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Supplemental Environmental Assessment

Specification of the 2010-11 Total Allowable Catch of Main Hawaiian Islands Deep 7 Bottomfish

July 9, 2010

Lead Agency: Pacific Islands Regional Office (PIRO)
National Marine Fisheries Service (NMFS)
National Oceanographic and Atmospheric Administration (NOAA)
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Background

Hawaiian archipelagic bottomfish stocks are managed under the Fishery Ecosystem Plan for the Hawaii Archipelago (Hawaii FEP) developed by the Western Pacific Fishery Management Council (Council). The Fishery Ecosystem Plan is approved by the Secretary of Commerce and implemented by NMFS. Federal requirements for the main Hawaiian Islands (MHI) bottomfish fishery include vessel registration, non-commercial fishing permits, non-commercial catch and effort logbooks, non-commercial bag limits, and the specification of an annual total allowable catch (TAC) limit for Hawaii restricted bottomfish species (Deep 7 bottomfish). Deep 7 bottomfish include onaga (*Etelis coruscans*), ehu (*E. carbunculus*), gindai (*Pristipomoides*

zonatus), kalekale (*P. sieboldii*), opakapaka (*P. filamentosus*), lehi (*Aphareus rutilans*), and hapuupuu (*Epinephelus quernus*).

The State of Hawaii and NMFS monitor commercial bottomfish landings, and when the TAC is projected to be reached, NMFS closes non-commercial and commercial fisheries for Deep 7 bottomfish in Federal waters through the end of the fishing year, which is August 31. If the TAC is reached and NMFS closes Federal waters, Hawaii law allows the State to adopt a complementary closure of the Deep 7 fishery in State waters.

Purpose and Need

The purpose of this action is to specify a TAC which will support the long-term sustainability of these stocks throughout the Hawaii Archipelago and allow for optimum yield. Specification of the TAC is required by 50 CFR 665.211.

Proposed Action

The proposed Federal fishery management action is the specification of the 2010-11 MHI Deep 7 bottomfish TAC recommended by the Council at 254,050 lb.

TAC Alternatives Considered

The Council considered the same range of TACs (and risks associated with the various TAC selections) as in the previous year and recommended the proposed TAC following its 148th meeting in Honolulu, Hawaii, held from June 28-July 1, 2010. In making its recommendation, the Council considered current information about the fishery, including a 2008 stock assessment, as updated in 2009 by NMFS Pacific Islands Fisheries Science Center (PIFSC), risks of overfishing, recommendations from the Council's Science and Statistical Committee, and input from the public.

Supplemental Environmental Assessment

NOAA Administrative Order (NAO) 216-6, Environmental Review Procedures, requires all proposed agency actions be reviewed with respect to environmental consequences on the human environment in accordance with the National Environmental Policy Act (NEPA).

This Supplemental Environmental Assessment incorporates the environmental impact analysis and findings of the "Environmental Assessment (EA) for the Specification of a Total Allowable Catch for the Main Hawaiian Islands Deep 7 bottomfish for 2009-10 Fishing Year," dated August 12, 2009, in its entirety. This Supplemental EA, prepared in accordance with 40 CFR 1502.9(c)(2) in furtherance of NEPA, includes updated information about the 2009-10 MHI bottomfish fishery and discloses the agency's conclusion that specifying the 2010-11 TAC at 254,040 lb would not result in any changes to the impact analysis in the previous EA because: 1) the 2010-11 TAC is the same as 2009-10 and, therefore, is likely to result in a reduced impact to bottomfish stocks as previously analyzed; 2) the TAC will provide for continued sustainability of

the MHI bottomfish fishery; 3) the TAC will not result in a change to the conduct of the fishery in terms of fishery effort.

Expected Fishery Outcomes and Impacts of the proposed 2010-11 TAC

The proposed TAC is not expected to result in a change in the conduct of the MHI bottomfish fishery and would maintain the same amount of allowable fishing harvest as was allowed the previous year. The proposed TAC is associated with a zero percent risk of overfishing of Hawaiian archipelagic bottomfish stocks. The risk of localized depletion of the MHI management subarea bottomfish stocks is estimated to be less than 38 percent. Risks of localized depletion associated with different TAC levels are summarized in column five of the attached Table 9 (NMFS 2010). The actual risk is expected to be more conservative (lower) because the most recent stock assessment assumed the entire 2009-10 TAC would be caught, but only 82% of the TAC was taken. The risk level is more conservative than the 50 percent risk threshold under the Magnuson-Stevens Fisheries Conservation and Management Act.

The impacts of this TAC were previously analyzed in the 2009 EA. The proposed TAC would not result in a change to, or a large or adverse differential effect on target and non-target species, marine mammals, sea turtles, or seabirds than previously analyzed. The 2009 EA indicated that protected resources interactions with the MHI bottomfish fishery are expected to be low and, indeed, no interactions between the MHI bottomfish fishery and any protected resources have been reported. The fishing activities pursuant to this proposed specification would not affect endangered or threatened species, or critical habitat, in any manner not considered in prior consultations on this fishery. In a biological opinion dated March 18, 2008, NMFS determined that fishing activities conducted under the bottomfish fishery management plan (now the Hawaii FEP) and its implementing regulations are not likely to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. This proposed action does not modify operations of the bottomfish fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in that consultation.

The proposed TAC would not result in adverse impacts to any designated Essential Fish Habitat (EFH), Habitat Areas of Particular Concern (HAPC), or any marine protected areas as analyzed in the 2009 EA.

Update to the Affected Fishery and Fishery Trends:

This TAC would affect approximately 451 vessels engaged in the commercial harvest of MHI bottomfish. A review of the fishery trends shows that the number of fishing trips decreased from 3,275 in the 2008-09 fishing year to 2,794 trips in the 2009-10 fishing year. Previous TAC specifications and the resulting bottomfish fishing activity have been closely monitored and, in those three years, no strong trends were observed in the number of fishing trips per vessel, average total landings per vessel, and average landings per fishing trip per vessel. Fishermen have not identified any significant social or economic impacts of previous TAC specifications, nor have previous TAC specifications created a “race to the fish” or indicated any other fishery management problems being associated with this level of TAC.

NMFS is seeking public comments on the proposed specification. The proposed rule and instructions on how to comment, as well as copies of the 2009 EA and the 2010 Supplemental EA can be found by searching on RIN 0648-XX15 at www.regulations.gov; or by contacting the responsible official at the above address.

Attachments:

National Marine Fisheries Service. 2010. Projected TACs, probabilities of overfishing, relative biomass, and probabilities of depletion of MHI bottomfish under the constant MHI TAC alternative in fishing years 2010-2011 given MHI bottomfish catches of 300,498 and 347,128 lb in fishing years 2008 and 2009. NMFS Pacific Islands Fisheries Science Center (PIFSC) Stock Assessment Division. Honolulu, HI.

National Marine Fisheries Service. 2009. Environmental Assessment (EA) for the Specification of a Total Allowable Catch for the Main Hawaiian Islands Deep 7 bottomfish for 2009-10 Fishing Year. August 12, 2009.

Table 9. Projected TACs, probabilities of overfishing, relative biomasses, and probabilities of depletion of MHI bottomfish under the constant MHI TAC alternative in fishing years 2010-2011 given MHI bottomfish catches of 300.498 and 347.138 (000 lbs) in fishing years 2008 and 2009.

Main Hawaiian Islands Bottomfish Total Allowable Catch in 2010 (thousands of lbs)	Main Hawaiian Islands Deep 7 Bottomfish Total Allowable Catch Equivalent in 2010 (thousands of lbs)	Probability of Overfishing of Bottomfish in the Hawaiian Archipelago in FY 2010	Probability of Overfishing of Main Hawaiian Islands Bottomfish in FY 2010	Probability of Overfishing of Main Hawaiian Islands Bottomfish in FY 2011	Mean Relative Bottomfish Biomass (B/BMSY) in the Main Hawaiian Islands at the Start of FY 2011	Probability That Main Hawaiian Islands Bottomfish Are Depleted (B<0.7*BMSY) in FY 2011
225	163	0.000	0.00	0.00	0.91	0.02
269	194	0.000	0.05	0.02	0.89	0.04
288	208	0.000	0.10	0.05	0.87	0.06
300	217	0.000	0.15	0.08	0.87	0.06
310	224	0.000	0.20	0.11	0.86	0.07
320	231	0.000	0.25	0.16	0.85	0.08
328	237	0.000	0.30	0.20	0.84	0.09
335	242	0.000	0.35	0.23	0.84	0.09
343	248	0.000	0.40	0.28	0.84	0.10
350	253	0.000	0.45	0.33	0.84	0.11
357	258	0.000	0.50	0.38	0.83	0.11
364	263	0.000	0.55	0.43	0.83	0.12
372	269	0.001	0.60	0.49	0.82	0.13
379	274	0.001	0.65	0.54	0.82	0.14
387	280	0.001	0.70	0.59	0.81	0.15
396	286	0.001	0.75	0.66	0.81	0.16
406	294	0.002	0.80	0.72	0.80	0.18
418	302	0.004	0.85	0.79	0.79	0.20
434	314	0.006	0.90	0.86	0.78	0.22
457	330	0.013	0.95	0.93	0.77	0.27
520	376	0.063	1.00	0.99	0.73	0.40

Source: Pacific Islands Fisheries Science Center (PIFSC) Stock Assessment Division, 2010

Environmental Assessment

Specification of a Total Allowable Catch for the Main Hawaiian Islands Deep 7 Bottomfish for 2009–10 Fishing Year

August 12, 2009

Lead Agency: Pacific Islands Regional Office (PIRO)
National Marine Fisheries Service (NMFS)
National Oceanographic and Atmospheric Administration (NOAA)
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Abstract

Hawaiian archipelagic bottomfish stocks are managed under the Fishery Management Plan for Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region (Bottomfish FMP) developed by the Western Pacific Fishery Management Council (Council), approved by the Secretary of Commerce, and implemented by NMFS. To provide for long-term sustainability of bottomfish stocks, provisions were implemented in 2008 to end overfishing that was occurring on bottomfish stocks in the Hawaiian Islands. Current requirements for the main Hawaiian Islands (MHI) federal bottomfish fishery include requirements for vessel registration, permits, Federal catch and effort logbooks, non-commercial Deep 7 bag limits, and the specification of an annual Total Allowable Catch (TAC) limit. Progress toward the TAC is monitored by NMFS based on reported commercial landings. When the TAC is reached, both the commercial and non-commercial MHI bottomfish fisheries will be closed for the remainder of the fishing year. A recent update to the Hawaiian archipelagic bottomfish stock assessment conducted by Pacific

Islands Fishery Science Center (PIFSC) in 2009 indicated Deep 7 bottomfish stocks are healthier than previously indicated.

An EA was developed that evaluates the environmental impacts of a range of proposed TACs including the no-action alternative of no TAC for the 2009–2010 MHI bottomfish fishing year. None of the proposed TACs would change the fishery or have large adverse effects on target, non-target and bycatch species, marine mammals, sea turtles, or seabirds. The ranges of TACs considered would not result in adverse impacts to any designated Essential Fish Habitat (EFH), Habitat Areas of Potential Concern (HAPC), or other marine protected area. The TACs would provide for a sustainable harvest of bottomfish which would have positive long term impacts on fishing communities.

The EA is available to the public. NMFS is seeking public comments on the proposed specification. Instructions on how to comment on the proposed specification, as well instructions on how to obtain a copy of the EA can be found by searching on RIN 0648-XQ14 at www.regulations.gov; or by contacting the responsible official at the above address.

Environmental Assessment for the Specification of a Total Allowable Catch for the Main Hawaiian Islands Deep 7 Bottomfish for 2009–10 Fishing Year

August 12, 2009

Prepared by:

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WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

National Marine Fisheries Service

Executive Summary

Bottomfish stocks in the Hawaii Archipelago are managed under the Fishery Management Plan for Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region (Bottomfish FMP) developed by the Western Pacific Regional Fishery Management Council (Council), and implemented by the National Marine Fisheries Service (NMFS). To support the continued sustainability of Hawaii's bottomfish stocks, provisions were implemented in 2008 to end overfishing that was occurring on seven species of bottomfish ("Deep 7" bottomfish) in the Hawaii Archipelago. Continuing provisions for the main Hawaiian Islands (MHI) bottomfish fishery include requirements for vessel registration; Federal fishing permits, logbooks and Deep 7 bag limits for non-commercial participants in EEZ waters around Hawaii; and an annual Total Allowable Catch (TAC) limit for commercial catches of Deep 7 species in the MHI. When the annual TAC is reached, the entire (commercial and non-commercial) MHI Deep 7 bottomfish fishery closes for the remainder of the fishing year. A recent update to the Hawaiian bottomfish stock assessment conducted by scientists at the National Marine Fisheries Service's Pacific Islands Fishery Science Center (PIFSC) indicates that stocks are healthier than previously indicated (Brodziak et al. 2009). At its 145th meeting (July 2009), the Council considered a range of TACs and their potential risk of overfishing.

This document examines a range of alternatives for the 2009-2010 TAC, the expected impacts of each alternative on the human environment, and the consistency of the preferred alternative with the Magnuson-Stevens Fishery Conservation and Management Act and other applicable laws. This document has been written and organized to meet the requirements of the National Environmental Policy Act and thus is a consolidated document, as described in NOAA Executive Order 216-6, Section 603.a.2. The Environmental Assessment contained in this document tiers off of, and incorporates by reference, a Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP (WPRFMC 2007).

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List of Acronyms and Abbreviations

BMUS	Bottomfish Management Unit Species
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FMP	Fishery Management Plan
FR	Federal Register
HAPC	Habitat Areas of Particular Concern
HDAR	State of Hawaii, Division of Aquatic Resources
MHI	Main Hawaiian Islands
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service (also known as NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
NWHI	Northwestern Hawaiian Islands
PIFSC	Pacific Islands Fisheries Science Center (NMFS)
PIRO	Pacific Islands Regional Office (NMFS)
PMUS	Pelagic Management Unit Species
TAC	Total Allowable Catch
WPacFIN	Western Pacific Fishery Information Network
WPRFMC	Western Pacific Regional Fishery Management Council (Council, also known as the Western Pacific Fishery Management Council)

1.0 Background Information

Bottomfish fishing in Federal waters of the Western Pacific Region is regulated by the Fishery Management Plan for the Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region (Bottomfish FMP), as developed by the Western Pacific Regional Fishery Management Council (Council) and implemented by the National Marine Fisheries Service (NMFS) under the authority of the Magnuson-Stevens Fisheries and Conservation Act (MSA).

Management of the bottomfish fishery in the main Hawaiian Islands (MHI) has recently focused on ending bottomfish overfishing to support sustainability. Based on a bottomfish stock assessment completed by the PIFSC in 2005, which used fishery data through 2003, NMFS determined that overfishing was occurring on the bottomfish multi-species stock complex (bottomfish complex) around the Hawaii Archipelago and requested the Council to take appropriate action to end this overfishing (70 FR 34452). NMFS' Pacific Islands Fisheries Science Center (PIFSC) recommended a reduction in fishing mortality in the MHI bottomfish fishery of 24 percent as compared to 2004. As recommended by the Council, a final rule implementing the provisions of Amendment 14 to the Bottomfish FMP was published by NMFS on April 4, 2008 (73 FR 18450). Amendment 14 contained a series of ongoing management actions which include an annual total allowable catch limit (TAC) for the commercial harvest of seven species of bottomfish determined to be subject to overfishing at that time (the "Deep 7"). When the TAC for the year is projected to be reached the MHI Deep 7 fishery (both commercial and non-commercial sectors) is closed until the end of the fishing year. The MHI bottomfish fishing year begins September 1 of each year and ends on August 31 of the following year.

The Deep 7 bottomfish are onaga (*Etelis coruscans*), ehu (*E. carbunculus*), gindai (*Pristipomoides zonatus*), kalekale (*P. sieboldii*), opakapaka (*P. filamentosus*), lehi (*Aphareus rutilans*), and hapuʻupuʻu (*Epinephelus quernus*). During a fishery closure for Deep 7 species, no person may fish for, possess, or sell any of these fish in the MHI, except as otherwise authorized by law. Fishing for, possession, and sale of Deep 7 bottomfish that are legally obtained by those with a permit to fish in the Northwestern Hawaiian Islands (NWHI), the Pacific Remote Island Areas or fish imported from overseas fisheries are not affected by the closure. There is no prohibition on fishing for or selling other non-Deep 7 bottomfish species throughout the year.

Additional ongoing Federal bottomfish management measures include requirements for annual vessel registration, gear restrictions, closed areas, and bag limits for non-commercial fishermen. Fishing permits and Federal logbooks (reporting of catch and effort) provide data that are important for monitoring the fishery. Historically, the fishery has been monitored using information reported by holders of State commercial marine licenses through monthly catch reports submitted to the State. Beginning with the 2008–09 MHI bottomfish fishing year, bottomfish catch and effort information from non-commercial fishermen who fish for bottomfish in Federal waters around Hawaii have been collected via mandatory Federal permits and logbooks. When sufficient non-commercial catch information becomes available to fishery scientists, it will be assessed and considered in future bottomfish stock and risk assessments.

The Hawaii Department of Land and Natural Resources' Division of Aquatic Resources (HDAR) regulates bottomfish fishing in nearshore waters (i.e., 0-3 miles from shore) around Hawaii via

gear restrictions, non-commercial bag limits for ehu and onaga, 19 areas closed to bottomfish fishing (bottomfish restricted fishing areas or BRFAs), requirements for registration and identification of bottomfish fishing vessels, and a control date for possible future implementation of a limited access management regime. In order to strengthen protection for Deep 7 bottomfish and to provide consistent State and Federal regulations, HDAR is working to amend its regulations to establish TACs and non-commercial bag limits that are consistent with the FMP measures established by the Council. There are no plans to amend the State regulations to require non-commercial permits or catch reporting in State waters.

1.1 Previous TACs for MHI Deep 7 Bottomfish

Based on an updated stock assessment from PIFSC, the MHI Deep 7 bottomfish TAC for the 2007-08 fishing year was 178,000 lb. Monitoring of commercial landings toward the TAC began on October 1, 2007, and the fishery was closed as of April 16, 2008, as a result of the commercial sector reaching the 2007-08 TAC. Due to a lag in achieving the fishery closure, the actual catch for 2007-08 was 192,600 lb of Deep 7 bottomfish (HDAR 2008).

Based on a second updated stock assessment from PIFSC (Brodziak et al. 2008), the MHI Deep 7 bottomfish TAC for the 2008-09 fishing year was 241,000 lb of Deep 7 bottomfish. This stock assessment also found that Hawaii's bottomfish were no longer subject to overfishing. Monitoring of commercial landings toward the 2008-09 TAC began on September 1, 2008, and the MHI bottomfish fishery was closed as of July 6, 2009, which was projected as the date on which the TAC would be reached.

1.2 Purpose and Need

The objective of this action is to specify a 2009-2010 commercial TAC for MHI Deep 7 bottomfish which will support the long-term sustainability of these stocks throughout the Hawaii Archipelago and allow for the achievement of optimum yield.

2.0 Description of Alternatives Considered

Five alternatives were developed by Council staff based on a 2009 assessment that provides the risk of overfishing associated with various TACs (Brodziak et al. 2009). These alternatives were developed to include a range of fishing levels and associated risks of overfishing. Under the MSA, bottomfish stocks around Hawaii are evaluated for fishing on an archipelagic basis, with overfishing occurring when the archipelagic fishing mortality rate (F) is greater than that which produces the maximum sustainable yield (F_{MSY}). Thus if F/F_{MSY} greater than 1, overfishing is occurring. None of the alternatives are expected to result in overfishing on an archipelagic basis; however they would allow varying levels of fishing pressure in the MHI and could result in F/F_{MSY} ratios greater than 1 in waters around the MHI.

Table 1.Summary of Alternatives for the 2009-2010 Main Hawaiian Islands (MHI) Deep 7 Commercial Total Allowable Catch (TAC)

Alternative	Total allowable MHI commercial catch of Deep 7 species	Risk of Hawaii overfishing	Risk of MHI F/ F_{MSY} greater than 1
Alternative 1: No action	No TAC is specified	Unknown	Unknown
Alternative 2:	241,000 lbs	0%	25%
Alternative 3:	249,000 lbs	0%	34%
Alternative 4:	253,000 lbs	0%	39%
Alternative 5:	262,000 lbs	0%	50%

3.0 Affected Environment

3.1 Bottomfish Management Unit Species

The bottomfish fisheries in Hawaii target an assemblage of species from the taxonomic groups: Lutjanidae (snappers), Serranidae (groupers), Carangidae (jacks), and Lethrinidae (emperors). Table 2 lists the species managed under the Bottomfish FMP. The Hawaii archipelago bottomfish fisheries target bottomfish species and species complexes at various depths. At shallow depths (surface to 40 fm) uku are fished while drifting or slowly trolling over relatively flat bottom. Deeper water species complexes (e.g., opakapaka at 40 to 120 fm; onaga at 80 to 150 fm) are found along high-relief, deep slopes and are fished with a different method, vertical handline. All of the Deep 7 bottomfish are snappers, except hapu‘upu‘u, which is a grouper. Please see the Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP for additional biological information on these species (WPRFMC 2007).

Table 2. Bottomfish Management Unit Species (BMUS)

Common Name	Local Name	Scientific Name
Snappers		
Silver jaw jobfish	lehi	*Aphareus rutilans*
Grey jobfish	uku	*Aprion virescens*
Squirrelfish snapper	ehu	*Etelis carbunculus*
Longtail snapper	onaga, ulaula	*Etelis coruscans*
Blue stripe snapper	ta‘ape	*Lutjanus kasmira*
Yellowtail snapper	yellowtail, kalekale	*Pristipomoides auricilla*
Pink snapper	opakapaka	*Pristipomoides filamentosus*
Yelloweye snapper	yelloweye opakapaka, kalekale	*Pristipomoides flavipinnis*
Snapper	kalekale	*Pristipomoides sieboldii*
Snapper	gindai	*Pristipomoides zonatus*
Jacks		

Common Name	Local Name	Scientific Name
Giant trevally	white ulua	*Caranx ignoblis*
Black jack	black ulua	*Caranx lugubris*
Thick lipped trevally	pig ulua, butaguchi	*Pseudocaranx dentex*
Amberjack	kāhala	*Seriola dumerili*
Groupers		
Blacktip grouper		*Epinephelus fasciatus*
Sea bass	hapuʻupuʻu	*Epinephelus quernus*
Lunartail grouper	NA	*Variola louti*
Emperors	NA	
Ambon emperor	NA	*Lethrinus amboinensis*
Redgill emperor	NA	*Lethrinus rubrioperculatus*
Seamount groundfish	NA	
Alfonsin	NA	*Beryx splendens*
Raftfish/butterfish	NA	*Hyperoglyphe japonica*
Armorhead	NA	*Pseudopentaceros richardsoni*

3.2 MHI Bottomfish Habitat

Commercially important deepwater bottomfish are found along the deep slopes of island coasts and banks at depths of 100 to 400 meters (55 to 218 fathoms). Because of the volcanic nature of the islands within the Hawaiian Islands archipelago, most bottomfish habitat occurs in steep-slope areas on the margins of the islands and banks. Recent mapping in the MHI shows that approximately 47 percent of the bottomfish habitat lies in State waters (Parke 2007). Please see the Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP for additional information on the habitat of these species (WPRFMC 2007).

3.3 Target Species

The Deep 7 bottomfish are the primary bottomfish species targeted by fishery participants. Metabolic processes of living organisms tend to be slower in deep, cool waters with low oxygen concentrations. Top carnivores in this cold, dark, relatively low-energy environment tend be long-lived, with slow growth rates and delayed reproductive maturity. This is generally the case for deep-slope bottomfish, and these characteristics make the Deep 7 susceptible to overfishing.

3.4 Bycatch Species

As is the case for most fisheries, some of the MHI bottomfish fishery catches are lost or discarded. Fish may be stripped off the lines by sharks or dolphins (i.e., lost) or they may be deliberately discarded due to shark damage or because of concerns regarding ciguatoxins.

Bycatch (i.e. discards) information from the MHI commercial bottomfish fishery has been compiled from catch and effort data submitted to HDAR by MHI commercial bottomfish fishery participants during 2003 and 2004. Overall, fishing for Deep 7 species is fairly target-specific,

and the bycatch rate is relatively low, with 8.5 percent of the catch reported as not retained either because it was either lost or deliberately discarded (Kawamoto and Gonzales 2005).

Pelagic management unit species comprise less than one percent (0.9 percent) of the total catch with less than one percent (0.3 percent of total catch) of this lost or discarded. The majority (88 percent) of this pelagic bycatch consists of sharks. It is believed that discarding sharks does not result in mortality because sharks do not suffer from barotraumas when brought up from depth (WPRFMC 2007).

Very little (3.3 percent) of the targeted Deep 7 species catch is reported as bycatch, and these are mostly snappers and groupers that have been damaged by sharks. If all fish in the BMUS complex (Deep 7 and other BMUS) are considered, the BMUS bycatch percentage rises to 7.5 percent. The majority of the BMUS bycatch is composed of kāhala, butaguchi, and white ulua. All of these species are members of the jack family (Carangidae) and no jacks are included in the Deep 7 species complex. Ninety-three percent of all kāhala (*Seriola dumerili* and *S. rivoliana*) were reported as bycatch. Release rates of kāhala are high because these fish are known to be ciguatoxic and, as a result, have little or no market value in Hawaii (WPRFMC 2007).

The miscellaneous species category includes over 30 species of near-shore and pelagic fishes that are occasionally caught while bottomfish fishing. Miscellaneous species comprise 4.4 percent of the overall catch and account for less than one percent (0.7 percent) of the bycatch.

Because non-commercial reporting requirements were only recently implemented, data on bycatch for the non-commercial sector of the MHI bottomfish fishery is not yet available. As compared to commercial fishery participants, non-commercial participants are believed to retain a greater variety of species for home consumption or distribution to relatives and friends, and thus their bycatch percentages are likely substantially lower than that of the commercial sector (Kawamoto, PIFSC, personal communication, reported in WPRFMC 2007). Stocks of non-Deep 7 bottomfish species are believed to be generally healthy and are able to withstand the impacts of bottomfish fishing (WPRFMC 2007).

The Bottomfish FMP includes five non-regulatory measures aimed at further reducing bycatch and bycatch mortality in the fishery and improving bycatch reporting: (1) outreach to fishermen and engagement of fishermen in management including research and monitoring in order to raise their awareness of bycatch issues and options to reduce bycatch and bycatch mortality, (2) research into fishing gear and method modifications to reduce bycatch and bycatch mortality, (3) research into the development of markets for discarded fish species (4) improvement of data collection and analysis systems to better measure bycatch and (5) training and outreach in methods to reduce the mortality of released fish due to barotrauma. These non-regulatory measures will continue in the fishery, regardless of the TAC that is specified.

3.5 Stock Status

Amendment 3 to the Bottomfish FMP defines recruitment overfishing as a condition in which the ratio of the spawning stock biomass per recruit at the current level of fishing to the spawning stock biomass per recruit that would occur in the absence of fishing (termed spawning potential

ratio, or SPR) is equal to or less than 20 percent. Given the scarcity of data, and using the best available information, the Council previously used SPR as a proxy for maximum sustainable yield (MSY). 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, the Hawaii archipelagic bottomfish multi-species stock complex was not overfished since the biomass standard using the catch per unit effort (CPUE) ratio was 0.82, above the threshold value of 0.7 established as the minimum stock size threshold (MSST). However, overfishing using the fishing effort ratio was occurring for the archipelago when evaluated as a whole since the 2003 effort ratio was 1.13, above the threshold value of 1.0 established as the maximum fishing mortality threshold (MFMT).

The Secretary of Commerce informed the Council on May 27, 2005, that, according to Magnuson-Stevens Act National Standard 1 guidelines and the associated reference points adopted by the Council, the bottomfish multi-species stock complex in the Hawaii Archipelago was experiencing overfishing. The NMFS Regional Administrator for the Pacific Islands Region provided formal notice to this on June 14, 2005 (70 FR 34452). NMFS determined that "the MHI is the zone that contributes most of the problems in terms of both reduced biomass and overfishing." The Regional Administrator further stated, "[t]herefore, it is likely that reducing fishing mortality here would be the most effective means to end overfishing in the Hawaiian Archipelago" (70 FR 34452).

2006 Stock Assessment

During the development of Amendment 14, which provided measures to end overfishing of bottomfish in the Hawaii archipelago, PIFSC conducted an updated stock assessment using one additional year's data (data through 2004) (Moffitt et al. 2006). This stock assessment employed the same dynamic production model approach used in the 2005 stock assessment.

In the Ho‘omalu Zone and Mau Zone, the analysis used commercial fishery data (catch-per-day) from State of Hawaii commercial vessel catch reports and interview data for the 1988 to 2004 period. In the MHI, State of Hawaii commercial catch data for the 1948−2004 period were used. For each management zone, zonal MSY contribution reference points for the bottomfish fishery were calculated separately. The results indicated that the 2004 MHI fishing mortality metrics were well above those of the other two zones and that excessive fishing pressure in the MHI was the major contributor to overfishing in the Hawaii Archipelago (Moffitt et al. 2006).

2008 Stock Assessment

In 2008 PIFSC scientists used information developed in a bottomfish CPUE standardization workshop to produce total allowable catch projections with associated risks of overfishing (Brodziak et al. 2008). The 2008 stock assessment included data through 2005 and concluded that Hawaii bottomfish were no longer experiencing overfishing and were not overfished. However localized depletion of MHI bottomfish had occurred. The modeling approach used to characterize the risk of overfishing in the Hawaii bottomfish fishery is described in PIFSC Administrative Report H-07-01 (Brodziak 2007).

In addition to updating the stock assessment for bottomfish, PIFSC identified bottomfish as a research priority (WPRFMC 2008) and launched a program to improve understanding of

bottomfish biology and collect data critical to improved stock assessment and effective management. Bottomfish specimens for the study are being collected from catches landed at the Honolulu fish auction and provided by cooperating local fishers. Sampled fish are examined to learn more about aging and longevity, growth, maturation, fecundity, and the genetics of each species making up the complex. Results of the biological studies are expected to aid in the construction of improved models of bottomfish population dynamics as well as more accurate stock assessments.

2009 Stock Assessment
The 2008 Hawaii bottomfish assessment was updated by PIFSC scientists using re-audited bottomfish catch and effort data from commercial catch reports collected during 1948-2007 (Brodziak et al. 2009). A Bayesian production model was used to estimate bottomfish biomass and harvest rate time series. The model was also used to conduct short-term projections of the risk of overfishing associated with a range of future harvest levels. This assessment concluded that in 2007 Hawaii bottomfish were not overfished or experiencing overfishing (the 2007 harvest rate was approximately 60 percent of F/F_{MSY}), but localized depletion of MHI bottomfish still existed. This assessment included a revised mean annual MSY estimate for MHI bottomfish (all managed species, including the Deep 7) of 456,000 lb. (Brodziak et al. 2009).

3.6 Protected Species

Protected species generally include sea turtles, marine mammals and seabirds. Please see the Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP for biological information on these species (WPRFMC 2007). Additional information is available in a 2008 Biological Opinion prepared by NMFS under section 7 of the ESA (NMFS 2008a).

Marine Mammals
Cetaceans listed as endangered under the ESA and that have been observed in the Western Pacific Region are the humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter macrocephalus*), blue whale (*Balaenoptera musculus*), fin whale (*B. physalus*), and sei whale (*B. borealis*). Although uncommon, the northern elephant seal (*Mirounga angustirostris*) has been occasionally observed in waters around the Hawaii Archipelago. The Hawaiian monk seal is the only endemic pinniped in Hawaii that is listed as endangered under the ESA.

The MHI bottomfish fishery catches some species that may be food resources for monk seals. Research on monk seal diets suggests that some deepwater bottomfish are part of the monk seal diet (unpublished report, NMFS PIFSC, Honolulu). However, under current levels of fishing pressure in the MHI, the monk seal population is growing, pupping is increasing, and the pups appear to be foraging successfully. Considering that monk seal foraging success appears to be high in the MHI than in the NWHI despite higher fishing pressure, competition for forage with the MHI bottomfish fishery does not appear to adversely impact monk seals in the MHI at this time. The 2008 Biological Opinion on the MHI Bottomfish fishery included an effects-exposure-response-risk analysis for monk seal hookings, behavioral modification, and prey reduction as a result of the MHI bottomfish fishery (NMFS 2008a). NMFS concluded that the MHI bottomfish fishery may affect, but is not likely to adversely affect endangered Hawaiian monk seals. The

Biological Opinion documented that the Hawaii's bottomfish fishery (in both the MHI and the NWHI management areas) may incidentally interact with monk seals. Although no hookings have been reported from the MHI bottomfish fishery, it is possible that hookings may have occurred without being observed and/or recorded. NMFS estimated that one seal would be hooked every 6.5 years, and that one serious injury/mortality would result from a hooking every 67 years. The Biological Opinion concluded that the Hawaii bottomfish fishery may affect, but is not likely to adversely affect the Hawaiian monk seal and that the fishery would not jeopardize the continued existence of the Hawaiian monk seal or destroy or adversely modify its critical habitat.

Other species of marine mammals that are not listed under the ESA that occur in the area where the MHI bottomfish fishery operates are:

Whales:
Blainsville beaked whale (*Mesoplodon densirostris*)
Bryde's whale (*Balaenoptera edeni*)
Cuvier's beaked whale (*Ziphius cavirostris*)
Dwarf sperm whale (*Kogia simus*)
False killer whale (*Pseudorca crassidens*)
Killer whale (*Orcinus orca*)
Longman's beaked whale (*Indopacetus pacificus*)
Melon-headed whale (*Peponocephala electra*)
Minke whale (*Balaenoptera acutorostrata*)
Pygmy killer whale (*Feresa attenuata*)
Pygmy sperm whale (*Kogia breviceps*)
Short-finned pilot whale (*Globicephala macrorhynchus*)
Dolphins
Bottlenose dolphin (*Tursiops truncatus*)
Dall's porpoise (*Phocoenoides dalli*)
Fraser's dolphin (*Lagenodelphis hosei*)
Risso's dolphin (*Grampus griseus*)
Rough-toothed dolphin (*Steno bredanensis*)
Spinner dolphin (*Stenella longirostris*)
Spotted dolphin (*Stenella attenuata*)
Striped dolphin (*Stenella coeruleoalba*)

The Hawaii bottomfish fishery is listed as a Category III fishery under Section 118 of the MMPA. A Category III fishery is one with a low likelihood or no known incidental takings of marine mammals. NMFS has also concluded that the Hawaii Archipelago commercial bottomfish fisheries will not affect marine mammals in any manner not considered or authorized under the Marine Mammal Protection Act.

Sea Turtles
The breeding populations of Mexico's olive ridley sea turtles (*Lepidochelys olivacea*) are currently listed as endangered, while all other ridley populations are listed as threatened. Leatherback sea turtles (*Dermochelys coriacea*) and hawksbill turtles (*Eretmochelys imbricata*)

are also classified as endangered. Loggerhead (*Caretta caretta*) and green sea turtles (*Chelonia mydas*) are listed as threatened (the green sea turtle is listed as threatened throughout its Pacific range, except for the endangered population nesting on the Pacific coast of Mexico). These five species of sea turtles are highly migratory, or have a highly migratory phase in their life history (NMFS 2001). The green turtle is the only species regularly seen in EEZ waters around Hawaii.

In its 2008 Biological Opinion on the MHI bottomfish fishery, NMFS determined that although sea turtles may be found within the MHI area and could interact with the fishery, there have been no reported or observed interactions with sea turtles in the history of the bottomfish fishery. Hawksbill, leatherback and olive ridley turtles are likely to be rare in the action area. NMFS concluded that the bottomfish fishery is not likely to adversely affect hawksbill, leatherback, loggerhead or olive ridley turtles. The opinion noted that green turtles are sometimes killed by collisions with vessels around the MHI and this is likely responsible for killing up to two green sea turtles per year. The resulting mortality is not likely to jeopardize the species because green sea turtles have been rapidly increasing in numbers in recent years when bottomfishing was occurring at a higher level of effort [than the current fishery], and they are extremely unlikely to be hooked or entangled by bottomfishing gear (NMFS 2008a).

Seabirds

Seabirds listed as threatened or endangered under the ESA are managed by the USFWS. The short-tailed albatross, which is listed as endangered under the ESA, is a migratory seabird that is known to be occasionally present in the NWHI. No interactions between seabirds and the MHI bottomfish fishery have been observed or reported. Other listed seabirds found in the region are the endangered Hawaiian petrel (*Pterodroma phaeopygia)* and the threatened Newell's shearwater (*Puffinus auricularis newelli*). Non-listed seabirds known to be present are the black-footed albatrosses (*Phoebastria nigripes*); Laysan albatross (*P. immutabilis*); wedge-tailed (*Puffinus pacificus*), sooty (*P. griseus*) and fleshfooted (*P. carneipes*) shearwaters, as well as the masked booby (*Sula dactylatra*), brown booby (*Sula leucogaster*), and red-footed booby *(Sula sula*). Most of these seabirds forage far from the islands and are unlikely to interact with the bottomfish fishery. In addition, bottomfish fishing gear is deployed close to the vessel and does not afford much opportunity for seabirds to attack the bait. When bottomfish fishing a weighted mainline is dropped vertically over the side of the vessel and it sinks rapidly beyond the range of a diving seabird. It is retrieved rapidly using electric or hydraulic pullers. The time that bait is within the range of a diving seabird is quite limited and the proximity of the vessel hull is a significant deterrent.

Protected Species Interactions

The 1990–1993, NMFS' observer program for the NWHI bottomfish fishery reported a moderate level of interactions between seabirds and the bottomfish fishery, with Laysan and black-footed albatrosses described as aggressively stealing bait from hooks during deployment and retrieval of bottomfish gear, causing lost fishing time (Nitta 1999). Birds were reported as being easily scared away from handlines by waving a pole or gaff. No seabird injuries or mortalities were observed while fishermen were fishing for bottomfish.[1] Although there is a possibility of

[1] Although Nitta (1999) defined an interaction to mean instances in which an animal is "caught or entangled," the report's statement that "many interactions" with albatrosses were observed appears to refer to instances in which the seabirds were not actually caught or entangled (as none were injured).

accidental hooking, the circle hooks used in the bottomfish fishery do not lend easily to incidental hooking of seabirds. One interaction involving a Laysan albatross occurred while a bottomfish fishing vessel was trolling for pelagic species. The bird became hooked, but was subsequently released.

The NWHI vessel observer program was renewed in October 2003, with observer coverage averaging 22 percent during 2004-2005. During the 2004-2005 time period a total of 26 trips carried observers. No interactions with sea turtles, monk seals, whales or other marine mammals, or endangered seabirds were observed. Eight interactions with seabirds were observed across six trips. Six of the interactions occurred during trolling operations and two during bottomfishing operations. Seven of the eight interactions were with boobies, the remainder was with a Laysan albatross during trolling operations (PIRO Observer Program webpage accessed March 2007). It is believed that all eight interactions were non-lethal and the seabirds were released alive.

Fishermen have reported that other species of birds, particularly juvenile boobies (*Sula* spp.), dive on trolling lures (Nitta and Henderson 1993). The potential for the bottomfish fishery to cause adverse impacts on seabirds due to competition for prey is negligible, as seabirds do not prey on bottomfish species. The potential for other ecosystem links between the bottomfish fishery and seabirds is unknown; however the level of fishery interactions with seabirds is expected to have no effect on seabird distribution, survival, or population structure (WPRFMC 2007).

During the vessel observer program conducted in the NWHI bottomfish fishery from 1990 through 1993, monk seals were observed taking and damaging hooked fish, with an average of one such interaction every 67 hours of fishing (Nitta 1999). A total of 23 monk seal interaction events were recorded during the program. Interactions occurred during 10 out of the 26 observed trips, and were estimated to have involved a maximum of 26 seals. No entanglements or hookings of monk seals were observed (Nitta 1999). An average of 2.67 dolphin-damaged fish per 1,000 fish caught was also observed (Kobayashi and Kawamoto 1995). The impact of the bottomfish fishery on the behavior or foraging success of bottlenose dolphins is unknown, but is not believed to be adverse.

NMFS has received a number of reports from various sources of monk seals with hooks embedded in their mouths or other body parts. Positively attributing a given hooking event to a particular fishery is difficult. A review of the reports led NMFS (NMFS 2002) to conclude that seven instances of hookings since 1982 may have been attributable to direct interactions with the bottomfish fishery. There has been one report by fishery participants of a hooking of a monk seal. In 1994, a bottomfish fisherman reported that a seal had stolen the catch and become hooked. The fisherman cut the leader line 12–18 inches from the seal. None of the hookings documented in the MHI since 1989 can be confirmed as originating from the bottomfish fishery (NMFS 2008a).

Following consultations under section 7 of the ESA, NMFS has determined that the bottomfish fisheries do not jeopardize any ESA-listed species or critical habitat in the Hawaii archipelago.

3.7. Essential Fish Habitat and Habitat Areas of Particular Concern

Essential fish habitat (EFH) is defined as those waters and substrate as necessary to fish for spawning, breeding, feeding, and growth to maturity. This includes the marine areas and their chemical and biological properties that are utilized by the organism. Substrate includes sediment, hard bottom, and other structural relief underlying the water column along with their associated biological communities. As part of Amendment 6 to the Bottomfish FMP, the Council designated EFH for BMUS that were approved by NMFS in 1999 (64 FR 19068).

In addition to and as a subset of EFH, the Council described habitat areas of particular concern (HAPC) based on the following criteria: ecological function of the habitat is important, habitat is sensitive to anthropogenic degradation, development activities are or will stress the habitat, and/or the habitat type is rare. In considering the potential impacts of a proposed fishery management action on EFH, all designated EFH must be considered. The designated areas of EFH and HAPC for all FMPs are shown in Table 3.

Weighted lines or baited hooks may rest on the bottom substrate during bottomfish fishing operations, and may impact substrate EFH and HAPC. However, larger onaga and ʻōpakapaka are often targeted at depths 20 meters (10.9 fm) from the bottom, a depth that reduces the opportunity for gear interactions with the substrate (Kelley and Moffitt 2004). Lost bottomfish fishing gear, including anchors and anchors lines, have the potential to impact the substrate. Research conducted in NWHI bottomfish fishing sites found low counts of this type of fishing debris (Raita and St. Rogatien Banks), but no data were presented for MHI sites (Kelley and Moffitt 2004).

No adverse effects to water column EFH and HAPC have been attributed to bottomfish fishing in Hawaii (G. Davis, PIRO, personal communication). Some have theorized that sending a weighted handline with baited hooks and a small chum bag to bottom depths, generally to 50 fathoms and below, may introduce parasites or disease into the water column, but to date no such problems have been reported or documented in Hawaii's bottomfish fisheries (Kelley and Moffitt 2004).

The use of explosives, poisons, trawl nets, and other destructive gears that may adversely affect EFH and HAPC is prohibited under the Bottomfish FMP.

Based on the best available information on habitats in waters of the Hawaii Archipelago and the existing fisheries, the Council has determined that the fisheries operating in the Hawaii Archipelago are not expected to have adverse impacts on EFH or HAPC for managed species. Continued and future operations of the MHI bottomfish fishery are not likely to lead to substantial physical, chemical, or biological alterations to the habitat, or result in loss of, or injury to, these species or their prey.

Table 3. EFH and HAPC for all Western Pacific FMPs

	Species Complex	EFH	HAPC
Bottomfish and Seamount Groundfish	**Shallow-water species (0–50 fm):** uku (*Aprion virescens*), thicklip trevally (*Pseudocaranx dentex*), giant trevally (*Caranx ignoblis*), black trevally (*Caranx lugubris*), amberjack (*Seriola dumerili*), taape (*Lutjanus kasmira*)	**Eggs and larvae:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm). **Juvenile/adults:** the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)	All slopes and escarpments between 40–280 m (20 and 140 fm) Three known areas of juvenile opakapaka habitat: two off Oahu and one off Molokai
Bottomfish and Seamount Groundfish	**Deep-water species (50–200 fm):** ehu (*Etelis carbunculus*), onaga (*Etelis coruscans*), opakapaka (*Pristipomoides filamentosus*), yellowtail kalekale (*P. auricilla*), kalekale (*P. sieboldii*), gindai (*P. zonatus*), hapuupuu (*Epinephelus quernus*), lehi (*Aphareus rutilans*)	**Eggs and larvae:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fathoms) **Juvenile/adults:** the water column and all bottom habitat extending from the shoreline to a depth of 400 meters (200 fm)	All slopes and escarpments between 40–280 m (20 and 140 fm) Three known areas of juvenile opakapaka habitat: two off Oahu and one off Molokai
Bottomfish and Seamount Groundfish	**Seamount groundfish species (50–200 fm):** armorhead (*Pseudopentaceros richardsoni*), ratfish/butterfish (*Hyperoglyphe japonica*), alfonsin (*Beryx splendens*)	**Eggs and larvae:** the (epipelagic zone) water column down to a depth of 200 m (100 fm) of all EEZ waters bounded by latitude 29°–35° **Juvenile/adults:** all EEZ waters and bottom habitat bounded by latitude 29°–35° N and longitude 171° E–179° W between 200 and 600 m (100 and 300 fm)	No HAPC designated for seamount groundfish

	Species Complex	EFH	HAPC
Crustaceans	**Spiny and slipper lobster complex:** Hawaiian spiny lobster (*Panulirus marginatus*), spiny lobster (*P. penicillatus, P.* spp.), ridgeback slipper lobster (*Scyllarides haanii*), Chinese slipper lobster (*Parribacus antarcticus*) **Kona crab :** Kona crab (*Ranina ranina*)	**Eggs and larvae:** the water column from the shoreline to the outer limit of the EEZ down to a depth of 150 m (75 fm) **Juvenile/adults:** all of the bottom habitat from the shoreline to a depth of 100 m (50 fm)	All banks in the NWHI with summits less than or equal to 30 m (15 fathoms) from the surface
Crustaceans	**Deepwater shrimp (*Heterocarpus* spp.)**	**Eggs and larvae:** the water column and associated outer reef slopes between 550 and 700 m **Juvenile/adults:** the outer reef slopes at depths between 300-700 m	No HAPC designated for deepwater shrimp.
Precious Corals	**Deep-water precious corals (150–750 fm):** Pink coral (*Corallium secundum*), red coral (*C. regale*), pink coral (*C. laauense*, gold coral (*Gerardia* spp.), gold coral (*Callogorgia gilberti*), gold coral (*Narella* spp.), gold coral (*Calyptrophora* spp.), bamboo coral (*Lepidisis olapa*), bamboo coral (*Acanella* spp.) **Shallow-water precious corals (10-50 fm):** black coral (*Antipathes dichotoma*), black coral (*Antipathis grandis*), black coral (*Antipathes ulex*)	EFH for Precious Corals is confined to six known precious coral beds located off Keahole Point, Makapuu, Kaena Point, Wespac bed, Brooks Bank, and 180 Fathom Bank EFH has also been designated for three beds known for black corals in the Main Hawaiian Islands between Milolii and South Point on the Big Island, the Auau Channel, and the southern border of Kauai	Includes the Makapuu bed, Wespac bed, Brooks Banks bed For Black Corals, the Auau Channel has been identified as a HAPC

	Species Complex	EFH	HAPC
Coral Reef Ecosystems	**All Currently Harvested Coral Reef Taxa** **All Potentially Harvested Coral Reef Taxa**	EFH for the Coral Reef Ecosystem MUS includes the water column and all benthic substrate to a depth of 50 fm from the shoreline to the outer limit of the EEZ	Includes all no-take MPAs identified in the CRE-FMP, all Pacific remote islands, as well as numerous existing MPAs, research sites, and coral reef habitats throughout the western Pacific

3.8 Economic Setting

Hawaii's economy is dominated by tourism and defense, with tourism being the leading industry in terms of employment and expenditures. The two represent approximately one quarter of Gross State Product (GSP) without consideration of ancillary services and also comprise the largest shares of "export" earnings. However, including retirement and disability payments, grants, contracts, other payments, and wages and salaries, total Federal expenditures in Hawaii were $13.5 billion in 2006 (DBEDT 2007), about 22 percent of GSP. Please see the Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP (WPRFMC 2007) for information on Hawaii's economy. Additional information is available in an Environmental Assessment prepared by NMFS in association with the implementation of the 2008-2009 MHI TAC (NMFS 2008b).

3.9 Overview of the MHI Bottomfish Fishery

The deep-slope bottomfish fishery in Hawaii concentrates on species of eteline snappers, carangids, and a single species of grouper concentrated at depths of 30 to 150 fathoms (55 to 275 m). The fishery can be divided into two geographical areas as follows: 1) the inhabited MHI with their surrounding reefs and offshore banks; and 2) the NWHI, a chain of largely uninhabited islets, reefs and shoals extending 1,200 nautical miles across the North Pacific. Recent mapping has shown in the MHI, approximately 47 percent of the bottomfish habitat lies in State waters (Parke 2007). Bottomfish fishing grounds within Federal waters (3 to 200 nm offshore) 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.

Handline gear used in the Hawaii's bottomfish fisheries consists of a main line with a 2- to 4-kg weight attached to the terminus. Several 40- to 60-cm branch lines with circle hooks are attached above the weight at 0.5- to 1.0-m intervals. A chum bag containing chopped fish or squid may be suspended above the highest of these hooks. The gear is retrieved after fish are hooked or when the bait is thought to be lost.

Oahu landings account for roughly 30 percent of the MHI commercial landings of the Deep 7 species from 1998 to 2004. Maui landings from the same time period represent 36 percent, with Hawaii, Kauai, and Molokai/Lanai representing 18, 10 and 5 percent, respectively (Kawamoto

and Tao 2005a). Specific bottomfish fishing locales favored by fishermen vary seasonally according to sea conditions and the availability and price of target species.

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. Except for those individuals who fish commercially on a full-time basis, most fishermen usually fish for bottomfish no more than 60 days a year (WPRFMC 1996).

Seasonal price variability causes part-time commercial fishermen to concentrate their bottomfish fishing effort during December, when they can take advantage of the high year-end (holiday season) demand for red snappers. Pelagic species are often an important secondary target of bottomfish fishing trips regardless of the season. The current MHI bottomfish fishery is estimated to have 380 active commercial vessels and up to 5,000 non-commercial vessels (WPRFMC 2007). In 2005, the annual value of BMUS landings in Hawaii was $2,261,338. The majority of this ($1,666,152 or 74 percent of the total) was attributable to landings of Deep 7 species. Most of the remainder (21 percent of the total) represented uku landings (HDAR and WPacFIN 2007).

It is also important to note that many people in Hawaii who might be considered commercial fishermen hold non-fishing jobs that contribute more to their household income than does fishing (Pooley 1993). For some fishermen, non-fishing jobs are not a choice, but a necessity because of the inability to earn an adequate return from fishing. Many participants in Hawaii's offshore fisheries often catch insufficient fish to cover even fuel, bait, and ice expenses, but they continue fishing simply for the pleasure of it. Some go so far as to pursue non-fishing occupations that allow them to maximize the time they can spend fishing regardless if it is profitable or not (Glazier 1999).

Individuals who participate in Hawaii's bottomfish fishery and other offshore fisheries comprise an ethnically diverse group. A survey by Hamilton and Huffman (1997) of small-boat owners who engage in Hawaii's commercial and non-commercial fisheries, including the troll, pelagic handline, and bottomfish fisheries, found that the overall distribution of survey participants' ethnicities is similar to that found in Hawaii's statewide population in that the three most common ethnicities are Japanese, part Hawaiian, and Caucasian. Part-Hawaiians made up 16 percent of the small-boat owners surveyed.

Please see the Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP (WPRFMC 2007) for additional information on the MHI bottomfish fishery.

4.0 Anticipated Impacts of the Alternatives

4.1 Impacts on Target Species

Alternative 1: No Action
Under Alternative 1 no commercial TAC would be set and the resultant MHI fishery harvests of Deep 7 are difficult to predict. The amount of fishing that would take place annually would be expected to be within the range of the 227,000-301,000 lb. of Deep 7 species commercially harvested each year between 1998 and 2004 when the fishery was open access with no TAC (Kawamoto et al. 2005). If harvests occurred at the higher end the archipelagic stock could again become subject to overfishing, however it would be unlikely to move to an overfished condition because the NWHI bottomfish fishery will be closed in June 2011 as a part of the implementation of the NWHI National Marine Monument. Under Alternative 1 bag limits for non-commercial participants would remain in place, but there would be no fishery closure for this sector.

Alternative 2: Set TAC at 241,000 lb.
Under Alternative 2 a TAC of 241,000 lb. of commercial MHI Deep 7 bottomfish would be set for the 2009-2010 fishing year (this is the TAC that was set for the 2008-2009 fishing year). This would be expected to result in a zero percent risk of archipelagic overfishing of bottomfish, and a 25 percent risk of exceeding F_{MSY} in the MHI during the 2009-2010 fishing year (Brodziak et al. 2009).

Alternative 3: Set TAC at 249,000 lb.
Under Alternative 3 a TAC of 249,000 lb. of commercial MHI Deep 7 bottomfish would be set for the 2009-2010 fishing year. This would be expected to result in a zero percent risk of archipelagic overfishing of bottomfish, and a 34 percent risk of exceeding F_{MSY} in the MHI during the 2009-2010 fishing year (Brodziak et al. 2009).

Alternative 4: Set TAC at 253,000 lb.
Under Alternative 4 a TAC of 253,000 lb. of commercial MHI Deep 7 bottomfish would be set for the 2009-2010 fishing year. This would be expected to result in a zero percent risk of archipelagic overfishing of bottomfish and a 39 percent risk of exceeding F_{MSY} in the MHI during the 2009-2010 fishing year (Brodziak et al. 2009).

Alternative 5: Set TAC at 262,000 lb.
Under Alternative 5 a TAC of 262,000 lb. of commercial MHI Deep 7 bottomfish would be set for the 2009-2010 fishing year. This would be expected to result in a zero percent risk of archipelagic overfishing of bottomfish, and a 50 percent risk of exceeding F_{MSY} in the MHI during the 2009-2010 fishing year (Brodziak et al. 2009).

Under all of the action alternatives highgrading within the Deep 7 species could result in additional mortality to target species if fishermen discard small fish in favor of larger fish or discard low-value species in favor of higher-value species. Deep-slope bottomfish generally have a high mortality rate resulting from barotrauma (physical damage to the fish as air in the swim bladder expands during ascent) after they are brought to the surface. If, and to what extent, high-

grading occurs, additional bottomfish mortality may occur due to barotrauma. However, there are ways to mitigate barotrauma and increase the survivability of the deep-water fish with gas bladders. The simplest is by venting the air bladder with a needle. Once the bladder has been vented, the fish can swim back down to depth and force gases back into the body fluids increasing the chances of survival. This technique has been used with Deep 7 species very successfully in mark/recapture studies. Recent education and outreach activities have been conducted by the WPRFMC, NMFS, and the State of Hawaii that include pamphlets and demonstrations on various techniques to reduce barotrauma on deep-water bottomfish. If high-grading were to occur, species most likely to be discarded include lehi, gindai, and kalekale, which receive the lowest prices at market of the Deep 7 species. Based on available information, these stocks are in relatively better condition than the higher priced ehu or onaga that would certainly not be discarded. It would not be necessary to discard any non-Deep 7 species caught, as they would not count against the TAC. At higher TACs there may be little incentive to highgrade (or even to harvest the entire TAC) as annual Deep 7 harvests when the fishery was open access ranged between 227,00-301,000 lb., demonstrating that the demand for MHI commercial Deep 7 bottomfish fishing may be lower than some of the higher TACs considered here.

The PIFSC has elevated the priority of research on bottomfish stocks (PIFSC 2007). In the future, as knowledge is gained regarding growth and fecundity, recruitment, population dynamics, and other basic biological parameters as well as post-release survival and high-grading in the fishery, there will be more and better information available to improve management of the stock.

4.2 Impacts on Bycatch

Alternative 1: No Action
As described in Section 3.4, fishing for Deep 7 species is fairly target-specific, and the bycatch rate for non-target species is relatively low (approximately 8 percent) in this fishery. However without a TAC, MHI bottomfish fishing would be expected to increase with an associated increase in the volume of bycatch. The amount of fishing that would take place annually under the No Action alternative is difficult to predict but is not expected to be more than the 1998-2004 high of 301,000 lb. of Deep 7 species that were harvested when the fishery was open access with no TAC (Kawamoto et al. 2005). Under Alternative 1 bycatch by MHI commercial bottomfish fishermen is not anticipated to lead to significant adverse impacts on bycatch species stocks. Bycatch stocks are considered healthy and the increased fishing effort and associated bycatch is not expected to significantly affect bycatch stocks or their prey, competitors and predators. The fact that all fish that are caught and discarded must be reported on Federal non-commercial logbooks and State commercial catch reports will help fishery managers to monitor bycatch and highgrading and address these topics in the future, as needed, to ensure that the fishery is not having a significant adverse impact on bycatch stocks.

Alternatives 2-5: Implement a TAC between 241,000 lb. and 262,000 lb.
As compared to the no action alternative, a relatively low TAC could lead to increased discards of less desirable commercial species on small vessels with limited storage space. To minimize mortalities associated with discards, the Council and NMFS have implemented an educational

program to teach fishermen how to release unwanted fishes and avoid excess mortality due to barotrauma. The current effort that goes into treating barotrauma fish by fishermen is not known. At higher TACs there may be little incentive to highgrade as annual Deep 7 harvests when the fishery was open access ranged between 227,00-301,000 lb., demonstrating that the demand for MHI commercial Deep 7 bottomfish fishing may be lower than some of the higher TACs considered here. Non-commercial fishermen in general are expected to have less targeting skill than commercial fishermen, and therefore may have higher non-target catches. They should, however, be less influenced by market value and therefore may be expected to retain more non-target species than commercial fishermen. In all cases bycatch by MHI bottomfish fishermen is not anticipated to lead to significant adverse impacts on bycatch species stocks. Bycatch stocks are considered healthy and the increased impacts on bycatch species that would result from the TACs considered here are not expected to significantly affect bycatch stocks or their prey, competitors and predators. The fact that all fish that are caught and discarded must be reported on Federal logbooks will help fishery managers to monitor bycatch and highgrading and address these topics in the future, as needed, to ensure that the fishery is not having a significant adverse impact on bycatch stocks.

Impacts to Pelagic Species
Under Alternatives 2-5, the closure of the MHI bottomfish fishery upon reaching the TAC could cause some fishery participants to move into the pelagic non-longline troll and handline fisheries. This potential displacement has not been specifically studied or quantified. A comparison of the commercial bottomfish and the commercial troll fishery finds that the 2006 MHI commercial bottomfish fishery had approximately 380 active commercial vessels and the Hawaii commercial troll fishery had 3,166 licensed fishermen 67 percent of whom fished primarily for pelagic species (HDAR unpublished data). However Hawaii's pelagic troll fishery (for yellowfin tuna) and the hook-and-line mackerel (akule and opelu) fishery are normally at their peak during the summer, and many of the fishermen who fish for bottomfish already shift to pelagic fisheries during the summer so the increase in pelagic fishing due to the MHI bottomfish TAC may be minor.

4.3 Impacts on Protected Species

Alternative 1: No Action
Under the No Action alternative impacts to protected species would be expected remain as described in Section 3.6 with no reported, observed or known interactions with protected species. However, as discussed in NMFS' 2008 Biological Opinion, green sea turtles could be hit by MHI bottomfish vessels each year transiting to and from fishing grounds. The amount of fishing that would take place annually under the No Action alternative is difficult to predict but is not expected to be more than the 1998-2004 high of 301,000 lb. of Deep 7 species that were harvested when the fishery was open access with no TAC (Kawamoto et al. 2005).

Alternatives 2-5: Implement a TAC between 241,000 lb. and 262,000 lb.

Gear, participation in, and conduct of the MHI bottomfish fishery would not change as a result of specifying a TAC under Alternatives 2-5. The increase in the TAC under these alternatives would allow a slight increase in the number of bottomfishing trips. However, potential impacts to

protected species, particularly collisions with green sea turtles would still be within the level of activity considered under the 2008 Biological Opinion.

4.4 Impacts on Marine Habitat, EFH and HAPC

As described in Section 3.7, due to prohibitions on destructive fishing gear, and the operations of the gear used, no adverse effects to water column EFH and HAPC (virtually all EEZ waters, see Table 3) have been attributed to bottomfish fishing in Hawaii (G. Davis, PIRO, personal communication). Because none of the alternatives considered here would allow destructive fishing gear or change the way fishing gear is currently deployed, they are not expected to lead to substantial physical, chemical, or biological alterations to the habitat, or result in loss of, or injury to managed species or their prey.

4.5 Impacts on Fishery Participants and Fishing Communities

The alternatives considered here would impact fishery participants and fishing communities in Hawaii. Under the MSA each of the inhabited MHI is defined as a fishing community.

Alternative 1: No Action
The amount of fishing that would take place annually under the No Action alternative is difficult to predict but would be expected to be within the 227,000 to 301,000 lb. of Deep 7 species that were annually harvested between 1998 and 2004 when the fishery was open access with no TAC. Using the average 2009 (January – April) price for Deep 7 species of $5.64 per lb. (PIFSC unpublished) and assuming that all catches were sold, the ex-vessel value for the MHI commercial Deep 7 fishery under Alternative 1 would be between $1,280,280 and $1,697,640. Dividing these fleet totals equally among all 380 commercial vessels active during 2008 would yield potential per vessel gross revenues between $3,369 and $4,468. Fishing communities are also expected to be impacted as they benefit from provisioning fishing vessels with bait, tackle, ice, and fuel as well as from the sales of harvested fish through wholesalers, retailers and restaurants, and the jobs created by these activities. The range of impacts to fishing communities under Alternative 1 has not been quantified.

Alternative 2: Set TAC at 241,000 lb.
Using the average 2009 (January – April) price for Deep 7 species of $5.64 per lb. and assuming that the entire TAC was caught and sold, the ex-vessel value for the MHI commercial Deep 7 fishery under Alternative 2 would be $1,359,240. Dividing this fleet total equally among all 380 commercial vessels active during 2008 would yield a potential per vessel gross revenue of $3,577. Fishing communities are also expected to be impacted as they benefit from provisioning fishing vessels with bait, tackle, ice, and fuel as well as from the sales of harvested fish through wholesalers, retailers and restaurants, and the jobs created by these activities. The impacts to fishing communities under Alternative 2 have not been quantified.

Alternative 3: Set TAC at 249,000 lb.
Using the average 2009 (January – April) price for Deep 7 species of $5.64 per lb and assuming that the entire TAC was caught and sold, the ex-vessel value for the MHI commercial Deep 7 fishery under Alternative 3 would be $1,404,360. Dividing this fleet total equally among all 380

commercial vessels active during 2008 would yield a potential per vessel gross revenue of $3,696. Fishing communities are also expected to be impacted as they benefit from provisioning fishing vessels with bait, tackle, ice, and fuel as well as from the sales of harvested fish through wholesalers, retailers and restaurants, and the jobs created by these activities. The impacts to fishing communities under Alternative 3 have not been quantified.

Alternative 4: Set TAC at 253,000 lb.
Using the average 2009 (January – April) price for Deep 7 species of $5.64 per lb and assuming that the entire TAC was caught and sold, the ex-vessel value for the MHI commercial Deep 7 fishery under Alternative 4 would be $1,426,920. Dividing this fleet total equally among all 380 commercial vessels active during 2008 would yield a potential per vessel gross revenue of $3,755. Fishing communities are also expected to be impacted as they benefit from provisioning fishing vessels with bait, tackle, ice, and fuel as well as from the sales of harvested fish through wholesalers, retailers and restaurants, and the jobs created by these activities. The impacts to fishing communities under Alternative 4 have not been quantified.

Alternative 5: Set TAC at 262,000 lb.
Using the average 2009 (January – April) price for Deep 7 species of $5.64 per lb and assuming that the entire TAC was caught and sold, the ex-vessel value for the MHI commercial Deep 7 fishery under Alternative 5 would be $1,477,680. Dividing this fleet total equally among all 380 commercial vessels active during 2008 would yield a potential per vessel gross revenue of $3,889. Fishing communities are also expected to be impacted as they benefit from provisioning fishing vessels with bait, tackle, ice, and fuel as well as from the sales of harvested fish through wholesalers, retailers and restaurants, and the jobs created by these activities. The impacts to fishing communities under Alternative 5 have not been quantified.

4.6 Cumulative Impacts

The specification of a TAC is designed to maintain the viability of the fish stocks and support sustainable fishing. The individually insignificant impacts of specifying a TAC would not become significant when considered along with other actions or conditions that are affecting the MHI bottomfish fishery. The TAC is part of a suite of management measures that were designed to ensure the resources are sustainably managed in accordance with the Bottomfish FMP and Amendment 14 to the Bottomfish FMP. Other actions that affect the MHI bottomfish fishery are primarily related to the State's management of bottomfish in State waters. The State of Hawaii has established Bottomfish Restricted Fishing Areas and is currently working to implement regulations that authorize it to establish complementary regulations for fishery closures in State waters when the commercial TAC is achieved. The specification of the 2009-2010 MHI Deep 7 bottomfish TAC is intended to continue to allow fishermen to fish sustainably and achieve optimum yields from bottomfish in the Hawaii archipelago. The TACs considered here are not inconsistent with the State of Hawaii's management of the bottomfish resources in the MHI or the Hawaii archipelago. The TACs considered here are not expected to result in cumulatively significant adverse impacts when considered in conjunction with past, present, or anticipated future actions by NMFS or other entities. Please see the Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP (WPRFMC 2007) for more information.

4.7 Climate Change

There are no specific studies about the impacts of ocean circulation pattern changes on bottomfish stocks. In general, it has been shown that large scale climate cycles can impact winds, currents, ocean mixing, temperature regimes, nutrient recharge, and affect the productivity of all trophic levels in the North Pacific Ocean (Polovina et al. 1994). These impacts can result in variability in fish stock size, recruitment, growth rates, or other factors. There is no available research specific to the impacts of climate change on Hawaii bottomfish. However, because the current fishery management action is managing fishing harvests, impacts from climate change are not likely to affect the success of managing the fishery. Bottomfish stocks, as well as non-target fishes and protected species that interact with the fishery are currently affected by these large-scale climate fluctuations and will continue to be affected in the same way regardless of which TAC alternative is selected for implementation. Condition of the stock, fishery yield, species interactions and other fishery outcomes are monitored through logbooks and sales reports. Therefore, any impacts to the fish stocks or other resources that are due to climate change or other ecosystem factors would be indirectly reflected in harvest reports and could be considered by scientists in the overall management of the fishery.

Due to the depths at which Deep 7 bottomfish live, these species are expected to be insulated from short term changes in the physical environment which may result from global climate changes. In the longer term potential changes in oceanic circulation, temperature, or other water quality parameters, or changes in productivity due to climate change could affect their reproduction, growth, or survival. Impacts of global climate change on Deep 7 species or other species caught in the MHI bottomfish fishery are expected to be observed through ongoing fishery monitoring and, if necessary, will be addressed in future management actions, including the specification of appropriate future TACs.

4.8 Irreversible and Irretrievable Commitments of Resources

None of the alternatives considered here would be expected to result in irretrievable or irreversible commitments of marine resources such as extinction to fish stocks, listed species, or other resources. Even the highest TAC considered (262,000 lb.) would not result in irretrievable commitments as it is associated with a zero risk of overfishing (Section 4.1) and very low potential impacts on bycatch (Section 4.2) or protected species (Section 4.3). The impact on pelagic species resulting from fishery participants switching to pelagic fishing when the TAC is reached is also expected to be minimal under all alternatives (Section 4.2). Federal reporting requirements for non-commercial bottomfishing participants in EEZ waters around Hawaii include reporting all catch and discards as well as any interactions with protected species. State reporting requirements apply to commercial participants in all fisheries which land fish in Hawaii and require that all catches and discards be reported. Thus under all alternatives impacts on bottomfish, pelagic and other species will continue to be monitored by fishery scientists who routinely collect, analyze and report on the information.

5.0 Consistency with the MSA and other Laws

5.1 Consistency with the National Standards

Section 301 of the Magnuson-Stevens Act requires that fishery management measures be consistent with the ten National Standards listed below.

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.

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 1 as it is anticipated to prevent overfishing of the Hawaiian archipelagic bottomfish stocks and localized depletion of the Deep 7 bottomfish in the main Hawaiian Islands subarea such that the optimum yield from this fishery can be sustainably harvested into the future.

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

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 2 because it is based on consideration of currently available information on bottomfish landings data derived from the commercial bottomfish fleet's reporting requirements analyzed by scientists at NMFS' PIFSC. This alternative is also based on information contained in the latest stock assessment completed by NMFS in 2008, as well as recommendations from the Council's Scientific and Statistical Committee.

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 proposed action is consistent with National Standard 3 because it is not expected to have a significant effect on the management of fish stocks as a unit despite the fact that this action aims to reduce fishing effort in a part of the complex's range. It was identified in NMFS' overfishing determination that the excessive fishing effort is occurring in the MHI part of the complex's range and not in the NWHI. This is because the bottomfish fishery in the NWHI is strictly controlled by a limited entry system with less than eight vessels permitted to fish, an annual catch limit and a maximum vessel length of 60 ft. With the exception of alternative 1, the proposed action alternatives address the management of Hawaii's archipelagic bottomfish stock complex as a unit by preventing localized depletion in one part of its range which could result in overfishing of the entire archipelagic stock. The extent of adult spillover and larval transport between the MHI and the NWHI is still largely unknown, however, it is expected that a reduction of fishing effort in the MHI will have beneficial effects on the stock complex as a whole.

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.

All of the proposed action alternatives are consistent with National Standard 4 because they do not discriminate between residents of different States or allocate fishing privileges among fishermen. The specification of a TAC would equally impact participants in the open access MHI Deep 7 bottomfish fishery regardless of their state of residence. However it will, for the reasons described above, impact Hawaii-based fishery participants who fish in the MHI while not affecting those who are licensed to fish in the NWHI limited entry fishery.

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.

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 5 because it considers efficiency in the utilization of the bottomfish resources of the MHI by seeking a relatively simple and focused regulatory approach combined with a fishing year which ensures that Deep 7 bottomfish are available during the peak holiday season when they are most in demand. Preventing overfishing is also expected to increase fishing efficiency through increases in catch rates as optimum yields are attained.

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

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 6 because it will control fishing mortality through the specification of a 2009-2010 TAC based on currently available information which takes into account variations in the fishery and the natural fluctuations of the resource.

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

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 7 because they do not duplicate other fishery regulations or add undue costs to fishing operations.

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.

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 8 because they consider and minimize adverse impacts to Hawaii's fishing communities by specifying a TAC based on a fishing year designed to allow Deep 7 fishing

during the peak holiday season when bottomfish is most in demand. Preventing overfishing is also expected to increase benefits to fishing communities through increases in catch rates as optimum yields are attained.

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.

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 9 because it limits the catch of Deep 7 bottomfish which is expected to concomitantly reduce bycatch. Displaced Deep 7 fishery participants could increase their fishing effort for other bottomfish or pelagic species however this is not expected to substantially increase bycatch due to the gear type used (hook-and-line, which has low bycatch rates) and the fact that there are very few species considered to be undesirable by fishery participants.

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

With the exception of alternative 1, the proposed action alternatives are consistent with National Standard 10 because it does not require changes to fishing gear or operations Although use of a fleetwide TAC may encourage a derby style fishery, this appears unlikely due to market factors in place and because this is a fresh fish fishery in which a large number of participants bring in relatively small catches.

5.2 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 tiers off of, and incorporates by reference, the Final Supplemental Impact Statement prepared in association with Amendment 14 to the Bottomfish FMP (WPRFMC 2007).

5.2.1 Purpose and Need

The purpose and need for this action are described in Section 1.2 of this document.

5.2.3 Alternatives Considered

The alternatives considered for this action are described in Section 2 of this document.

5.2.4 Affected Environment

The affected environment for this action is described in Section 3 of this document.

5.2.5 Impacts of the Alternatives

The expected impacts of the alternatives considered for this action are described in Section 4 of this document.

5.3 Coastal Zone Management Act

The Coastal Zone Management Act requires a determination that a recommended management measure has no effect on the land, water uses, or natural resources of the coastal zone or is consistent to the maximum extent practicable with an affected state's enforceable 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 alternatives are consistent, to the maximum extent practicable, with their coastal zone management program.

5.4 Information Quality Act

To the extent practicable, the information in this amendment complies with the Information Quality Act and NOAA standards (NOAA Information Quality Guidelines, September 30, 2002) which recognize information quality is comprised of three elements: utility, integrity, and objectivity. Central to the preparation of this amendment is objectivity which consists of two distinct elements: presentation and substance. The presentation element includes whether disseminated information is presented in an accurate, clear, complete, and unbiased manner and in a proper context. The substance element involves a focus on ensuring accurate, reliable, and unbiased information. In a scientific, financial, or statistical context, the original and supporting data shall be generated and the analytic results shall be developed using sound statistical and research methods. At the same time, however, the Federal government has recognized that "information quality comes at a cost. In this context, agencies are required to weigh the costs and the benefits of higher information quality in the development of information, and the level of quality to which the information disseminated will be held" (OMB Guidelines, pp. 8452-8453).

One of the important potential costs in acquiring "perfect" information (which is never available) is the cost of delay in decision-making. While the precautionary principle suggests that decisions should be made in favor of the environmental amenity at risk this does not suggest that perfect information is required for any alternative to proceed. In brief, it does suggest that caution be taken but that it not lead to paralysis until perfect information is available. This document uses currently available information and makes a broad presentation of it. The process of public review of this document provides an opportunity for comment and challenge to this information, as well as for the provision of additional information.

5.5 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to minimize the paperwork burden on the public resulting from the collection of information by or for the Federal government. It is intended to ensure the information collected under the proposed action is needed and is collected in an

efficient manner (44 U.S.C. 3501(1)). The alternatives considered here would not establish any new permitting or reporting requirements and therefore are not subject to the provisions of the Paperwork Reduction Act.

5.6 Endangered Species Act

The Endangered Species Act of 1973, as amended, (Public Law 93-205; 87 Stat. 884) prohibits the taking of any endangered species except under limited circumstances. As described in Section 3.4, NMFS prepared a Biological Opinion under section 7 of the ESA regarding the ongoing operations of the MHI bottomfish fishery (NMFS 2008a). This Biological Opinion concluded that Hawaii's bottomfish fisheries are not likely to jeopardize any ESA-listed species in the Hawaii Archipelago. Green sea turtles may be adversely affected by collisions with bottomfish vessels transiting to fishing grounds but their continued existence is not likely to be jeopardized. Because no critical habitat has been designated for protected species in the area in which the MHI bottomfish fishery operates, no destruction or adverse modification of critical habitat is anticipated. Section 3.4 describes the threatened and endangered species known to occur around the MHI and Section 4.2 describes the potential impacts of the alternatives considered here on listed species. Based on this information the Council believes that the alternatives considered here would not jeopardize any populations or habitats of species listed as endangered or threatened under the ESA.

5.7 Marine Mammal Protection Act

The Hawaii bottomfish fishery is listed as a Category III fishery under Section 118 of the MMPA. A Category III fishery is one with a low likelihood or no known interactions with marine mammals. NMFS has concluded that the Hawaii Archipelago commercial bottomfish fisheries will not affect marine mammals in any manner not considered or authorized under the MMPA.

Vessels participating in Category III fisheries may incidentally interact with marine mammals without registering or receiving an Authorization Certificate under the MMPA, but they are required to: 1) report all incidental mortality and injury of marine mammals to NMFS, 2) immediately return to the sea with minimum of further injury any incidentally taken marine mammal, 3) allow vessel observers if requested by NMFS, and 4) comply with guidelines and prohibitions under the MMPA when deterring marine mammals from gear, catch, and private property (50 CFR 229.5, 229.6, 229.7). See Section 3.6 of this document for descriptions of marine mammals found in the Hawaii Archipelago. Section 4.3 provides an analysis of the anticipated impacts on these species under each of the alternatives considered here. Based on this information the Council believes that the alternatives considered here will not adversely affect any marine mammal populations or habitats.

6.0 References

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