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COUNCIL

Draft Amendment to the Hawaii Archipelago Fishery Ecosystem Plan

Revised Descriptions and Identification of Essential Fish Habitat and
Habitat Areas of Particular Concern for
Bottomfish and Seamount Groundfish
of the Hawaiian Archipelago

June 8, 2010

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1.0 Introduction

Section 303(a)(7) of the Magnuson Steven Fishery Conservation and Management Act (MSA) requires the National Marine Fisheries Service (NMFS) and Regional Fishery Management Councils to describe and identify essential fish habitat (EFH) in fishery management plans (FMP), minimize to the extent practicable adverse fishing impacts effects on EFH, and identify other actions to encourage the conservation and enhancement of EFH. The MSA defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." The MSA also requires Federal agencies that authorize, fund, or undertake actions that may adversely affect EFH to consult with NMFS, and NMFS must provide conservation recommendations to federal and state agencies regarding actions that would adversely affect EFH. Regional fishery Management Councils also have the authority to comment on federal or state agency actions that would adversely affect the habitat, including EFH, of managed species.

On December 19, 1997 (62 FR 66531), NMFS published an interim final rule establishing guidance to assist Regional fishery Management Councils in complying with the EFH requirements and later published final guidance on January 17, 2002 (67 FR 2342). The NMFS guidelines state that Regional fishery Management Councils must demonstrate that the best scientific information available was used in the description and identification of EFH and that the quality of available data used should be ranked using the following four level system:

Level 1: Distribution data are available for some or all portions of the geographic range of the species.
Level 2: Habitat-related densities of the species are available.
Level 3: Growth, reproduction, or survival rates within habitats are available.
Level 4: Production rates by habitat are available.

The NMFS guidelines also recommend Regional fishery Management Councils should strive to describe habitat based on the highest level of detail (i.e., Level 4). With higher quality data, those habitats most highly valued by a species can be identified, allowing a more precise designation of EFH. However, if there is no information on a given species or life stage, and habitat usage cannot be inferred from other means, such as information on a similar species or another life stage, the NMFS guidelines recommends EFH not be designated.

In addition, the NMFS guidelines also recommend Regional fishery Management Councils identify EFH that is especially important ecologically or particularly vulnerable to degradation as habitat areas of particular concern (HAPC) to help provide additional focus for conservation efforts. Identification of HAPC must be based on one or more of the following considerations:

- The importance of the ecological function provided by the habitat.
- The extent to which the habitat is sensitive to human-induced environmental degradation.
- Whether, and to what extent, development activities are, or will be, stressing the habitat type.
- The rarity of the habitat type.

In 1999, the Western Pacific Fishery Management Council (Council) developed and NMFS approved EFH definitions for management unit species (MUS) of the Bottomfish and Seamount Groundfish FMP, Crustacean FMP, Pelagic FMP, and Precious Corals FMP (74 FR 19067, April 19, 1999). Additional EFH definitions for coral reef ecosystem species were approved by NMFS in 2004 as part of the implementation of the Coral Reef Ecosystem FMP in 2004 (69 FR8336, February 24, 2004) and for deepwater shrimp through an amendment to the Crustaceans FMP in 2008 (73 FR 70603, November 21, 2008).

In 2009, the Council developed and NMFS approved five new fishery ecosystem plans (FEP) – the American Samoa FEP, the Mariana Archipelago FEP, the Hawaii Archipelago FEP, the Pacific Remote Island Area FEP and the Pacific Pelagic FEP. The FEPs incorporate and reorganize elements of the Council's FMPs from a species-or fishery-basis to one that is founded on geography (75 FR 2198, January 14, 2010). As a result, EFH definitions and related provisions for all FMP fishery resources are subsequently carried forward into the FEPs. Table 1 summarizes EFH for all western Pacific MUS.

Table 1: EFH and HAPC for Management Unit Species of the Western Pacific Region

MUS	EFH (Juveniles and Adults)	EFH (Eggs and Larvae)	HAPC
Pelagic	Water column down to 1,000 m	Water column down to 200 m	Water column down to 1,000 m that lies above seamounts and banks
Bottomfish	Water column and bottom habitat out to a depth of 400 m	Water column down to 400 m	All escarpments and slopes between 40–280 m and three known areas of juvenile opakapaka habitat
Seamount Groundfish	Water column and bottom from 80 to 600 m, bounded by 29°-35°N and 171°E-179°W (adults only)	Epipelagic zone (0–200 nm) bounded by 29°-35°N and 171°E-179°W (includes juveniles)	Not identified
Precious Corals	Keahole, Makapuu, Kaena, Westpac, Brooks, and 180 Fathom gold/red coral beds, and Milolii, S. Kauai, and Auau Channel black coral beds	Not applicable	Makapuu, Westpac, and Brooks Bank beds, and the Auau Channel
Crustaceans	Bottom habitat from shoreline to a depth of 100 m	Water column down to 150 m	All banks within the Northwestern Hawaiian Islands with summits less than 30 m
Coral reef ecosystem	Water column and benthic substrate to a depth of 100 m	Water column and benthic substrate to a depth of 100 m	All MPAs identified in the FMP, all PRIA, many specific areas of coral reef habitat

MUS	EFH (Juveniles and Adults)	EFH (Eggs and Larvae)	HAPC
Heterocarpus spp.	Outer reef slopes between 300 and 700 meters surrounding every island and submerged banks in the Western Pacific Region	Outer reef slopes between 300 and 700 meters surrounding every island and submerged banks in the Western Pacific Region	Not identified

1.1 Responsible Agencies

The Western Pacific Regional Fishery Management Council was established by the Magnuson-Stevens Fishery and Conservation Management Act to develop management plans for U.S. fisheries operating in the offshore waters around American Samoa, Guam, Hawaii (including Midway Atoll), the Northern Mariana Islands and the U.S. Pacific remote island areas which include Palmyra Atoll, Kingman Reef, Jarvis Island, Baker Island, Howland Island, Johnston Atoll, and Wake Island (collectively, the western Pacific region). Once a plan is approved by the Secretary of Commerce, it is implemented by federal regulations which are enforced by the NMFS and the U.S. Coast Guard, in cooperation with state, territorial and commonwealth agencies. For further information contact:

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1.3 Summary of the Hawaii Archipelago Fishery Ecosystem Plan

The Hawaii Archipelago Fishery Ecosystem Plan is one of five FEPs developed by the Council and approved by NMFS in 2010. The Hawaii Archipelago FEP was developed to regulate the harvest of non-pelagic marine resources in the U.S. exclusive economic zone (EEZ) around the Hawaiian Islands (3-200 nautical miles offshore) through an ecosystem-based approach. The Hawaii Archipelago FEP contains conservation and management measures for fisheries

harvesting bottomfish and seamount groundfish, crustaceans, precious corals and coral reef ecosystems species, and provides formal mechanisms for coordination and management among federal, state, local agencies, the fishing industry, local communities and the general public. The overall goal of the Hawaii Archipelago FEP is to establish a framework under which the Council will improve its abilities to realize the goals of the MSA through the incorporation of ecosystem science and principles. To achieve this goal, the Council has adopted the following ten objectives for the Hawaii Archipelago FEP:

Objective 1: To maintain biologically diverse and productive marine ecosystems and foster the long-term sustainable use of marine resources in an ecologically and culturally sensitive manner through the use of a science-based ecosystem approach to resource management.

Objective 2: To provide flexible and adaptive management systems that can rapidly address new scientific information and changes in environmental conditions or human use patterns.

Objective 3: To improve public and government awareness and understanding of the marine environment in order to reduce unsustainable human impacts and foster support for responsible stewardship.

Objective 4: To encourage and provide for the sustained and substantive participation of local communities in the exploration, development, conservation, and management of marine resources.

Objective 5: To minimize fishery bycatch and waste to the extent practicable.

Objective 6: To manage and comanage protected species, protected habitats, and protected areas.

Objective 7: To promote the safety of human life at sea.

Objective 8: To encourage and support appropriate compliance and enforcement with all applicable local and federal fishery regulations.

Objective 9: To increase collaboration with domestic and foreign regional fishery management and other governmental and non-governmental organizations, communities, and the public at large to successfully manage marine ecosystems.

Objective 10: To improve the quantity and quality of available information to support marine ecosystem management.

Complete information on Hawaii Archipelago fisheries including information on target and non-target stocks, bycatch, protected species, and fishing communities found in the Fishery Ecosystem Plan for the Hawaiian Archipelago (WPFMC 2009).

2.0 Purpose and Need for Action

The MSA requires the NMFS and Regional Fishery Management Councils to describe and identify essential fish habitat (EFH) in fishery management plans (FMP), minimize to the extent practicable adverse fishing impacts effects on EFH, and identify other actions to encourage the conservation and enhancement of EFH. NMFS guidelines (67 FR 2342, January 17, 2002) further recommended EFH provisions be periodically reviewed and revised or updated as warranted at least once every five years, or whenever information becomes available.

Since the approval of the Council's initial EFH descriptions in 1999, various research programs and scientific investigations by the Council, NMFS and the State of Hawaii have been undertaken, particularly for bottomfish MUS in the Hawaiian archipelago which was briefly subject to overfishing in 2005 (70 FR 34452, June 14, 2005). These studies assisted the Council, NMFS and the State of Hawaii to develop complementary conservation and management measures which effectively ended overfishing of Hawaii bottomfish stocks. In 2008, NMFS PIRO Habitat Division hired a contractor to compile and review the available scientific literature, unpublished reports and other data sources available on Hawaii bottomfish species for the purposes of improving and reviewing EFH descriptions.

The review was completed in December 2010 and underwent an independent review through the Western Pacific Stock Assessment Review (WPSAR) process on April 5—7, 2011 (FR 13604. March 14. 2011) . The Council's Scientific and Statistical Committee (SSC) reviewed the report and recommendations from the WPSAR panel at its 107th SSC meeting on June 13—15, 2011, concurred with the WPSAR finding and forwarded recommendations for Council consideration and approval. At its 151st meeting on June 15-18, 2011 in Honolulu, the Council adopted the WPSAR findings and resulting range of options that are now incorporated into the draft amendment to revise Hawaii Archipelago bottomfish and seamount groundfish EFH and HAPC designations. At its 152nd meeting on October 19-22, 2011 in Honolulu, the Council selected the preliminary preferred alternative as recommended by the WPSAR panel and endorsed by the SSC.

The purpose of this action is to revise EFH and HAPC designation for Hawaii bottomfish MUS based on the best scientific information available. To support the proposed action, this document also updates the description of life history and habitat requirements for all bottomfish MUS by life stage, including the identification of preys species, where available.

3.0 Description of Alternatives

3.1 Bottomfish Essential Fish Habitat Designation

3.1.1 **Alternative 1:** No Action – Maintain Existing EFH Designation

The Bottomfish Management Unit Species (BMUS) found for the Hawaii Archipelago are include the following:

Family	Scientific Name	Common Name	Hawaii
Carangidae	*Caranx ignobilis*	giant trevally	white ulua/pauu
	Caranx lugubris	black trevally	black ulua
	Pseudocaranx cheilio	thicklip trevally	butaguchi/pig ulua
	Seriola dumerili	greater amberjack	Kahala
Lutjanidae	*Aphareus rutilans*	silvermouth snapper	Lehi
	Aprion virescens	gray snapper	Uku

	Etelis carbunculus	ruby snapper	Ehu
	Etelis coruscans	flame snapper	Onaga
	Lutjanus kasmira	blue-line snapper	Taape
	Pristipomoides auricilla	yellowtail snapper	Yellowtail kalekale
	Pristipomoides filamentosus	pink snapper	Opakapaka
	Pristipomoides sieboldii	lavender snapper	Kalekale
	Pristipomoides zonatus	oblique banded snapper	Gindai
Serranidae	*Epinephelus quernus*	Hawaiian grouper	Hapuupuu

The current bottomfish EFH designation as shown in the Table 2 has remained in place since established in the Bottomfish and Seamount Ground FMP in 1999. The designation was adopted based on the following assumptions and information:

a) Eggs and larvae of at least some of the species in this fishery reach surface waters
b) Eggs and larvae depth ranges do not extend below those of adults because the eggs of broadcast spawners are typically neutral or positively buoyant
c) Juveniles are no deeper that eggs, larvae, and adults
d) While the adults of some of the species were observed at depths below 400m, these records represented a very low proportion of the total number of records for these species.

At the time of original EFH designation, there was not enough data on the relative productivity of different habitats to develop EFH designation based on Level-3 or Level 4 data. Given the uncertainty concerning the life histories and habitat requirements of many BMUS, the Council designated EFH for adult and juvenile bottomfish as the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fathoms) encompassing the steep drop-offs and high relief habitats that are important for bottomfish.

The eggs and larvae of all BMUS are pelagic, floating at the surface until hatching and subject thereafter to advection by the prevailing ocean currents. There have been taxonomic studies of these life stages of snappers and groupers. At the time of EFH designation, few larvae can be identified to species. As snapper and grouper larvae have been rarely collected in plankton surveys, it is extremely difficult to study their distribution. Because of the scientific uncertainty about the distribution of the eggs and larvae of bottomfish, the Council designated the water column extending from the shoreline to the outer boundary of the EEZ to a depth of 400 m as EFH for bottomfish eggs and larvae.

Table 2: Existing EFH Designations for Hawaii Archipelago Bottomfish MUS

Fishery	**Species**	**Eggs/Larvae**	**Juveniles/Adults**
Bottomfish 0-400m	14 bottomfish species	pelagic out to EEZ 0-400m	benthic or benthopelagic 0-400m

3.1.2 Alternative 2: Bottomfish EFH Designation with Three Sub-groups and individual species descriptions (Preliminarily Preferred)

This Alternative retains the overall EFH designation of 0-400m for the bottomfish but provides finer species-level resolution through the defining of three sub-group and four discrete life stage categories. The three sub-groups include: Shallow, Intermediate and Deep-water Complexes.

The four life stage categories include: eggs; post hatch pelagic; post settlement and sub adult; and adult.

Alternative 2 also provides an EFH description for each species, provides a more accurate descriptor of the water column zone each species is generally found in at different life stages, and adds an additional species, *Seriola rivoliana* to the bottomfish species list. Alternative 2 is based on the findings and recommendations from the 2011 WPSAR panel which best addresses the requirements in the NMFS Guidance to Refine the Description and Identification of Essential Fish Habitat (NMFS 206). The rationale for these changes is based on the following:

a) Existing species complexes each have depth ranges in their descriptions, which are confusing since these are not EFH designations but are often mistaken to be. These depth ranges do not take into account egg and larval stages of the deeper species. Furthermore, over 90% of recently analyzed depth records for three of the shallow complex species (*P. dentex*, now renamed to *P. cheilio*, *C. ignobilis*, and *S. dumerili*) were below the lower depth limit for the shallow complex. Their inclusion in this complex is therefore inconsistent with existing data.
b) Based on new and existing data, the depth ranges of the 15 species of Hawaiian bottomfish exhibit considerable overlap. However, the adults of three shallow species (*L. kasmira*, *C. ignobilis*, and *A. virescens*) have rarely been recorded together and at the same depth as the adults of 5 deeper species (*E. carbunculus*, *E. coruscans*, *P. auricilla*, *P. sieboldii*, and *P. zonatus*). The adults of each of the remaining 7 species (*C. lugubris*, *S. dumerili*, *S. rivoliana*, *P. cheilio*, *E. quernus*, *A. rutilans*, and *P. filamentosus*) have all been recorded together with members of the shallow group, members of the deeper group, or both.
c) Creating a third "intermediate" complex is a reasonable way to respond to these observations and has the advantage of providing greater resolution to the EFH descriptions which is a priority stated in the guidance document.
d) Overall complex EFH depth ranges for all life stages combined in each of the three new complexes would be 0-240m for the shallow complex, 0-320m for the intermediate complex, and 0-400m for the deep complex.
e) Complex EFH descriptions for the 4 different life stages would be the similar to those above for the egg and larval stages on the basis that these stages are presently believed to reach surface waters with regularity. Juveniles and adults however are proposed to be 0-240m (shallow), 40-320m (intermediate), and 80-400m (deep) on the basis that there is no evidence the juveniles or adults of the intermediate and deep complexes reach surface waters with any regularity. The lower and upper depth limits for each complex and life stage are based on published and non-published data. The latter is primarily a new analysis of over 18,000 records from Pisces submersible dives, BotCam drop camera deployments, and DLNR-funded fishing surveys. These limits encompass approximately 95% of the observations for each species, not the entire range of existing data, which was purposely done to allow for outliers. These ranges are still "conservatively broad" because of the lower sampling effort by submersible, fishing, or drop camera surveys in depths shallower than 100m or greater than 350m.
f) The terms pelagic, benthic, and benthopelagic were added to each of the EFH descriptions to capture more accurately the water column zone for each life stage based on existing information. This change again provides greater resolution to the descriptions since there are clearly differences in zone preference between the eggs, juveniles, and adults as well as

between the juveniles and adults of different species. For example, all of the bottomfish species are believed to be broadcast spawners that release eggs into the pelagic zone. Like many species of fish, settlement close to the substrate occurs after the completion of the pelagic phase. Juveniles of many bottomfish species, particularly non-schooling species, will remain close to the bottom until they are too large for predators that consume their prey whole. This behavior, which has been documented with some but not all bottomfish, is captured by using the term benthic in the juvenile EFH descriptions. The expression "benthic or benthopelagic" is used when juvenile behavior has not yet been documented and is therefore unknown or, in the case of *P. filamentosus*, the juveniles are known to school above the bottom. Adults of large schooling species such as *P. filamentosus* and *E. coruscans* are almost always observed much higher in the water column than the adults of the smaller, non-schooling species and this is captured by using the terms benthopelagic and benthic for their respective descriptions.

g) The justification for adding *S. rivoliana* is that the catch data for *S. dumerili* almost certainly includes catches of *S. rivoliana* due to the similarity of their appearances. Backing off to *Seriola sp* may be misleading since *S. dumerili* appears to range deeper than *S. rivoliana*. Also, *S. rivoliana* is now being cultured in Hawaii which justifies more attention be spent on this species.

Table 3: Alternative 2: Bottomfish EFH Designation with Three Sub-groups and individual species descriptions

Species	EFH
Shallow sub-group	
Uku (*Aprion virescens*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 240 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 240 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 0 and 240 m
Taape (*Lutjanus kasmira*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 240 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 240 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 0 and 240 m
Ulua (*Caranx ignoblis*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 200 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 200 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 0 and 200 m
Intermediate sub-group	
Lehi (*Aphareus rutilans*),	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 280 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 280 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 40 and 280 m.
Opakapaka (*Pristipomoides filamentosus*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 280 m. **Post Hatch Pelagic:** the water column extending from the

Species	EFH
	shoreline to the outer limit of the EEZ down to a depth of 280 m. **Post Settlement/Sub-Adult:** the water column and all bottom habitat between 40 and 100 m. **Adults:** the water column and all bottom habitat between 40 and 280 m.
Hapuupuu (*Epinephelus quernus*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 320 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 320 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 40 and 320 m.
Black trevally (*Caranx lugubris*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 320 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 320 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 40 and 320 m.
Thicklip trevally (*Pseudocaranx dentex/*))	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 280 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 280 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 40 and 280 m.
Amberjack (*Seriola dumerili*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 320 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 320 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 40 and 320 m.
Deep sub-group	
Ehu (*Etelis carbunculus*),	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 400 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 80 and 400 m.
Onaga (*Etelis coruscans*),	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 400 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 80 and 400 m.
Yellowtail kalekale (*P. auricilla*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 400 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 80 and 400 m.
Kalekale (*P. sieboldii*),	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 400 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 80 and 400 m.

Species	EFH
Gindai (*P. zonatus*)	**Eggs:** the water column extending from the shoreline out to 50 miles down to a depth of 400 m. **Post Hatch Pelagic:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m. **Post Settlement/Sub-Adult/Adult** the water column and all bottom habitat between 80 and 400 m.

3.1.3 Alterative 3: Bottmfish EFH Designation with Three Sub-groups and individual species descriptions for "Deep 7" Species

Alternative 3 is consistent with Alterative 2 above with the exception of the species level EFH definitions and descriptions are only provided for the "Deep 7" species which include *A. rutilans, E. carbunculus, E. coruscans, P. filamentosus, P. sieboldii, P. zonatus,* and *E. quernus*.

a) This is the alternative consistent with the recommendations of the SSC when presented the options for revising the bottomfish EFH definitions in October, 2009.
b) Only *A. rutilans* has less than 700 observations per species, with all of the other six species exceeding this number. There has been considerable sampling in the 100-280m portion of its proposed 40-280m EFH depth range. The lower number of observations for this species (93) is believed to be due to its apparent lower abundance compared to other deep 7 species coupled with the lower sampling effort at 40-100m. *A. rutilans* has not been recorded in Hawaii at depths shallower than 40m in either published or non-published sources and only 0.2% of the existing records were obtained at depths below 280m. The proposed 40-280m therefore appears to be a reasonable EFH depth range for this species.

Table 4: Alternative 3: Bottmfish EFH Designation with Three Sub-groups and individual species descriptions for "Deep 7" Species

Complex	Species	Eggs	Post Hatch Pelagic	Post Settlement and Sub Adult	Adults
Bottomfish All - 0-400m	**All Species**	**pelagic out to EEZ - 0- 400m**	**pelagic out to EEZ - 0-400m**	**benthic or benthopelagic 0-400m**	**benthic or benthopelagic 0-400m**
Bottomfish Shallow 0-240m	**Shallow Species**	**pelagic out to EEZ - 0-240m**	**pelagic out to EEZ - 0-240m**	**benthopelagic 0-240m**	**benthopelagic 0-240m**
Bottomfish Intermediate 0-320m	**Intermediate Species**	**pelagic out to EEZ - 0-320m**	**pelagic out to EEZ - 0-320m**	**benthic or benthopelagic 40-320m**	**benthic or benthopelagic 40-320m**
	Aphareus rutilans	pelagic out to EEZ - 0-280m	pelagic out to EEZ - 0-280m	benthic or benthopelagic 40-280m	benthopelagic 40-280m
	Pristipomoides filamentosus	pelagic out to EEZ - 0-280m	pelagic out to EEZ - 0-280m	benthopelagic 40-280m	benthopelagic 40-280m
	Epinephelus quernus	pelagic out to EEZ - 0-320m	pelagic out to EEZ - 0-320m	benthic 40-320m	benthic 40-320m
Bottomfish Deep 0-400m	**Deep Species**	**pelagic out to EEZ - 0-400m**	**pelagic out to EEZ 0-400m**	**benthic 80-400m**	**benthic or benthopelagic 80-400m**
	Pristipomoides sieboldii	pelagic out to EEZ - 0-320m	pelagic out to EEZ 0-320m	benthic 80-320m	benthopelagic 80-320m

	Pristipomoides zonatus	pelagic out to EEZ - 0-320m	pelagic out to EEZ 0-320m	benthic 80-320m	benthic 80-320m
	Etelis coruscans	pelagic out to EEZ - 0-360m	pelagic out to EEZ - 0-360m	benthic 80-360m	benthopelagic 80-360m
	Etelis carbunculus	pelagic out to EEZ - 0-400m	pelagic out to EEZ - 0-400m	benthic 80-400m	benthic 80-400m

Seamount Groundfish EFH

The three Alternatives presented for refining EFH designations for seamount groundfish species in the Hawaii Archipelago include:

1. No Action – EFH for groundfish remain the same
2. Define EFH for specific life stages and add area specific boundary designations for groundfish at Cross Seamount
3. Define species specific EFH for life stages and remove the area specific designation for groundfish

3.2.1 Alternative 1: No Action for Seamount Groundfish EFH

The overall groundfish EFH designation of 100-600m around Hancock Seamount (latitude 29°–35° and longitude 171° E–179° W) remains unchanged under this Alternative (Table 1). This is based on the following assumptions and data:

a) Eggs and larvae of the three groundfish species reach surface waters but do not extend below 200m.

b) Juveniles and adults do not regularly come up to depths above 200m or below 600m.

c) None of the life stages of any groundfish species can be found in significant numbers below the latitude 29°.

Table 5: Alternative 1: No Action for Seamount Groundfish EFH

Complex	Species	EFH Designation
Seamount Groundfish	Armorhead (*Pseudopentaceros richardsoni*), Raftfish/butterfish (*Hyperoglyphe japonica*), Alfonsin (*Beryx splendens*)	**Eggs and Post Hatch Pelagic:** the (epipelagic zone) water column down to a depth of 200 m (100 fm) of all EEZ waters bounded by latitude 29°–35° and longitude 171° E–179° W. **Post Settlement/Sub-Adult/Adult** all EEZ waters and bottom habitat bounded by latitude 29°–35° N and longitude 171° E–179° W between 80 and 600 m (40 and 300 fm)

3.2.2 Alternative 2: Define EFH for specific life stages and add area specific boundary designations for groundfish at Cross Seamount (Preliminarily Preferred)

Alternative 2 keeps all three species in a single groundfish complex, as consistent with the no action alternative. However, under Alternative 2 the following differences are proposed:

a) add area specific EFH designations to include the Cross Seamount that surrounds the 3000 m contour (158.21', 18.48'; 158.11', 18.48'; 158.21', 18.37'; 158.11', 18.37'),

b) change the overall EFH depth range to from 80-600 m to 0-600m,
c) change the post settlement, sub-adults and adult depth ranges to 120-600m, and
d) provide a more accurate descriptor of the water column zone that each species is generally found in at different life stages.

These changes are based on the following assumptions and data:

a) At least one species of groundfish, *B. splendens*, has been positively identified as being present and in large numbers at Cross seamount. The other two species have also been recorded below latitude 29° although not nearly as far south as *B. splendens*.
b) If spawning takes place below 200m, the egg stage depth range is incorrect. A large portion of the adults of these species have been recorded well below that depth suggesting at least some spawning may be taking place in deeper water.
c) The existing literature provides references where the adults of all three species have been recorded at depths above 200m.
d) Due to the uncertainties regarding these species and the relatively low number of recent observations, broader EFH depth ranges would seem to be warranted.

Table 5: Alternative 2: Define EFH for specific life stages and add area specific boundary designations for groundfish at Cross Seamount

Complex	**Species**	**Eggs**	**Post Hatch Pelagic**	**Post Settlement Sub-Adults**	**Adults**
Groundfish 0-600m	Groundfish species All	pelagic out to EEZ 0-600m	pelagic out to EEZ 0-600m	benthic or benthopelagic 120-600m	benthopelagic 120-600m

3.2.3 Alternative 3: Define EFH for specific species and at each life stage

Alternative 3 keeps the changes proposed in Alternative 2 and in addition provides EFH definitions for individual species. This Alternative removes the area specific designations as proposed in Alternative 2. Given the limited information on species distribution and habitat dependence at various life stages as stated under Alternative 1, this alternative is difficult to justify.

Table 6: Alternative 3: Define EFH for specific species and at each life stage

Complex	**Species**	**Eggs**	**Post hatch Pelagic**	**Post Settlement Sub-Adult**	**Adults**
Groundfish 0-600m	**Groundfish species All**	**pelagic out to EEZ 0-600m**	**pelagic out to EEZ 0-600m**	**benthic or benthopelagic 120-600m**	**benthopelagic 120-600m**
	Beryx splendens	pelagic out to EEZ 0-600m	pelagic out to EEZ 0-600m	benthic or benthopelagic 120-600m	benthopelagic 120-600m
	Pseudopentaceros wheeleri	pelagic out to EEZ 0-600m	pelagic out to EEZ 0-600m	benthic or benthopelagic 120-600m	benthopelagic 120-600m
	Hyperoglyphe japonica	pelagic out to EEZ 0-560m	pelagic out to EEZ 0-560m	benthic or benthopelagic 160-560m	benthopelagic 160-560m

3.3 Bottomfish Habitat of Particular Concern

In addition to EFH, the Council identified habitat areas of particular concern (HAPCs) within EFH for all FMPs. HAPCs are specific areas within EFH that are essential to the life cycle of important bottomfish species. In determining whether a type or area of EFH should be designated as an HAPC, one or more of the following criteria established by NMFS should be met: (a) the ecological function provided by the habitat is important; (b) the habitat is sensitive to human induced environmental degradation; (c) development activities are, or will be, stressing the habitat type; or (d) the habitat type is rare. However, it is important to note that if an area meets only one of the HAPC criteria, it will not necessarily be designated an HAPC.

The Alternatives presented for refining and/or designating HAPC for bottomfish and seamount groundfish include the following:

Bottomfish
1. No-Action – Current Designations
2. Sixteen Defined HACP Areas – Review Recommendations
3. Seven Defined HAPC Areas – WPSAR Recommendations **(Preliminarily Preferred)**

Seamount Groundfish
1. No Action
2. WPSAR Recommendation **(Preliminarily Preferred)**

3.3.1 Alternative 1: HAPC for Bottomfish

On the basis of the known distribution and habitat requirements of adult bottomfish, the Council designated all escarpments/slopes between 40–280 meters throughout the Western Pacific Region, including the Hawaii Archipelago, as bottomfish HAPC. In addition, the Council designated the three known areas of juvenile opakapaka habitat (two off Oahu and one off Molokai) as HAPC. The basis for this designation is the ecological function that these areas provide, the rarity of the habitat, and the susceptibility of these areas to human-induced environmental degradation. Off Oahu, juvenile snappers occupy a flat, open bottom of primarily soft substrate in depths ranging from 40 to 73 meters. This habitat is quite different from that utilized by adult snappers. Surveys suggest that the preferred habitat of juvenile opakapaka in the waters around Hawaii represents only a small fraction of the total habitat at the appropriate depths. Areas of flat featureless bottom have typically been thought of as providing low-value fishery habitat. It is possible that juvenile snappers occur in other habitat types, but in such low densities that they have yet to be observed.

The recent discovery of concentrations of juvenile snappers in relatively shallow water and featureless bottom habitat indicates the need for more research to help identify, map, and study nursery habitat for juvenile snapper.

3.3.2 Alternative 2: HAPC for Bottomfish based on HAPC Designation Review

Alternative 2 proposes 16 candidate HAPCs located throughout the main Hawaiian islands. The detailed rationale and recommendations can be found in the HAPC Justification report (Kelley et. al, 2010; contract to NMFS PIRO). The 16 areas recommended include:

1) Middle Bank

2) Kaula Rock
3) East Niihau
4) Northwest Kauai
5) Kaena Point, Oahu
6) Kaneohe, Oahu
7) Makapuu Point, Oahu
8) Penguin Bank
9) North Molokai
10) Pailolo Channel
11) Hana, Maui
12) North Kahoolawe
13) South Kahoolawe
14) Kohala, Hawaii
15) Hilo, Hawaii
16) South Point, Hawaii

The specific rationale and associated map delineating the location and size of each proposed HAPC area is included in the HAPC Justification document. In summary, the proposed locations in Alternative 2 were based on the following assumptions:

a. Bottomfish habitat is generally found well offshore and as a result is far less susceptible to disturbance from development than other near shore fisheries habitats.
b. Rarity was based on the presence of unusual physical or biological characteristics in the context of the current state of knowledge of bottomfish habitats.
c. The topography of these habitats is well-known as a result of a nearly complete multi-beam coverage of bottomfish depths in the Main Hawaiian Islands.
d. Unusual topography in some bottomfish habitat areas was considered against the rarity criterion.
e. Ecological importance was evaluated with respect to modeled larval dispersal characteristics or the presence of critical life history stages (i.e., juveniles and spawning adults).
f. Sensitivity was evaluated with respect to the habitats vulnerability to disturbance from either fishing or non-fishing activities. These would include the risk of significantly depleting the targeted bottomfish species or presence of substantial invertebrate beds (i.e., corals or sponges) that could be impacted by fishing gear and anchors.

Based on the criteria above, the Table below summarizes how the 16 proposed areas met the NMFS HAPC criteria of ecological importance, sensitivity, susceptibility and rarity.

Table 7: Alternative 2: HAPC for Bottomfish based on HAPC Designation Review

HAPC	Location	Importance	Sensitivity	Susceptibility	Rarity
1	Middle Bank	X	X	n/a	
2	Kaula Rock		X	n/a	X
3	E Niihau		X	n/a	X
4	NW Kauai	X		n/a	X
5	Kaena Pt	X		n/a	

6	Kaneohe	X		n/a	
7	Makapuu Pt	X	X	n/a	X
8	Penguin Bank	X		n/a	
9	N Molokai	X		n/a	X
10	Pailolo	X	X	n/a	X
11	Hana	X	X	n/a	X
12	N Kahoolawe	X		n/a	X
13	S Kahoolawe	X	X	n/a	
14	Kohala	X		n/a	X
15	Hilo	X		n/a	X
16	South Pt	X	X	n/a	

3.3.3 Alternative 3: HAPC for Bottomfish based on HAPC WPSAR Working Group Recommendations (Preliminarily Preferred)

Alternative 3 proposes seven (7) candidate areas be considered as Hawaii Archipelago Bottomfish HAPC. The seven candidate areas are based on a sub-set of the areas as recommended through the NMFS Review (Kelley et al.) from which several have been modified. The WPSAR Working Group recommends the following sites with proposed modifications/notations:

Table 8: Alternative 3: **HAPC for Bottomfish based on HAPC WPSAR Working Group Recommendations**

Proposed HAPC Area	Modifications/Notations
1) Kaena Point, Oahu	• As proposed in the NMFS Review (Kelley et al.) and recommended by WPSAR panel
2) Kaneohe Bay, Oahu	• Exclude encompassing the 2 pinnacles, and the HAPC should delineate the nursery area as well as best available science allows.
3) Makapuu, Oahu	• Exclude encompassing the coral beds or pinnacles, and suggests delineation of the onaga and ehu nursery area as well as best available science allows. • Exclude delineation of the opakapaka nursery area because it does not appear to be of critical ecological importance, due to its small size and proximity to the Kaneohe nursery ground.
4) Penguin Bank, South Molokai	• Note: While supportive of the location and size of this HAPC, the Working Group realizes that its large size may be of concern. With that in mind, the Working Group in particular notes the importance of the first finger as a *P. filamentosus* nursery ground and the observation of potentially pre-spawning behavior of *E. coruscans* on the second finger. Also, the three fingers and nearby habitat collectively comprise one of the most important fishing grounds in the islands.
5) Pailolo Channel,	• As proposed in the NMFS Review (Kelley et al.) and

Maui	recommended by WPSAR panel
6) North Kahoolawe, Kahoolawe	• As proposed in the NMFS Review (Kelley et al.) and recommended by WPSAR panel
7) Hilo, Hawaii	• As proposed in the NMFS Review (Kelley et al.) and recommended by WPSAR panel

The rationale for endorsing the seven areas as candidates for HAPC for Hawaii bottomfish was based on the criteria as developed by and specified in the WPSAR Working Group Final Report for Hawaii Bottomfish EFH and HAPC (WPSAR, 2011).

3.4 Seamount Groundfish HAPC Designation

3.4.1 Alternative 1: No Action for Seamount Groundfish

Habitat of Particular Concern has not been defined for Seamount Groundfish. The no-action alternative is to maintain the absence of the definition within the FEP.

3.4.2 Alternative 2: WPSAR Working Group Recommendation for Seamount Groundfish HAPC Designation (Preliminarily Preferred)

Alternative 2 is based on the WPSAR Working Group Recommendation to develop HAPC designations for areas encompassing Hancock Seamount and Cross Seamount summits and slopes. Under this Alternative, the HAPC designation is proposed to be congruent with the Alternative 2 EFH designations for Seamount Groundfish. Therefore, this Alternative will define HAPC for Seamount Groundfish for all three species as a single groundfish complex. Add area specific HAPC designations around Cross Seamount consistent with EFH. Establish the overall depth range for Seamount Groundfish as 0-600m. Establish the post settlement, sub-adults and adult depth ranges as 120-600m and provide a more accurate descriptor of the water column zone each species is generally found at during different life stages.

4.0 Affected Environment

Described below is a summary of the affected environment and habitat requirements for the Bottomfish management unit species in the Hawaiian archipelago. For a complete description of each species, refer to Appendix I.

4.1 Hawaii Bottomfish

4.1.1 Habitat Summary for *Aphareus rutilans* (silver jaw jobfish, lehi)

	Egg	**Larvae**	**Juvenile**	**Adult**
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown <350m	Unknown <350m	40m	61-350m
Water Column Zone	Pelagic	Pelagic	Benthic or benthopelagic	Benthopelagic
Water Quality	Unknown	Unknown	Unknown	14-23 °C
Substrate Type	N/A	N/A	Unknown	Hard rocky bottoms, areas of high relief

Prey	N/A	Unknown	Unknown	Fish, squid, and crustaceans

4.1.2 Habitat Description for *Aprions virescens* (green jobfish, uku)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown <227m	Unknown <227m	40-61m	0-227m
Water Column Zone	Pelagic	Pelagic	Benthic	Benthopelagic
Water Quality	Unknown	Unknown	Unknown	20-24 °C
Substrate Type	N/A	N/A	Hard, flat, course sand bottom	Top of banks, mixed sediment and rocks
Prey	N/A	Unknown	Unknown	Fish (89%), larval fish (6%), Planktonic crustaceans (1%), shrimp (3%) and crab (1%), (Haight 1989).

4.1.3 Habitat summary for *Caranx ignobilis* (giant trevally, white ulua)

	Egg	**Larvae**	**Juvenile**	**Adult**
Geographic Area	**Hawaiian Archipelago**	**Hawaiian Archipelago**	**Hawaiian Archipelago**	**Hawaiian Archipelago**
Depth Range (m)	**unknown < 190m**	**unknown < 190m**	**0-10m**	**10-190m**
Water Column Zone	**Pelagic**	**Pelagic**	**Benthic or benthopelagic**	**Benthopelagic**
Water Quality	**18-30°C**	**18-30°C**	**Unknown**	**21-24 °C**
Substrate Type	**N/A**	**N/A**	**Often found in near-shore and estuarine waters and in small schools over sandy inshore reef flats**	**Wide variety of substrates**
Prey	**N/A**	**Unknown**	**Predominantly fish, including kuhliids, bothids, mugilids, and gobioids. Also preys on crustaceans, including amphipods, tanaids, isopods, shrimp, stomatopods, copepods and crabs.**	**Habitat dependent. Predominantly fish in areas in the NWHI while predominantly crustaceans in Kaneohe Bay. Also preys on gastropods and cephalopods.**

4.1.4 Habitat summary for *Caranx lugubris* (black trevally/black ulua)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown <367m	Unknown <367m	Unknown <367m	12-367m
Water Column Zone	Pelagic	pelagic	benthic or benthopelagic	benthopelagic
Water Quality	18-30°C	18-30°C	Unknown	Unknown
Substrate Type	N/A	N/A	Unknown	shallow coastal areas and in estuaries and on reefs, the deep reef slope, banks and seamounts
Prey	N/A	Unknown	Unknown	predominantly piscivorus, fish comprising >90% of its diets. Also preys on crustaceans, gastropods and cephalopods, eels. Shallow-water reef habitats are of prime importance as foraging habitat for large jacks. Time is also spent foraging in the water column.

4.1.5 Habitat summary for *Epinephelus quernus* (sea bass, hapu, hapuupuu)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown <380m	Unknown <380m	14-121m	5-380m
Water Column Zone	Pelagic	pelagic	Benthic	Benthic
Water Quality	Unknown	Unknown	Unknown	15-24 °C
Substrate Type	N/A	N/A	Unknown	Rocky bottom substrate.
Prey	N/A	Unknown	Unknown	Fishes, shrimps, octopods and other invertebrates

4.1.6 Habitat Description for *Etelis carbunculus* (red snapper, ehu)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown <515m	Unknown <515m	183-313m	89-515m
Water Column Zone	pelagic	pelagic	benthic	benthic
Water Quality	>20 °C?	>20 °C?	10-15 °C	10.2-19.1 °C
Substrate Type	N/A	N/A	hard substrate that has cavities for shelter and may include carbonate, basalt, or manmade objects. Slope and relief are of secondary importance.	hard substrate that has cavities for shelter and may include carbonate, basalt, or manmade objects. Slope and relief are of secondary importance.
Prey	N/A	Unknown	Unknown	include fish, benthic crustaceans and pelagic urochordates

4.1.7 Habitat Description for *Etelis coruscans* (red snapper, onaga)

	Egg	**Larvae**	**Juvenile**	**Adult**
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	unknown <410m	unknown <410m	known between 222-350m	90-457m
Water Column Zone	pelagic	pelagic	benthic	benthopelagic
Water Quality	Unknown	Unknown	Unknown	11.65-18.98 °C
Substrate Type	N/A	N/A	hard natural or manmade substrate having cavities	Areas of high relief, (e.g., steep slopes, pinnacles, headlands, rocky outcrops)
Prey	N/A	Unknown	Unknown	fish (76.4%), shrimp (16.4%), planktonic crustaceans (3.4%), cephalopods (2%), urochordates (1.5%), crabs (.2%) (Haight 1989).

4.1.8 Habitat Description for *Lutjanus kasmira* (blue-lined snapper, taape)

	Egg	**Larvae**	**Juvenile**	**Adult**
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown < 265m	Unknown < 265m	0-20m	3-265m
Water Column Zone	pelagic	pelagic	benthic	benthopelagic
Water Quality	Unknown	Unknown	Unknown	20.8-24.1 °C
Substrate Type	N/A	N/A	Unknown	mixed rock and sediment
Prey	N/A	Unknown	Unknown	primarily fish and crustaceans

4.1.9 Habitat Description for *Pristipomoides auricilla* (yellowtail snapper, yellowtail kalekale)

	Egg	**Larvae**	**Juvenile**	**Adult**
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown, ≤360m	Unknown, ≤360m	Unknown, ≤360m	90-360m
Water Column Zone	pelagic	pelagic	unknown but probably benthic	benthopelagic
Water Quality	Unknown	Unknown	Unknown	18.5-22.3 °C
Substrate Type	N/A	N/A	Unknown	rocky bottoms
Prey	N/A	Unknown	Unknown	fish, crab, shrimp, polychaetes, pelagic urochordates and cephalopods

4.1.10 Habitat description for *Pristipomoides sieboldii* (pink snapper, kalekale)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown, ≤360	Unknown, ≤360	80-187m	65-360m
Water Column Zone	Pelagic	pelagic	Benthic	benthopelagic
Water Quality	Unknown	Unknown	Unknown	11.72 ^{o}C to 22.28 ^{o}C
Substrate Type	N/A	N/A	Primarily rocky	rocky bottom substrate
Prey	N/A	Unknown	Unknown	fish, crab, shrimp, polychaetes, pelagic urochordates and cephalopods

4.1.11 Habitat Description for *Pristipomoides filamentosus* (pink snapper, opakapaka)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown, ≤400m	Unknown, ≤400m	40-100m	55-400m
Water Column Zone	pelagic	pelagic	benthopelagic	benthopelagic
Water Quality	Unknown	Unknown	20.5 ^{o}C to 22.5 ^{o}C	11.7 ^{o}C to 24.4 ^{o}C
Substrate Type	N/A	N/A	Low relief, sediment, low slope	generally high relief, rocky with steep slope
Prey	N/A	Unknown	Small crustaceans, juvenile fish, cephalopods gelatinous plankton, fish scale	pelagic tunicates, fish, shrimp, cephalopods gastropods, planktonic urochordates, crabs

4.1.12 Habitat Description for *Pristipomoides zonatus* (snapper, gindai)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown, ≤352m	Unknown, ≤352m	200m	70-352m
Water Column Zone	pelagic	pelagic	benthic	benthic
Water Quality	Unknown	Unknown	Unknown	13.7-19.8 ^{o}C
Substrate Type	N/A	N/A	rocky bottom	rocky bottom
Prey	N/A	Unknown	Unknown	Benthic fish, crab, shrimp, polychaetes, pelagic urochordates and cephalopods

4.1.13 Habitat description for *Pseudocaranx cheilio* (thick-lipped trevally, butaguchi)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown <321m	Unknown <321m	0-64m	18-321m

Water Column Zone	pelagic	pelagic	benthic or benthopelagic	benthopelagic
Water Quality			Unknown	Unknown
Substrate Type	N/A	N/A		Carbonate and mixed carbonate/sediment
Prey	N/A	Unknown	Unknown	Fish, cephalopods, and crustaceans

4.1.14 Habitat description for *Seriola dumerili* (greater amberjack, kahala)

	Egg	**Larvae**	**Juvenile**	**Adult**
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	Unknown <555m	Unknown <555m	0-80m	1-555m
Water Column Zone	pelagic	pelagic	benthic or benthopelagic	benthopelagic
Water Quality	18-30 °C	Unknown	Unknown	13-24 °C
Substrate Type	N/A	N/A	often found in near-shore and estuarine waters and in small schools over sandy inshore reef flats	shallow coastal areas and in estuaries and on reefs, the deep reef slope, banks and seamounts
Prey	N/A	Unknown	Unknown	Mostly piscivorous, with fish comprising >90% of its diets. Also preys on crustaceans, gastropods and cephalopods, eels. Shallow-water reef habitats are of prime importance as foraging habitat for large jacks. Time is also spent foraging in the water column.

4.2 Hawaii Seamount Groundfish

4.2.1 Habitat Summary for *Pseudopentaceros wheeleri* (armorhead)

	Egg	**Larvae**	**Juvenile**	**Adult**
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	unknown <900m	unknown <900m	unknown <900m	80-900m
Water Column Zone	pelagic	pelagic	pelagic then benthopelagic after 1.5 yrs	benthopelagic
Water Quality	Unknown	Unknown	Unknown	Unknown
Substrate Type	N/A	N/A	N/A	slopes of seamounts
Prey	N/A	Zooplankton	Zooplankton	epipelagic crustaceans, copepods, amphipods, tunicates,eupausiids, pteropods, sergestids, myctophids, macrura and mesopelagic fish.

4.2.2 Habitat Summary for *Beryx splendens* (alfonsin)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	unknown <1240m	0-50m	shallower than adults	10-1240m
Water Column Zone	pelagic	pelagic	pelagic then benthopelagic after 1.5 yrs	benthopelagic
Water Quality	18-30°C	18-30°C	Unknown	Unknown
Substrate Type	N/A	N/A	N/A	rocky bottom habitats
Prey	N/A	Unknown	Unknown	Small fish dominate this species diet. Other prey items include small crustaceans including decapods, euphausiids, krill and mysids

4.2.3 Habitat Summary for *Hyperoglyphe japonica* (Pacific Barrelfish, Japanese butterfish)

	Egg	Larvae	Juvenile	Adult
Geographic Area	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago	Hawaiian Archipelago
Depth Range (m)	unknown <537m	unknown <537m	unknown <537m	150-537m
Water Column Zone	pelagic	pelagic	Unknown	benthopelagic
Water Quality	Unknown	Unknown	Unknown	Unknown
Substrate Type	N/A	N/A	N/A	slopes of seamounts
Prey	N/A	Zooplankton	Zooplankton	Maurolicus muelleri, invertebrate zooplankton

4.3 Overview of the Hawaii Bottomfish Fishery

Bottomfish fishing was a part of the economy and culture of the indigenous people of Hawaii long before European explorers first visited the islands. Descriptions of traditional fishing practices indicate that Native Hawaiians harvested the same deep-sea bottomfish species as the modern fishery and used some of the same specialized gear and techniques employed today.

Bottomfishers use a hook-and-line method of fishing in which weighted and baited lines are lowered and raised with electric, hydraulic, or hand-powered reels. The main line is typically 400–450 pounds test, with hook leaders of 80–120 pound test monofilament. The hooks are circle hooks, and a typical rig uses six to eight hooks branching off the main line. The weight is typically 5–6 pounds. The hook leaders are typically 2–3 feet long and separated by about 6 feet along the main line. Squid and fish are the bait typically used. It is sometimes supplemented with a chum bag containing chopped fish or squid suspended above the highest hook. The use of bottom trawls, bottom gillnets, explosives and poisons are prohibited.

The deep-slope bottomfish fishery in Hawaii concentrates on species of eteline snappers (e.g., opakapaka), carangids (e.g., jacks), and a single species of grouper (hapuupuu) concentrated at depths of 30–150 fathoms. The fishery was once divided into two geographical areas: (a) the inhabited MHI with their surrounding reefs and offshore banks and the (b) NWHI, a 1,200-

nautical mile chain of largely uninhabited islets, reefs, and shoals. However, establishment of the NWHI National Marine Monument (71 FR 36443, June 26, 2006) created a sunset date of August 2011 for the NWHI bottomfish fishery. In December 2009, the NMFS conducted a compensation program for all remaining NWHI bottomfish permit holders which required active permits holders to surrender their permits as a condition of receiving compensation.

In the MHI, approximately 47 percent of the bottomfish habitat lies in state waters (Parke, 2007) Bottomfish fishing grounds within federal waters around the MHI include Middle Bank, most of Penguin Bank, and approximately 45 nautical miles of 100-fathom bottomfish habitat in the Maui–Lanai–Molokai complex.

Data from various surveys indicate that the importance of the MHI bottomfish fishery varies significantly among fishermen of different islands. According to a 1987 survey of boat fishing club members, bottomfish represented roughly 13 percent of the catch of Hawaii fishermen, 25 percent of the catch of Oahu and Kauai fishermen, and 75 percent of the catch of Maui fishermen (Meyer Resources 1987). A survey of licensed commercial fishermen conducted about the same time indicated that the percentage of respondents who used bottomfish fishing methods was 25 percent on Hawaii, 28 percent on Kauai, 29 percent on Oahu, 33 percent on Lanai, 50 percent on Molokai, and 51 percent on Maui (Harman and Katekaru 1988). Presumably, the differences among islands relate to the proximity of productive bottomfish fishing grounds.

Oahu landings (including fish reported from Penguin Banks) account for roughly 30 percent of the MHI commercial landings of deepwater bottomfish species from 1998 to 2004. Maui landings from the same time period represent 36 percent of total MHI deepwater bottomfish landings, with Hawaii, Kauai and Molokai/Lanai representing 18, 10 and 5 percent, respectively (Kawamoto and Tao 2005). Specific bottomfish fishing locales favored by fishermen vary seasonally according to sea conditions and the availability and price of target species. Historically, Penguin Bank is one of the most important bottomfish fishing grounds in the MHI, as it is the most extensive shallow shelf area in the MHI and within easy reach of major population centers. Penguin Bank is particularly important for the MHI catch of uku, one of the few bottomfish species available in substantial quantities to Hawaii consumers during summer months.

The number of fishermen engaged in commercial bottomfish fishing in the MHI increased dramatically in the 1970s peaking in 1980s with over 500 active vessels annually. However, participation in the fishery then declined in the early 1990s, rebounded somewhat in the late 1990s, but in 2003 reached its lowest level since 1977, with 325 vessels (WPFMC, 2007). The decline in vessels and fishing effort during this period may have been due to the long-term decrease in catch rates in the bottomfish fishery and a shift of fishing effort towards tuna and other pelagic species. However, since a catch limit system was implemented in the 2007-08 fishing year, participation in the commercial fishery sector (measured by the number of vessels reporting catch of MHI Deep 7 bottomfish) has fluctuated but appears to be gradually increasing. In that fishing year, 351 vessels were actively engaged in the fishery, increasing to 468 vessels in fishing year 2008-09. Fishing year 2009-10 saw a slight decline to 451 vessels but rebounded again to 475 vessels in the 2010-11 fishing year.

During the 2010-11 fishing year, commercial participants made approximately 3,331 Deep 7 bottomfish trips compared to 2,794 trips in 2009-10, 3,275 trips in 2008-09 and 2,345 trips in the 2008-09 fishing year. Assuming participation and fishing effort is equal throughout the fleet, each vessel would have made approximately 7 trips per year catching between 75 and 85 pounds of Deep 7 bottomfish per trip. Table 9 summarizes various characteristics of the commercial sector of the MHI Deep 7 bottomfish fishery for fishing years 2007-09 to 2010-11.

In the small-boat bottomfish fishery that is active around the MHI, the distinction between recreational and commercial fishermen is extremely tenuous, with many otherwise recreational fishermen opportunistically selling small amounts of fish to cover trip expenses. With the exception of noncommercial fishing participants fishing in federal waters, the MHI bottomfish fishery is not subject to federal permit or reporting requirements while commercial fishermen (those who sell one fish during the year) are required to obtain commercial marine licenses (CML) and to submit State trip catch reports on all fishing activity including all catches and bycatch (discards).

Participation in the MHI Deep 7 bottomfish fishery by non-commercial vessels is largely unknown. However, the State of Hawaii deep bottomfish vessel registration program has been used to provide some estimates. The program requires any person who may fish for MHI Deep 7 bottomfish to register their vessel with HDAR and display the letters “BF” on their boat. This rule applies to all vessels, whether the owner is a commercial or a non-commercial fisherman (WPFMC, 2007). Based on this database and responses from a 2005 HDAR survey of all registered vessel owners, the Council estimates that approximately 1,972 non-commercial vessels are registered to participate in the MHI Deep 7 fishery; however only up to 750 may be actively fishing (WPFMC 2007).

When the federal non-commercial bottomfish permit was implemented in 2008, NMFS issued nearly 100 permits. As of 2011, only 17 individuals possess federal non-commercial MHI Deep 7 bottomfish permits. Since non-commercial fishermen are subject to a five fish per trip bag limit, the subsequent decrease in federal non-commercial permits from nearly a 100 to 17 is likely attributed to fishermen electing to obtain a state CML, which is comparable in cost to the federal permit, but does not subject them to the 5 fish per trip bag limit. This development may explain the rise in commercial vessel participation and corresponding decline in federal non-commercial permits in recent years. Ongoing cost-earning surveys conducted by PIFSC indicated that approximately 25 percent of CML holders do not sell bottomfish (J. Hospital, pers. comm., June 21, 2011) indicating that they are actually non-commercial, giving some credence to this theory. Since a non-commercial fishing permit is not required to fish in state waters, the true level of participation by the non-commercial sector in this fishery remains unquantifiable. However, the recent revision to Hawaii Revised Statutes (HAR 13-94-9, effective October 18, 2010), which requires an annual bottomfish vessel registration renewal may allow the state to identify fishing vessels that are registered to a CML holder from those that do not have a CML (i.e., non-commercial).

In 2010, NOAA’s PIFSC conducted the Hawaii Bottomfish Survey to estimate important economic contributions bottomfish fishing activities provide to the State of Hawaii. Surveys were mailed to all federal non-commercial bottomfish permit holders and all Hawaii CML

holders who report catching bottomfish, including Deep 7 bottomfish since November 2008. Of the 519 total survey respondents, approximately 83 percent reported catching less than 500 lb of Deep 7 bottomfish in the past 12 months while 17 percent caught more. Of those that caught less than 500 lb, 35 percent reported selling a portion of the catch compared to 79 percent of those who reported catching more than 500 lb (Hospital, 2010). Only 10 percent of survey respondents reported catching more than 1000 lb in the past 12 months. Survey respondents also reported making an average of 14 trips in the past 12 months, with Maui County residents making the most (20), followed by Hawaii County (15), and Kauai and Honolulu (Oahu) counties with the least (12).

The majority of participants in the MHI bottomfish fishery are able to and do shift their fishing to target different bottomfish species at different times and shift from the bottomfish fishery to other fisheries, primarily the pelagic fishery, in response to seasonal fish abundance or fluctuations in price. Typically, seasonal runs of yellowfin tuna begin in late-May or June and many bottomfish fishermen take advantage of their availability.

Since 2007, the MHI bottomfishery management regime implemented a total allow catch system that was triggered by an annual review of the status of the fishery which indicated that overfishing was occurring. The annual fleet-wide quota management regime is based on a September to August fishing year. Federal non-commercial bottomfish permit and reporting requirements and non-commercial bag limits for deep seven bottomfish species is required for bottomfishing in the US EEZ surrounding the MHI. The annual quota program has since transitioned to an annual catch limit (ACL) regime with actual quota limit being set at an annual catch target (ACT). For the 2011/2012 deep 7 bottomfishing season, the ACT has been set at 325,000 pounds with an ACL of 345,000 pounds. A separate ACL is established for the non-deep 7 BMUS complex.

Table 4.3. Annual TAC specifications, opening and closing dates of the fishery and final reported landings.

Year	**TAC/ACL**	**Open**	**Close**	**Final Landing**
2007/2008	*178K	Oct 1, 2007	April 16, 2008	195,861 lbs
2008/2009	**241K	Nov. 15, 2008	July 6, 2009	258,544 lbs
2009/2010	***254,050	Sept 1, 2009	April 20, 2010	208,369 lbs
2010/2011	***254,050	Sept 1, 2010	March 12, 2011	267, 569 lbs
2011/2012	325,000 (ACT) 345,000 (ACL)	Sept 1, 2011	Open	TBD

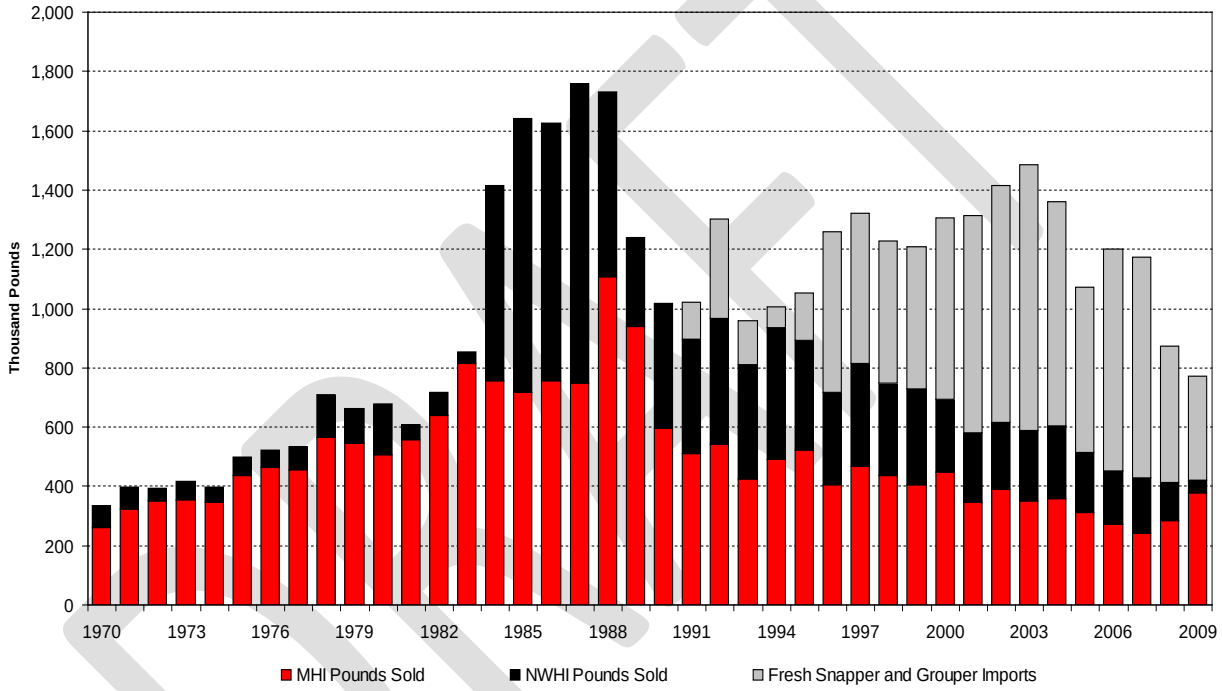
Information Used for Setting TACs
* 2006 Stock Assessment/Amendment 14 (Moffitt et al. 2006)
** 2008 Stock Assessment from PIFSC (Brodziak et al. 2008)
*** 2009 Stock Assessment from PIFSC (Brodziak et al. 2009)

Bottomfish are an important part of the local culture especially during holidays and on special occasions. Bottomfish caught in the MHI fishery are sold in a wide variety of market outlets (Haight et al. 1993b). Some are marketed through the fish auction and intermediary buyers on all islands. Sales of MHI bottomfish also occur through less formal market channels such as local restaurants, hotels, grocery stores, and to individual consumers. Unsold fish are consumed by

fishermen and their families, given to friends and relatives as gifts, and bartered in exchange for various goods and services. Onaga and opakapaka make up the largest valued landings in each area for most years (ignoring the highly fluctuating landings of uku).

During the past decade imports of fresh snapper and grouper into Hawaii have increased dramatically. More than 460,000 pounds were imported from Tonga, New Zealand, Indonesia, Fiji and Australia in 2008 accounting for more than 50 percent of Hawaii bottomfish market (Figure 1). The increase in imports is likely the combined result of continued high demand, closure of the NWHI bottomfish fishery and management changes to the MHI fishery since 2007.

Figure 1. Hawaii Bottomfish Market Supply 1070-2008



Source data: Hawaii Division of Aquatic Resources, national Marine Fisheries Service, US Census Bureau Foreign Trade Division (Hospital, PIFSC 2010)

4.4 Overview of the Hancock Seamounts Fishery

There is no domestic or foreign fishery at Hancock Seamounts currently; there was never a domestic fishery for bottomfish, seamount groundfish, or precious corals. However, prior to the moratorium from 1978-1984, the U.S. administered a permit fishery to Japanese trawlers to harvest armorhead at Hancock Seamounts. The fishery never attained its total annual quota of 1,000 mt and the moratorium was implemented in 1986.

4.4.1 Target and Non-Target Species

The potential target species for a domestic fishery is armorhead and alfonsin; butterfish, scorpionfish, and other fishes are potential non-target species. Armorhead was the primary target of foreign fleets prior to the moratorium at Hancock Seamounts and is still the primary

target of foreign fleets throughout the SE-NHR Seamounts. Alfonsin has become a secondary target species since armorhead catches declined after 1976.

Armorhead undergo an initial 2+ year pre-recruit pelagic phase in the temperate and subarctic North Pacific. They then return at full size to the SE-HNR seamounts, including Hancock Seamounts, in late spring-early summer. After recruitment to the seamounts, armorhead cease somatic growth, but develop reproductively. They spawn annually during November-December, surviving 4-5 years at the seamounts. They become emaciated during their time at the seamounts and therefore, annual increases in biomass at the seamounts are solely dependent on new recruitment.

4.4.2 Bycatch Species

Due to the moratorium on the Hancock Seamounts for over 20 years, there has been no domestic fishery and therefore no bycatch. Potential bycatch species associated with the SE-NHR Seamounts bottom trawl fisheries (which is a prohibited gear in the U.S. EEZ under the Hawai`i FEP), that have that have been caught by Japanese, Korean, and Russian trawlers are Japanese boarfish (*Pentaceros japonicus*), broad alfonsin (*Beryx decadactylus*), Japanese butterfish (*Hyperoglyphe japonica*), mirror dory (*Zenopsis nebulosa*), skilfish (*Erilepis zonifer*), boarfishes (*Antigonia* spp.), cardinalfish (*Epigonus* spp.), snake mackerel (*Promethichthys prometheus*), morid cods (Moridae), and squalid shards and scorpionfishes (Sebastidae and *Helicolenus* spp.) (Sasaki 1986 and FAJ 2008 as quoted in NPRFMO 2008).

4.4.3 Stock Status

The Hawai`i FEP defines recruitment overfishing for bottomfish as a condition in which the ratio of the current spawning stock biomass proxy (CPUE scaled by the percent mature fish in the catch) for a specific species to a given reference level drops below the limit specified for that species. The 1996 reauthorization of the Magnuson-Stevens Act by the Sustainable Fisheries Act contained new requirements for monitoring potential overfishing. Under Magnuson-Stevens Act National Standard 1 guidelines, armorhead at the Hancock Seamounts are still overfished. However, the other two seamount groundfish (alfonsin and raftfish) and the bottomfish stocks are not overfished or experiencing overfishing.

After discovery of the armorhead stock over the SE-NHR Seamounts by a Soviet trawler in 1967 (Baytalyuk and Katugin 2009), Soviet and Japanese trawlers fished pelagic armorhead through its peak in 1973. The U.S. administered permits to foreign trawlers to fish armorhead at the Hancock Seamounts from 1978-1984 with U.S. observers on board. The fishery never attained its annual armorhead quota and the program was discontinued in 1984. A 6-year moratorium on fishing for all groundfish and seamount groundfish was subsequently implemented at Hancock Seamounts in 1986 to restore depleted armorhead stocks. A second six year moratorium was implemented in 1992; after periodic reviews indicated no recovery had occurred, armorhead was listed as overfished in the September 1997 “Report to Congress Status of Fisheries of the United States” and continues to remain in that condition.

Although there are no current data for Hancock Seamounts, a series of stock assessment research cruises from 1985-1993 was conducted on the armorhead stock at Southeast Hancock Seamount. The data collected were used to create frequency distributions of fatness index in order to track

recruitment cohorts over time within the Southeast Hancock population of armorhead. Research plans are being established by the NPRFMA that seek to update stock assessments throughout the armorhead range of the SE-NHR Seamounts chain, including Hancock Seamounts.

4.4.4 Specification of Rebuilding Time

The armorhead fishery is currently considered to be in an overfished condition and has been subject to four consecutive 6-year fishing moratoria at Hancock Seamounts totaling 24 years. Thus, the armorhead stock is still in rebuilding. Pursuant to the MSA, the Council is required to recommend conservation and management measures to rebuild overfished stocks and specify a time period for rebuilding the stock that is short as possible (T_{min}), taking into account the status and biology of the stock, needs of the fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem. Since the moratorium was implemented, there have been only two major recruitment events in 1992 and 2004 (Humphreys PIFSC 2009 pers. comm.). It is suggested that perhaps the combination of low stock size and unidentified environmental influences have contributed to the sparse episodic recruitment. Based on the long-term low stock size of armorhead and the uncertainty of future recruitments that could rebuild the stock, a T_{min} of 35 years has been determined based on five generation times and the assumption of a 7-year lifespan for armorhead (Humphreys 2009; although there is disagreement about 7 versus 11 years, NPRFMO 2008).

As previously noted in Section 1.0, less than five percent of armorhead habitat lies within waters under U.S. jurisdiction which limits the ability of the United States to unilaterally effectuate significant rebuilding of the stock. Thus, it will take further international agreement and cooperation to fully rebuild the armorhead stock throughout its range. However, the proposed moratorium on fishing within the Hancock Seamounts EMA ensures U.S. fishermen do not contribute to overfishing and delay rebuilding of the stock. The previous four moratoria have prohibited fishing on the Hancock Seamounts for the past 24 years and provided a control site against which to assess armorhead population and habitats of other seamounts on the high seas. Work of the Participating States within the NPRFMA to conduct an armorhead stock assessment and the development of appropriate management measures based on the outcome of the assessment will provide much-needed international support for the rebuilding of the armorhead stock throughout its range. Of note is that management measures developed by the NPRFMA could supersede management measures implemented under the MSA.

4.5 Other Resources or Activities

Other fishing and non-fishing activities also occur in affected environment. Commercial and non-commercial fisheries for species other than BMUS include coral reef and pelagic fisheries. Fishing methods and gear used in these fisheries include trolling, trap, net and dive.

Other fisheries occurring on and surrounding the Cross Seamount area include pelagic trolling, shortline, longline and handline.

Non-fishing activities that may occur in the area could include such activities as cable laying, dredge spoil deposition, off-shore aquaculture, off-shore wind energy farms, Ocean Thermal Energy Conversion (OTEC), the Honolulu Seawater Air Conditioning project and wave energy.

Any federal action or activity that may adversely affect the areas designated as EFH will require consultation with NMFS.

5.0 Impacts of the Alternatives

5.1 Bottomfish EFH Designations

5.1.1 Alternative 1: No Action

5.1.1.1 Impact to Hawaii Bottomfish and Habitat

5.1.1.2 Impact to Bottomfish Fishery Participants

5.1.1.3 Impact to Other Resources and Activities

5.1.2 Alternative 2:

5.1.2.1 Impact to Hawaii Bottomfish and Habitat

5.1.2.2 Impact to Fishery Participants

5.1.2.3 Impact to Other Resources and Activities

5.1.3 Alternative 3:

5.1.3.1 Impact to Hawaii Bottomfish and Habitat

5.1.3.2 Impact to Fishery Participants

5.1.3.3 Impact to Other Resources and Activities

5.2 Seamount Groundfish EFH Designations

5.2.1 Alternative 1: No Action

5.2.1.1 Impact to Hawaii Seamount Groundfish and Habitat (Hancock and Cross Seamounts)

5.2.1.2 Impact to Fishery Participants

5.2.1.3 Impact to Other Resources and Activities

5.2.2 Alternative 2: Revise EFH and add Cross Seamount

5.2.2.1 Impact to Hawaii Seamount Groundfish and Habitat (Hancock and Cross Seamounts)

5.2.2.2 Impact to Fishery Participants

5.2.2.3 Impact to Other Resources and Activities

6.0 Assessment of Activities that May Adversely Affect EFH

6.1 Fishing Related Activities

Fishing related activities that may adversely affect EFH for all federally managed resources in Hawaii are described and assessed in the Fishery Ecosystem Plan for the Hawaii Archipelago (WPFMC 2009). The predominant fishing gear types—hook and line, longline, troll, traps—used in the fisheries managed by the Council cause few fishing-related impacts to the benthic habitat utilized by coral reef species, bottomfish, crustaceans, or precious corals. The current management regime prohibits the use of bottom trawls, bottom-set nets, explosives, and poisons. The use of non-selective gear to harvest precious corals is prohibited and only selective and non-destructive gear may be allowed to fish for Coral Reef Ecosystem MUS.

With respect to bottomfish fishing Council has identified the following potential sources of fishery-related impacts to benthic habitat that may occur during normal bottmfishing operations:

- Anchor damage from vessels attempting to maintain position over productive fishing habitat;
- Heavy weights and line entanglement occurring during normal hook-and-line fishing operations.

Submersible surveys conducted at depths of 656 to 1,148 feet (199.9 to 349.9 meters) on several fishing banks in the NWHI found little evidence of physical disturbances by bottomfishing from anchors and fishing gear (Kelley and Ikehara 2006). Although other fishing areas in Hawaii have not been studied extensively, hook and line methods like those used in bottomfishing operations are considered to be “low impact” and is not likely to adversely affect EFH.

The Council has determined that current management measures to protect fishery habitat are adequate and that no additional measures are necessary at this time. However, should future research demonstrate a need, the Council will act accordingly to protect habitat necessary to maintain a sustainable and productive fishery.

6.2 Non-Fishing Related Activities

The Council is also required to identify non-fishing activities that have the potential to adversely affect EFH quality and, for each activity, describe its known potential adverse impacts and the EFH most likely to be adversely affected. The descriptions should explain the mechanisms or processes that may cause the adverse effects and how these may affect habitat function. Non-fishing related activities that my adversely affect EFH are described and assessed in the Fishery Ecosystem Plan for the Hawaii Archipelago (WPFMC 2009).
Examples from the FEP for the Hawaii Archipelago (2009) of categories of non-fishing activities that have been identified as impacting EFH include:

- Habitat Loss and Degradation
- Pollution and Contamination
- Dredging
- Marine Mining
- Water Intake Structures
- Aquaculture Facilities
- Introduction of Exotic Species

EFH Consultations

The MSA requires that federal agencies consult with NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect EFH. It is then required that NMFS provide the federal action agency with EFH conservation recommendations to avoid, minimize, mitigate or otherwise offset any adverse affects. For projects within the WPR, the Habitat Conservation Division (HCD) at NMFS' Pacific Islands Regional Office (PIRO) performs those consultations with federal action agencies in order to assess any adverse effects to EFH and recommend any measures to conserve EFH.

According to NMFS guidelines, activities that may result in adverse affects on EFH should be avoided where less environmentally harmful alternatives are available. If there are no alternatives, the impacts of these actions should be minimized. Environmentally sound engineering and management practices should be employed for all actions that may adversely affect EFH. If avoidance or minimizations are not possible and unavoidable impact to EFH result, mitigation to offset impacted EFH is recommended. Ultimately, EFH protection will lead to more robust fisheries, providing benefits to coastal communities and commercial and recreational fishers alike (Benaka 1999).

Current EFH Impacts in Hawaii

NOAA Fisheries developed an online query system which allows federal agencies and Corps' Applicants to track the status of a NMFS consultation under the ESA and under the MSA. The Public Consultation Tracking System (PCTS) allows for all NOAA Fisheries regions to track EFH consultation records since October 2004. The results of the query provide information regarding such things as the lead agency, the consultation type, the status, the location of the project and the final response. Limitations of PCTS include that it does not specify which EFH may be affected, such as for bottomfish, pelagic, coral reef, etc., and the description of the projects is not very thorough. Since 2004, there have been 56 projects out of the 129 consultations recorded in PCTS that were determined 'Would Adversely Affect' EFH, for which conservation recommendations were made. Thirty-nine of those were in Hawaii.

Harbor projects have been common in Hawaii. These projects often involve dredging, which removes EFH for shallow BMUS. There have also been several projects in the last several years involving the installation of fiber optic cables. These particular projects have been determined to not have an adverse effect on EFH, some of them only after NMFS recommendations. The recommendation given for one particular project involved bending the cable to go around coral mounds. The HCD asked that any unavoidable impacts to coral during operations despite the avoidance and minimization efforts be quantified and mitigated. The HCD also asked that any video footage taken post-construction of the cable be sent to them for review.

The installation of cables can result in the loss of benthic habitat from dredging and plowing through the seafloor. The conversion of benthic habitat can occur if cables are not buried sufficiently within the substrate. Other possible concerns regarding habitat for BMUS include:

- Siltation, sedimentation and turbidity during installation;
- Release of contaminants; and

- Alteration of community structure.

Potential future EFH Impacts in Hawaii

Looking forward, an area of growing interest related to non-fishing impacts to EFH is the development of renewable energy. Several renewable energy projects have been proposed throughout the WPR, particularly in Hawaii, in the last several years, such as for off-shore wind energy farms, Ocean Thermal Energy Conversion (OTEC), the Honolulu Seawater Air Conditioning project, and wave energy.

Wind Energy
There is a pending wind farm project currently being reviewed in which several wind turbines would be located off-shore with an undersea cable connecting to a land distribution line. Some of the possible concerns specific to EFH include:

- Alteration of ecosystem structure due to the foundations acting as Fish Aggregating Devices (FAD), possibly creating more vulnerability of biota to be fished;
- Multiple stressors, such as the presence of electric cables on the seafloor and underwater sound generated by the turbines, could have cumulative effects on marine ecosystem and community dynamics;
- Alteration of hydrological regimes from the placement of wind farms could change current patterns and affect the distribution of species within estuaries and bays, as well as the migration patterns of anadromous fishes;
- Undersea cable maintenance, repairs and decommissioning can result in impacts to benthic resources and substrate;
- Siltation, sedimentation and turbidity during construction of wind turbine and support structures may cause temporary disruption and displacement of eggs and larvae for BMUS; and
- Discharge of contaminants into the water, including hazardous materials that may be stored at the service platform (fluids from transformers, diesel fuel, oils, etc.) can affect the water quality of BMUS habitat.

Ocean Thermal Energy Conversion (OTEC)
Another type of project regarding renewable energy technology that is on its way to further development in the WPR is OTEC. Basically, OTEC uses warm surface water to vaporize ammonia, which turns a turbine to drive a generator to produce electricity. Deep, cold ocean water then cools the ammonia back into liquid in order to be heated again in a constant cycle of vaporization and condensation. A land-based OTEC site has recently come one step closer to securing a 30-year lease for a 2.5 acre demonstration plant located at the Natural Energy Laboratory of Hawaii Authority on the Island of Hawaii (Miller 2012). There have been other test sites proposed, such as one off of Maui. Proponents of OTEC have struggled to get funding for new projects, but it is their hope to work with the Hawaiian Electric Company to install a 100-megawatt plant off-shore of Oahu. If off-shore OTEC projects become more common in the future, there are concerns that will need to be addressed regarding any potential adverse effects they may have on BMUS EFH.

A draft needs assessment from a recent OTEC meeting states that the following information regarding EFH/HAPC is needed:

- Is there EFH or HAPC designated in the vicinity of the proposed facility?
- Will the zone of influence of the intake or discharge impact EFH or HAPC?
- What impact will the discharge water quality have on EFH/HAPC?
- Will the discharge and intake directly or indirectly impact EFH/HAPC through change in abundance or behavior of predator and/or prey species?
- Will electromagnetic field and noise generated during operation impact the behavior of fish and/or their habitat?

Some of these same concerns were identified by NMFS Pacific Islands Fisheries Science Center (PIFSC). A brief description of a few of the possible operational impacts from the discharge included:

Biostimulation/Inhibition

- Elevated levels of dissolved inorganic nutrients, primarily phosphate, nitrate and silicate;
- Changes to phytoplankton and zooplankton; and
- Promotion of harmful algal blooms.

Impacts on Fisheries Life History

- Greater primary production and/or truncated trophic relationships;
- Changes to recruitment, mortality, and larval ecology;
- Changes to temporal and spatial distribution of the early life stages; and
- Increase/decrease in fish production.

Impacts on Fisheries

- May serve as very large FADs; and
- May increase entrainment and/or morbidity of eggs, larvae, juveniles.

One other concern is impingement occurring at the intake. Impingement occurs when organisms too large to pass through the intake screen are pulled against it, and are unable to escape due to the intake current velocity. It causes ecological (loss of a large number of organisms), operational (reduction in cooling water flow), and cost problems (removal and disposal of organisms. Impingement rates depend on the location and velocity of the intake, time of day/season, behavior characteristics of the populations of organisms associated with the plant site, among other factors.

Another possibility of adverse impacts is in regards to primary and secondary entrainment. Any organism small enough to pass through the intake screens will be entrained in the seawater flowing through (primary). The capture of organisms in discharge waters as a result of turbulent mixing or behavior response is secondary entrainment. The rate at which organisms are entrained in this manner will depend on the discharge flow rate, the near-field dilution and the average population density along the near-field trajectory of the plume.

The final concerns discussed in this particular presentation were in regards to acoustical and electromagnetic field (EMF), the leaching of small amounts of toxic metals through heat exchangers, and any possible interaction with endangered species. There is still more research

that needs to be done on the possible impacts of this technology, as the technology itself continues to develop, but it does appear from the questions that were raised at the OTEC meeting that proponents of OTEC technology are taking a proactive stance in trying to address these concerns that would likely come up in a NMFS EFH consultation.

Seawater Air Conditioning System

There is currently a proposed action which involves using a 63-inch intake pipe to pump cold seawater from about a 1,750 ft depth to land in order to supply centralized air conditioning for downtown Honolulu buildings. After the seawater is circulated through an on-shore cooling station, heat exchangers and a network of distribution pipes downtown, it will then be returned to near-shore at discharge depths ranging from a depth of 150 to 500 ft.

Some construction activities will be modified in order to reduce environmental impacts, but some of the adverse effects to EFH from this project include:

Permanent loss of juvenile and adult benthic habitat for BMUS as a result of receiving pit excavation and pipe collar installation;

- Temporary and/or permanent loss of juvenile and adult benthic habitat for BMUS from sedimentation;
- Temporary disruption and displacement of eggs and larvae for BMUS due to increased turbidity from the various construction activities;
- Disruption and displacement of eggs and larvae for BMUS within the Zone of Mixing associated with the return-water discharge;
- Impingement/entrainment at the seawater intake location; and

Possible permanent alteration of the biotic and abiotic conditions in the near-shore environment from the continuous discharge of cold nutrient-rich return water.

Wave Energy Facilities

The information in this section is adapted from the following reference: Johnson, M.R., Boelke, C., Chiarella, L., Colossi, P., Green, K., Lessis-Dibble, K., Ludemann, H., Ludwig, M., McDermott, S., Ortiz, J., Rusanowsky, D., Scott, M. and Smith, J. 2008. Impacts to Marine Fisheries Habitat from Nonfishing Activities in the Northeastern United States. NOAA Technical Memorandum NMFS-NE-209.

This technology involves the construction of stationary or floating devices that are attached to the ocean floor, the shoreline or a marine structure like a breakwater. Ocean wave power systems can be utilized in the off-shore or near-shore environments. Off-shore systems can be situated in deep water, typically in depths greater than 40m. Some examples of off-shore systems include using the bobbing motion created by passing waves to power a pump that creates electricity. Other off-shore devices use hoses connected to floats that move with the waves. The rise and fall of the float stretches and relaxes the hoses, which pressurizes the water, which in turn rotates a turbine. There was one wave energy technology (WET) project for which the HCD of NMFS performed a consultation in 2006.

The construction of wave energy facilities includes the placement of structures within the water column, along with the placement of support structures, transmission lines and anchors on the

substrate, which will result in a direct impact to benthic habitats possibly impacting the feeding or spawning habitats for various MUS. Other possible impacts include:

- Alteration of hydrological regimes, which can affect the distribution of eggs and larvae for BMUS;
- Impingement and/or entrainment;
- EMFs produced by the electrical distribution cables associated with wave-power facilities may interfere with fish behavior (Gill et al 2005).

Also, the impacts associated with the decommissioning and/or dismantling of wave energy facilities should be included as part of the environmental analysis.

Aquaculture

Plans of aquaculture projects around Hawaii have been in discussion for some time. In 1999, the Hawaii State Legislature even amended a state law to encourage large-scale commercial aquaculture in off-shore waters (Cates et al. 2001). This controlled cultivation and harvest of aquatic organisms utilizes netpens, cages, ocean ranching, longline culture or bottom culture. There are currently three aquaculture projects around Hawaii, one of which is not currently in production, and a few other projects in the works. The Department of Health recently granted a National Pollutant Discharge Elimination System permit for a planned fish farm off of Kohala on the Big Island of Hawaii. For marine-based off-shore aquaculture facilities in Hawaii, some of the known and potential impacts to habitats include:

- Discharge of organic and chemical waste, which can degrade the quality of the water column and the benthic environment, possibly affecting all life stages of BMUS. Organic wastes include uneaten fish food, feces, mucus and by-products of respiration, while chemical wastes include antibiotics, pesticides, hormones and vitamins (Navas et al. 2011; Wai 2011);
- Food web impacts via localized nutrient loading from organic waste and by large-scale removals of oceanic fish for fish feed;
- Possible gene pool alterations from escaped aquaculture species interbreeding with native species;
- Changes in species diversity and abundance from increased organic waste, modification to bottom habitat and the attraction of predators to the farmed species;
- Introduction of parasites and diseases; and
- Habitat replacement/conversion from sediment deposition causing underlying habitat to become eutrophic, thus converting viable bottomfish habitat to unusable or less productive seafloor area.

7.0 Actions to Encourage Conservation and Enhancement of EFH

According to NMFS guidelines, Councils must describe ways to avoid, minimize, or compensate for the adverse effects to EFH and promote the conservation and enhancement of EFH. Generally, non-water dependent actions that may have adverse impacts should not be located in EFH. Activities that may result in significant adverse effects on EFH should be avoided where less environmentally harmful alternatives are available. If there are no alternatives, the impacts

of these actions should be minimized. Environmentally sound engineering and management practices should be employed for all actions that may adversely affect EFH. Disposal or spillage of any material (dredge material, sludge, industrial waste, or other potentially harmful materials) that would destroy or degrade EFH should be avoided. If avoidance or minimization is not possible, or will not adequately protect EFH, compensatory mitigation to conserve and enhance EFH should be recommended. FEPs may recommend proactive measures to conserve or enhance EFH. When developing proactive measures, Councils may develop a priority ranking of the recommendations to assist federal and state agencies undertaking such measures. Councils should describe a variety of options to conserve or enhance EFH, which may include, but are not limited to the following:

Enhancement of rivers, streams, and coastal areas through new federal, state, or local government planning efforts to restore river, stream, or coastal area watersheds.

Improve water quality and quantity through the use of the best land management practices to ensure that water-quality standards at state and federal levels are met. The practices include improved sewage treatment, disposing of waste materials properly, and maintaining sufficient instream flow to prevent adverse effects to estuarine areas.

Restore or create habitat, or convert non-EFH to EFH, to replace lost or degraded EFH, if conditions merit such activities. However, habitat conversion at the expense of other naturally functioning systems must be justified within an ecosystem context.

8.0 EFH Research Needs

The NMFS PIRO contracted in 2008 to conduct an inventory of available environmental and fisheries data sources relevant to the EFH of the Hawaii bottomfish fishery. Based on this inventory, this amendment to the Hawaii Fishery Ecosystem Plan is being updated to supplement existing data for individual MUS in the Hawaii bottomfish fishery. For analysis of this information, refer to the Fishery Ecosystem Plan for the Hawaii archipelago and appendix 1.

Additional research is needed to make available sufficient information to support a higher level of description and identification of EFH and HAPC. Additional research may also be necessary to identify and evaluate actual and potential adverse effects on EFH, including, but not limited to, direct physical alteration; impaired habitat quality/functions; cumulative impacts from fishing; or indirect adverse effects, such as sea level rise, global warming, and climate shifts.

The following scientific data are needed to more effectively address EFH provisions:

All Bottomfish MUS

- Distribution of early life history stages (eggs and larvae) of MUS by habitat
- Juvenile habitat (including physical, chemical, and biological features that determine suitable juvenile habitat)
- Food habits (feeding depth, major prey species, etc.)
- Habitat-related densities for all MUS life history stages
- Habitat utilization patterns for different life history stages and species for BMUS

- Growth, reproduction, and survival rates for MUS within habitats
- Inventory of marine habitats in the EEZ of the Western Pacific Region
- High-resolution maps of bottom topography/currents/water masses/primary productivity

9.0 Consistency with MSA and Other Laws

9.1 Consistency with National Standards

National Standard 1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The measures in this FEP are consistent with National Standard 1 because they emphasize managing the fisheries in a sustainable manner to best obtain optimum yield. The measures in the FEP are a result of the consolidation of the Council's previous four species-based demersal FMPs (Bottomfish and Seamount Groundfish, Coral Reef Ecosystems, Crustaceans, and Precious Corals) into one place-based Hawaii Archipelago Fishery Ecosystem Plan. The reference points and control rules for species or species assemblages within those four FMPs are maintained in this FEP without change.

National Standard 2 states that conservation and management measures shall be based upon the best scientific information available.

The updated life history information provided on the BMUS complex through this amendment includes the best scientific information available on the habitat requirements at the various life stages. The new scientific information and data used to evaluate EFH and HAPC designations have gone through the Western Pacific Stock Assessment Review process and Scientific and Statisical Committee review. In addition, management decisions have complied with environmental laws including NEPA, which ensures that the public is part of the data review process.

National Standard 3 states that, to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The scientific literature review supporting this amendment confirms the Hawaii BMUS complex is being managed consistently with National Standard 3 to the maximum extent practicable.

National Standard 4 states that conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The measures in this amendment are consistent with National Standard 4 because they do not

discriminate between residents of different States or allocate fishing privileges among fishery participants.

National Standard 5 states that conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

The measures in this amendment are consistent with National Standard 5 because they do not require or promote inefficient fishing practices nor is economic allocation among fishery participants their sole purpose.

National Standard 6 states that conservation and management action shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The measures in this amendment are consistent with National Standard 6 because they support a management structure that facilitates consultation among Federal agencies conducing activities that may affect bottomfish EFH.

National Standard 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

The measures in this amendment is consistent with National Standard 7 because its facilitates actions that are specific to circumstances in the Hawaii Archipelago.

National Standard 8 states that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The measures in this amendment are consistent with National Standard 8 because they promote participation of fishing communities in the development and implementation of future management measures in the Hawaii Archipelago.

National Standard 9 states that conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided minimize the mortality of such bycatch.

The measures in this amendment are not applicable to National Standard 9.

National Standard 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

The measures in this amendment are consistent with National Standard 10 because they do not require or promote any changes to current fishing practices or increase risks to fishery participants.

9.2 Consistency with Objectives of the Fishery Ecosystem Plan

The Council has adopted the following ten objectives for the Hawaii Archipelago FEP:

Objective 1: To maintain biologically diverse and productive marine ecosystems and foster the long-term sustainable use of marine resources in an ecologically and culturally sensitive manner through the use of a science-based ecosystem approach to resource management.

The measures in this amendment provide an improved scientific baseline for bottomfish EFH and HAPC in the Hawaiian archipelago.

Objective 2: To provide flexible and adaptive management systems that can rapidly address new scientific information and changes in environmental conditions or human use patterns.

The measures in this amendment are consistent with Objective 2 because they do not require or promote any changes to current fishing practices or change management measures within the FEP for the Hawaii archipelago.

Objective 3: To improve public and government awareness and understanding of the marine environment in order to reduce unsustainable human impacts and foster support for responsible stewardship.

The measures in this amendment will provide improved scientific information on the habitat requirements for bottomfish management unit species in the Hawaiian archipelago to which the public and government agencies can assess potential impacts of proposed future activities.

Objective 4: To encourage and provide for the sustained and substantive participation of local communities in the exploration, development, conservation, and management of marine resources.

The measures in this amendment will provide improved scientific information on the habitat requirements for bottomfish management unit species in the Hawaiian archipelago which the public can utilize to explore, develop, conserve and manage Hawaii's marine resources.

Objective 5: To minimize fishery bycatch and waste to the extent practicable.

The measures in this amendment are consistent with Objective 5 because they do not require or promote any changes to current fishing practices or increase risks to fishery participants.

Objective 6: To manage and comanage protected species, protected habitats, and protected areas.

The measures in this amendment are consistent with Objective 6 because they do not require or promote any changes to current fishing practices or increase risks to protected species.

Objective 7: To promote the safety of human life at sea.

The measures in this amendment are consistent with Objective 7 because they do not require or promote any changes to current fishing practices or increase risks to fishery participants.

Objective 8: To encourage and support appropriate compliance and enforcement with all applicable local and federal fishery regulations.

The measures in this amendment are consistent with Objective 8 because they do not require or promote any changes to current fishing practices or increase risks to fishery participants.

Objective 9: To increase collaboration with domestic and foreign regional fishery management and other governmental and non-governmental organizations, communities, and the public at large to successfully manage marine ecosystems.

The measures in this amendment will provide an improved baseline to which other domestic and foreign fishery management and other governmental and non-governmental organizations, communities and the public at large can assess potential impacts to bottomfish EFH and HAPC in the Hawaiian archipelago.

Objective 10: To improve the quantity and quality of available information to support marine ecosystem management.

This amendment include improved scientific information on the essential fish habitat requirements for bottomfish management units species in the Hawaiian archipelago.

9.3 National Environmental Policy Act

This document has been written and organized to meet the requirements of the National Environmental Policy Act and thus is a consolidated document including an Environmental Assessment, as described in NOAA Administrative Order 216-6, Section 603.a.2. The Environmental Assessment contained in this document uses biological information from, and incorporates by reference, the affected environment described in the Programmatic Environmental Impact Statement (PEIS) prepared in association with the implementation of the FEPs.

9.3.1 Purpose and Need

The purpose and need is for this action is described in Section 2.0.

9.3.2 Alternatives Considered

The alternatives considered for this action are described in Section 3.0.

9.3.3 Affected Environment

The affected environment for this action is described in Section 4.0.

9.3.4 Impacts of the Alternative

The expected impacts of the alternatives considered for this action are described in Section 5.0.

9.4 Regulatory Impact Review/E.O. 12866

In order to meet the requirements of Executive Order 12866 (E.O. 12866), NMFS requires that a Regulatory Impact Review be prepared for all regulatory actions that are of public interest. As this proposed action will not result in a regulatory action, a RIR was not prepared.

9.5 Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedures Act (APA) (5 U.S.C. Subchapter II) which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the Federal Register and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it becomes effective, with rare exceptions. This amendment complies with the provisions of the APA through the Council's extensive use of public meetings, requests for comments, and consideration of comments. The notice of availability associated with this amendment will also include requests for public comments.

9.6 Coastal Zone Management Act

The Coastal Zone Management Act requires a determination that a recommended management measure has no effect on the land or water uses or natural resources of the coastal zone or is consistent to the maximum extent practicable with the enforceable polices of an affected state's approved coastal zone management program. A copy of this document will be submitted to the appropriate state government agencies in Hawaii for review and concurrence with a determination that the recommended measures are consistent, to the maximum extent practicable, with the state coastal zone management program.

9.7 Information Quality Act

To the extent feasible, the information in this document is current. Much of the information was made available to the public during the deliberative phases of developing the amendment during meetings of the Council. The information was also improved based on the guidance and comments from the Council's advisory groups. Additional comments are expected to be received during the comment period for the amendment.

The document was prepared by Council and NMFS staff based on information provided by NMFS Pacific Islands Fisheries Science Center (PIFSC) and NMFS Pacific Islands Regional Office (PIRO). The document will be reviewed by PIRO and NMFS Headquarters staff (including the Office of Sustainable Fisheries). Legal review is expected from NOAA General Counsel Pacific Islands and General Counsel for Enforcement and Litigation for consistency with applicable laws, including but not limited to the Magnuson-Stevens Act, National Environmental Policy Act, Administrative Procedure Act, Paperwork Reduction Act, Coastal

Zone Management Act, Endangered Species Act, Marine Mammal Protection Act, and Executive Orders 13132 and 12866.

9.8 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act (PRA) is to minimize the burden on the public by ensuring that any information requirements are needed and are carried out in an efficient manner (44 U.S.C. 350191(1)). None of the measures contained in this amendment have any new public regulatory compliance or other paperwork requirements and all existing requirements were lawfully approved and have been issued the appropriate OMB control numbers.

9.9 Regulatory Flexibility Act

In order to meet the requirements of the Regulatory Flexibility Act (RFA), 5 U.S.C. 601 et seq. requires government agencies to assess the impact of their regulatory actions on small businesses and other small entities via the preparation of regulatory flexibility analyses. The RFA requires government agencies to assess the impact of significant regulatory actions on small businesses and other small organizations. The basis and purpose of the measures contained in this amendment are described in Section 2.0 and the alternatives considered are discussed in the amendment prepared for this action. Because none of the alternatives contain any regulatory compliance or paperwork requirements, the Council believes that this action is not significant (i.e., it will not have a significant impact on a substantial number of small entities) for the purposes of the RFA, and no Initial Regulatory Flexibility Analysis has been prepared.

9.10 Endangered Species Act

The ESA requires that any action authorized, funded, or carried out by a federal agency ensure its implementation would not jeopardize the continued existence of listed species or adversely modify their critical habitat. Pursuant to Section 7 of the Endangered Species Act, the fisheries managed by the Council have been analyzed and found to not jeopardize or adversely affect any populations or habitats of species listed as endangered or threatened under the ESA.

In a biological opinion issued in March 2002 NMFS concluded that the ongoing operation of the Western Pacific Region's bottomfish and seamount fisheries, as managed under the Bottomfish and Seamount Groundfish FMP, was not likely to jeopardize the continued existence of any threatened or endangered species under NMFS's jurisdiction or destroy or adversely modify any critical habitat (NMFS 2002a). This determination was made pursuant to section 7 of the ESA.

A biological opinion issued in March 2008 examined the impacts of MHI bottomfish fisheries and concluded that they are likely to adversely affect up to two green sea turtles each year but are not likely to jeopardize the species or adversely affect any other ESA-listed species or critical habitat (NMFS 2008).

The Council believes that the proposed action is not likely to jeopardize the continued existence of any threatened or endangered species under NMFS's jurisdiction or destroy or adversely modify critical habitat.

9.11 Marine Mammal Protection Act

Under section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that classifies U.S. commercial fisheries into one of three categories. These categories are based on the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. Specifically, the MMPA mandates that each fishery be classified according to whether it has frequent, occasional, or a remote likelihood of or no-known incidental mortality or serious injury of marine mammals.

Hawaii bottomfish fishery is listed as a Category III fishery under Section 118 of the 2012 MMPA List of Fisheries (76 FR 73912, November 29, 2011. The Council believes that the proposed action would not modify fishery operations in any manner affecting marine mammals not previously considered or authorized by the commercial taking exemption under section 118 of the Marine Mammal Protection Act.

Therefore, no increased impacts on marine mammals that occur in the waters around the Hawaii Archipelago are expected under the proposed action.

10.0 References

See Appendix 1.

Appendix 1: New Life History Descriptions for Hawaii Bottomfish.
Appendix 2: HAPC Maps for BMUS