hard corals. NMFS modified the EIS accordingly.

The parameters used in the fishing effects model draw a distinction between habitat features on hard substrates (rock and boulders) and those on soft (gravel, sand, and mud). The slowest recovering living structure organisms (e.g., hard corals requiring immobile attachments) are associated with hard substrates, while features associated with softer, more mobile substrates were considered to have quicker recovery rates. The eastern Bering Sea shelf was the only area for which relatively comprehensive substrate data were available (Smith and McConnaughey 1999). These data indicate that hard substrates are very rare in this region; most occur in shallow water areas near the Pribilof Islands and the Alaska Peninsula that are subject to little or no fishing effort. Therefore, the analysis only used the soft substrate recovery rates for this region. While coral has been recorded in surveys of this area, it principally consists of soft coral species such as *Gersimia* sp., which are more adapted to soft substrates and, based on available information, are not as slow to recover as the hard corals.

Comments: Several conservation groups commented that habitat removal, with possibly irreversible consequences, would continue under the Council’s preliminary preferred alternative. A fishermen’s association commented that the recovery time for most benthic habitat, and particularly living habitat such as corals, is so long that impacts would be irreversible by the time an associated fish species falls below the Minimum Stock Size Threshold (MSST). Other commenters noted that there may be a

significant lag time between habitat damage and any resulting declines in fish productivity that can be observed via stock status relative to MSST.

Response: NMFS agrees that fishing activities would continue to remove habitat features under the status quo management regime, and that the recovery time for some habitats is very long. The fishery evaluation model projected habitat effects for the 95 and 75 percent distributions of salmon, crab, target groundfish species, and forage species. The analysis noted these effects in terms of projected reductions of features (epifauna prey, infauna prey, living structure, non-living structure, and hard corals) within defined habitat substrates (e.g., Bering Sea sand, Bering Sea mud, Aleutian Islands shallow, Aleutian Islands deep). Table B.3-3 shows results of these projections, termed LEIs. The analysis then assessed whether these impacts to EFH are more than minimal and temporary, i.e., whether adverse effects to EFH are sufficient to impair the ability of EFH to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. The analysis was not designed to assess in the abstract whether impacts on coral or other specific habitats are minimal and temporary, but rather whether such effects are consequential for managed species. NMFS found that the current level of impact to EFH is minimal for most target species and unknown for many species taken incidentally in the catch.

To address the potential lag time between habitat disturbance and any resulting effects on productivity, NMFS considered whether the level of impact would affect future stock status. In longer lived species, this type of forecast is needed because impacts on reproductive success could take several years to manifest themselves at the population level. NMFS stock assessment scientists examined the time series of reproductive success (recruitment), spawning biomass, and growth.

NMFS included a better description of the basis for the impact ratings in Appendix B to the final EIS. NMFS stock assessment scientists reevaluated the consequences of habitat disturbance for each stock using a revised set of instructions that directed analysts to consider more explicitly all of the available information that could help determine whether there is evidence that fishing adversely affects EFH in a manner that is more than minimal and not temporary in nature. NMFS undertook the reevaluation in response to public comments as well as an outside peer review conducted by the Center for Independent Experts. Analysts followed seven steps. First, they reviewed and updated information from the draft EIS regarding habitat associations for each stock. Second, they reviewed maps of the areas with high LEI scores to assess overlap with distribution of each stock. Third, they reviewed and updated information from the draft EIS regarding the relationship between habitat impacts and reproduction of the species. Fourth, they reviewed and updated information from the draft EIS regarding the relationship between habitat impacts and growth to maturity for each species. Fifth, they reviewed and updated information from the draft EIS regarding the relationship between habitat impacts and feeding success for the species. Sixth, they assessed whether available information on the stock status and trends indicates any potential influence of habitat disturbance due to fishing. For this step the analysts considered not only whether habitat impacts may adversely affect the ability of the stock to remain above MSST, but also whether the temporal or spatial pattern of habitat disturbance on stock abundance is sufficient to adversely affect the ability of the stock to product MSY over the long term. (For most stocks in Alaska, available data do not provide reliable estimates of MSY, so a proxy is used). Finally, analysts summarized the results of the previous six steps based on the overall weight of available evidence, and assigned an overall rating as to whether the effects of fishing are both more than minimal and not temporary, or either minimal or temporary, or unknown.

Comments: Several conservation groups stated that the EFH EIS should have taken the same approach as the programmatic supplemental EIS for the groundfish fisheries by designing the analysis to avoid a Type II error. Conservation groups as well as fishing industry groups asked for clarification of a related statement on page 4-401 of the draft EIS: "Reducing the probability of making a Type II error is more

precautionary and is more responsive to both EFH mandates and the public comment received on the 2001 draft PSEIS.” A fishing industry alliance asked NMFS to modify Section 4.5.4 to describe more accurately the differences between the purposes of the two EISs and the corresponding reasons for differences between the analyses.

Response: In scientific studies, a Type II error occurs when a false hypothesis fails to be rejected. In the context of the EFH EIS, a Type II error would occur if the analysis examines whether fishing has minimal adverse effects on habitat and does not reveal more than minimal effects, yet in reality such effects are occurring. In other words, if the EIS analysis finds no indication that fishing is causing more than minimal adverse effects, but in actuality the analysis is wrong, a Type II error will have occurred. Scientific studies typically test a null hypothesis (e.g., fishing has no effect on habitat) rigorously and only reject the null hypothesis if there is a low statistical probability of its being true. To reduce the possibility of a Type II error, the results of an analysis can be interpreted with a high degree of precaution.

The potential for Type II error in impacts analyses involving natural resources is an important consideration because of the large number of factors influencing living populations. In the present case the status of commercially targeted species in Alaska is well documented and uncertainty in stock trends is presented in annual SAFE documents. With the exception of selected crab stocks, stock conditions are sufficient to support sustainable fisheries. This information, coupled with the absence of evidence of an impact on growth or a change in habitat usage to avoid heavily fished areas, was an integral part of the analysts’ evaluations. The results of the analysis do not preclude the Council and NMFS from insuring against the possibility of a Type II error by protecting additional habitat based on the large number of species for which time trends in reproduction, growth, and distribution are not known.

The sentence cited by the commenters incorrectly implied that the EFH provisions of the Magnuson-Stevens Act include explicit direction to use a high degree of precaution when assessing the effects of fishing on habitat. Neither the Magnuson-Stevens Act nor the EFH regulations address the degree of precaution that is appropriate for the analysis. Instead, the general guidance from National Standard 2 applies: conservation and management measures must be based upon the best scientific information available. Thus, given the scientific uncertainties, the Council must make a policy determination regarding the level of precaution that is appropriate.

The preferred alternative for Action 3 includes substantial new fishery restrictions in the Aleutian Islands and the Gulf of Alaska to reduce the potential effects of fishing on EFH. The Council endorsed these measures expressly for the purpose of being precautionary, given the amount of scientific uncertainty regarding the effects of habitat disturbance for managed species.

NMFS agrees that the final EIS should explain more clearly its relationship to the programmatic supplemental EIS for the groundfish fisheries, and has modified Section 4.5.4 accordingly.

Comments: A conservation group stated that the draft EIS includes an incorrect assumption that rationalization programs will, by definition, result in additional habitat conservation. The commenter stated that any benefits for EFH need to be articulated in the design of a rationalization program, including measurable objectives for habitat protection as well as spatial management to protect certain habitat features. A fishing industry group commented that rationalization should be considered in the future as a tool for reducing the effects of fishing on EFH and allowing vessels the opportunity to experiment with pelagic gear. Another fishing industry group said rationalization will reduce habitat impacts and increase the safety and efficiency of fisheries.

Response: NMFS agrees with the commenters that rationalization can be beneficial for EFH under certain circumstances. If rationalization programs are intended to meet multiple objectives, including habitat conservation objectives, the associated management measures should be designed carefully to meet the intended purposes. In general, rationalization reduces fishing effort and excess capacity, which increases catch per unit effort and decreases the opportunity for interactions between fishing gear and fish habitat.

Comments: Several conservation groups commented that Figure ES-1, titled Areas Closed Year-round to Bottom Trawling, is misleading. The commenters said this figure either should show only areas closed year round to all bottom trawling, or acknowledge that it represents only closures to some fisheries, and bottom trawling in other fisheries is still permitted in these areas.

Response: NMFS agrees that limited state-managed bottom trawling occurs in some of the depicted areas. Beam trawling for shrimp is allowed in southeast Alaska, Prince William Sound, and the Kodiak area, although effort is extremely low. NMFS modified Figure ES-1 for the final EIS accordingly.

Comments: A few commenters provided lists of literature citations related to the effects of fishing on EFH and asked NMFS to incorporate those studies into the analysis.

Response: NMFS reviewed these lists of citations, which contained a broad sampling of studies from the literature regarding the effects of fishing on habitat. The EIS cites review articles to represent general findings in this field and concentrates on describing and using those studies most relevant to Alaska fisheries. Many of the listed citations were included in those review articles, were similar to articles (many by the same authors) that were cited in the draft EIS or were not available when the draft EIS was prepared. The final EIS incorporates those that provide relevant information that was not covered by references already cited.

### **Comments on the Evaluation of the Effects of Fishing on EFH**

Comments: A state agency commented that the Appendix B results are filtered through a screen of professional opinions based on apparent productivity of the species and a qualitative assessment of the likelihood of the species remaining above MSST when that reference point is known.

Response: NMFS agrees. In most cases, impacts analyses were assigned to individuals responsible for conducting annual stock assessments to ensure that decisions would be made by individuals who were familiar with the stock and the data available for the species. Each stock assessment author was asked to consider the LEI maps in conjunction with information on the past, present, and expected future status of their assigned stock to determine whether potential impacts were more than minimal and not temporary. Stock assessment authors were not given a time trend in the degree of habitat impact. For the draft EIS, NMFS was unable to map LEIs on 5-year time periods to track temporal shifts in habitat impact. A proxy for this product appears in the revised version of Appendix B for the final EIS based on a time series of trawl effort in the three management regions. In all three regions the LEIs depend on the amount of effort that occurs within 5 km x 5 km blocks, where time series of pelagic and non-pelagic trawl effort are available.

Comments: A fishing industry alliance commented that the analysis could be improved by a more systematic representation of the available information for each species.

Response: NMFS agrees. The past and present status of the stocks was evaluated using survey, fishery, and stock assessment information. Most assessment authors include plots of catch distribution and

survey biomass in their annual stock assessments. Time series of recruitment, spawning biomass, and total biomass were available for species that are assessed using age- or size-based statistical age structured models. In some cases, authors had information on interannual variations in size-at-age or weight-at-age by area. Information on spatial distributions, recruitment trends, and biomass relative to biological reference points is included in Appendix B to the final EIS.

Comment: One commenter objected to an assertion in Appendix B that refers to patchiness of coral habitats and indicates that fishing activity would likely avoid coral due to potential net damage. The commenter said that no evidence supports this behavior, and LEI values for coral are underestimated. The commenter cited data from R. Stone showing that 87 percent of adult FMP species were found to be associated with coral, and said fishing would likely occur in these areas.

Response: NMFS agrees that LEIs may be underestimated if the distributions of habitat features and the targeted species are correlated, as may be the case for living substrates in hard bottom areas. However, the LEIs also may overestimate the impact because the analysis assumes that hard corals occur everywhere in the prescribed depth ranges, which is unlikely. The principal point of the paragraph cited by the commenter was a source of LEI overestimation where fishing is constrained to a more limited distribution than that represented by the model's assumption of random fishing distribution within 5 km x 5 km blocks. Hence, more effort is expended at sites where some habitat features have already been removed, resulting in less total removals than a broader fishing distribution. While the distribution of the targeted fish is generally more concentrated than random in hard bottom areas, fishers must consider the added constraint of avoiding structures that damage fishing gear. This additional constraint has not been carefully studied and cited by the scientific community, but NMFS does not agree that no evidence supports it. The fisheries descriptions (Sections 3.4.1.2.2.7 and .8) of the Aleutian Islands rockfish and Atka mackerel fisheries describe fishing "adjacent to areas with large potential for hangs" as well as numerous adjustments to gear and fishing methods to reduce net damage, such as lifting trawls from the bottom when rough areas are encountered during a tow. These statements derived from public meetings with fishermen (held during development of the EIS) for the purpose of describing their gear and fishing techniques. NMFS also has considerable direct experience with the prevalence of very rough substrates in the Aleutian Islands. The NMFS bottom trawl survey of the Aleutian Islands is severely constrained by difficulty in locating trawlable bottom, frequent hanging of the trawl on bottom obstructions, and damage to trawl nets. In summary, fishermen need to balance the desire to fish in areas where target species are abundant (including areas of high coral abundance) against the potential to damage their fishing gear. Further study and analysis is necessary to determine which of these two factors is the stronger driving force in present fisheries distribution and which most affects the accuracy of LEI estimates.

Comment: One commenter asserted that the model should assume a one-to-one linkage between several FMP species and corals and sponges.

Response: While some data show associations between FMP species and corals and sponges, the causal mechanism for these associations remains unclear. For example, Kreiger and Wing (2002) found that 85 percent of large rockfish observed from a submersible at 11 sites in the Gulf of Alaska were found on large boulders with corals, and hypothesized that the abundance of shrimp (a prey species) near corals may result in this association. Additionally, rockfish were found in only 81 of the 599 coral colonies observed, leaving open the question of whether the association of rockfish with corals is mediated by other, currently unknown, habitat factors. Kreiger and Wing (2002) conclude that more research is needed to describe the underlying mechanisms of species associations with rockfish. Therefore, assuming a one-to-one linkage between habitat and feeding, spawning/breeding, and/or growth to maturity for FMP species would not be appropriate.



Reference:

Kreiger, K.J. and B.L. Wing. 2002. Megafauna associations with deepwater corals (*Primnoa* spp.) in the Gulf of Alaska. *Hydrobiologica* 471:83-90.

Comment: Several commenters disagreed with the conclusion that bottom trawling has no adverse effect on Atka mackerel habitat. One commenter suggested that reanalysis with information from subsection 4.3.2.2.1.4, p.4-59, may justify rating the impact as “adverse.” The commenter noted that Appendix B, Table B.3-3 indicates that living structure, non-living structure, and hard corals will be reduced by 20, 13, and 40 percent, respectively, and stated that these are significant changes to Atka mackerel habitat. The commenter said that videos collected by NOAA demonstrate that Atka mackerel use habitat with these features, and the analysis should specifically address the effects of habitat supply. The commenter said the age-structured population model used did not address impacts on habitat, and it is not a valid tool for assessing effects on the quality or quantity of habitat.

Response: The analysis does not claim that fishing has no adverse effect on Atka mackerel habitat; it finds that effects to the Atka mackerel population are minimal based on the projected reductions of habitat features (epifauna prey, infauna prey, living structure, non-living structure, and hard corals) within defined substrates (e.g., Aleutian Islands shallow, Aleutian Islands deep). While NMFS has data that show associations between Atka mackerel and various habitat features, the weight of evidence is unclear regarding the type of linkages that may exist between habitat and feeding, spawning/breeding, and/or growth to maturity for Atka mackerel. As such, the information is not adequate to assess the direct impacts to Atka mackerel of particular percentage reductions in the living structure, non-living structure, and hard coral habitat features. Given the data gaps, NMFS considered indirect evidence of impacts on habitat through a broader perspective of the health of the Atka mackerel population. The age-structured population model is a valid tool to assess the effects of the quality and quantity of habitat on target groundfish, and is based on the best available information. The age-structured model projections in the groundfish programmatic supplemental EIS showed that the effects of fishing did not jeopardize the ability of the Atka mackerel stock to maintain itself at or above its MSST. Furthermore, no evidence suggests low productivity, recruitment failures, or fishery collapse for Atka mackerel. To the contrary, the Aleutian Islands Atka mackerel stock appears to be robust and productive, and has sustained good recruitment with several average and above average year classes. Most recently, two back-to-back strong year classes are contributing to the population (1998 and 1999 year classes). Therefore, NMFS found no data to justify an adverse rating for Atka mackerel, and rated the impact of the status quo fishery on Atka mackerel EFH “minimal and temporary.”

Comment: One commenter asserted that the omission of several literature sources on the connections between corals and sponges and target fish resulted in incorrect conclusions about whether impacts listed in Table B-3.3 were minimal.

Response: As discussed above for Atka mackerel, NMFS has data that show associations between FMP species and corals and sponges, but is not aware of any evidence that shows specific habitat linkages to feeding, spawning/breeding, and/or growth to maturity for FMP species. For rockfish, the evaluation of the effects of fishing on EFH considered the potential association between rockfish and living and non-living substrates as well as the use and projected reductions in habitat. For example, for shortraker and roughey rockfish, which are species associated with particular living and non-living benthic structures, the evaluation regarding growth to maturity was rated as “unknown” because insufficient information exists to assess whether the adverse effects of displaced boulders and damaged corals would be more than minimal. For other rockfish species, the ratings of minimal and temporary reflect not an omission of

the relevant literature, but rather the lack of strong associations with benthic habitat in terms of prey species or habitat use, the level of projected impacts on the benthic habitats, and, where available, the population-level responses such as recruitment time-series.

Comment: One commenter said evidence suggests Atka mackerel nest in deeper habitat (>100 m), contradicting the idea that bottom trawling does not overlap with nesting grounds, and cited pages B-37 and 4-59 in the draft EIS.

Response: NMFS agrees. The draft EIS assumed that the directed Atka mackerel fishery has "...little or no overlap with Atka mackerel nesting grounds." Indirect evidence from cannibalized eggs (Yang 1999) and archival tags (Nichol and Somerton 2002) suggest that there may be nests deeper than 100 m. The archival tagging study by Nichol and Somerton (2002) documents the capture of brightly colored males in spawning condition in a single tow. Two of the males captured in this tow displayed what was interpreted as apparent nest-guarding behavior (extended period of bottom tending during the spawning season). Based on this information, the authors assumed that the location of the tow was a spawning site. The bottom depth recorded for these fish was 115 to 117 m. The final EIS addresses this evidence and acknowledges the possibility for overlap of the fishery with Atka mackerel nesting grounds.

References:

Nichol D.G., Somerton D.A. 2002. Diurnal vertical migration of the Atka mackerel *Pleurogrammus monoptygius* as shown by archival tags. *Mar Ecol Prog Ser* 239: 193-207.

Yang, M-S. 1999. The trophic role of Atka mackerel *Pleurogrammus monoptygius*, in the Aleutian Islands area. *U.S. Fish. Bull.* 97(4)1047-1057.

Comment: One commenter suggested that the Appendix B evaluation of effects for sablefish should include additional text regarding anthropogenic effects and other effects on survivorship. The commenter recommended including reference to coastal development and its effects on juvenile sablefish habitat, as well as reduced survivorship of sablefish due to bycatch. Additionally, the commenter suggested adding new text regarding juvenile sablefish distribution relative to habitat on the continental shelf.

Response: NMFS agrees that potential habitat effects that are unrelated to fishing (e.g., coastal development) should be included, and NMFS updated Appendix B accordingly. NMFS disagrees with the comment that juvenile sablefish bycatch should be included in this section, because mortality from bycatch is unrelated to habitat concerns. NMFS agrees with adding the new information regarding juvenile sablefish distribution on the continental shelf. Most years juvenile sablefish are not common on the Bering Sea shelf. However, sablefish were abundant on the Bering Sea shelf during a period of strong year classes. Juvenile sablefish may use the area only when they are abundant. Strong year classes provide much of the productivity (biomass and yield) of the sablefish population. Thus habitat effects on the eastern Bering Sea shelf have the potential to affect juvenile sablefish and the productivity of the sablefish stock.

Comment: One commenter opposed NMFS's position that snow crab and blue crab are at low numbers due to climatic changes in the ocean.

Response: As summer water temperatures have risen in the period since 1979, and particularly in the past 5 years, red king crab have nearly replaced blue king crab in the Pribilof Islands management district of the EBS despite the closure of all trawling since 1995 and extremely conservative management of commercial king crabbing including closures during eleven of the past 20 years (1988-1992, 1999-2004).

Declines in the St. Matthew island area have also occurred and that fishery has been closed from 1998 onward. Declines and changes in distribution of blue king crab in the Pribilof Islands area have been closely correlated with warmer bottom temperatures during the annual NMFS survey. They are also correlated with increased prevalence of finfish predators and competitors which in turn may reflect climatic changes. Neither decline is associated with bottom trawling, which was never prevalent and then prohibited in both the Pribilof Island District and in state waters of the St. Matthew area.

The distribution of snow crab is strongly associated with cold waters of the EBS mid-shelf. Unlike blue king crab, snow crab are not associated with rocky bottoms but rather with mud-sand bottoms that occur over most of the Bering Sea. Consequently, the snow crab habitat of the EBS is extremely large and covers most of the area where summer bottom temperatures are less than 5 degrees C. Year to year changes in prevalence and distribution are correlated with shifts in the distribution of cold water in the summer months. Bottom trawling occurs on the mud-sand-silt bottoms that are inhabited by snow and Tanner crabs but there is little epifauna to be disturbed on these bottoms. The critical habitat is the substrate itself where juveniles and adults burrow and feed. Both species are further protected by quotas on bycatch which tend to limit total bottom trawl effort. There can be synergistic effects of various bycatch quotas, for example the bycatch quota on halibut is usually reached before that of snow and Tanner crab and hence limits trawling in many areas. Bering sea snow crab increased in abundance in the 1980s to a high in 1992, and has since declined. The distribution of snow crab has shifted northward over time, with current centers of abundance north of the Pribilof Islands up to St. Matthews Island. The shift in distribution appears to be due to environmental conditions and to catch occurring mostly from the southern portion of the range.

Comments: A conservation group stated that the draft EIS did not adequately consider the effect of trawling on crab populations. The commenter faulted the draft EIS for not stating that the presently low population levels of red king crab may have been caused by bottom trawling in the important “hatching grounds” or “primary brood stock refuge,” nor that continued trawling in those areas may be suppressing the population from rebounding to historic levels. The commenter said the EIS also must address the effects of bottom trawling on other crab populations in the Gulf of Alaska and Bering Sea, such as mature female snow crab. A state agency noted that for the EBS, the red king crab evaluation reflects the current status of crab but does not reflect information on the historic distribution of red king crab females, which as recently as the 1970s were common north of Unimak Island in areas trawled for cod and flatfish (e.g., Figures 3.4-20 and 22).

Response: As stated above, changes in crab distribution and abundance appear to be attributable to changes in water temperature, not the effect of fishing gear on crab habitat. Nevertheless, many areas considered critical to crab populations in the continental shelf waters of Alaska are closed to bottom trawling and dredging. These areas were closed because they were the known habitats of adult female and juvenile crabs, and because of a perception that the habitat was important since it produced crabs so consistently. Other areas where crabs may have been found in the past but are not currently important in their distribution are protected by bycatch caps, and no known disruptions to the habitat would preclude recolonization.

The area north of Unimak Island which some refer to as the “primary brood stock refuge” is currently protected by various caps on bycatch of king crabs, Tanner crab, and snow crab. It was very important in the distribution of red king crab females during periods of high abundance in the mid to late 1970s, but was not particularly important prior to that time and has not been important since. In contrast, the crab habitat areas that currently are closed to trawling have been important for crabs in every year for which there are records. Additionally, the area north of Unimak was not very important for red king crabs during the years that produced the peak abundance in the mid to late 1970s. That period of high

abundance coincided with anomalously cold waters in the outer Bristol Bay area, which may have affected crab distribution. Finally, the biomass of cod and flounders in the Bering Sea has increased sharply since the 1970s and may inhibit restoring red king crabs to former levels of abundance. The abundance of red king crabs in the late 1970s was anomalously high and should not be viewed as a realistic goal for restoring the population.

The distribution of female snow crab is vast and much of it occurs in areas where there is very sparse bottom trawling. Due to changing water temperatures, as discussed above, the areas where female snow crabs are prevalent is not constant. Under these circumstances, a bycatch cap is effective because it discourages trawling in the areas that are most important at any given point in time. Available information does not indicate any known attributes of snow crab habitat that are critical to protect from disturbance by trawling.

Comment: One commenter asked why NMFS did not consider bycatch and discards in Alaska's groundfish fisheries in the analysis of reduced prey on the habitat quality of FMP species.

Response: NMFS collects and analyzes food habits information to track factors impacting foraging behavior of selected groundfish. Commercial fisheries tend to target adult fish. Piscivorous fishes tend to consume juvenile fish (age-0 or age-1). The bycatch of young fish in trawling operations is small relative to the abundance of fish remaining on the grounds. The groundfish FMPs include a retention cap on bycatch of forage species in commercial trawls. The final EIS includes text to describe these existing mitigation activities.

Comment: One commenter asserted that loss of habitat features must be calculated on the same time scale as the source of the stock size. The commenter said that results of calculations from Equations 4, 5, and 6 from the fishing effects model should be made available to the public so they can determine how close the current habitat losses are to equilibrium. The commenter said the EIS should include the trajectory of habitat loss through time and show how each alternative would change the trajectory for each habitat feature.

Response: Historical fishing effort data would be needed to determine how close the current habitat losses are to equilibrium. The hypothetical average equilibrium values of habitat loss (LEIs) are shown for each alternative in Table 4.3-1. LEI as presented in the EIS is the hypothetical long term habitat loss given that fishing continues as estimated for 1998-2002. Showing trajectories would require knowing the current amount of habitat by habitat type, which is unknown. In the absence of such data, trajectories of habitat loss would have to be based on unknown current habitat levels and uncertain assumptions about habitat distribution and the model parameters for recovery and sensitivity. NMFS determined that given the data gaps, conducting such an involved and voluminous analysis would not be appropriate.

Comment: One commenter highlighted that fishing data used in the model were from 1998-2002 and asserted that if effort changes from that pattern, the LEI values will be inaccurate and likely underestimated.

Response: The LEI was defined for this analysis as the equilibrium value that would result from fishing indefinitely at the rate estimated for the years 1998 to 2002. NMFS used these years to represent the current state of the fishery and to reflect some of the year-to-year movements of fishing effort. If future effort patterns are different such that effort is increased in areas unfished or lightly fished during 1998-2002, LEIs would likely increase, particularly for habitat features that recover slowly.

Comment: One commenter suggested that frequency histograms of the effort distribution for each fishery listed in Table B.2-3 be included in the Appendix B.

Response: NMFS agrees. Frequency histograms of effort distribution would provide more information for readers to assess the frequency of different levels of fishing intensity. All such plots for all fisheries may not provide useful additional information, but NMFS included in the final EIS examples of such histograms to allow readers to make such assessments.

Comment: One commenter argued that the draft EIS tends to accept modeled estimates of habitat benefits from additional closed areas, but tends to discount model results pertaining to the benefits of proposed gear modifications.

Response: Estimating the effects of both closures and gear modifications requires a number of assumptions, but there were significant differences in the data available to evaluate each of these concepts. Fishing distribution data and the effects of fishing model allowed many of the parameters related to the effects of the closures to be quantified, but no such data were available to flesh out the most basic assumptions for the effects of the gear modifications. Both evaluations relied on assumptions with considerable uncertainty, yet the available data provided a better basis for assessing the closures than the gear modifications.

Comment: One commenter claimed that the assumption in the draft EIS that the distribution of corals and sponges on the seafloor is uniform is contradicted by catch-per-unit-effort (CPUE) data, which can be used to calculate relative abundance of habitat types. The commenter said these data should be used to weight each block-specific LEI value to calculate the aggregate LEI value for each habitat feature by region.

Response: The analysis did not assume that the distribution of corals and sponges is uniform. For summed habitat LEIs, the analysis assumed distribution is random within blocks and within general topographic (slope versus shelf) and substrate types. Insufficient CPUE and topographic data were available to provide a higher resolution breakdown of LEIs.

Comment: A state agency noted that the results of the fishing effects model serve as an important basis for the evaluation of the importance of effects of fishing on habitat, and emphasized the caution noted in Appendix B, page 23: “Both the developing state of the model and the limited quality of available data to estimate input parameters prevent this from providing a clear view of habitat effects. While output detail may provide an illusion of precision, the results are actually subject to considerable uncertainty.” The commenter observed that impacts are summed up over very large areas, equivalent to large percentages of habitat used by a species, such that local effects, even if they were to be severe, typically end up as small percentages.

Response: NMFS agrees that there are local habitat reductions (LEIs) that are much larger than the average values for large habitat areas. The distribution and range of LEIs within those areas are not evident when only the average is shown. Therefore, Appendix B provides charts of LEI values, representing the spatial variation at the smallest feasible scale (5 x 5 km). NMFS agrees that caution is warranted insofar as the LEI concept provides only a framework and a preliminary comparison of fisheries and management alternatives for different areas. Due to the lack of information, the current application assumes equal habitat abundance and value over large areas or habitat types. The LEI values provide a relative index of the vulnerability of different habitat features, but do not account for spatial variation in the abundance or function of such features. As more information on habitat distribution and value is obtained, the LEI approach will become more useful.

Comment: One commenter suggested an alternative model to be used with the LEI analysis. This model indicates a high risk of future overfishing for populations that are harvested at the MSY determined by conventional models.

Response: The commenter's model assumes a direct relationship between catch and the reduction of carrying capacity of the target species. The relationship involves a linkage between fishing effort and habitat reduction, which may be a relatively simple linkage and not hard to envisage. However, the model also requires is a linkage between habitat reduction and carrying capacity. Such a linkage could occur in a number of ways, likely through intermediate linkages or interactions, but very little research exists to substantiate the connection between habitat and carrying capacity. The commenter's model condenses a complex relationship of many basic interactions into a simple relationship represented by a single parameter. While a relationship between habitat and carrying capacity likely exists, there is likely a high degree of stochasticity (variability) associated with it. NMFS determined that using such a model for the analysis of the effects of fishing on EFH would not be appropriate without either a sufficient time series of catch and abundance data that fits the model, or research results that demonstrate how habitat affects at least some of the necessary linkages (such as food abundance, predator-prey relationships, interspecies competition, spawning success, etc.). The commenter's model may be useful in comparing policy decisions, but its use for the EFH EIS would imply an understanding and substantiation of the ecological effects of fishing that does not currently exist.

Comment: One commenter suggested using observer data to assess the quality and quantity of effects of fishing on corals and sponges. The commenter said that locations with high LEI values correspond to areas with recorded coral bycatch in the Aleutian Islands, but said the areas with the highest bycatch do not match the LEI score maps.

Response: The effect and recovery model was used to evaluate the effects of fishing on corals and sponges. The model predicts an estimate of the proportional reduction in a habitat feature (e.g., corals or sponges) relative to an unfished state, if a fishery were continued at current intensity or distribution. NMFS determined that the model was the best tool available for the assessment. The model considers the intensity of fishing effort, sensitivity of habitat features, recovery rates of habitat features, and distribution of fishing effort. The analysis incorporated a range of plausible values for sensitivity and recovery rates of corals and sponges. The observer data provide estimates of the bycatch of corals and sponges, but are not particularly useful for analyzing fishing impacts. These data document that corals and sponges are taken incidently in various fisheries, but do not provide a quantitative estimate of the relative abundance and distribution of corals and sponges, nor the proportional reduction in coral and sponge habitat relative to unfished levels.

Comment: One commenter discussed whether the effects of fishing should be viewed on a global versus a local scale. The commenter opined that the guidelines for evaluating the effect of fishing on EFH take a global view. The commenter said that consideration of localized effects to EFH would be appropriate for a managed species if it were possible to identify a limited range of available habitat that is vital to the survival of the managed species and vulnerable to the effects of fishing. The commenter said that even if concentrated fishing effort causes localized habitat impacts, the important question is whether productivity of the managed species is substantially reduced due to the concentration of fishing, i.e., whether species abundance remains sustainable. The commenter noted that no empirical evidence suggests that harvests of managed species in Alaskan waters are not sustainable. Other commenters took the opposing view and criticized NMFS for focusing only on aggregate LEI values instead of using each block as the unit of analysis. These commenters maintained that site-specific effects were subsumed

inappropriately into the larger scale analysis. One commenter said that ignoring local impacts could be significant for non-migratory species such as rockfish.

Response: Results of the fishing effects analysis were provided to the expert evaluators for each managed species aggregated on scales ranging from the entire general distribution of the species to charts showing effects for each 5 km by 5 km grid cell, allowing evaluators to consider whatever scale and locations they found important to the welfare of their species. While values aggregated on larger scales were useful in summarizing evaluations, consideration of local effects was available if specific sites were considered very important to a species. However, the final evaluations of whether the effects of fishing on EFH are more than minimal and not temporary were made at the population / ecosystem scale because the regulatory definition of EFH notes that habitat “necessary” for fish means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem (50 CFR 600.10). Therefore, the consequences of fishing’s effects on EFH ultimately were evaluated across fished populations and ecosystems. Site-specific effects were considered relative to their importance to the species on these larger scales.

Comments: A number of commenters discussed the propriety of considering effects on the productivity of managed species when evaluating the effects of fishing on EFH. Commenters affiliated with the fishing industry stated that productivity is central to the goals of the Magnuson-Stevens Act and provides the context for assessing potential benefits to EFH of any of the mitigation measures. Thus, if productivity is not adversely affected, no mitigation is necessary. Commenters affiliated with conservation groups stated that assessing impacts relative to stock productivity is improper. Some of these commenters said that limiting the scope of inquiry to an assessment of whether stocks are overfished is contrary to the requirements of the Magnuson-Stevens Act. Some said waiting for evidence that habitat disturbance causes fish stocks to decline raises the burden of proof beyond that which is attainable. One conservation group said that the analysis should consider additional factors besides whether fishing affects the ability of the managed species to support a sustainable fishery and a healthy ecosystem.

Response: The preamble to the final EFH regulations discusses the threshold that requires Councils to minimize adverse effects of fishing on EFH. Action to minimize adverse effects of fishing “is warranted to regulate fishing activities that reduce the capacity of EFH to support managed species, not fishing activities that result in inconsequential changes to the habitat.” Nevertheless, the preamble continues by stating that “[i]t is not appropriate to require definitive proof of a link between fishing impacts to EFH and reduced stock productivity before Councils can take action to minimize adverse fishing impacts to EFH to the extent practicable. Such a requirement would raise the threshold for action above that set by the Magnuson-Stevens Act” (67 FR 2354; January 17, 2002). The EIS appropriately considers the productivity of managed species to assess whether habitat disturbance caused by fishing reduces the capacity of EFH to support those species. Likewise, the analysis appropriately considers whether fishing changes the ability of habitat “to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem,” which is what makes a particular habitat “necessary” to fish in the context of the definition of EFH (see the regulatory definition of EFH at 50 CFR 600.10). The analysis completed for the draft EIS considered whether fishing affects the ability of the stocks to remain above their MSSTs into the future, and was not limited to an assessment of whether stocks are overfished. The analysis also considered other information besides stock status relative to MSST, such as any published literature regarding the habitat requirements of managed species, and the opinions of NMFS experts in the biology and stock structure of the various species. For the final EIS, NMFS reevaluated the effects of fishing on EFH and examined more broadly whether stock status and trends indicate any potential influence of habitat disturbance due to fishing. The analysis considered whether credible evidence exists (i.e., not whether definitive proof exists) to support a conclusion that disturbance to EFH caused by fishing

reduces the capacity of EFH to support managed species, and found no indication of such effects that are more than minimal. Nevertheless, even though the available information does not identify adverse effects of fishing that are more than minimal and temporary in nature, that finding does not necessarily mean that no such effects exist.

Comments: Several commenters questioned using MSST as an element for evaluating present sustainability of managed fisheries.

Response: As discussed above, MSST was one of several factors considered in the analysis. The following discussion explains why NMFS used stock forecasts relative to MSST as a reference point for the draft EIS. Given the apparent confusion from some commenters over how NMFS considered stock status in this analysis, for the final EIS NMFS modified Appendix B to address whether stock status and trends indicate any potential influence of habitat disturbance due to fishing. Such effects on stock status could be detected relative to MSST, Bmsy, or any other benchmark. For the final EIS, NMFS analysts assessed for each stock whether the temporal or spatial pattern of habitat disturbance on stock abundance is sufficient to adversely affect the ability of the stock to produce MSY over the long term.

Harvests of BSAI and GOA Groundfish stocks are limited by a number of stringent management measures. For a given stock or stock complex (except for the GOA “other species” complex, which is managed using slightly different rules), the total allowable catch (TAC) is always set less than or equal to the acceptable biological catch (ABC), which is always set less than or equal to the maximum permissible ABC (maxABC), which is always set substantially below the overfishing level (OFL), except in the limiting case where OFL is zero, in which case maxABC, ABC, and TAC are also zero.

The maxABC and OFL are prescribed by formulae called harvest control rules. Six pairs (“tiers”) of maxABC and OFL control rules are specified by the BSAI and GOA Groundfish FMPs, corresponding to six levels of data availability. The parameters (“reference points”) used in the tier system vary from tier to tier, but a common theme throughout the system is that the maxABC control rule is always proportionally less than the OFL control rule, except in the limiting case where OFL is zero, in which case maxABC is also zero.

Presently, nearly all major stocks and stock complexes are managed under Tier 3. The level of data availability corresponding to Tier 3 is such that reliable estimates of MSY-related reference points do not exist. Instead, reference points in the Tier 3 control rules are based on relative spawning per recruit (SPR). Relative SPR is the ratio between lifetime egg production of two hypothetical cohorts, one of which is fished and one of which is not. The cohort that is fished produces fewer eggs over the course of its lifetime than the cohort that is not, because the process of fishing removes some fish from the cohort and these removed fish are no longer able to contribute to egg production. Thus, relative SPR is a number that ranges between 0 (obtained in the case of extremely intense fishing) and 1 (obtained in the case of no fishing), and is often displayed as a percentage. For example,  $F_{35\%}$  is the fishing mortality rate that reduces the lifetime egg production of a cohort to 35 percent of what it would be in the absence of fishing,  $F_{40\%}$  is the fishing mortality rate that reduces the lifetime egg production of a cohort to 40 percent of what it would be in the absence of fishing, and so forth. For a given stock,  $F_{35\%}$  will always be higher than  $F_{40\%}$ , because more fishing is required to reduce lifetime egg production to 35 percent of the unfished level than is required to reduce lifetime egg production to 40 percent of the unfished level. In terms of biomass, SPR-based reference points represent the long-term average biomass that would result if the average strength of future cohorts were equal to the historic average and all future cohorts were fished at the corresponding SPR-based fishing mortality rate. For example,  $B_{35\%}$  represents the long-term average biomass that would result if the average strength of future cohorts were equal to the historic average and all future cohorts were fished at  $F_{35\%}$ .



The control rules for Tier 3 are shown in Figure 1. In Tier 3, the proxies for  $B_{MSY}$  and  $F_{MSY}$  are  $B_{35\%}$  and  $F_{35\%}$ , respectively. The fishing mortality rate corresponding to OFL can never exceed  $F_{35\%}$  and the fishing mortality rate corresponding to maxABC can never exceed  $F_{40\%}$ . In the event that stock size declines below  $B_{40\%}$ , both the OFL and maxABC fishing mortality rates decline linearly with stock size. These mandated reductions in fishing mortality begin as soon as a stock declines below  $B_{40\%}$ , well before the stock reaches its MSY proxy level of  $B_{35\%}$ . In the unlikely event that a stock falls to a size less than 5 percent of its MSY proxy level, both OFL and maxABC (and therefore ABC and TAC) are set equal to zero. As Figure 1 implies, the fishing mortality rates corresponding to all ABCs and TACs are less than the MSY proxy fishing mortality rate of  $F_{35\%}$ . As a practical matter, many Tier 3 stocks are harvested at rates that are only small fractions of  $F_{35\%}$ , even though their biomass levels are well above  $B_{40\%}$ .

In the terminology of the National Standard Guidelines, the fishing mortality rate corresponding to OFL represents the “maximum fishing mortality threshold” (MFMT). The MFMT plays a key role in determining the MSST, which is defined in the National Standard Guidelines (§600.310(d)(2)(ii)) as follows: “To the extent possible, the stock size threshold should equal whichever of the following is greater: one-half the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock or stock complex were exploited at the maximum fishing mortality threshold specified under paragraph (d)(2)(ii) of this section.”

The MSST does not represent the point at which fishing mortality rates begin to be reduced. In Tier 3, the point at which fishing mortality rates begin to be reduced is  $B_{40\%}$ , well above the MSY proxy stock size of  $B_{35\%}$  and far above MSST. MSST represents the point at which the reductions in fishing mortality already mandated by the tier system are required to be reexamined and adjusted if they are found to result in an insufficient rate of rebuilding.

The draft EIS used MSST to represent the lower bound of the range of sustainability. A stock is determined to be above its MSST only if it is above the biomass that produces MSY ( $B_{msy}$ ) or is expected to rebuild to  $B_{msy}$  within 10 years. To ensure that the test for recovery errs on the conservative side, rebuilding rates are computed using the assumption that the stock will be harvested at the overfishing level throughout the rebuilding period, although actual harvesting rates in the BSAI and GOA groundfish fisheries invariably are much lower. Assessing stock status relative to MSST ensures that the stock is either above or reasonably close to the MSY level, so this test is more rigorous than a test for “sustainability” per se.

The draft EIS Appendix B analysis assessed whether the effects of fishing alter the ability of a stock to sustain itself above MSST (i.e., not whether the stock is currently below MSST). The answer to that question would be yes if there are downward trends in the stock status sufficient to drive the population below its MSST, and if those trends are related to poor recruitment. Such trends should be evident long before the stock reaches its MSST. Hence, considering the ability of a stock to remain above MSST is not an insensitive measure of the response of the stock to habitat perturbations. NMFS did not identify any such downward trends in stock status that could reasonably be attributed to habitat factors.

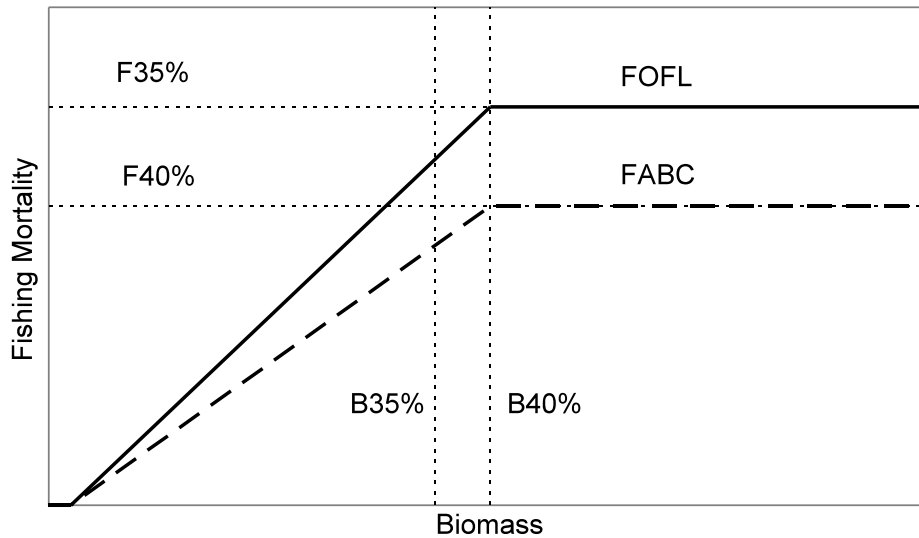


Figure 1. Tier 3 harvest control rules. The fishing mortality rate corresponding to OFL is shown by the solid segmented line and the fishing mortality rate corresponding to maxABC is shown by the dashed segmented line.

Comment: One commenter recommended changing the biomass threshold for habitat health to Bmsy or a proxy for Bmsy.

Response: The draft EIS Appendix B analysis used MSST to assess whether the current status of habitat is sufficient to sustain managed fish species, not to evaluate habitat health. The MSST test evaluates whether the current stock condition is capable of rebuilding to Bmsy or a proxy ( $B_{35\%}$ ) in 10 years if the stock is fished at a level greater than status quo  $F_{msy}$  or  $F_{35\%}$ . Several indicators of stock status could have been considered for this analysis. NMFS selected MSST because it has been accepted by the Council and NMFS as a reasonable process of evaluating the status of a stock. The Bmsy or  $B_{35\%}$  is an integral part of the test, as it is the target level for rebuilding over a 10-year time horizon. NMFS did not select a Bmsy or  $B_{35\%}$  threshold for current stock size because stocks are likely to fluctuate above and below the target biomass level. An advantage of the biomass forecasts is that they provide an estimate of the range of likely biomass levels in the next decade. In the case of the BSAI groundfish stocks, the mean spawning stock biomass level is expected to be above the Bmsy or  $B_{35\%}$  level in 2013 under status quo harvest policies. As discussed above, for the final EIS NMFS used a more general approach and assessed whether stock status and trends indicate any potential influence of habitat disturbance due to fishing, rather than expressly evaluating such effects relative to the ability of the stock to remain above its MSST.

Comment: One commenter stated that if population trends vary in proportion to fishery impacts on habitat, the MSST standard for sustainability could be thought of as a coarse measure of habitat health.

Response: NMFS agrees. While developing Appendix B, analysts evaluated available information to assess whether fish populations vary as a function of habitat condition. The first part of this analysis involved determining whether there was evidence of a functional relationship between spatial or temporal trends in habitat impact and the spatial distribution or temporal trends in fish production. Stock assessment authors reviewed time series of production indices and maps of fish distribution to assess whether there were trends in the population that raised concerns. If a decline in recruitment or growth

coincided with an increase in habitat impact, or if shifts in distribution coincided with maps of high habitat impact, the authors were encouraged to identify potential links in their evaluations. Authors were not encouraged to raise concerns based solely on evidence of a declining population trend; a link to spatial or temporal trends in habitat impacts was required. The authors were cautioned to differentiate between shifts due to targeted fishing or incidental catch and shifts potentially caused by a change in habitat. The results found no indication that current levels of habitat impact negatively affect the ability of the stocks to support sustainable fisheries for target species.

Comment: Some commenters said that the species-by-species productivity approach NMFS undertook to evaluate fishery effects on habitat failed to adequately address documented habitat impacts, species declines, and ecosystem functions. Another commenter said that whether or not a higher biomass threshold than MSST is used as an indicator of potential effects of habitat disturbance for managed species, the rigor of the inference that fishing impacts on EFH are minimal is strengthened by cumulative indicators of fishery impact: healthy stocks, low levels of fishing effort, low habitat sensitivity to fishing, and fairly rapid recovery rates from the effects of fishing.

Response: NMFS disagrees with the criticisms. The functional relationship between habitat and fish productivity or fish distribution is not documented for most target species in Alaska. In the absence of direct functional relationships, NMFS stock assessment scientists based their evaluations on a review of temporal trends in abundance, temporal trends in recruitment, and spatial and temporal trends in distribution relative to available information regarding spatial or temporal trends in habitat impacts. NMFS analysts examined the available data to determine whether fish population trends varied in response to fishery impacts on habitat. They used indices of past, present, and future stock status to evaluate the sustainability of managed fish species given current levels of habitat impact. This type of analysis is used commonly in retrospective analyses of impacts of climate or oceanographic factors on the distribution or production of marine fish (Francis et al. 1998, Anderson and Piatt 1999, Hunt et al. 2001). In Appendix B, retrospective analyses searched for evidence that habitat impacts influence the productivity of managed species. The conceptual foundation for this technique is that if fish populations were tightly coupled to habitat, and the habitat was severely degraded, then impact of degraded habitat condition would be detectable at the population level.

Moreover, MSST does not represent the point at which fishing mortality rates begin to be reduced. In Tier 3 stock assessments, the point at which fishing mortality rates begin to be reduced is  $B_{40\%}$ , well above the MSY proxy stock size of  $B_{35\%}$  and far above MSST. MSST represents the point at which the reductions in fishing mortality already mandated by the tier system are required to be reexamined and adjusted if they are found to result in an insufficient rate of rebuilding. Thus, NMFS agrees with the comment that cumulative indicators of fishery impacts over time are very useful and appropriate for this analysis.

#### References:

Francis, R. C., Hare, S. R., Hollowed, A. B., Wooster, W. S., 1998. Effects of interdecadal climate variability on the oceanic ecosystems of the NE Pacific”, *Fisheries Oceanog.* 7: 1-21.

Hunt, G.L., P. Stabeno, G. Walters, E. Sinclair, R.D. Brodeur, J.M. Napp, and N.A. Bond. 2002. Climate change and control of the southeastern Bering Sea pelagic ecosystem. *Deep-Sea Research II* 49:5821-5853.

Anderson, P. J., and J. F. Piatt. 1999. Community reorganization in the Gulf of Alaska following ocean climate regime shift. *Mar. Ecol. Prog. Ser.* 189:117-123.

Comment: One commenter suggested that references to projected stock biomass from the draft programmatic groundfish EIS should be replaced with the specific stock biomass values used to judge stock sustainability.

Response: NMFS agrees and has incorporated this information into the final EIS.

### **Comments on the Alternatives for Minimizing the Effects of Fishing on EFH**

Comments: Many commenters addressed the adequacy of the range of alternatives for minimizing the effects of fishing on EFH. Some fishing industry commenters stated that the range of alternatives meets the requirements of NEPA and the Magnuson-Stevens Act and should not be expanded. Some conservation group commenters stated that the draft EIS failed to consider all reasonable alternatives or to take a hard look at the environmental impacts of the alternatives, but these comments did not include specific suggestions for new alternatives or analyses. However, the commenters criticized some of the alternatives for applying only to a certain region, such as the Gulf of Alaska, and for focusing on lightly fished or unfished areas rather than areas with heavy fishing activity. Some conservation groups stated that the draft EIS should have included multiple alternatives containing combinations of fishing equipment restrictions, time/area closures, and harvest limits. Some of these groups also cited the failure to include research closures among the alternatives. One comment letter stated that the alternatives failed to focus on the fisheries identified by NMFS's fishing effects model as having the most significant effect on EFH, and the draft EIS improperly rejected as impracticable an alternative that would reduce total allowable catch to reduce fishing effort.

Response: NMFS and the Council developed the alternatives in the draft EIS through an extensive public process that included numerous public meetings and opportunities for comment. Section 2.5 discusses many additional alternatives that were considered but not carried forward for detailed analysis, and explains the reasons for rejecting those alternatives. The suite of alternatives was developed specifically to address the fisheries identified by NMFS's fishing effects model as having the greatest potential impact on EFH. The alternatives start with status quo measures, which include many measures that benefit habitat. Each alternative adds progressively more restrictive measures in addition to the status quo, starting with the fisheries and habitat areas identified in the model as having the greatest potential disturbance to EFH. Each alternative includes fishing equipment restrictions, time/area closures, and harvest limits, insofar as these types of measures are a part of the status quo management regime. The range of alternatives also includes new fishing equipment restrictions, time/area closures, and harvest limits (i.e., in addition to status quo), although not all of these types of new measures are included in each alternative.

Comments: A conservation group recommended that the final EIS evaluate a revised version of the Aleutian Islands component of Alternative 5B. The revisions incorporate three differences from Alternative 5B in the draft EIS: prohibit bottom contact fishing in six identified coral garden sites, modify eight specific open areas (making some larger and some smaller), and eliminate the proposed reduction in total allowable catch (TAC) for Pacific cod. Another conservation group commented that the TAC reduction for Pacific cod is not a vital component of Alternative 5B and that the conservation benefits can be attained without it.

Response: The final EIS includes the suggested revisions in a new option for Alternative 5B. The Council also voted to include a third option for Alternative 5B wherein the open area are identified based on a spatial analysis of areas that have supported the highest catch rates, with specific modifications

based on data analysis and input from Aleutian Islands trawl fishermen. This option would have no TAC reductions or bycatch caps. The new alternatives are described in more detail in Section 2.3.3 of the final EIS.

Comments: A fisherman commented that for the Aleutian Islands component of Alternative 5B, open areas should be identified using all observer data, VMS data, and logbook information from fishermen. The commenter said that open areas should be displayed on 1:300,000 scale nautical charts to help stakeholders interpret the proposal.

Response: As discussed above, for the final EIS the Council added two new options for the Aleutian Islands component of Alternative 5B to identify open areas that are important to the industry while closing relatively undisturbed habitats. The Council also directed staff to display all of the Alternative 5B options for the Aleutian Islands on 1:300,000 scale charts and make them available to the public.

Comments: A fisherman objected to the following portions of Alternative 5B: TAC reductions, bycatch caps for corals and sponges, and open areas that do not include all trawling grounds currently or recently used by the industry. The commenter stated that some specific areas in the Aleutians that are fished were excluded from the identified open areas in Alternative 5B. The commenter also said the components of Alternative 5B should be independent such that the Council could adopt the Aleutian Island portion but reject the Bering Sea and Gulf of Alaska portions, or accept only parts of the Aleutian Islands measures and reject others.

Response: As discussed above, for the final EIS the Council added two new options, including one that omits TAC reductions and bycatch caps. The two new options revise the open areas to better reflect important fishing grounds as compared to the version of Alternative 5B that was included in the draft EIS.

Final Council and NMFS decisions regarding preferred alternatives must be based upon the analysis in the final EIS, such that the decision makers are aware of the effects of selected management measures, including costs and benefits, before making a final decision. The administrative record must include sufficient information to enable decision makers to make informed judgments about the effects of the combinations of management measures selected.

Comments: A conservation group said NMFS should consider two additional options for the Bering Sea component of Alternative 5B. First, permanently close to all trawling one third of each of the five proposed Bering Sea rotational management areas, selected to provide maximum benefits for mature female snow crab. Second, use a rotational approach that leaves only one third of each of the five blocks open for 5 years so that after 15 years all areas would have been closed for 10 years rather than the 5 years proposed in Alternative 5B.

Response: The Council and its EFH Committee considered a variety of options when designing the Bering Sea rotational management approach included in Alternative 5B. The Council decided against permanent closures because it wanted to retain flexibility for the industry to fish in different areas over time in response to shifts in stock distribution and abundance. The Council selected the particular time periods for the proposed rotational management areas based on considerations for the time estimated for partial habitat recovery in closed areas, balanced against the need to provide flexibility for the industry as discussed above.

Comments: Several comments addressed how the alternatives for minimizing the effects of fishing on EFH may affect communities and existing fishing effort. An environmental group noted that most of the

alternatives focus on areas with little fishing effort and where habitat could be protected with the least economic impact. Several conservation groups recommended that NMFS work with local communities to minimize impacts and to identify areas to close to bottom trawling. Other commenters thought NMFS should adopt new management measures to protect EFH from the impacts of industrial fisheries.

Response: The Council and its EFH Committee devoted considerable effort to developing the alternatives in a manner that would meet conservation objectives while minimizing impacts to the fishing industry and communities. Unfortunately, the joint stipulation that established the schedule for the EIS limited the time available to the Council to work with affected communities and industry sectors to refine some of the alternatives and reduce potential impacts, most notably for Alternative 6.

Comments: Most commenters expressed an opinion regarding a preferred alternative for minimizing the effects of fishing on EFH. Many fishing industry commenters supported the Council's preliminary preferred alternative: status quo management measures (Alternative 1). These commenters generally thought the Council employs a sufficiently precautionary management policy and that no further action to protect habitat is needed because there is no clear indication that existing fishing practices are reducing the productivity of managed stocks. Conservation groups, private citizens, and some fishing industry commenters supported Alternative 5B. These commenters generally thought additional protection is warranted to reduce the effects of bottom trawling and protect corals, particularly in the Aleutian Islands, and expressed opposition to the Council's preliminary preferred alternative. One conservation group cited the benefits of Alternative 5B for reducing habitat impacts along the Gulf of Alaska slope, the northwest portion of the Eastern Bering Sea (including Opilio crab habitat), and the Aleutian Islands shelf and slope. Another conservation group endorsed the marine reserves concept that led to Alternative 6, and stated that at a minimum the Council should adopt Alternative 5B. A fixed gear fishing group endorsed Alternative 3 and cited the need to reduce the effects of bottom trawling on the upper slope in the Gulf of Alaska. The same commenter stated that Alternative 5B would provide significant habitat protection, but would impose significant costs on the industry. A federal environmental agency recommended that the final EIS endorse a preferred alternative that is more protective than the status quo.

Response: The Council selected Alternative 5C, Expanded Closures in the Aleutian Islands and Gulf of Alaska, as its preferred alternative for minimizing the effects of fishing on EFH. The Council endorsed Alternative 5C for a number of reasons. The Council recognized that, based on the best available scientific information, the EIS concludes that the effects of fishing on EFH are minimal because the analysis finds 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. Nevertheless, the Council acknowledged that considerable scientific uncertainty remains regarding the consequences of habitat alteration for the sustained productivity of managed species. The Council also noted recent information from a variety of sources about the existence, fragility, and potential ecological significance of cold water corals and other epifauna, particularly in the Aleutian Islands area, and the Council noted considerable public support for adopting precautionary measures to protect such habitats while maintaining important fisheries. The Council considered a wide range of management options for reducing the potential effects of fishing on EFH, and it selected an alternative that incorporates measures that enhance protection for the most vulnerable habitats while minimizing costs for the fishing industry.

Alternative 5C incorporates measures from other alternatives that focus on the areas that support (or are most likely to support) corals and other fragile sea floor habitats that may be especially slow to recover following disturbance. For the Aleutian Islands, Alternative 5C includes a variation of the open area approach from Alternative 5B, resulting in extensive closures to bottom trawling to protect relatively undisturbed habitats. Additionally, Alternative 5C prohibits all bottom contact fishing within six coral

garden areas, providing a higher level of protection for those especially diverse and fragile habitats. For the Gulf of Alaska, Alternative 5C includes closures to bottom trawling in ten areas on the Gulf of Alaska slope to reduce the effects of fisheries with higher scores in the evaluation of the effects of fishing on EFH (Appendix B). Alternative 5C does not include new management measures for the Bering Sea because available information indicates that the Bering Sea does not support the kind of hard bottom habitats that sustain extensive corals and other particularly sensitive benthic invertebrates. However, under this alternative the Council would initiate a subsequent analysis specifically to consider potential new habitat conservation measures for the Bering Sea, including the management options identified in this EIS and other options.

Alternative 5C also incorporates many existing measures that protect habitat, such as the Bristol Bay closure area, Pribilof Islands habitat conservation area, Southeast Alaska trawl closure, Sitka Pinnacle marine reserve, red king crab savings area, Kodiak king crab protection zones, and Steller sea lion measures. The Council also initiated a HAPC process to consider additional habitat protection measures in the future (see Appendix J).

Although most fishing industry commenters endorsed Alternative 1 in their comments on the draft EIS, many of these commenters provided written or verbal testimony to the Council in February 2005 supporting Alternative 5C as the preferred alternative. These commenters generally agreed that the measures included in Alternative 5C are reasonable and precautionary steps to provide additional habitat protection. Similarly, although most commenters who supported additional habitat protection endorsed Alternative 5B, the majority focused on the Aleutian Islands, and the preferred Alternative 5C incorporates a variation of the Aleutian Islands component of Alternative 5B.

Comment: A fishing industry alliance and some of its supporters expressed concern about the proposal in Section 4.5.3.3 of the draft EIS to prohibit bottom trawl fisheries in lower slope/basin areas deeper than 1,000 m. The commenters stated that this proposal does not seem designed to address identifiable adverse effects of fishing and thus does not address the Council's problem statement.

Response: The potential bottom trawl closure in waters deeper than 1,000 m was included in the practicability analysis in the draft EIS to illustrate one low cost option for protecting habitats from potential future disturbance. The Council did not direct staff to evaluate this option as a stand alone alternative for the final EIS.

Comments: A private citizen stated that Alternative 6 was designed to fail because it did not properly account for economic, socioeconomic, and cultural considerations. The commenter made a number of procedural and substantive suggestions for reworking Alternative 6 to make it more practicable. A conservation group commented that the analysis highlighted the negative aspects of Alternative 6 over the positive benefits to habitat. The commenter stated that NMFS and the Council should either change Alternative 6 to make it more practicable or add a new marine reserve alternative. The commenter also thought Alternative 6 should incorporate an effort limitation component.

Response: The Council added Alternative 6 to the analysis in response to requests from a conservation group for a marine reserves alternative and a recommendation from NMFS to broaden the overall range of alternatives. Unfortunately, Alternative 6 evolved rather late in the development of the alternatives and, as mentioned above, stipulated constraints on the time frame for the EIS limited the Council's ability to refine Alternative 6 and reduce potential impacts. The Council decided not to include new effort limitations in Alternative 6 because the Council already limits overall fishing effort, and the Council was concerned that additional effort limitations may not be necessary and would greatly increase the costs of Alternative 6, which are already quite high.

Comment: One commenter asked for an explanation of the Council’s rationale behind the proposal in Alternative 6 to close 20 percent of fishable waters in Alternative 6, as opposed to a greater or smaller portion of available habitat.

Response: As noted in Section 2.3.3.7, the Council was not aware of any definitive study to estimate marine reserve area requirements relative to the goals of protecting habitat or minimizing the effects of fishing on habitat. In the absence of a scientifically accepted proportion of the available habitat, the Council chose 20 percent based upon public comment that cited a consensus in some circles that 20 percent is a reasonable figure to use when designing marine reserves.

### **Comments on the Analysis of Economic and Socioeconomic Costs**

Comment: One commenter questioned the basic premise for the analysis that “eliminating 20 percent of fishing grounds in each region would require additional running time to reach open areas and to return to port to deliver catch (or product)” from page 4-261 of the draft EIS and page C.3.8.2 of Appendix C.

Response: Appendix C and Chapter 4 of the EIS contain an assessment of anticipated economic and socioeconomic impacts from adoption and implementation of the Council’s proposed action alternatives. While primarily qualitative, the analytical descriptions of the expected impacts (e.g., increased running time) and their distribution among the various fishing sectors (e.g., disproportionately burdensome for smaller catcher vessels (CVs) delivering catch to shoreside plants for processing) are consistent with empirical findings associated with other fishery management area closures (e.g., Steller sea lion no-transit zones) and also reflect information gleaned from public testimony on the range of EFH alternatives submitted to the Council.

Comment: One commenter said that in Section 2.3.1, Regional Fishery Dependence Profiles, the discussion on vessel ownership should be expanded to note substantial ownership of mobile groundfish processing (motherships and catcher-processors) by western Alaska communities. The commenter said the at-sea sector is a significant component of Alaska’s groundfish fisheries and reference to ownership by Community Development Quota (CDQ) groups based in Alaskan communities should be included.

Response: NMFS agrees that analyzing CDQ ownership of mothership, catcher/processor, and shoreside processing capacity would enhance the RIR’s treatment of regional and community dependence and investment in the processing sectors of the fishing industry. A section addressing CDQ ownership of mobile, as well as shorebased, processing capacity in the North Pacific commercial fisheries has been added to Appendix C, Section 2.3-6.

Comment: Add a discussion and cost estimate of a mechanical system or observer coverage level to determine whether a vessel was engaged in fishing in any of the proposed closed areas.

Response: Estimates of these costs are already contained in the RIR. For example, the expected increase in U.S. Coast Guard and NMFS enforcement costs is presented in Section 3.1.2.7, Management and Enforcement Costs. Cost estimates associated with VMS mechanical systems, designed to track fishing vessel location, are presented in the same section. Increased observer coverage is presented as a possible alternative to VMS, as well as a measure that may be combined with VMS. While the RIR specifically cites average historical observer costs, based on empirical experience with both state and federal observer programs, it is not possible to quantify the costs that may accrue under the various alternatives due to indeterminate requirements for expanded observer coverage. Nonetheless, the RIR highlights the potential substantial economic, logistical, and operational impacts expanded observer coverage



requirements would impose on the industry, observer providers, NMFS Observer and In-season Management Programs, and the individuals employed as observers.

Comment: Discuss costs, practicability, and safety tradeoffs associated with no entry designations.

Response: Supplemental text addressing the economic and operational costs, practicability, and safety implications of closures and no transit zones has been added to Appendix C, Sections C.3.1.2.3 and C.3.1.2.4.

Comment: Economic impacts of mitigation alternatives should be revised to assess more accurately the impacts on gross revenues and operating costs, and should be better tailored to determine impacts to specific participants and communities.

Response: NMFS disagrees. The draft EIS characterized the economic impacts of the fishing impact mitigation measures to the fullest extent practicable, given available data and federal and state of Alaska confidentiality constraints. Estimates of fishing gross revenues are derived by taking reported landings, using NMFS's blend data, obtained from state fish ticket files and onboard observer data, by various categorical combinations (e.g., vessel size, gear type, area, target species, operating mode), then combining those data with an estimated ex-vessel price, developed by using the Alaska Commercial Fishery Entry Commission's price deck, Council database analysis, and NMFS REFM Division data analysis. These constitute the official record of landings and the best available price data for these fisheries. At the processor level, fish ticket data, weekly processor reports, state and federal observer reports, and the Comprehensive Annual Operators Report database have all been used to derive catch, production, and first wholesale gross revenue estimates. These, too, constitute the best available data on this segment of the industry.

NMFS used these data, combined with GIS models developed to characterize the spatial limits of each proposed alternative, to estimate the gross revenues at risk, by fishery, fleet component (e.g., gear type, vessel size, operational mode), region, and (where appropriate) community. These represent the most accurate assessment of gross revenue impacts that currently available data and fishing pattern models allow. A more accurate assessment of economic impacts on operational costs is severely constrained by lack of empirical cost data for the affected fishing sectors. The same data limitations (e.g., fixed and variable costs, prices, net revenues), combined with state of Alaska and federal confidentiality rules, preclude a more precise tailoring of the analysis to determine impacts to specific participants.

Comment: A fishing industry alliance said Appendix C assumes fishing consumes habitat in economic terms, while NMFS finds there is no adverse effects on EFH in regulatory terms. Appendix C and Chapter 4 speculate that reducing habitat consumption will produce greater long-term benefits and, thus start with a second presumption not supported by the analysis. Appendix C also offers an internally contradictory perspective on the issue of whether the alternatives create benefits.

Response: NMFS disagrees. The economic theory of production is based on the functional relationship between use (consumption) of input factors and outputs. Just as farm production is characterized by combining inputs, such as labor, land, water, etc., to yield a harvestable output, commercial fishing uses production inputs to derive a harvest. As in other forms of commercial production, the producer need not own, or even pay for, every input employed. The producer consumes those free inputs, just like owners and purchasers in the marketplace. In the farming example, if water is drawn from a commonly shared underground aquifer, the farmer consumes that input at no (or little) cost. This results in the producer externalizing the costs of using this particular input. It is, nonetheless, a necessary input consumed in the production process. Likewise, prohibited species are taken unavoidably in some fisheries, so for example

halibut may be considered an input in rock sole roe production. To the extent that marine habitat disturbance accrues as part of commercial fisheries (e.g., bottom contact by non-pelagic trawl gear), that habitat is being consumed as an input to production, even though the associated cost of its use is external to the producer's incurred cash outlays. The use of this concept from production economics is appropriate in this context.

NMFS also disagrees with the assertion that Appendix C offers an internally contradictory perspective on whether the alternatives create benefits. The comment apparently considers only benefits for commercial fisheries. As discussed in the RIR, several other non-commercial sources of benefits may be attributable to the EFH mitigation alternatives, including passive-use values, non-market consumptive use values, and nonmonetary benefits associated with maintenance of ecological equilibrium and biodiversity.

Comment: The EIS provided no adequate quantitative analysis of expected economic benefits of increased fisheries productivity as the result of trawl closures. Estimates of revenue changes associated with each alternative should include the value of increased productivity of FMP species as a result of changes in habitat impacts such as reductions in coral sponge bycatch or LEI value.

Response: Quantitative analysis of expected economic benefits from increased fisheries productivity depends upon quantitative biological evidence of the size, composition, and timing of such productivity gains, and that type of information is not available. As the draft EIS indicates (Executive Summary, page ES-8): "Limited information is available to describe the effects on productivity of managed species from habitat alteration caused by fishing. Likewise, there are no proven techniques for quantifying the benefits to target species that may accrue as a result of adopting any of the alternatives to minimize the effects of fishing on EFH (although many studies worldwide have documented the results of implementing various closed areas). In summary, although short-term costs to the industry are relatively easy to identify, the long-term economic and socioeconomic benefits that may accrue from habitat conservation measures are harder to predict with much precision. Nevertheless, the EIS uses the best information available to summarize the effects of fishing on EFH and the consequences of the alternatives."

The EIS contains an evaluation of the effects of fishing on general classes of habitat features and the broad connections to be drawn between these features and the life histories of some managed species. The level of effects on the stocks or potential yields of these species cannot be estimated with current knowledge. An expectation of substantial recoveries due to mitigation measures would require species with clear habitat limitations and poor stock condition. Because such data are lacking, no quantitative measures of sustained or increased yield in production or biomass of FMP species are available.

Comment: Appendix C's commentary on the six mitigation alternatives fails to provide any method of balancing or measuring benefits versus costs and provides no metric to measure benefits or to compare benefits to costs.

Response: NMFS disagrees. To the fullest extent practicable, given the limitations of empirical data, Appendix C provides quantitative estimates (in dollars) of the potential benefits and costs attributable to the action alternatives. For other economic and socioeconomic impacts, data are insufficient to support precise dollar estimates. In such instances, the analysis relied on economic theory, as well as previous experience under similar regulatory circumstances, to characterize the expected nature, magnitude, direction, and distribution of potential impacts, consistent with Executive Order 12866 and other applicable standards for regulatory impact analyses.

Executive Order 12866 states, in part, that "...costs and benefits are, herein, understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider." The Executive Order continues: "...in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits [including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity]..."

NMFS's Guidelines for Economic Analysis of Fishery Management Actions (revised August 16, 2000) state "Economists may use several analytical options to meet the spirit and requirements of E.O.12866, the RFA, and other applicable laws. The appropriate options depend on the circumstances to be analyzed, available data, the accumulated knowledge of the fishery and of other potentially affected entities, and on the nature of the regulatory action." Elsewhere, the guidelines state "... the analyst is expected to make a reasonable effort to organize the relevant information and supporting analyses, [but] ...at a minimum, the RIR and RFA should include a good qualitative discussion of the economic effects of the selected alternatives. Quantification of these effects is desirable, but the analyst needs to weigh such quantification against the significance of the issue and available studies and resources. Generally, a good qualitative discussion of the expected effects would be better than poor quantitative analyses." Appendix C was prepared consistent with these standards.

Owing to the qualitative nature of the estimates of impacts for a number of benefits and costs, the relative importance (i.e., weighting) of each in the benefit/cost calculation is subjective. Decision makers should consider all available sources of information, including the benefit/cost analysis, and apply relative weights as appropriate.

Comment: Appendix C makes no attempt to analyze other closures and restrictions that apply in the North Pacific, which makes a shift of effort from one area to another difficult.

Response: NMFS disagrees. Appendix C incorporates relevant analysis concerning existing regulatory restrictions and anticipated fishing industry responses to proposed alternatives. All of the fishing effort redeployment and revenue-at-risk analyses explicitly incorporate existing closures and other restrictions. In addition, Appendix C considers measures in some of the alternatives that would reduce regulatory barriers to mobility between areas and/or fishing gear groups (e.g., allowing fishermen to switch gear type).

Comment: Appendix C makes a determination of fishable area so it can compare the amount of area that would be closed to the amount of area that would be available. The method for determining areas to be fishable is not stated.

Response: No method for determining an area to be fishable is defined in Appendix C because such methodology is not used in the analysis. The analysis relies on the record of reported locations where catches have occurred over the entire range of fishing grounds. A plot of the locations of all reported/observed catches was overlain on the areas where fishing would be restricted under each alternative. The catch (and associated value) in the remaining open areas was then summed, yielding an expected catch and value estimate for each alternative. The arithmetic difference between the status quo catches and values for the management area and the estimated catches and value within the proposed management areas represents the catch and revenue at risk, as characterized in the economic impacts analysis. This methodology effectively incorporated all other closures and restrictions, because it included only areas with reported/observed catches.

The analysis is predicated on the spatial distribution of catches that were recorded inside the proposed management areas and those recorded outside, without making any assumptions about fishable areas. The implicit presumption was that if fishermen used these locations and reported catches, these must be fishable areas. Following that logic, areas in which no historic activity was reported were not attributed to the remaining open area category, for purposes of describing redeployment opportunities.

Comment: Chapter 4 states that Alternatives 2 through 5 can be expected to have positive effects in terms of benthic biodiversity and habitat complexity while at the same time imposing relatively minimal socioeconomic effects on the sectors that catch and process fish as well as communities and related businesses. Appendix C, however, comes to a distinctly different conclusion.

Response: NMFS disagrees. Chapter 4 acknowledges significant uncertainty, but find that one may expect Alternatives 2 through 5 to result in some positive effects for benthic biodiversity and habitat complexity, and unknown net economic and socioeconomic effects on the fishing sector. The chapter also indicates that adverse impacts (economic costs, as well as other negative socioeconomic effects) would be expected to accrue to the fishing and processing sectors, at least in the short run. Consistent with the information presented in Appendix C, Chapter 4 emphasizes the uncertainty that surrounds the economic and social impact estimates. Chapter 4 states that Alternative 2 would have unknown net effects on revenues for the fishing industry. In the short term, certain sectors could experience decreased revenues because of measures resulting from the Magnuson-Stevens Act requirement to reduce adverse effects of fishing on EFH. In the long term, if reducing the effects of fishing on sensitive habitats leads those habitats to produce greater numbers of fish, fishing industry revenues could increase.

Comment: A resource development association objected to the absence of a quantitative analysis of the costs that may be incurred by NMFS, other federal agencies, and permit applicants to conduct interagency consultations regarding federal actions that may adversely affect EFH. The commenter provided suggestions for analyses to include in the RIR/IRFA (Appendix C) to evaluate costs for EFH consultations on non-fishing activities.

Response: The Regulatory Flexibility Act requires federal agencies to prepare an initial and final regulatory flexibility analysis for a rulemaking unless the agency can certify that the rule will not have a significant economic impact on a substantial number of small entities. The EFH EIS includes such an analysis for those portions of the action that will affect small entities, i.e., proposed fishery management measures. EFH consultations and recommendations under Section 305(b) of the Magnuson-Stevens Act do not have direct economic effects on applicants for permits for non-fishing activities. EFH consultations regarding federal permits, licenses, or funding could lead the responsible federal agency to restrict or limit the proposed action, which may result in indirect costs for the entity seeking the authorization or funding. However, EFH conservation recommendations are advisory and not binding. Any resulting requirements on non-fishing entities would be imposed at the discretion of the responsible federal agency, and it would be speculative to evaluate such costs in conjunction with this action.

Comment: For the at-sea sector, the analysis concludes that Seattle has too much economic activity and too many people relative to the estimated impacts, hence there are no effects on communities. In reality, the affected people are the catcher-processor owners and their employees who operate dozens of fishing and marine dependent service businesses, mostly out of Seattle's Ballard/Fishermen's Terminal area. These businesses cannot readily redirect their investments into the high-tech oriented economy of Seattle, and their employees have fishing industry training and skills that are largely not transferable. The Ballard/Fishermen's Terminal community is not so large as to not feel the impacts of the EFH alternatives.

Response: NMFS acknowledges the potential for substantial hardships to individual companies and their employees as a result of implementation of several of the alternatives. NMFS disagrees, however, that a clearly identifiable community exists within the Seattle metropolitan region for which such impacts may be isolated and estimated. As noted in the draft EIS, potential impacts to the catcher-processor sector and associated communities vary by alternative. Under Alternatives 1 (Status Quo) and 4, impacts to the catcher-processor sector would be negligible. Under Alternatives 2 and 3, revenue at risk to catcher-processors would be in the 1 to 2 percent range of the total gross revenue of involved vessels, and no impacts would be anticipated for any communities as a result of ties to this sector. Under Alternatives 5A and 5B, revenue at risk for affected catcher-processors (primarily head and gut vessels) would be in the 3 to 5 percent range of the total catch valuation for those operations. Alone, a 3 to 5 percent impact would typically be considered less than significant. Further, some revenue at risk probably could be made up by redirecting fishing effort from closed to open areas. The draft EIS indicates that some operations may be harder hit than others, although a 3 to 5 percent reduction in total gross receipts would not likely result in significant impacts at the sector level. In terms of linking those impacts back to a particular community, much of the support activity for this sector occurs in the Seattle area where most of the involved vessels are based. If a 3 to 5 percent reduction in total gross receipts would result in a proportional reduction in demand for local support services, this would probably not result in a significant impact to the Seattle support service sector, even if the support sector were exclusively dependent upon this particular catcher-processor fleet segment. Given that whatever negative impacts would occur to the fleet might not be evenly distributed among individual operations, however, particular support service businesses might be hit harder than others.

In general, however, neither Alternative 5A nor 5B would result in an overall reduction of harvest quota. The same aggregate volume of fish likely would be harvested under either of these alternatives, and the demand for support services would be roughly equal to demand under status quo conditions. While there may be some redistribution of catch among different fleet sectors, NMFS finds no indication that there would be a net reduction in demand for support services from Seattle.

The draft EIS indicates that Alternative 6 would have significant negative impacts to communities and shoreside industries. Seattle would experience a wide range of negative impacts under this alternative because that it is the most heavily engaged of any community in the at-risk fisheries in terms of catcher vessel, catcher-processor, and mothership participation. Furthermore, Seattle is the predominant center of shoreside processor ownership and the business and operational headquarters for most of these firms. The draft EIS concludes that, given the size and diversity of the local economy, however, Seattle itself cannot be considered a community that depends of the affected fisheries, despite the fact that Seattle based businesses would be affected. In this sense, the current fisheries are dependent upon Seattle, but Seattle is not dependent on these fisheries.

In terms of specific links of catcher-processors to Seattle, a wider range of catcher-processors would experience negative impacts under Alternative 6 than under any of the other alternatives. Under Alternative 6, negative impacts would also be felt by the largest groundfish catcher-processors in the region, the BSAI pollock and cod oriented vessels, as well as among catcher-processors harvesting non-groundfish species. These operations are largely concentrated in Seattle. According to earlier reports (e.g., regional and sector profiles, [http://www.fakr.noaa.gov/npfmc/misc\\_pub/misc\\_pub.htm](http://www.fakr.noaa.gov/npfmc/misc_pub/misc_pub.htm)), however, they are not exclusively associated with a particular neighborhood in the community. Similarly, commercial fishing related suppliers and offices are spread along both sides of the Salmon Bay-Lake Washington Ship Canal, around Lake Union, along 15th Avenue West through Queen Anne, and along the shores of Elliot Bay, bordered by the Ballard, Fremont, Queen Anne, Magnolia, and Interbay neighborhoods. Ballard was a definable fishing community historically, but with respect to the Alaska groundfish fishery, today the area does not appear to be a clearly definable community within the larger

community of Seattle. A loss of investment or employment may be significant at the individual, operational, and, possibly, sector levels under Alternative 6, but from a community dependency perspective, no significant community-level impacts would be anticipated for greater Seattle, given the size of the community and its economy relative to the scale of the affected portions of the fishing industry and the total revenues at risk.

Comment: A fisherman noted that under the status quo, the vast majority of the bottom in the Aleutian Islands is not impacted by bottom trawls. The commenter said that analysis of passive use values should tell the public the actual present impact as well as changes with protection measures.

Response: NMFS agrees that most of the Aleutian Islands bottom habitat is not impacted by trawling, and added such a statement to Appendix C. NMFS disagrees with the assertion that the passive use value analysis in the EIS should predict actual present impact, as well as changes with protection measures, because no such baseline study exists.

Comment: A fishing industry alliance said that the draft EIS includes inappropriate assumptions about the industry's ability to make up GOA slope rockfish revenues by fishing in areas not part of the slope or by using alternative gear. The commenter said the methodology could greatly underestimate the amount of catch attributable to the GOA slope area that would no longer be open to bottom trawling, because the entire harvest for any particular statistical area actually could have come from the portion of the area that is greater than 200m deep. To evaluate effects on each sector, a more meaningful context would report the percentage of annual revenue at stake for affected vessels in proportion to the gross annual revenues for each proposed alternative.

Response: NMFS recognizes the limitation cited in the comment, but disagrees that a potentially less biased approach is available. Rather than risk underestimating the potential catch and revenues at risk, the analysis was designed to be inclusive by estimating the proportion of catch in any given haul that came from within the closure area versus outside of it. The catch and revenue at risk calculations do not include hauls where haulbacks are reported to have occurred in waters less than 200m deep (outside of the proposed closure area). For haulbacks that occur within the closure area, the analysts acknowledge that potential imprecision resulting from trawling across the 200m contour during a tow could overstate the size of the potential loss associated with that tow.

NMFS disagrees with the comment regarding the use of catch mitigation assumptions that underestimate the losses attributable to the GOA slope closures. The analysis did not assume that fishing would occur in areas other than the GOA slope, nor did it attempt a formal spatial analysis of redeployment of effort and resultant catch. Rather, Appendix C qualitatively assessed catch and revenue at risk in the proposed closure areas versus those that might occur in the remaining open areas, based on historic fishing activity, anecdotal information, and expert advice. The analysis assessed the fleet's ability to mitigate at risk losses based on sector structure and fishing patterns, as well as available fishing areas. Sections C3.3.2.1, C3.4.2.1, C3.5.2.1, C3.6.2.1, and C3.7.2.1 provide the rationale for each conclusion. The potential for catcher vessels and catcher-processors to mitigate losses are discussed differentially, where possible, and the ability of the sector to use the gear type allowed by the alternative is discussed (see C3.4.2.1). In addition, each discussion of the mitigation potential for revenue at risk is explicitly qualified. For example, affected fishermen themselves probably do not yet know exactly how they would adjust to such a new management environment. Some or all of the revenue at risk may be recovered by fishing in adjacent open areas or with allowable gear types, but this outcome is not assured.

Regarding revenue comparisons, the argument has some merit. NMFS considered using the approach suggested in the comment, but determined that it was not appropriate. The analysis compares, by

alternative, estimated revenue at risk for affected vessels with status quo revenue attributable to the entire fleet component. Table 3.3-2 in Appendix C indicates that virtually all effects of the proposed GOA slope measures would accrue to GOA rockfish target fishery catcher vessels and catcher-processors operating in the central Gulf and using non-pelagic trawl gear.

The status quo catch and revenue constitute the baseline against which the alternatives can be measured and contrasted. As such, the methodology cannot restrict the status quo calculations to only those vessels in a fleet component that are directly affected by the proposed closure, as suggested in the comment. Doing so would not yield a consistent metric across alternatives with which to compare the effects of each alternative.

Disparate effects on a small number of vessels within a category may have been masked by not doing an individual vessel revenue analysis for every operation. However, data on the operational costs, structure, ownership, and affiliation of vessels are not available, making it impossible to identify and define the dimensions of the fishing firm being impacted, attribute foregone catch and associated revenues, or compare the relative impact of revenues at risk for an alternative to the entity's total revenue flow. Moreover, data confidentiality constraints effectively preclude reporting analytical findings of at-risk catch and revenues, as compared to total revenues, on a vessel-by-vessel basis for any category with fewer than four entities, requiring aggregation of data that would largely reinstate the masking of disproportionate individual effects.

Comment: A fishing industry association stated that using ADF&G fish ticket information to determine catch from less than and greater than 200m greatly underestimates the amount of catch attributable to the GOA slope area that would be closed to bottom trawling. The commenter said the catcher-processor first wholesale value should be used to reflect shoreside value, and the entire value of sablefish and shortraker/rougeye should be assumed at risk. The commenter noted that the catcher vessels and catcher-processors compete for rockfish catch shares, so if travel time to and from grounds increases, the shorebased sector may lose catch share. The commenter stated that slope rockfish is very important to Kodiak, and the finding of no community impact is inaccurate.

Response: NMFS disagrees that using ADF&G fish ticket information to distinguish location of catch in the GOA slope rockfish fishery greatly understates the impacts on bottom trawling. NMFS also disagrees that the proposed slope rockfish bottom trawl closure areas would eliminate bottom trawl catch of sablefish and/or slope rockfish. Based on the best available stock biomass and species distribution information, as well as catch location data, substantial areas that have supported commercial catches of slope rockfish and sablefish would be unaffected by adoption of the closed areas. Appendix C plots the location of the rockfish and other harvests from Kodiak-based catcher vessels, confirming that these boats have historically fished for rockfish, including slope rockfish, in many areas not affected by the 200 to 1,000 m closure area. Much of the at-risk catch would be recoverable in these unaffected areas, and some diminished deep water bycatch of sablefish may accompany this effort redeployment.

The slope bottom trawl gross ex-vessel revenues represent a fairly small percentage of overall groundfish revenues for these catcher vessels. Several vessels rely relatively more heavily on rockfish, and particularly rockfish harvests affected by the proposed closure, compared to most of the GOA slope rockfish trawl sector. These operators (approximately 10) could be relatively more severely adversely impacted by the EFH measures if they could not mitigate any of their revenue at risk. Historically, directed rockfish revenues have been generated in a number of areas not impacted by the GOA slope bottom trawl EFH measures, and these areas may reasonably be expected to provide some mitigation opportunities through redeployment of effort.

NMFS agrees with the comment regarding the potential shorebased sector catch share losses that may accompany some area closures. If the remaining open areas require significantly longer running time to and from port, catcher vessels that must deliver to shore plants may lose fishing time to catcher-processors that can stay on the grounds throughout the opening. As a result, sector catch shares could be altered, as discussed in Appendix C.

NMFS disagrees that slope rockfish are “very important to Kodiak.” Preliminary analyses pertaining to community dependency showed the status quo value of the directed slope rockfish fishery in the GOA to be approximately \$2.2 million for catcher vessels. Of this amount, about \$1.5 million in ex-vessel gross revenue value accruing to participants in this sector of the slope rockfish fishery was derived from sablefish and Pacific cod bycatch, implying that the rockfish catch is not the major component of the gross earnings in this fishery. Even assuming that all of the sablefish and Pacific cod bycatch revenue is placed at risk, the upper bound total GOA catcher vessel revenue at risk under the slope bottom trawl closures is approximately 74 percent. While this effect is significant for the slope bottom trawl catcher vessel sector, it represents about 4 percent of the \$37 million total ex-vessel value of groundfish delivered to Kodiak annually, and approximately 2 percent of the \$76 million ex-vessel value of all catches delivered to Kodiak shorebased processors (Appendix C, Table 2.3-9).

Appendix C indicates that the GOA slope rockfish closures may place at risk between 0 and 2 percent of the total ex-vessel value of all fish delivered to Kodiak for processing. To the extent that some vessels depend more heavily on the slope rockfish fishery than others, the closures could have detrimental impacts on a subset of the catcher vessel fleet. For the approximately 10 vessels that appear to rely heavily on slope bottom trawling for rockfish, if mitigation opportunities provided in the action (e.g., remaining open areas, exemption for gear switching) do not successfully offset lost catch, the operations may incur substantial economic hardship.

Depending on the success of catcher vessels in recouping at-risk catches, a reduction in rockfish and associated bycatch landings could have some impact for processors, and potentially substantial impacts for the few processors that specialize in rockfish products. However, revenue from rockfish landings and bycatch in this fishery represents a rather minor overall community effect in Kodiak compared with all other catcher vessel landings. Overall, processor activities and impacts from the loss of unmitigated rockfish and associated bycatch landings are not likely to be significant at a community or regional level.

### **Comments on the Practicability Analysis**

Comments: A fishing industry alliance questioned the analysis of the practicability of the alternatives to minimize the effects of fishing on EFH. The commenter felt that such an analysis is unnecessary and inappropriate in the absence of a clear determination that fishing is causing adverse effects that must be minimized under the Magnuson-Stevens Act. The commenter said that the practicability analysis did not effectively balance costs and benefits, included no metric for measuring benefits, and did not have a clear methodology for determining practicability.

Response: NMFS disagrees. Although the EIS finds no indication that Council-managed fishing activities have more than minimal and temporary adverse effects on EFH, the analysis indicates that there are persistent effects of fishing on benthic habitat features off Alaska, and highlights considerable scientific uncertainty regarding the consequences of such habitat changes for the sustained productivity of managed species. Faced with that uncertainty, the Council must choose a preferred alternative. The Council may choose the status quo, or it may choose to be more precautionary by selecting another alternative. The practicability analysis provides information to assist the Council in balancing relative



costs and benefits of the alternatives so the Council can avoid selecting an option that may not be practicable.

The EFH regulations at 50 CFR 600.815(a)(2)(iii) provide considerations for Councils to determine whether it is practicable to minimize an adverse effect from fishing. As stated in Section 4.5.3.3 of the EIS, NMFS has not adopted a preferred methodology as national guidance for conducting the practicability analysis. Due to limitations in the available data, the approach used in the EIS mixes quantitative and qualitative factors to assess relative (rather than absolute) benefits of the alternatives. Readers can compare these relative benefits to the estimated costs of each alternative in terms of revenue at risk, and use that comparison to judge the practicability of the alternatives.

Comments: A number of fishing industry commenters stated that the EIS should reconcile potential effects of the proposed management measures with a demonstrated need for mitigation measures based on an assessment of whether the impacts of fishing are more than minimal and temporary, and a demonstrated benefit of the proposed new measures.

Response: NMFS agrees that the EIS must consider the practicability of options for minimizing the effects of fishing on EFH. In accordance with 50 CFR 600.815(a)(2)(iii), the EIS includes a practicability analysis that considers the nature and extent of the adverse effects of fishing on EFH and the long and short term costs and benefits of potential management measures to EFH, associated fisheries, and the nation.

#### **Other Comments on the Analysis of Alternatives for Minimizing the Effects of Fishing**

Comments: A fishing industry alliance commented that the EIS should not assume that proposed habitat conservation measures necessarily will lead to more robust fisheries. The commenter asserted that the analysis should only infer fishery benefits from habitat conservation if several facts can be documented: a particular habitat performs an essential function for a managed species; fishing is having adverse effects on that habitat; and the adverse effects are more than minimal and temporary.

Response: NMFS agrees that habitat conservation measures must remedy some particular damage or threat to habitat functions before one can expect to see increased productivity or more stable fish stocks that are attributable to the management measures. However, in most cases the available scientific information regarding habitat function is not sufficient to establish such linkages conclusively. The analysis therefore incorporates professional judgment, and in some cases infers benefits that can reasonably be anticipated from the proposed management measures. Importantly, the Magnuson-Stevens Act does not require a definitive link between habitat conservation and resulting increased fish stock productivity before the Council may adopt new measures to protect habitat.

Comments: Several fishing industry commenters recommended reorganizing a portion of the Section 4.3 analysis of the consequences of the alternatives for minimizing the effects of fishing on EFH. They suggested discussing “productivity benefits” separately from “passive use.” They also suggested evaluating effects on passive use under a different heading than “Effects on the Fishing Fleet.” Finally, they suggested including productivity effects in Tables ES-6 and ES-7.

Response: NMFS agrees that clarification is warranted. In the final EIS, effects on passive use values are discussed under a separate heading from effects on the fishing fleet, and the text refers to potential productivity benefits in the context of a possible influence on passive use values. NMFS did not add a new category for productivity effects in Tables ES-6 and ES-7 because those tables already discuss

effects on the target species of groundfish, crabs, scallops, and salmon, including effects on stock biomass, reproduction, feeding, and growth to maturity.

Comments: A fishing industry alliance and some of its supporters recommended providing more justification for the purported benefits of some of the alternatives for habitat complexity, diversity, and ecosystems, or else removing all suggestions that such benefits will accrue from the alternative.

Response: The final EIS includes revisions to provide additional justification where possible. However, NMFS disagrees that qualitative descriptions of anticipated benefits should be removed from the EIS. Under National Standard 2, all conservation and management measures must be based upon the best available information. In some cases, such as those cited by the commenter, qualitative professional judgment is the best available information for analyzing the pros and cons of various factors that must be evaluated to understand the environmental consequences of proposed management measures.

Comments: A fishing industry alliance questioned the expectation in the draft EIS that the proposed measures restricting Gulf of Alaska trawl fisheries will result in net habitat benefits. The commenter stated that in the absence of restrictions, fishing tends to occur in areas with the highest catch per unit effort, so alternatives that would shift effort to new and relatively unfished areas would result in additional fishing-induced disturbance to habitat as compared to the status quo. The commenter stated that shifting fishing effort to areas with lower catch per unit effort is incongruous with the intent of the Magnuson-Stevens Act.

Response: NMFS agrees that effort displacement can result in new effects to habitat in areas that presently are relatively unfished. However, an assessment of net benefits for habitat requires considering the potential impacts that would be avoided as well as the potential new impacts that may occur. The draft EIS finds that Alternatives 3, 5A, and 5B all would result in positive effects for habitat complexity and benthic biodiversity in the Gulf of Alaska because LEI values would be reduced substantially on sensitive hard substrates. Estimated increased effects on adjacent deep shelf habitats from fishing redistribution would be small proportional increases to LEIs that already are small.

Comments: A fishing industry alliance and some of its supporters questioned the expectation in the draft EIS that the proposed measures restricting Aleutian Islands trawl fisheries will result in net habitat benefits. The commenters stated that within the proposed Alternative 5B open areas, fishing occurs in a patchy fashion because fishermen tend to avoid unfishable bottom and return to areas they have towed in the past. The commenters said that within the proposed open areas fishing may shift to new sites, and thus the potential habitat benefits cited in the draft EIS may be overstated in Chapter 4 (although the commenter noted that Appendix C acknowledges this potential for Alternative 5B to push fishing into new areas).

Response: As stated above, NMFS agrees that effort displacement can result in new effects to habitat in areas that presently are relatively unfished. Chapter 4 of the final EIS acknowledges that within the proposed open areas in Alternative 5B, fishing effort is not uniform and could shift to areas that are not fished regularly under current conditions. However, for the same reasons cited by the commenters, NMFS expects that most fishing effort in the open areas will remain where it has historically occurred.

Comment: A fishing industry alliance cited the analysis of the effects on ecosystem diversity for Alternative 2 for minimizing the effects of fishing on EFH. The commenter criticized the analysis for stating that the alternative would have no effect on structural habitat diversity in the Aleutian Islands where most hard corals are found. The commenter noted that reference to the Aleutian Islands is irrelevant because the alternative only addresses fishing in the Gulf of Alaska.

Response: NMFS agrees. Section 4.3.3.6 of the final EIS omits the reference to the Aleutian Islands.

Comment: A federal environmental agency commented that the draft EIS does not provide enough specifics regarding the types of enforcement measures that would be needed to make the proposed actions effective.

Response: Section 4.3 of the EIS discusses the effects of the management alternatives on enforcement programs, including the aspects of each alternative that would facilitate or complicate enforcement. The NMFS Office of Law Enforcement and the U.S. Coast Guard participated in the evaluation of the management alternatives, and would use all available enforcement assets to enforce the Council's preferred alternative, including a variety of ships, aircraft, and vessel monitoring systems. Enforcement of new measures to protect EFH would occur in tandem with enforcement of other fishery management regulations throughout the EEZ, using the same techniques and resources that are used currently.

Comment: A fishing vessel owner and a fishing industry alliance asked for the EIS to discuss observer coverage needed to determine whether a vessel is fishing in the proposed closed areas, and stated that the EIS should discuss the costs, practicability, and safety issues associated with "no entry" designations.

Response: Observer programs are conducted by NMFS for the groundfish fishery and by ADF&G for the crab and scallop fisheries. Appendix C explains that the fishing industry contracts directly with authorized observers and pays for their services based upon observer coverage levels specified in regulation. Appendix C acknowledges that some of the alternatives for minimizing the effects of fishing on EFH would increase fishing and running time, so the cost of providing observer coverage would increase proportionately. None of the alternatives include "no entry" designations (akin to the existing "no transit zones" to protect Steller sea lions in some areas), so the EIS does not discuss such measures.

Comments: A federal minerals management agency noted that the draft EIS does not use explicit significance thresholds and said that the analysis should indicate the magnitude of potential environmental consequences on different resources. The commenter also thought the EIS should clarify that the no action alternatives each have effects and the magnitude of those effects are presented in relation to the effects of the other alternatives.

Response: NMFS elected not to use significance thresholds to evaluate each effect upon a resource. Instead, the EIS identifies whether each effect is positive, neutral, negative, or unknown and provides supporting text to describe the magnitude and intensity of anticipated effects. The text also explains that the no action alternatives have effects. As discussed in Section 4.0, the no action alternatives for identifying EFH and establishing an approach to identify HAPCs differ from the status quo because the Council and NMFS have already identified EFH and HAPCs, and thus choosing no action would mean rescinding the existing designations. In the alternatives for minimizing the effect of fishing on EFH, no action and status quo are treated synonymously.

Comments: A fishing industry alliance and some of its supporters criticized the ratings of effects (positive, neutral, negative, or unknown) for the alternatives to minimize the adverse effects of fishing on EFH, as well as the supporting rationale for those ratings. The commenters stated that the summary tables did not provide a clear basis for comparisons between alternatives, and thought many more effects should have been rated "unknown."

Response: NMFS agrees that the summary tables alone do not provide all of the information needed to compare alternatives. As discussed in the draft EIS, the analysis was hampered by incomplete information, so many of the different categories of potential effects of the alternatives were evaluated

qualitatively, with supporting rationales to help explain the context and intensity of the anticipated effects. Where NMFS had sufficient information to determine that the probable effects would be positive or negative, the draft EIS rated the particular effects accordingly.

Comments: A federal minerals management agency suggested that the analysis should assess the effects of Council managed fisheries on other biological resources such as sharks and skates, and should address the effects of invasive species introductions on EFH. The commenter also said the EIS should analyze the effects of the proposed actions on sea turtles.

Response: An analysis of the effects of Council managed fisheries on sharks and skates is beyond the scope of this EIS, as is an analysis of the effects of invasive species introductions on EFH. Sea turtles occur in Alaska waters very infrequently. Chapter 3 of the final EIS acknowledges that sea turtle species occasionally visit Alaska waters, but NMFS does not expect any of the alternatives to affect them.

Comments: A conservation group questioned the conclusion that Alternative 5B for minimizing the effects of fishing on EFH may result in increased interactions with Steller sea lions and whales, and asked NMFS to reevaluate that finding.

Response: NMFS reevaluated the potential effects of Alternative 5B for Steller sea lions and whales, and the findings in the draft EIS remain valid. The principal concern for these marine mammals is displacement of Pacific cod and Atka mackerel fishing activity out of the proposed Aleutian Islands closed areas, presumably concentrating this activity in the remaining open areas where there may be increased potential for conflicts between fishing activities and ESA-listed marine mammals. The potential for adverse effects exists with or without the proposed TAC reductions.

The western stock of Steller sea lions has declined considerably, and is listed as endangered under the ESA. The “fishable” areas that would remain open under any of the Alternative 5B management options are fairly small, especially when combined with other existing closed areas. Fisheries for Pacific cod and Atka mackerel would be concentrated spatially into remaining open areas, including areas near important sea lion habitats. Furthermore, with TAC reductions under two of the Alternative 5B management options, there could be a “race for fish” during open seasons, with a fixed numbers of vessels competing for a smaller TAC, concentrating fishing activity temporally.

Concentrated fishing activity during winter months when sea lions forage further from shore (outside existing sea lion closed areas) could increase the potential for conflicts from competition for prey, disturbance, or entanglement or other injury. In the past, rookeries in the western Aleutian Islands have experienced greater declines than others; fishery encounters with these groups of sea lions would be of additional concern. A similar concern exists for ESA-listed whales that may forage in the Aleutian Islands region or move through migratory corridors where more concentrated fishing activity may occur.

NMFS will complete a consultation under Section 7 of the ESA if the Council selects Alternative 5B as its preferred alternative. However, NMFS does not expect the adverse effects for sea lions and whales to be substantial because the redistribution of fishing effort under Alternative 5B would be small under any of the three management options. Alternative 5B was designed to allow fishing to continue in areas with the highest historical catch rates, and to preclude fishing in new areas.

Comments: A federal minerals management agency asked NMFS to clarify that areas subject to bottom trawling closures would not have any direct implications to oil and gas related activities.

Response: NMFS agrees. However, if areas are closed to fishing to protect sensitive habitat features, NMFS would encourage agencies with appropriate jurisdiction to consider whether restrictions may also be warranted to protect the same habitat features from disturbance by non-fishing activities.

### **Comments on the Cumulative Effects Analysis**

Comments: Several conservation groups criticized the cumulative effects analysis and stated that it indicated an adverse effect on habitat and ecosystems only if the effect of an alternative would be additive to an existing adverse trend or cause an adverse trend. The commenters said this approach misleads the public into thinking impacts are not significant if they are already occurring.

Response: NMFS disagrees. Section 4.4 of the EIS notes that active foreign and domestic trawl fisheries over time may have had negative effects on habitat, and Appendix B includes a detailed evaluation of the effects of fishing activities on EFH. NMFS prepared the EIS precisely because existing fishery management as modified by the proposed actions could have significant effects on the environment.

### **Comments in Favor of Interagency EFH Consultations Regarding Non-fishing Activities**

Comments: Some commenters cited the effects of non-fishing activities on EFH. The commenters stated that non-fishing threats to EFH should be considered thoroughly, and supported the Magnuson-Stevens Act requirements for interagency consultations to minimize adverse effects to EFH.

Response: NMFS agrees that non-fishing activities should be designed to avoid or minimize adverse effects to EFH. Such activities are regulated under a variety of federal and state laws to reduce potential environmental impacts, including impacts to fish habitat. Interagency EFH consultations ensure that environmental reviews specifically address potential effects to the habitats that are necessary to managed species for spawning, breeding, feeding, and growth to maturity. Appendix G includes a comprehensive review of non-fishing activities that may adversely affect EFH.

Comments: Two commenters stated that due to recent legal and policy changes within the State of Alaska, the State is no longer capable of protecting EFH in inland waters. The commenters said NMFS clearly has the authority to do so because anadromous fish affect commerce throughout the nation. Another commenter stated that adverse impacts still occur even when other regulations are followed and that it is not unusual for adverse effects to be overlooked or discounted.

Response: Many species targeted by federal fisheries spend part of their life cycle in state waters, and EFH for these species (e.g., salmon) may be affected by various human activities. NMFS strives to work with all entities, including state agencies, to provide effective management of living marine resources that cross jurisdictional boundaries.

The Magnuson-Stevens Act requires Councils to describe and identify EFH for all life stages of managed species, with no limitations placed on the geographic location of EFH. Therefore, EFH may be identified in state and/or federal waters depending on the biological requirements of the species. The Magnuson-Stevens Act also requires NMFS to provide EFH Conservation Recommendations to state and federal agencies regarding actions that would adversely affect EFH, including actions in state waters. NMFS provides technical advice to regulatory agencies to avoid or minimize effects to EFH, but NMFS's EFH Conservation Recommendations are non-binding.

## **Comments on the Coordination, Consultation, and Recommendation Procedures**

Comments: Several commenters were concerned that the EFH consultation process duplicates regulatory efforts and adds unnecessary layers, thereby increasing costs, creating permit delays, and resulting in lost revenue. The commenters stated that NMFS does not have responsibility for protecting salmon or other fish habitat within Alaskan waters.

Response: NMFS agrees that existing federal statutes such as the Fish and Wildlife Coordination Act (FWCA), Endangered Species Act (ESA), and National Environmental Policy Act (NEPA) require consultation or coordination with NMFS and other federal agencies, and the need for federal agencies to evaluate the effects of their actions on fish and fish habitat is not a new requirement imposed by the Magnuson-Stevens Act. However, Congress indicated through the EFH provisions of the Magnuson-Stevens Act that existing environmental reviews are not adequate for the conservation and management of fishery resources of the United States. Direct and indirect habitat losses have been and continue to be a threat to the long-term sustainability of many fisheries. The EFH provisions enable NMFS to work cooperatively with other agencies to avoid and/or minimize adverse effects to EFH, thereby promoting the conservation of living marine resources. In addition, the EFH regulations for the consultation process (50 CFR 600.920) encourage NMFS and other agencies to use existing environmental procedures to fulfill the EFH consultation requirements, minimizing the possibility of increased costs or permit delays.

Comments: A number of commenters said that the EFH consultation process should complement rather than duplicate the existing regulatory framework for other agencies to protect fish habitat in Alaska's coastal and marine waters, and that EFH consultation should go no further than monitoring compliance with existing laws and regulations. One commenter said that consultation under the Magnuson-Stevens Act should be restricted to fishing related activities.

Response: NMFS agrees that other laws also have environmental review requirements; however, no other federal mandate specifically evaluates potential adverse effects on habitats for federally managed fish species. Section 2(b)(7) of the Magnuson-Stevens Act states that one of Congress' purposes was to "promote the protection of essential fish habitat in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat." Therefore, an important purpose of EFH consultations is to provide information to action agencies to ensure consideration of potential impacts to EFH. The information provided during EFH consultation complements the information provided through other required reviews and consultations.

Comment: A resource development interest group commented that the consultation process took NMFS's focus away from EFH conservation efforts in the EEZ and duplicates ESA requirements for listed fish populations.

Response: NMFS disagrees. The EFH consultation process strengthens NMFS's ability to reduce and mitigate degradation and loss of habitat that may result in subsequent impacts to populations of fish. Maintaining the health and productivity of managed species enhances current and future opportunities for the sustainable use of these resources, as well as the health and biodiversity of their ecosystems. No species managed by the Council are listed under the ESA. By promoting the conservation of habitat via the EFH consultation process, NMFS hopes to avoid the future need to list fish species under the ESA.

Comment: One commenter was unclear as to whether federally funded programs that are administered or delegated to state authorities were subject to consultation, and if so, when that consultation occurs.

Response: The EFH regulations at 50 CFR 600.920(a)(1) require consultation on federal programs delegated to non-federal entities at the time of delegation for those programs that result in activities that may adversely affect EFH. For programs that were delegated prior to the approval of EFH designations by the Secretary, EFH consultation is required when the delegation is reviewed, renewed, or revised.

Comments: Several comments questioned NMFS's ability to keep up with the additional workload caused by EFH consultations, and stated that EFH consultations have resulted in absurd recommendations including monitoring programs and restrictions on dredging operations that had no scientific basis.

Response: The EFH regulations include numerous provisions to make consultations efficient and effective, such as the use of existing environmental review procedures, General Concurrences, programmatic consultations, and options for using compressed schedules for abbreviated or expanded consultation. NMFS designed these approaches for EFH consultation to implement the EFH provisions in an efficient manner and minimize additional workload. NMFS Alaska Region has taken advantage of these mechanisms and strives to provide EFH Conservation Recommendations to action agencies within the normal public or agency comment period.

NMFS uses the best scientific information available to support its EFH conservation recommendations. In areas where site specific information is not available, monitoring may be appropriate to identify ways to avoid, minimize, or offset adverse effects on EFH. Also, since EFH conservation recommendations are non-binding, they do not impose restrictions on proposed actions, and the agency responsible for the action chooses whether to require measures such as permit conditions or monitoring.

Comment: One commenter stated that agencies should not be required to reply in writing to NMFS's conservation recommendations as a result of the consultation process because of increased cost and permitting delays.

Response: Section 305(b)(4)(B) of the Magnuson-Stevens Act requires federal agencies to provide a detailed response in writing within 30 days after receiving EFH conservation recommendations from NMFS. NMFS has no authority to alter this statutory requirement, and is unaware of any resulting increased costs or permitting delays for applicants.

Comments: Several commenters noted that although compensatory mitigation is referred to in several sections of Appendix G, it is not defined or explained, and stated that these references should be clarified to explain that compensatory mitigation is that required under Section 404 [of the Clean Water Act]. The commenters said that compensatory mitigation should not be recommended for a minor loss of fish habitat in an area that is not habitat limited.

Response: NMFS agrees that Appendix G should clarify the authority for requiring compensatory mitigation, and has revised the text accordingly. Section 404 of the Clean Water Act requires developers to go through a sequencing process prior to the Corps of Engineers issuing a permit for the discharge of dredged or fill material into waters or wetlands. If impacts cannot be avoided or minimized, compensatory mitigation provides a way to offset unavoidable habitat loss.

Comment: One commenter suggested developing a collaborative working relationship between NMFS and the Alaska Board of Forestry, recognizing that the Alaska Forest Resources and Practices Act is the standard for compliance with federal coastal zone management and Clean Water Act requirements in Alaska.

Response: NMFS agrees, and will work with the Board of Forestry if NMFS identifies EFH concerns with any specific state managed forest practices.

### **General Comments on the Description of Non-fishing Effects in Appendix G**

Comments: Commenters affiliated with non-fishing industries stated that NMFS exceeded its authority and area of expertise in describing potential impacts from non-fishing activities, and as a result the ensuing conservation recommendations are too restrictive or unnecessary and might conflict with recommendations from other agencies. Many of these commenters said that Appendix G should include a list of all state and federal habitat regulations, permitting requirements, best management practices, standards, procedures, and conservation recommendations that pertain to each of the non-fishing activities described therein. The commenters said that these existing measures provide sufficient oversight and therefore there is little benefit in NMFS identifying conservation recommendations for non-fishing activities. Two commenters encouraged NMFS and the Council to consider additional public review of Appendix G after language is added to more accurately portray current processes, agency oversight, and regulatory requirements used by industry.

Response: NMFS disagrees. Section 303(a)(7) of the Magnuson-Stevens Act requires FMPs to identify measures for actions other than fishing to promote the conservation and enhancement of EFH. NMFS has extensive experience reviewing non-fishing activities and recommending conservation measures. NMFS has commented on thousands of potential non-fishing impacts to fish habitat under the FWCA, NEPA, and other statutes since the agency was established in 1970.

Appendix G acknowledges that non-fishing activities are subject to a variety of regulations and restrictions under federal, state, and local laws designed to limit environmental impacts and that many of these existing requirements help to avoid or minimize adverse effects to aquatic habitats, including EFH. Listing all applicable laws and management practices in Appendix G is unnecessary. NMFS recognizes that the conservation recommendations in Appendix G are rather general and may overlap with certain existing standards for specific development activities. Nevertheless, the recommendations highlight practices that can help to avoid and minimize adverse effects and promote the conservation and enhancement of EFH.

During EFH consultations between NMFS and other agencies, NMFS strives to provide reasonable and scientifically based recommendations that account for restrictions imposed under various state and federal laws by agencies with appropriate regulatory jurisdiction. NMFS will not recommend that state or federal agencies take actions beyond their statutory authority, and NMFS's EFH conservation recommendations are not binding.

In response to concerns about the scope and purpose of Appendix G, NMFS revised the text to clarify that coordination and consultation required by Section 305(b) of the Magnuson-Stevens Act does not supersede the regulations, rights, interests, or jurisdictions of other federal or state agencies. Interested parties may comment on the revisions in response to the Federal Register notice of availability for the final EIS.

Comments: Two commenters expressed concern about the inclusion in Appendix G of tables from the 1999 EFH Environmental Assessment (EA) for comparative purposes. One commenter said that the word "threat" used in those tables to describe the potential effects from non-fishing activities should not be repeated in the EFH EIS. Another commenter thought that Table 2 could be used out of context and should be revised to reflect existing habitat protections.



Response: NMFS agrees that including the tables from the 1999 EA could be confusing, and omitted those tables from the final EIS.

Comment: One commenter stated that Appendix G conveys the erroneously broad notion that “EFH is the geographic area where the species occurs at any time during its life” (draft EIS Appendix G, Section 1, G-2) and that the concept of “essential” or “necessary” habitat is lacking.

Response: NMFS deleted the language cited by the commenter and revised the text to clarify that EFH is defined in the Magnuson-Stevens Act as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”

Comment: Numerous commenters suggested that Appendix G should be revised because it does not reflect the current science and references and is not focused on Alaska specific impacts.

Response: NMFS agrees that Appendix G should use the best scientific information available to identify conservation measures that can be taken to avoid, minimize, or offset adverse effects to EFH from non-fishing activities. NMFS revised Appendix G as appropriate to focus on Alaska specific impacts.

Comment: One commenter stated that Appendix G could be greatly reduced in scope and otherwise simplified if NMFS adopts Alternative 6 for describing and identifying EFH, thereby limiting EFH designation to the EEZ.

Response: NMFS agrees, insofar as Alternative 6 would eliminate EFH designations in freshwater areas, estuaries, or nearshore marine waters under jurisdiction of the State of Alaska. However, as discussed in Section 4.5.1.3, Alternative 6 is not consistent with the Magnuson-Stevens Act because it fails to identify nearshore and freshwater habitats that are necessary to managed species of fish for spawning, breeding, feeding, or growth to maturity. Even if NMFS could forego EFH designations in those areas, NMFS would continue to have authority under the FWCA, NEPA, and other laws to comment on non-fishing activities that impact living marine resources and their habitats.

## **Comments on Specific Sections of Appendix G**

### Silviculture/Timber Harvest

Comment: Several commenters asserted that NMFS did not consider that the regulations, standards, and best management practices (BMPs) of the Alaska Forest Resources and Practices Act are fully protective of fish habitat from the hazards associated with timber harvest. The commenters said that the conservation recommendations for timber harvest activities duplicate the efforts of other state and federal resource management agencies and are redundant and harmful to timber harvesting businesses.

Response: Appendix G cites the Alaska Forest Resources and Practices Act BMPs as silviculture/timber harvest conservation recommendations, along with the BMPs developed for the Tongass National Forest Land Management Plan and for the Chugach National Forest Land Management Plan. The silviculture industry currently operates under these standards and BMPs and would not be harmed by having those recommendations included in Appendix G. NMFS has not developed additional BMPs and participated in developing the aforementioned BMPs for timber harvest. The list of timber harvest conservation recommendations paraphrases the content of these BMPs and is not duplicative.

Comment: One commenter expressed concern that the conservation recommendations for timber harvest would not receive critical review by the Council because they are contained in an appendix to the EIS.

Response: NMFS disagrees. The Council is aware of the scope of Appendix G and has provided specific guidance to staff regarding its content. Moreover, Appendix G is subject to public review and comment along with the rest of the EIS.

Comment: One commenter said that Appendix G must clearly state that its conservation recommendations are advisory only and that projects cannot be denied because they do not comport with one or more recommended conservation measures.

Response: NMFS agrees. The advisory nature of the recommendations is stated clearly in Appendix G. NMFS has no authority under the Magnuson-Stevens Act to deny or impose conditions upon projects that do not incorporate conservation recommendations.

Comment: Several silviculture industry commenters said Appendix G should clarify that potential impacts to EFH from forestry would not occur if Alaska Forest Resources and Practices Act guidelines are followed, and that violation rates are rare (average compliance rate >90 percent). The commenters said NMFS should acknowledge that the State of Alaska has been successful in protecting fish habitat through implementation of these guidelines and associated BMPs. A conservation group commented that the impacts of logging on private lands, including construction and maintenance of logging roads, are minimally regulated and have large impacts on EFH. The commenter stated that the Alaska Forest Resources and Practices Act regulations are rarely enforced with minimal consequences for violators, and encouraged NMFS to monitor timber harvest and road building in Alaska and play a role in mitigating impacts.

Response: Appendix G acknowledges that recent revisions of both state and federal timber harvest regulations and BMPs have resulted in increased protection of EFH on state, federal, and private timber lands. However, Appendix G also notes that if these management practices are not fully implemented or effective, adverse effects to EFH are likely. NMFS revised Appendix G to indicate that BMPs are implemented at a rate of about 90 percent and to reference current data on their effectiveness at protecting fish habitat. NMFS is involved in mitigating potential impacts through the review of federally funded or permitted projects that may adversely effect EFH.

Comment: Many resource developers and foresters commented that Appendix G combines timber harvest and deforestation when in fact these are two different actions. Deforestation is a permanent land use conversion, whereas timber production areas on state and private lands must be fully restocked within 7 years of harvest and lands are managed for the continual production of timber.

Response: NMFS agrees that these two land development actions should be addressed separately and revised Appendix G accordingly.

Comment: One commenter disagreed that logging impairs fish passage through inadequate design, construction, and/or maintenance of stream crossings.

Response: Appendix G states that while current standards and BMPs for road crossings including culverts are intended to avoid impairment of fish passage, many older stream crossings are not providing fish passage and require repair. Even modern crossing structures can fail, with adverse effects to EFH, although this occurs with much less frequency than in the past.

Comment: Many resource development agencies and corporations commented that conservation measure #3 is specific to California where numerous salmon stocks are listed under the Endangered Species Act

as threatened or endangered, and thus this recommendation does not apply to Alaska and should be replaced with a reference more appropriate for Alaska.

Response: NMFS disagrees. Recommendation #3 is a clearly cited reference to the Tongass National Forest Land Management Plan's recommendation to avoid timber harvest adjacent to wetlands. This recommendation is specific to the Tongass National Forest in southeast Alaska and is a recommendation that would protect EFH in many instances.

Comment: A resource development group commented that Appendix G inaccurately states that timber harvest can cause increased stream temperatures and low oxygen levels resulting in significant mortalities to pink and chum salmon.

Response: NMFS clarified Appendix G to explain that significant pink salmon prespawner mortalities have been documented in southeast Alaska streams when high escapements and low flows combined, resulted in low dissolved oxygen levels. This phenomenon has occurred in logged and unlogged streams, and generally is the result of streams lacking protective riparian buffers.

Comment: One commenter offered the correction that timber harvest in Alaska does not reduce the permeability of soils and increase the area of impervious surfaces because the most prevalent methods of timber harvest, cable yarding and helicopter logging, minimize the compaction of soils.

Response: NMFS agrees and modified Appendix G to describe the minimal effects of cable yarding and helicopter logging on soil compaction and permeability.

### Riverine Mining

Comments: Several commenters asserted that NMFS is not an authority on mining and the conservation recommendations are redundant, unrealistic, and overly restrictive. In addition, the commenters expressed concern that the recommendation to avoid mining in EFH is not reasonable since NMFS has indicated that most waters and streams in Alaska are EFH.

Response: NMFS agrees that it is not an authority on mining. The recommendations contained in Appendix G include actions that can contribute to the conservation, enhancement, and proper functioning of EFH. They should be viewed as options to avoid, minimize, or compensate for adverse impacts and promote the conservation and enhancement of EFH. Ideally, non-water-dependent actions should not be located in EFH if such actions may have adverse impacts on EFH. Activities that may result in significant adverse effects on EFH should be avoided where less environmentally harmful alternatives are available. NMFS recognizes that impacts to EFH from specific projects may be unavoidable and the impacts of these actions should be minimized to the extent practicable.

### Dredging

Comments: Several commenters recommended that Appendix G differentiate between maintenance dredging and dredging in locations that are undisturbed. The commenters recommended that there should be no mitigation or other onerous requirements associated with maintenance dredging or additional dredging in previously disturbed areas.

Response: NMFS agrees that maintenance dredging may affect EFH to a lesser extent than dredging in an area previously undisturbed. However, in some cases routine or maintenance dredging has the potential to impact areas that have been previously undisturbed (e.g., new disposal sites for dredged material) and

site specific EFH conservation recommendations would be provided to the action agency through the EFH consultation process. Such recommendations are non-binding, and any restrictions are applied at the discretion of the appropriate action agency.

#### Vessel Operations/Transportation/Navigation

Comment: A transportation industry commenter expressed concern regarding an Appendix G conservation recommendation that calls for avoiding disturbance to eelgrass beds, mudflats, and wetlands as part of project design, and providing suitable compensatory mitigation in situations where such impacts are unavoidable (with the approval of appropriate regulatory agencies). The commenter stated that this would affect potential development or expansion in areas that contain this type of habitat.

Response: The recommendations contained in Appendix G include actions that can contribute to the conservation, enhancement, and proper functioning of EFH. They should be viewed as options to avoid, minimize, or compensate for adverse impacts and promote the conservation and enhancement of EFH. Ideally, non-water-dependent actions should not be located in EFH if such actions may have adverse impacts on EFH. Activities that may result in significant adverse effects on EFH should be avoided where less environmentally harmful alternatives are available. NMFS recognizes that impacts to EFH from specific projects may be unavoidable and the impacts of these actions should be minimized to the extent practicable.

#### Pile Installation and Removal

Comment: Several commenters stated that the Appendix G conservation recommendations for pile driving and removal are impractical, and that some of the recommendations may harm habitat.

Response: NMFS reviewed the recommendations and deleted two that may have been impractical or unnecessary (one involving the placement of clean sand around the base of old pilings before removal, and one involving the placement of clean fill in holes left following the removal of piles). NMFS also modified the recommendation to drive broken pile stubs below the substrate surface to prevent release of contaminants from treated wood into the water column. The revision clarifies that driving pile stubs below the surface should be done to the extent practicable, in response to a comment that doing so is not always feasible.

Comment: Several commenters were concerned that Appendix G recommendations regarding prohibition of the use of creosote treated timber in the nearshore marine environment are inconsistent with U.S. Army Corps of Engineers Nationwide Permit Regional Condition B, which prohibits the use of creosote treated timbers in freshwater.

Response: Substantial scientific information indicates that creosote and its component pesticides, primarily polycyclic aromatic hydrocarbons, may harm EFH and federally managed fish species. NMFS has a responsibility under the Magnuson-Stevens Act to recommend measures to conserve EFH using the best available science. NMFS is coordinating with the Corps of Engineers and other agencies to investigate options for revising the regional permit conditions regarding creosote.

#### Log Transfer Facilities/In-water Log Storage

Comment: Several comments supported Appendix G's direct reference to the siting and operational guidelines for log transfer facilities (LTFs) developed by the Alaska Timber Task Force and stated that these guidelines should be cited in the recommended conservation measures.

Response: NMFS agrees. The siting and operational guidelines for LTFs are cited as conservation recommendation #7 of section 4.9.

Comment: A resource development corporation commented that the discussion of commercial forestry and LTFs in Appendix G dwells on worst-case scenarios from old studies that predate current BMPs and ignore the effectiveness of modern BMPs. The commenter stated that the conservation recommendations are vaguely worded and either already required by current BMPs, unsupported by any evidence, or unrelated to the protection of managed fish species.

Response: Many logging activities occur coincident with sites that were harvested or supported LTFs that were developed under old forest management regulations and BMPs. Appendix G acknowledges the existence and effectiveness of modern BMPs for timber harvest activities and LTF siting and operations. NMFS clarified this point for the final EIS.

Comment: One commenter suggested that the release of hazardous materials such as oil from heavy machinery be added to the list of potential adverse effects from LTFs.

Response: While release of oil from heavy machinery is unlikely if BMPs are followed, NMFS agrees that there is a potential for releases of such hazardous materials and modified Appendix G to note this possibility.

#### Point Source Discharges

Comment: One commenter asked NMFS to eliminate the Appendix G recommendation to avoid siting pipelines and treatment facilities in wetlands and streams. The commenter said that in numerous cases the U.S. Fish and Wildlife Service has determined that it is more important to minimize upland habitat impacts than wetland impacts.

Response: NMFS disagrees that the recommendation should be deleted. Pipelines and treatment facilities are not water-dependent with regard to positioning, and avoiding the placement of pipelines within streambeds and wetlands can reduce inadvertent infiltration into conveyance systems and retain natural hydrology of streams and wetlands. If NMFS's recommendations for a specific project differ from those of another resource agency, the applicable regulatory agency would decide which measures best serve the public interest.

#### Oil and Gas Exploration, Development, and Production

Comment: A federal agency recommended adding information to Appendix G regarding oil spill risk, its likelihood, and how to balance EFH conservation recommendations with effects on economics or operational realities of oil and gas projects. Another commenter took issue with specific language stating that offshore oil and gas development inevitably results in oil entering the environment.

Response: Information regarding the risk of an oil spill is project specific. Balancing EFH conservation recommendations against the economics or operational realities of oil and gas projects is the purview of the action agency; NMFS's role is to provide recommendations for minimizing effects to EFH using the best available scientific information. The language regarding oil entering the environment was not meant to imply that every oil and gas facility will experience an oil spill, but rather that oil development in a given geographic area typically results in some amount of oil, be it large or small, entering the environment. NMFS revised Appendix G to clarify this point.

Comment: A federal agency requested that NMFS insert a reference for the statement that “petroleum exploration/development/production occurs...usually over soft-bottom substrates, although hard-bottom habitats may be present in the general vicinity.”

Response: NMFS deleted the statement cited by the commenter.

Comment: A federal agency and other commenters recommended that NMFS locate more relevant scientific studies to draw conclusions on the effects of noise and other impacts of oil and gas exploration, development, and production. These commenters also were concerned that NMFS failed to recognize the existing federal and state oversight of this industry.

Response: NMFS revised Appendix G to include more relevant scientific studies and to explain more clearly that non-fishing activities are subject to a variety of regulations that limit environmental impacts.

### Marine Mining

Comment: A mining industry commenter stated that the conservation recommendation to avoid mining in waters containing EFH implies that mining should not be done at all.

Response: NMFS disagrees. Ideally, non-water-dependent actions should not be located in EFH if such actions may have adverse impacts to EFH. Activities that may result in significant adverse effects on EFH should be avoided where less environmentally harmful alternatives are available. NMFS also recognizes that impacts to EFH from specific projects may be unavoidable and the impacts of these actions should be minimized to the extent practicable.

### **Comments Regarding Compliance with Applicable Laws**

Comment: Many commenters expressed an opinion about whether the EIS meets the requirements of the Magnuson-Stevens Act and the joint stipulation and court order that required development of the EIS. In general, fishing industry commenters thought the EIS met the applicable requirements, and conservation group commenters thought it did not. Reasons cited by commenters for alleged noncompliance included failure to employ the proper legal standards, failure to consider all relevant information, and reaching arbitrary conclusions. Commenters said that the analysis focused on the effects of fishing on fish rather than the effects on habitat, and used too high a standard for evidence that fishing adversely affects EFH. A non-fishing industry association alleged that the broad EFH designations violate the Magnuson-Stevens Act and the analysis of non-fishing actions that may adversely affect EFH fails to incorporate the best available scientific information.

Response: NMFS finds that the final EIS provides all of the information required by Section 303(a)(7) of the Magnuson-Stevens Act and 50 CFR 600.815(a) and meets the requirements of the joint stipulation and order approved by the U.S. District Court for the District of Columbia. The final EIS addresses the applicable legal standards, uses the best available scientific information, and explains the basis for its conclusions. Additional information supporting these conclusions is documented in the administrative record. In response to public comments on the draft EIS and an independent peer review, the final EIS includes additional supporting information and analyses.

The analysis of the effects of fishing on EFH contains all of the information required by 50 CFR 600.815(a)(2). The analysis considers the effects of fishing on habitat features within EFH, as well as the consequences of habitat alteration for managed species of fish. The analysis of effects to managed species provides necessary information to understand the degree to which Council-managed fishing

reduces the quality and/or quantity of EFH, and the degree to which fishing may reduce the capacity of EFH to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. The EFH regulations at 50 CFR 600.815(a)(2)(ii) provide the applicable threshold for Council action: "Councils must act to prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable, if there is evidence that a fishing activity adversely affects EFH in a manner that is more than minimal and not temporary in nature." The EIS examines the available information and finds no indication that fishing reduces the capacity of EFH to support managed species. Despite this conclusion, the EIS identifies a variety of practicable management measures that could be taken to provide additional habitat protection. As noted in the preamble to the final EFH regulations, "[i]t is not appropriate to require definitive proof of a link between fishing impacts to EFH and reduced stock productivity before Councils can take action to minimize adverse fishing impacts to EFH to the extent practicable" (67 FR 2354; January 17, 2002). Thus, even in the absence of clear linkages between habitat and stock productivity, the Council has the authority to take additional precautionary action to reduce potential adverse effects to EFH, if warranted. Based on the information and analysis in the final EIS, the Council chose to support Alternative 5C for minimizing the effects of fishing on EFH. Alternative 5C includes extensive new bottom trawl closures designed to protect relatively undisturbed habitats in the Aleutian Islands; new closures to all bottom contact fishing in six areas of the Aleutian Islands to protect coral garden habitats, which are especially diverse and vulnerable; and new closures to bottom trawling in ten areas on the Gulf of Alaska slope to reduce the effects of fishing on rocky areas that may support coral. The Council determined that adopting these measures is an appropriate and precautionary step in light of the scientific uncertainties about the effects of habitat disturbance for managed species. Moreover, the Council determined that Alternative 5C is a practicable option to enhance protection for the most vulnerable habitats while minimizing costs for the fishing industry.

The description and identification of EFH contains all of the information required by 50 CFR 600.815(a)(1). The Council's preferred alternative incorporates the best available information regarding the distribution and relative abundance of managed species, and employs a new analytical methodology that reduces the size of EFH descriptions for many species. The analysis of non-fishing actions that may adversely affect EFH (Appendix G) has been revised in response to public comments and incorporates the best available scientific information.

Comments: Several conservation groups criticized NMFS for delegating the agency's public process to an industry-dominated process. The commenters also asserted that selecting and finalizing alternatives by the vote of a non-federal body (the Council) undermines the fundamental requirements of the National Environmental Policy Act (NEPA).

Response: NMFS disagrees with the criticism. Section 302 of the Magnuson-Stevens Act requires Councils to prepare fishery management plans and amendments as necessary and submit those documents to the Secretary. Under Section 304 of the Magnuson-Stevens Act, the Secretary may approve, disapprove, or partially approve such plans and amendments. The Secretary, acting through NMFS, advises the Council regarding technical matters as well as compliance with the Magnuson-Stevens Act and other applicable laws. The Council process affords ample opportunity for public review and comment on proposed actions. During Secretarial review of Council actions, NMFS provides another opportunity for public comment before deciding whether to approve, disapprove, or partially approve the action.

The Council's role in the development of the EIS (or any other NEPA analysis for Council actions) is to define the purpose and need for action and the range of alternatives, and to assist with the analysis as appropriate. Depending on the action, the Council either takes a lead role or a supporting role in developing a NEPA analysis that complies with all applicable requirements and can be adopted by the

Secretary to support NMFS's decision to approve, partially approve, or disapprove the action recommended by the Council. NMFS disagrees that having the Council develop the alternatives violates NEPA.

Comments: A resource development group asserted that the EFH designations proposed in the draft EIS are excessively broad and render meaningless the statutory definition of EFH in violation of the Magnuson-Stevens Act, and are arbitrary and capricious under the Administrative Procedures Act. The commenter also said that amendment of an FMP to designate EFH is a rule within the meaning of the Administrative Procedures Act and should be treated as such.

Response: NMFS disagrees. The EIS includes a wide range of alternatives for describing and identifying EFH, based upon the best available scientific information regarding the habitat requirements, distribution, and relative abundance of species managed by the Council. As noted in the EIS, three of the alternatives are not consistent with the Magnuson-Stevens Act, but the other three alternatives are, and the EIS provides the rationale and scientific basis for each alternative. Amendment of an FMP to designate EFH is not a rule within the meaning of the Administrative Procedures Act and does not require codification in the Code of Federal Regulations.

Comments: A number of commenters addressed the adequacy of the draft EIS under NEPA. Some commenters affiliated with the fishing industry supported the range of alternatives and said the draft EIS complies with NEPA. Commenters from several conservation groups said the alternatives for minimizing the effects of fishing on EFH are redundant and unresponsive to the EFH and NEPA mandates. The commenters said the draft EIS does not comply with NEPA because it does not consider all relevant information; fails to consider fully and fairly the direct, indirect, and cumulative effects of fishing on the environment; and fails to explain these impacts to the public in an understandable fashion. The same groups asserted that the draft EIS violates NEPA because NMFS failed to solicit the views of those who live in small communities throughout Alaska, and did not hold public meetings in communities that are affected by ecological harm from industrial fishing practices. The commenters said NMFS violated NEPA by permitting status quo fishing practices that have adverse effects on EFH to continue during development of the EIS, and failing to comply with NEPA's procedures for incomplete information. Other commenters said the draft EIS does not take a "hard look" as required by NEPA at effects to slow growing species.

Response: NMFS disagrees with the criticisms and finds that the EIS complies fully with NEPA. The EIS includes a wide range of alternatives to address the stated purpose and need for all three actions considered, and uses the best available scientific information to evaluate the direct, indirect, and cumulative environmental consequences of the alternatives. The alternatives for minimizing the effects of fishing on EFH are distinctly different from one another, although some of them have common elements because each alternative adds successively more restrictive management measures. The methods used to display the analysis are similar to those used in many other NEPA analyses, and the final EIS incorporates a number of revisions to clarify items that various commenters thought were unclear in the draft EIS. NMFS sought comments from all interested parties by publishing notices in the Federal Register, holding numerous public meetings, and using the Council's paper and electronic mailing lists to inform the public of opportunities for input. NMFS held public meetings related to the development of the EIS in many communities that have a stake in the fishing industry and habitat conservation, such as Kodiak, Sitka, Unalaska, Anchorage, Juneau, and Seattle. NMFS did not violate any law by allowing fishing to continue while NMFS developed the EIS. The EIS clearly discloses the incomplete scientific information regarding the distribution of habitat types, the functional linkages between habitats and fish species, and the effects of fishing and other human activities on fish habitat, and summarizes the existing scientific information NMFS used to conduct the analysis, in accordance



with the NEPA regulations at 40 CFR 1502.22. The EIS examines in detail the effects of fishing on many aspects of the environment, including slow growing and fragile living substrates such as corals and sponges, and slow growing fishes such as rockfish.

Comments: A conservation group recommended that NMFS reevaluate its conclusions regarding the effects of fishing on EFH in a second draft EIS. The commenter said a second draft EIS should not rely on MSST as a standard for evaluating fishery effects, and instead should focus on habitat features that likely provide functions to managed species and infer that these habitat features are linked to productivity of managed species.

Response: NMFS disagrees that a second draft EIS is necessary under NEPA. The final EIS incorporates many revisions in response to public comments on the draft EIS and the peer review conducted by the Center for Independent Experts, but these revisions are not substantial changes that warrant preparation of a second draft EIS. As discussed above, the evaluation of the effects of fishing on EFH considered other information besides stock status relative to MSST to assess the consequences of habitat alteration for managed species. The analysis also considered published literature regarding the habitat requirements of managed species, time series of stock status relative to changes in fishing effort, and the professional opinions of NMFS experts in the biology and stock structure of the various species. Appendix B to the final EIS clarifies this point and discusses in detail the information NMFS used to reevaluate the effects of fishing on EFH based on public comments and the Center for Independent Experts review. NMFS did not have evidence to indicate direct habitat linkages to feeding, spawning/breeding, and/or growth to maturity for managed species, and the information NMFS analyzed did not support inferring that a certain amount of habitat disturbance yields a proportional decrease in productivity of managed species.

Comment: A federal environmental agency said the EIS needs to identify tribal resources, if applicable, and assure that treaty rights and privileges are addressed appropriately.

Response: Alaska Native groups are recognized as Indian tribes under Executive Order 13175, and compliance with that order is addressed in Appendix I. During the development of the EIS, NMFS encouraged Alaska Native participation in numerous public meetings. These meetings were held in various locations throughout Alaska, including small communities, to ensure ample vetting to Alaska Native groups and to receive their input. Alaska Natives testified at some of those meetings. Furthermore, the Council includes an Alaska Native representing the Community Development Program (a program specifically designed to benefit Alaska Natives) as a voting member. NMFS will continue to work with Alaska Native groups during implementation of the EFH provisions of Council FMPs.

Comments: A federal environmental agency said the draft EIS does not disclose what efforts NMFS and the Council took to ensure effective public participation, particularly from low income and minority communities. The commenter also suggested moving the section that addresses environmental justice requirements (Executive Order 12898) from Appendix C into the main body of the EIS, with a corresponding reference in the Table of Contents.

Response: Appendix A describes the scoping process NMFS used to obtain public input early in the planning of the EIS. As noted above, throughout development of the EIS NMFS sought comments from all interested parties by publishing notices in the Federal Register, holding numerous public meetings, and using the Council's paper and electronic mailing lists to inform the public of opportunities for input. Many low income and minority communities engaged in the fishing industry sent representatives to Council meetings, some of whom testified on EFH issues at various points during the development of the EIS.

The EIS addresses compliance with applicable laws and other requirements in Appendix I, which is clearly identified in the Table of Contents. Appendix I references the more detailed evaluation of effects related to environmental justice that appears in Appendix C. NMFS does not agree that the environmental justice section needs to appear in the main body of the EIS versus an appendix.

### **Other Comments**

Comment: One commenter suggested that the Division of Forestry within the Alaska Department of Natural Resources should be a cooperating agency for the development of the EIS. To justify the request, the commenter criticized the discussion of the Alaska Forest Resources and Practices Act and associated management practices in the draft EIS.

Response: NMFS disagrees that the Division of Forestry should be a cooperating agency, but NMFS met with Division of Forestry staff and the Board of Forestry during the development of the EIS to discuss ways to ensure the EIS accurately reflects existing forest management practices related to fish habitat, including the requirements of the Alaska Forest Resources and Practices Act.

Comment: A federal agency noted that the description of salmon fishery management in Chapter 3 does not mention federal subsistence fishery management under Title 8 of the Alaska National Interest Lands Conservation Act. Department of the Interior land management agencies and the Forest Service jointly manage the harvest of salmon and other fish and wildlife species by rural residents on waters within proclamation boundaries of federal land units. The commenter recommended adding this information to the discussion of salmon management in Chapter 3.

Response: NMFS agrees and added the information to Section 3.4.2 of the final EIS.

Comment: A federal agency suggested adding a discussion of herring biology to Section 3.2.4.2, which describes other important forage fish. The commenter acknowledged that the draft EIS also discusses herring in the context of a state managed commercial fishery (Section 3.4.2.4).

Response: NMFS agrees and added the information to Section 3.2.4.2 of the final EIS.