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Environmental Assessment

Specification of 2016-2018 Annual Catch Limits and Accountability Measures for Pacific Islands Crustacean and Precious Coral Fisheries

(RIN 0648-XE587)

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Abstract

NMFS is specifying annual catch limits (ACLs) and accountability measures (AMs) for Pacific Islands crustacean and precious coral fisheries of American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, and Hawaii. Species that have historically been harvested in Pacific Island crustacean fisheries include deep-water shrimps, spiny and slipper lobsters, and kona crab. Currently there is little-to-no fishing of these resources in areas administered as Federal fisheries. Precious coral fisheries have only developed in Hawaii and have historically targeted black, pink, and bamboo corals. Currently, only the Hawaii fishery for black corals is active with fewer than three participants and most of the fishing is occurring in nearshore waters managed by the State. Fishing for, taking, or retaining any gold coral in any precious coral permit area is prohibited through June 30, 2018.

The purpose of this action is to comply with provisions of the fishery ecosystem plans (FEPs) for American Samoa, the Mariana Islands, and Hawaii, which require NMFS to specify an ACL

for Pacific Island crustacean and precious coral fisheries and implement AMs that prevent ACLs from being exceeded, and correct or mitigate overages of ACLs if they occur. The proposed ACLs and AMs cover all previous crustacean and precious coral management unit species (MUS), except for Hawaii kona crab. The Western Pacific Fishery Management Council (Council) proposed the ACL specifications and developed in accordance with the approved ACL mechanism described in each FEP. The proposed specifications consider the best available scientific, commercial, and other information.

For all crustacean fisheries other than Hawaii kona crab, the ACLs and AMs would be applicable in fishing years 2016–2018, which begin on January 1 and end December 31 of each year. For all precious coral fisheries, the ACLs and AMs would be applicable in fishing years 2016–17, 2017–18, and 2018–19, which begin on July 1 and end June 30, the following year. Currently, near-real time processing of catch information is not being applied in any Pacific Island crustacean or precious coral fishery and, therefore, in-season AMs to prevent an ACL from being exceeded (e.g., fishery closures in Federal waters) are not possible; only a post-season AM is possible. As a proposed AM after the end of each fishing year, if NMFS and the Council determine that the average catch from the most recent three-year period exceeds a specified ACL, NMFS would reduce the ACL in the subsequent fishing years by the amount of the overage. Prior to implementing a reduced ACL, NMFS would conduct additional environmental analyses, if necessary, and the public would have the opportunity to provide input and comment on the reduced ACL specification at that time. If a fishery exceeds an ACL more than once in a four-year period, the Council is required to re-evaluate the ACL process and adjust the system, as necessary, to improve its performance and effectiveness.

In December 2015, NMFS and the Council received new information on the historical and projected stock status of Hawaii kona crab. While this information may accurately describe the stock status in 2006, NMFS notes that an independent reviewer identified data gaps and methodological concerns with the 2015 stock assessment. The NMFS Pacific Islands Fisheries Science Center (PIFSC), however, found that this assessment contains useful scientific information on the status of the stock over the last decade. NMFS believes that the stock assessment, although in need of updating with current information about the management of this stock, should be considered when setting an ACL. However, because the Council did not account for this information with other relevant information in recommending the 2016 kona crab ACL, NMFS will not set an ACL for Hawaii kona crab for 2016. Instead, NMFS will work with the Council to review available information and to work with its Scientific and Statistical Committee and PIFSC to set an acceptable biological catch and annual catch limit consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) for the Hawaii kona crab stock for fishing year 2017.

NMFS prepared this environmental assessment (EA) to evaluate the potential environmental effects of the proposed ACL and AM specifications in fishing years 2016–2018 for crustaceans and in fishing years 2016–17, 2017–18, and 2018–19 for precious coral fisheries. Because there is no in-season management measure, NMFS does not expect the specification of ACLs or AMs to change the conduct of any Pacific Island crustacean or precious coral fishery and the fisheries would continue to be monitored and landings compared against ACLs annually. NMFS does not expect large or adverse environmental effects on target, non-target, or bycatch species, or on

protected species that may interact with these fisheries. The proposed ACL specifications and AMs would not result in conflicts with ongoing fishery management activities or result in any impacts to coastal or marine areas, including designated essential fish habitat, critical habitat, marine protected areas, or unique areas. Overall, the proposed action is expected to provide for sustainable harvest of crustacean and precious coral fishery resources while preventing overfishing from occurring, which would have positive long-term impacts on fishery participants and fishing communities. This EA, the proposed rule, and supporting documents may be found at www.regulations.gov by searching on RIN 0648-XE587, or by contacting the responsible official or Council at the above address.

Environmental Assessment

Specification of 2016-2018 Annual Catch Limits and Accountability Measures for Pacific Islands Crustacean and Precious Coral Fisheries

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Acronyms and Abbreviations

ABC – Acceptable Biological Catch
ACL – Annual Catch Limit
ACT – Annual Catch Target
AM – Accountability Measure
CNMI – Commonwealth of the Northern Mariana Islands
Council – Western Pacific Fishery Management Council (also WPFMC)
CPUE – Catch Per Unit of Effort
DAWR – Guam Division of Aquatic and Wildlife Resources
DMWR – American Samoa Department of Marine and Wildlife Resources
DFW – Northern Mariana Islands Division of Fish and Wildlife
EA – Environmental Assessment
EC – Ecosystem Component
EEZ – Exclusive Economic Zone
FEP – Fishery Ecosystem Plan
FMP – Fishery Management Plan
FR – Federal Register
HDAR – Hawaii Division of Aquatic Resources
MHI – Main Hawaiian Islands
MFMT – Maximum Fishing Mortality Threshold
Magnuson-Stevens Act – Magnuson-Stevens Fishery Conservation and Management Act
MSST – Minimum Stock Size Threshold
MSY – Maximum Sustainable Yield
MUS – Management Unit Species
NEPA – National Environmental Policy Act
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
OFL – Overfishing Limit
OY – Optimum Yield
PIFSC – NMFS Pacific Islands Fisheries Science Center
PIRO – Pacific Islands Regional Office
SSC – Scientific and Statistical Committee
WPacFIN – Western Pacific Fisheries Information Network
WPFMC – Western Pacific Fishery Management Council (also Council)

1 Background Information

Fishing for crustaceans and precious corals in Federal waters (that is, in the U.S. Exclusive Economic Zone (EEZ), generally 3-200 nm from shore) around the U.S. Pacific Islands is managed under one of four fishery ecosystem plans (FEPs) developed by the Western Pacific Fishery Management Council (Council) and implemented by the National Marine Fisheries Service (NMFS) under the authority of the Magnuson-Stevens Act. Three of the FEPs are archipelagic-based and include the American Samoa Archipelago FEP, the Hawaii Archipelago FEP, and the Mariana Archipelago FEP (which covers Federal waters around Guam and the CNMI). The fourth FEP covers Federal waters of the U.S. Pacific remote island areas (PRIA) which include Palmyra Atoll, Kingman Reef, Jarvis Island, Baker Island, Howland Island, Johnston Atoll, and Wake Island. ACLs and AMs are required to be specified for all stocks and stock complexes of management unit species (MUS) included in each FEP, with the exception of species with short life cycles, those stocks managed through international agreements, or those that qualify as ecosystem component species.

The crustacean management unit species include the following stocks and stock complexes:[1] deepwater shrimps, spiny lobsters, slipper lobsters, and Kona crab (see full species list, Appendix A). Precious corals MUS include the following stocks and stock complexes: black corals, pink corals, bamboo corals and gold corals (see full species list, Appendix B).

General Federal fishery regulations for crustacean and precious coral fisheries of the Western Pacific Region are found in 50 CFR 665 and include Federal permit and reporting requirements, vessel identification and observer requirements, fishing seasons, and size restrictions. Precious coral fishing in Hawaii is further regulated through closed areas and harvest quotas; however, there are no active fisheries for crustaceans or precious corals in Federal waters around any island area at present. Additionally, there is a moratorium on fishing for gold corals in the U.S. EEZ through June 30, 2018.

Overview of the ACL Specification Process

NMFS is required to specify ACLs and AMs for all crustacean and precious coral stocks in fisheries of the Pacific Islands Region, as recommended by the Council, and in consideration of the best available scientific, commercial, and other information about the fishery for that stock or stock complex. This section provides an overview of the steps taken by the Council in developing its recommendation.

In accordance with the Magnuson-Stevens Act and the FEPs, there are three required elements in the development of an ACL specification. The first requires the Council's Scientific and Statistical Committee (SSC) to calculate an acceptable biological catch (ABC) that is set at or below the stock or stock complex's overfishing limit (OFL). The OFL is an estimate of the catch level above which overfishing is occurring. ABC is the level of catch that accounts for the

[1] The Magnuson-Stevens Act defines the term "stock of fish" to mean a species, subspecies, geographic grouping, or other category of fish capable of management as a unit. Federal regulations at 50 CFR §660.310 (c) defines "stock complex" to mean a group of stocks that are sufficiently similar in geographic distribution, life history, and vulnerability to the fishery such that the impact of management actions on the stock is similar.

scientific uncertainty in the estimate of OFL and other scientific uncertainty inherent in the estimate of fish stock status. In determining determine the appropriate ABC, the SSC follows the ACL mechanism described in the FEPs which includes a five-tiered system of "ABC control rules" that allows for different levels of scientific information to be considered. Tiers 1 and 2 involve data-rich to data-moderate situations and include levels of scientific uncertainty derived from model-based stock assessments. Tiers 3 through 5 involve data-poor situations and include levels of scientific uncertainty derived from ad-hoc procedures including simulations models or expert opinion.

When calculating an ABC for a stock or stock complex, the SSC must first evaluate the information available for the stock and assign the stock or stock complex into one of the five tiers. The SSC must then apply the control rule assigned to that tier to determine ABC.

For stocks like most precious corals and deepwater shrimp, which have estimates of maximum sustainable yield (MSY), but no current harvest, the ABC is to be calculated by the SSC based on the Tier 4 ABC control rule described in each FEP, which sets ABC as equal to 91% of the MSY estimate. As explained in the FEPs, the application of this control rule would result in a fishing mortality rate of 0.70 F_{MSY}, which would maximize yield while minimizing biomass impacts, and account for scientific uncertainty.

For data-poor stocks like slipper lobsters and Kona crab, for which only catch data are available and the OFL is unknown, ABC is to be calculated by the SSC based on the Tier 5 ABC control rule (Tier 5: Data poor, Ad-hoc Approach to Setting ABCs). Under this control rule the SSC is to multiply the average catch from a time period when there is no quantitative or qualitative evidence of declining abundance ("Recent Catch") by a factor based on a qualitative estimate of relative stock size or biomass (B) in the year of management. When it is not possible to analytically determine B relative to the biomass necessary to produce the MSY from the fishery, or B_{MSY}, the process allows for an approach based on informed judgment, including expert opinion and consensus-building methods. Table 1 provides a summary of the Council's default ABC control rule for data poor stocks.

Table 1. Tier 5 ABC Control Rule (Data poor, Ad-hoc Approach to Setting ABCs)

If estimate of B is above B_{MSY}	ABC = 1.00 x Recent Catch
If estimate of B is above minimum stock size threshold (MSST), but below B_{MSY}	ABC = 0.67 x Recent Catch
If estimate of B is below MSST (i.e., overfished)	ABC = 0.33 x Recent Catch

The ACL process also allows the SSC to utilize any other information deemed useful to establish an ABC and allows the SSC to recommend an ABC that differs from the results of the default ABC control rule calculation based on factors such as data uncertainty, recruitment variability, declining trends in population variables, and other factors determined relevant by the SSC. When using an alternate method, the SSC must explain its rationale.

The second step requires the Council to determine an ACL that may not exceed the SSC recommended ABC. The process includes methods by which the ACL may be reduced from the

ABC based on social, economic, and ecological considerations, or management uncertainty (SEEM). An ACL set below the ABC further reduces the probability that actual catch will exceed the OFL and result in overfishing.

The third and final step in the ACL process is the development of AMs. There are two categories of AMs; in-season AMs, and AMs that make adjustments to an ACL if it is exceeded. In-season AMs prevent an ACL from being exceeded and may include, but are not limited to, closing the fishery, closing specific areas, changing bag limits, or other methods to reduce catch. If the Council determines that an ACL has been exceeded, the Council may recommend, as an AM, that NMFS reduce the ACL in the subsequent fishing year by the amount of the overage. In determining whether an overage adjustment is necessary, the Council would consider the magnitude of the overage and its impact on the affected stock's status. Additionally, if an ACL is exceeded more than once in a four-year period, the Council is required to re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness. Figure 1 illustrates the relationship among the OFL, ABC, and ACLs described in this section.

For more details on the specific elements of the ACL specification mechanism and process, see Amendment 1 to the PRIA FEP, Amendment 2 to the American Samoa Archipelago FEP, Amendment 2 to the Mariana FEP, Amendment 3 to the Hawaii Archipelago FEP, and the final implementing regulations at 50 CFR §665.4 (76 FR 37285, June 27, 2011).

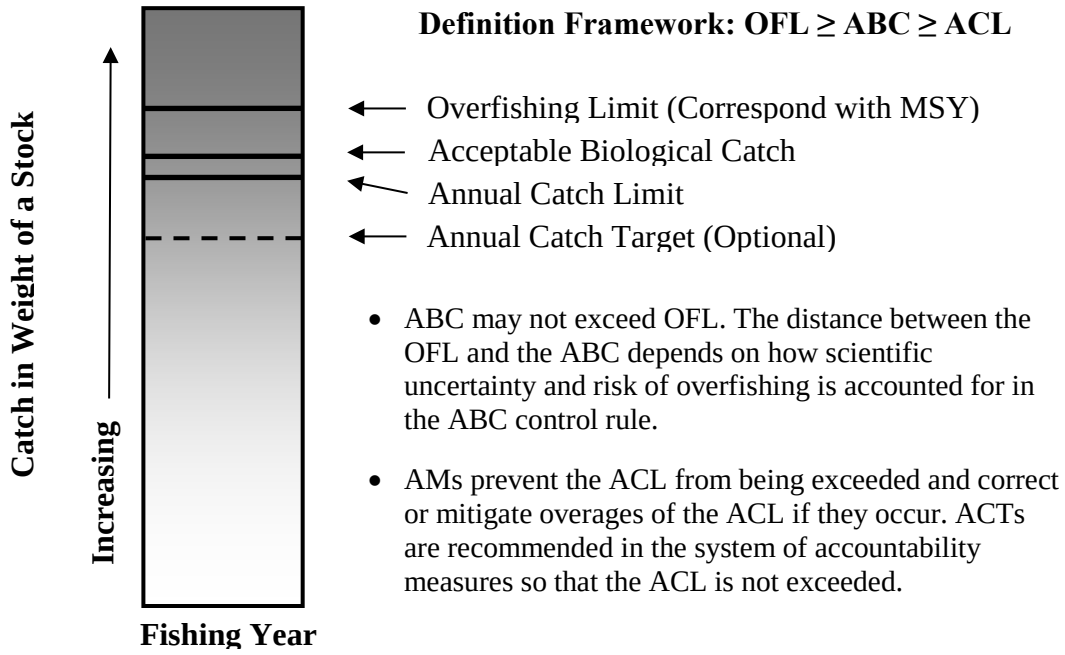

Figure 1. Relationship among OFL, ABC, ACL and ACT.

1.1 Purpose and Need

ACLs are needed in order to comply with the Magnuson-Stevens Act and provisions of the FEPs for American Samoa Archipelago, the Mariana Archipelago, and the Hawaii Archipelago which require NMFS to specify an ACL for each stock and stock complex in Pacific Island crustacean and precious coral fisheries. The fishery management objective of this action is to specify an ACL for all crustacean and precious coral MUS to prevent overfishing from occurring, and provide for long-term sustainability of the fishery resources while allowing fishery participants to continue to benefit from their utilization. AMs are to be used to correct or mitigate overages of the ACL should they occur.

1.2 Proposed Action

Based on recommendations by the Council, NMFS proposes to specify multi-year annual catch limits (ACLs) and implement accountability measures (AMs) for each crustacean and precious coral stock or stock complex managed under the FEPs for American Samoa, the Mariana Islands (which include Guam and the CNMI), and Hawaii effective in fishing years 2016–2018. ACLs and AMs for spiny lobsters are not included in the proposed action here, as the specifications are covered in a separate environmental review (NMFS 2015).[2] NMFS proposes to implement the specifications for fishing year 2016, 2017, and 2018 separately prior to each fishing year. Each fishing year, in each island area, catches would be counted towards the ACL for the stock or stock complex based on catch data collected by local resource management agencies through their respective fishery monitoring programs,[3] and by NMFS through Federal logbook reporting.

Pursuant to applicable fishery management regulations found at 50 CFR 665.4, when an ACL for any stock or stock complex is projected to be reached, based on best available information, NMFS will restrict fishing for that stock or stock complex in Federal waters around the applicable U.S. EEZ to prevent the ACL from being exceeded. The restriction may include, but is not limited to closure of the fishery, closure of specific areas, or restriction in effort. However, in-season restrictions are not possible for any precious coral or crustacean fishery at this time because catch statistics are generally not available until at least six months after the data has been collected (see Section 2.3 for more details on data collection). For this reason, only a post-season AM is possible. Specifically, after the end of each fishing year, if NMFS and the Council determine that the average catch from the most recent three-year period exceeds the specified ACL, NMFS would reduce the ACL in the subsequent fishing years by the amount of the overage. Prior to implementing a reduced ACL, NMFS would conduct additional environmental analyses, if necessary, and the public would have the opportunity to provide input and comment on the reduced ACL specification at that time. If a fishery exceeds an ACL more than once in a

[2] NMFS prepared a separate EA for the spiny lobster fisheries of the western Pacific because in 2015 the Council used a new method to set ABCs and ACLs that was better than using the 75th-percentile of catch. The effects of those specifications are considered together with the current proposed specifications, other ACL specifications and other actions by others and NMFS, as required under NEPA.

[3] Catch data for crustacean and precious coral fisheries in each island area are collected at the lowest taxonomic level possible by state, territorial, and commonwealth fishery management agencies in American Samoa, the CNMI, Guam, and Hawaii. The data are then expanded using algorithms developed by NMFS Pacific Islands Fisheries Science Center (PIFSC), Western Pacific Fisheries Information Network (WPacFIN) to generate estimates of total catches from both commercial and non-commercial sectors, except in Hawaii where total catch is based only on catch reported by the commercial fishing sector, as required under State law.

four-year period, the Council is required to re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness.

1.3 Decision Made After Considering Public Input

NMFS considered public comments on the proposed action and alternatives, and decided to specify ACLs and AMs for crustacean and precious coral stocks and stock complexes in American Samoa, the CNMI, Guam, and Hawaii for fishing years 2016 through 2018, in accordance with the Council's recommendations. NMFS received no comments during the public comment period for the proposed specification (82 FR 5517, January 18, 2017).

1.4 Public Involvement

The current proposed ACLs and AMs for Pacific Island crustacean and precious corals in American Samoa, the CNMI, Guam, and Hawaii, including ABC recommendations were considered in public meetings in 2014. At its 160th meeting, the Council considered and discussed issues relevant to the ACLs and AMs, including the ABC recommendations of the 116th SSC. The 116th SSC and the 160th Council meetings were held June 17-19, 2014, and June 25-27, 2014, respectively. Both meetings were open to the public and advertised through notices in the *Federal Register* (79 FR 31310, June 2, 2014), and on the Council's website. The public had an opportunity to comment at the meetings on the proposed ACL specifications and AMs and no public comment was provided at either meeting.

Prior to 2014, the public had been provided several opportunities to have input on previous years' ACLs and AMs for Pacific Island precious coral and crustacean fisheries. The 108th SSC and the 152nd Council meetings were held October 17-19, 2011, and October 19-22, 2011, respectively. Both meetings were open to the public and advertised through notices in the Federal Register (76 FR 60004; September 28, 2011) and on the Council's website. The public had an opportunity to comment at the meetings on the proposed ACL specifications and AMs and no public comment addressed this topic at either meeting.

NMFS provided the public with an opportunity to review and comment on a draft EA for proposed ACL specifications and AMs for crustacean and precious coral fisheries in the Pacific Islands for 2012 and 2013. No comments were received and the EA was finalized in December 2011 (NMFS 2011).

NMFS has provided the public with opportunities to comment on proposed ACL specifications and AMs over the past 4 years. No public comments have been received on the proposed ACL specifications or AMs during rulemaking.

NMFS sought public comment on the proposed rule and draft EA for the proposed ACL specifications and AMs for crustacean[4] and precious coral fisheries of the Pacific Island for fishing years 2016 through 2018 (82 FR 5517, January 18, 2017). NMFS received no comments.

[4] Spiny lobster ACLs and AMs are not included in this EA; they are evaluated in a separate EA

2 Description of the Alternatives

The alternatives considered in this document are a range of annual catch limits (ACLs) for crustacean and precious coral MUS caught in these fisheries in American Samoa, Guam, the CNMI and Hawaii. Although the estimate of the overfishing limit (OFL) and calculation of the acceptable biological catch (ABC) are part of the ACL mechanism, the establishment of these reference points is not part of the proposed Federal action because OFL is unknown, and, has not been determined for any crustacean or precious coral stock or stock complex. Additionally, the development of ABCs is not part of the Federal action, but a summary of their development by the Council's Scientific and Statistical Committee (SSC) is described in this section for informational purposes. ABCs were previously calculated by the Council's SSC at its 116th meeting, in accordance with the approved ACL mechanism described in the FEPs and implementing Federal regulations at 50 CFR 665.4, and in consideration of the best available scientific, commercial, and other information. In accordance with the Magnuson-Stevens Act and the ACL mechanism described in all western Pacific FEPs, the Council's ACL recommendation may not exceed the ABC recommended by the Council's SSC.

Table 2 summarizes the ACL alternatives considered for crustacean and precious coral fisheries in American Samoa, Guam, CNMI and Hawaii, including the most recent landing data, where available. Alternative 2 is the preferred alternative for all FEP fisheries and would result in NMFS specifying ACLs that are equal to the fishing level recommendation of the Council.

Features common to all alternatives

Pursuant to 50 CFR 665.4, when an ACL for any stock or stock complex is projected to be reached, based on best available information, NMFS will restrict fishing for that stock or stock complex in Federal waters around the applicable U.S. EEZ to prevent the ACL from being exceeded. The restriction may include, but is not limited to closure of the fishery, closure of specific areas or restriction in effort (76 FR 37286, June 27, 2011). However, in-season restrictions are not being recommended by the Council for any fishery at this time because catch statistics are generally not available until at least six months after the data has been collected (see Section 2.3 for more details on data collection). For these reasons, NMFS would apply a moving 3-yr average catch to evaluate fishery performance against the proposed ACLs. Specifically, NMFS and the Council will use the average catch during fishing year 2014, 2015, and 2016 to evaluate fishery performance against the appropriate 2016 ACL. At the end of each fishing year, the Council will review catches relative to each ACL. If NMFS and the Council determine the three-year average catch for the fishery exceeds the specified ACL, NMFS and the Council will reduce the ACL for that fishery by the amount of the overage in the subsequent year (80 FR 52415, August 31, 2015). Additionally, as a performance measure specified in each FEP, if an ACL is exceeded more than once in a four-year period, the Council is required to re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness. Each alternative also assumes continuation of all existing Federal and local resource management laws and regulations.

Table 2. Summary of the ACL Alternatives for Crustacean and Precious Coral Fisheries

Fishery	Alternative 1 *No Action*	Alternative 2 *Council Recommended ACL* ***(Preferred)***	Alternative 3 *ACL = 90% of ABC*	Most Recent Annual Average Landings (Years)[1]
HAWAII				
Deepwater Shrimp	No ACL	250,773 lb	225,695 lb	22,892 lb (2011-2015)
Slipper Lobster	No ACL	280 lb	252 lb	0 lb (2014)
Kona Crab	No ACL	27,600 lb	24,840 lb	2,921 lb (2015)
Auau Channel Black Coral	5,000 kg*	2,500 kg	6,750 lb	1,840 lb (2011-2015)
Makapuu Bed Pink/Bamboo Coral	2,000/500 kg*	1,000/250 kg	1,229/233 kg	0
180 Fathom Bank Pink/Bamboo Coral	222/56 kg**	222/56 kg	273/51 kg	0
Brooks Bank Pink/Bamboo Coral	444/111 kg**	444/111 kg	546/104 kg	0
Kaena Point Bed Pink/Bamboo Coral	67/17 kg**	67/17 kg	82/15 kg	0
Keahole Bed Pink/Bamboo Coral	67/17 kg**	67/17 kg	82/15 kg	0
Precious Coral Exploratory Area	1000 kg**	1000 kg	900 kg	0
AMERICAN SAMOA				
Deepwater Shrimp	No ACL	80,000 lb	72,000 lb	0
Slipper Lobster	No ACL	30 lb	27 lb	Unknown
Kona Crab	No ACL	3,200 lb	2,880 lb	0
Black Coral	No ACL	790 lb	711 lb	0
Precious Coral Exploratory Area	1,000 kg**	1,000 kg	900 kg	0
CNMI				
Deepwater Shrimp	No ACL	275,570 lb	248,018 lb	0
Slipper Lobster	No ACL	60 lb	54 lb	165 lb (2009)
Kona Crab	No ACL	6,300 lb	5,670 lb	0
Black Coral	No ACL	2,100 lb	1,890 lb	0
Precious Coral Exploratory Area	1,000 kg**	1,000 kg	900 kg	0
GUAM				
Deepwater Shrimp	No ACL	48,488 lb	43,639 lb	0
Slipper Lobster	No ACL	20 lb	18 lb	0
Kona Crab	No ACL	1,900 lb	1,729 lb	0
Black Coral	No ACL	700 lb	630 lb	0
Precious Coral Exploratory Area	1,000 kg**	1,000 kg	900 kg	0

[1]Catch reported to local marine resource management agencies through their respective data collection programs.
*Represents the current harvest quota that can be taken over the course of two consecutive fishing years.
**Represents the current annual harvest quota that can be taken annually.

2.1 Development of the Alternatives for Crustaceans – Deepwater Shrimp

Deepwater shrimp managed under the FEPs for Hawaii, American Samoa and the Mariana Archipelago (including Guam and the CNMI) include all species of the genus *Heterocarpus* and occur primarily at depths of between 350 m and 1,200 m. Also referred to as "pandalid shrimp" or "smooth nylon shrimp," they are harvested by traps made from steel, wire, and/or plastic with conical entrances that allow the shrimp to get into the trap, but not out. Trap lines are marked with flags and spaced out at approximately 30 meters apart. The traps are left out overnight to fish and collected the next day (King 1993).

In the Pacific Islands Region, deepwater shrimp fisheries have operated intermittently, including some operations in Hawaii that have operated occasionally since the 1960s. Other places in the region, such as Guam, have attempted a small-scale fishery for deepwater shrimp in the 1970s. The CNMI also had a deepwater shrimp fishery during the mid-1990s, around Saipan and Tinian. In general, these operations have consisted of from one to four vessels and have been rather sporadic. Gear loss, a short product shelf life, and history of inconsistent product quality have led to fluctuating market demand. Also, known fishing areas tend to be limited and subject to reduced catch rates following large initial harvests. Vessels generally leave the fishery for two to five years while the biomass increases enough to make the fishery profitable again.

In accordance with Federal regulations, any vessel used to fish for deepwater shrimp or lobsters in the U.S. EEZ must obtain a Federal permit and submit catch logbooks to NMFS within 72 hours of landing. Crustacean Permit Area 1 includes the EEZ around the Northwestern Hawaiian Islands (NWHI). Crustacean Permit Area 2 includes the EEZ around the main Hawaiian Islands (MHI). Crustacean Permit Area 3 includes the EEZ around American Samoa. Crustacean Permit Area 4 includes the EEZ around the U.S. Pacific Remote Island Areas. Crustacean Permit Area 5 includes the EEZ around Guam and the CNMI.

Comprehensive information on target, non-target stocks, bycatch, protected species, and conservation and management measures for deepwater shrimp fisheries can be found in the American Samoa Archipelago FEP (WPFMC 2009a), the Hawaii Archipelago FEP (WPFMC 2009b), and the Mariana Archipelago FEP (WPFMC 2009c). Additionally, Amendment 13 to the Fishery Management Plan for Crustacean Fisheries of the Western Pacific provides detailed fishery descriptions including ecology and life history information for deepwater shrimps of the western Pacific (WPFMC 2008).

The SSC and Council developed the ABC and ACL recommendations for deepwater shrimp MUS in accordance with the Magnuson-Stevens Act and Federal regulations at 50 CFR §665.4 that implement the ACL specification mechanism of the FEPs described in Section 1. The following section summarizes the data, methods, and procedures considered in SSC and Council deliberations as described more fully in the Council's first ACL and AM specification (WPFMC 2011). A full report of the 116th SSC and 160th Council deliberations can be found on the Council website at: www.wpcouncil.org.

2.1.1 Hawaii Deepwater Shrimp ACL Alternatives

In Hawaii, an intermittent deepwater shrimp fishery began in 1967 (Tagami and Ralston 1988) and continues to vary from year to year with an average of three vessels reporting the catch of deepwater shrimp to the State of Hawaii. Vessels ranged in size from 7.5 to 40 m in length, though the number of smaller vessels increased as larger vessels left the fishery (Tagami and Barrows 1988). Between 1982 and 2005, the cumulative (23-year) landings of *Heterocarpus laevigatus* amounted to over 1.0 million pounds, while during the same time period, *Heterocarpus ensifer* landings totaled over 20,000 pounds. There are currently no Federal crustacean permits issued for deepwater shrimp harvest in Hawaii.

Table 3 summarizes total landings and average annual landings for both species of deepwater shrimp in the main Hawaiian Islands (MHI) for three decadal periods, 1982-1989, 1990-1999 2000-2010, and the most recent five-year period (2011 – 2015). Landing information is grouped into multi-year bins to protect confidential fishery data as there may have been fewer than three participants in the fishery during certain years. Therefore, individual years in which less than three vessels participated in the fishery cannot be reported.

Table 3. Total and Average Annual Landings of Hawaii Deepwater Shrimp (1982–2015)

Years (Grouped)*	Total Landings (lb)	Average Annual Landings (lb)
1982–1989 (8 yrs.)	320,195	40,024
1990–1999 (10 yrs.)	881,548	88,155
2000–2010 (11 yrs.)	206,176	18,743
2011–2015 (5 yrs.)	114,461	22,892

*Landing information grouped to protect confidential fishery data.
Source: Landings data from (HDAR 2016) State of Hawaii, Dept. of Land and Natural Resources Division of Aquatic Resources.

NMFS/Council Estimation of OFL

There is no OFL estimate for deepwater shrimp in Hawaii.

SSC's Calculation of ABC

The most current estimate of maximum sustainable yield (MSY) for the deepwater shrimp stock complex in Hawaii is 125 mt/yr or 275,575 lb/yr (Tagami and Ralston 1988). At 116th SSC meeting, the SSC determined that the Hawaii deepwater shrimp stock complex can be regarded as Tier 4 because MSY is known, but there is no current harvest. Therefore, consistent with the Tier 4 ABC control rule described in the FEP of the Hawaiian Archipelago, the SSC recommended the ABC be set equal to 0.91*MSY. As explained in the FEP of the Hawaii Archipelago, the application of this control rule would result in a fishing mortality rate of 0.70 F_{MSY} which would maximize yield while minimizing biomass impacts, and account for scientific uncertainty.

In calculating the ABC, the SSC applied the value for exploitable biomass (271.4 mt/yr or 598,328 lb/yr) as estimated by Ralston and Tagami (1992) instead of the MSY estimated by Tagami and Ralston (1988), and calculated an ABC of 544,479 lb which the SSC then rounded

down to 544,000 lb. Because the SSC used the value for exploitable biomass in the Tier 4 ABC control rule calculation, the SSC-recommended ABC of 544,000 lb, which exceeds the MSY estimate of 125 mt/yr or 275,575 lb/yr. Therefore, consistent with the intent of the SSC's recommendation, NMFS is making a technical correction to the ABC calculation by applying the correct MSY value of 125 mt/ yr or 275,575 lb/yr into the Tier 4 ABC control rule which results in a corrected ABC of 250,773 lb.

Council ACL Recommendation

At its 152nd meeting held October 17 – 19, 2011, the Council recommended setting the ACL for the Hawaii deepwater shrimp stock complex as equal to the ABC, which, as re-calculated by NMFS, is 250,773 lb. In recommending the ACL, the Council considered the average annual landings for the three approximately 10-year periods as shown in Table 3. The Council did not recommend reducing the ACL from the ABC for social, economic, ecological considerations or management uncertainty as described in the FEP of the Hawaii Archipelago, because average annual landings within each of three approximately 10-year periods are substantially lower than the MSY of 125 mt/yr (275,575 lb/yr) estimated by Ralston and Tagami (1988). Therefore, while setting the ACL equal to the ABC does not provide for consideration of management uncertainty, it is highly unlikely that catch would ever approach ACL based on the historical performance of the Hawaii deepwater shrimp fishery, and it is unlikely that the Hawaii deepwater shrimp stock complex would experience overfishing during the 2012 or 2013 fishing years. The Council recommended the same ACL for fishing years 2012 – 2015 and catch has never exceeded the ACL. The Council reaffirmed this ACL recommendation for the 2016 – 2018 fishing years at its 160th meeting held June 25 – 27, 2014, in Honolulu, Hawaii.

2.1.1.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the Hawaii deepwater shrimp stock complex and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or provisions of the FEP of the Hawaii Archipelago which require ACLs to be specified for all stocks and stock complexes in the deepwater shrimp fishery. Alternative 1 serves as the baseline for the environmental effects analysis.

2.1.1.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the Hawaii deepwater shrimp stock complex would be set equal to the ACL recommended by the Council or 250,773 lb. This ACL is equal to the ABC and is 91% of the estimated annual MSY of 275,575 lb/yr. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.1.1.3 Alternative 3: Specify ACL at 90% of ABC

Under this alternative, the ACL for Hawaii deepwater shrimp stock complex would be set at 90% of the 250,773 lb ABC, or 225,695 lb. This ACL would be 82% of the annual MSY estimate of 275,575 lb/yr (Tagami and Ralston 1988). The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.1.2 American Samoa Deepwater Shrimp ACL Alternatives

No fishing for deepwater shrimp has ever been reported around American Samoa and no Federal permits have ever been issued. However, in 1987, PIFSC fishery scientists conducted sampling at 10 shrimp trapping stations at depths ranging between 200 and 510 fathoms around American Samoa (Moffitt and Polovina 1987). Large pyramid single set traps were used and at least some *Heterocarpus* were present in every trap haul. Unpublished results from the cruise showed that deepwater shrimp were found at every trapping station and may be more abundant in some places than others. Additionally, depletion trapping surveys were conducted in Western Samoa (near Apia) which yielded 0.6 kg of deepwater shrimp per trap (King 1980, King 1984). Other trapping studies have been conducted in other Pacific Islands including Hawaii, the Marianas, Guam, Tonga, Fiji, Vanuatu, New Caledonia, French Polynesia and the Kiribati.

NMFS/Council Estimation of OFL

There is no estimate of OFL for deepwater shrimp in American Samoa.

SSC's Calculation of ABC

At its 116th SSC, the SSC developed a proxy for estimating MSY for the American Samoa deepwater shrimp stock complex based on the product of an equilibrium sustainable yield estimate for deepwater shrimps and an estimate of the available deepwater shrimp habitat based on an estimate of the amount (area) of substrate that lies between 600 and 800 m deep.

Based on the trapping studies conducted in the Pacific Islands, King (1986) provides a potential equilibrium sustainable yield estimate for deepwater shrimps in the Pacific Islands of 200 kg/km^2 per year. The equilibrium yield is estimated as the ratio of yield-per-unexploited biomass (Y/Bo) multiplied by the unexploited biomass estimated from the depletion experiments described in King (1986). Additionally, King (1988) estimates American Samoa contains approximately 200 km^2 of available deepwater shrimp habitat area, which includes substrates between 600 and 800 m in depth, though this may be an underestimate because of the incomplete coverage in the depth range of interest and because some banks and seamounts have yet to be mapped sufficiently to

provide an accurate area estimate (Michael Parke, NMFS PIFSC, *pers. comm.*; Robert O'Conner, NMFS PIRO, *pers. comm.*).

Multiplying the King (1986) equilibrium sustainable yield estimate of 200 kg/km^2 by the King (1988) estimate of 200 km^2 of deepwater shrimp habitat for the Territory, the SSC calculated a potential MSY proxy for deepwater shrimp in American Samoa of 40,000 kg/yr or approximately 88,000 lb/yr. The SSC determined that American Samoa deep water shrimp can be regarded as Tier 4 because an MSY proxy can be calculated, but there is no current harvest. Therefore, consistent with the Tier 4 ABC control rule described in the American Samoa FEP, which requires ABC be set equal to 0.91*MSY, the SSC calculated ABC to be 80,000 lb. As explained in the American Samoa FEP, the application of this control rule would result in a fishing mortality rate of 0.70 F_{MSY}, which would maximize yield while minimizing fishery impacts to biomass, and account for scientific uncertainty.

Council ACL Recommendation

At its 152nd meeting held October 19-22, 2011, in Honolulu, Hawaii, the Council recommended setting ACL for America Samoa deepwater shrimp stock complex equal to the SSC recommended ABC of 80,000 lb. The Council did not recommend reducing the ACL from the ABC for social, economic, ecological considerations or management uncertainty, as described in the American Samoa FEP, because no fishing for deepwater shrimp has ever been reported around American Samoa and none was expected to occur in 2012 or 2013. Therefore, it is highly unlikely that catch would approach the ACL any time in the foreseeable future, and it is unlikely that the American Samoa deepwater shrimp stock complex would experience overfishing during the 2012 or 2013 fishing years. The Council recommended the same ACL for fishing years 2012 – 2015 and catch has never exceeded the ACL. The Council reaffirmed this ACL recommendation for the 2016 – 2018 fishing years at its 160th meeting held June 25 – 27, 2014.

2.1.2.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the American Samoa deepwater shrimp stock complex and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the American Samoa FEP, which requires ACLs to be specified for all stocks and stock complexes in the fishery. Alternative 1 serves as the baseline for the environmental effects analysis.

2.1.2.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the American Samoa deepwater shrimp stock complex would be set equal to the ACL recommended by the Council or 80,000 lb. This ACL is equal to the ABC recommended by the SSC and is 91% of the estimated MSY proxy of 88,000 lb/yr. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that

caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.1.2.3 Alternative 3: Specify ACL at 90% of ABC

Under this alternative, the ACL for American Samoa deepwater shrimp stock complex would be set at 90% of the 80,000 lb ABC recommended by the SSC or 72,000 lb. This ACL would be 81% of the estimated MSY proxy of 88,000 lb. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.1.3 CNMI Deepwater Shrimp ACL Alternatives

A directed fishery for deepwater shrimp in the CNMI began in mid-1994, but lasted only two years. One of two companies involved stopped fishing in mid-1995, after fishing a total of 193 days. Between May 1994 and February 1996, approximately 27,000 lb of deepwater shrimp were landed in the CNMI. Of these, more than 97 percent were *Heterocarpus laevigatus.* The remainder of the catch was *Heterocarpus ensifer* (WPFMC 2008). Small amounts of catch were reported in 2001, 2005, and 2006 as local fishermen explored re-invigorating the deepwater shrimp fishery; however the landings cannot be publicly reported to protect fishery data confidentiality. No shrimp catches have been reported recently. There are currently no Federal crustacean permits issued for deepwater shrimp harvest in the CNMI.

NMFS/Council Estimation of OFL

There is no OFL estimate for deepwater shrimp in the CNMI.

SSC's Calculation of ABC

Based on an equilibrium yield assessment conducted by NMFS Southwest Fisheries Science Center in 1987, the most current estimate of maximum sustainable yield (MSY) for the deepwater shrimp stock complex in the Mariana Archipelago is 161.5 mt/yr (Moffitt and Polovina 1987). The assessment identified *Heterocarpus ensifer*, *H. laevigatus*, and *H. longirostris* as the major components of catch in the Mariana Archipelago. The assessment also estimated sustainable yield for each individual island, bank and seamount in the archipelago (Table 4). Note that commercial fishing is prohibited in waters of the Islands Unit of the Marianas Trench Marine National Monument.

Table 4. Equilibrium yield for Heterocarpus shrimps in the Mariana Archipelago by location.

Bank Area (CNMI)	**Yield (mt/yr)**
Maug*	0.9
Asuncion*	1.5
Agrihan	3.0
Pagan	4.3
Alamagan	3.0
Guguan	1.7
Sarigan	0.8
Anatahan	3.1
38 Fathom	1.7
Esmeralda	0.3
Farallon de Medinilla	10.6
Saipan	54.1
Tinian	16.3
Aguijan	7.8
Rota	24.7
Bank C	0.7
Bank D	0.9
Pathfinder	0.9
Arakane	0.5
Bank A	0.6
CNMI Total	**137.4**
Bank Area (Guam)	**Yield (mt/yr)**
Guam Island	3.9
Galvez and Santa Rosa	20.2
Guam Total	**24.1**
Archipelagic Total (CNMI + Guam)	***161.5***

* - banks which are in the Islands Unit of the Marianas Trench Marine National Monument and are not open to commercial fishing.
Source: Adapted from Moffitt and Polovina (1987)

At its 116th meeting, the SSC determined that the CNMI deepwater shrimp stock complex can be regarded as a Tier 4 stock complex because an MSY is known, but there is no current harvest. Therefore, consistent with the Tier 4 ABC control rule described in the Mariana Archipelago FEP, the SSC recommended the ABC = 0.91*MSY. As explained in the Mariana FEP, the application of this control rule would result in a fishing mortality rate of 0.70 F_{MSY} , which would maximize yield while minimizing biomass impacts, and account for scientific uncertainty. Applying the Tier 4 ABC control rule to the CNMI deepwater shrimp MSY estimate of 137.4

mt/yr (302,830 lb), as provided for in Moffitt and Polovina (1987) and listed in Table 4, yields an ABC of 125 mt or 275,575 lb.[5]

Council ACL Recommendation

At its 152nd meeting held October 19-22, 2011, the Council recommended setting the ACL for the CNMI deepwater shrimp stock complex equal to the ABC or 275,575 lb. The Council did not recommend reducing ACL from ABC for social, economic, ecological considerations or management uncertainty as described in the Mariana Archipelago FEP because there have been no reported landings of deepwater shrimp for the past five years and none is expected to occur in 2012 or 2013. Therefore, it is highly unlikely that catch would approach the ACL anytime in the foreseeable future, and it is unlikely that the CNMI deepwater shrimp stock complex would experience overfishing during the 2012 or 2013 fishing years. The Council recommended the same ACL for fishing years 2012 – 2015 and catch has never exceeded the ACL. The Council reaffirmed this ACL for the 2016 – 2018 fishing years at its 160th meeting held June 25 – 27, 2014.

2.1.3.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the CNMI deepwater shrimp stock complex and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the Mariana Archipelago FEP which require ACLs to be specified for all stocks and stock complexes in the fishery. Alternative 1 serves as the baseline for the environmental effects analysis. .

2.1.3.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the CNMI deepwater shrimp stock complex would be set equal to the ACL recommended by the Council or 275,575 lb. This ACL is equal to the ABC recommended by the SSC and is 91% of the MSY of 302,830 lb/yr (137.4 mt/yr) estimated by Moffitt and Polovina (1987). The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

[5] Note that this is a corrected ABC. At its 116th meeting, the SSC applied an MSY estimate of 133.8 mt/yr (294,975 lb/yr) for CNMI deepwater shrimp, resulting in an ABC of 268,000 lb. However, the MSY estimate used by the SSC is the result of a technical error in the interpretation of Moffitt and Polovina (1987) who calculate the MSY for deepwater shrimp in the CNMI as 137.4 mt/yr as shown in Table 4.

2.1.3.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for the CNMI deepwater shrimp stock complex would be set at 90% of the 275,575 lb ABC recommended by the SSC or 248,018 lb. This ACL is 82% of the MSY of 302,830 lb/yr (137.4 mt/yr) estimated by Moffitt and Polovina (1987). The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.1.4 Guam Deepwater Shrimp ACL Alternatives

A small-scale fishery for deepwater shrimp occurred in the 1970s, but ended shortly thereafter. No fishing or landings have been reported since. There are currently no Federal crustacean permits issued for deepwater shrimp harvest in Guam and no recent shrimp harvests have been reported. Based on an equilibrium yield assessment conducted by NMFS Southwest Fisheries Science Center in 1987 (Moffitt and Polovina 1987), the most current estimate of MSY for the deepwater shrimp stock complex in Guam, including the offshore banks of Galvez and Santa Rosa, is 24.1 mt/yr or 53,116 lb/yr (Table 4).[6]

SSC's Calculation of ABC

At its 116th meeting, the SSC determined that the Guam deepwater shrimp stock complex can be regarded as Tier 4 because an MSY is known, but there is no current harvest. Therefore, consistent with the Tier 4 ABC control rule described in the Mariana Archipelago FEP, the SSC recommended ABC = 0.91*MSY. As explained in the Mariana FEP, the application of this ABC control rule would result in a fishing mortality rate of 0.70 F_{MSY} , which would maximize yield while minimizing biomass impacts, and account for scientific uncertainty. Applying the Tier 4 ABC control rule to the MSY estimate of 24.1 mt/yr, as provided for in Moffitt and Polovina (1987) and listed in Table 4, yields an ABC of 22 mt or 48,488 lb.

Council ACL Recommendation

At its 152nd meeting held October 19–22, 2011, the Council recommended setting the ACL for the Guam deepwater shrimp stock complex equal to the ABC or 48,488 lb. The Council did not recommend reducing the ACL from the ABC for social, economic, ecological considerations or management uncertainty as described in the Mariana Archipelago FEP because there have been

[6] Note that this is a corrected ABC. At its 116th meeting, the SSC applied an MSY estimate of 27.7 mt/yr (61,067 lb/yr) for Guam deepwater shrimp, resulting in an ABC of 268,000 lb. However, the MSY estimate used by the SSC is the result of a technical error in the interpretation of Moffitt and Polovina (1987) who calculate the MSY for deepwater shrimp in Guam as 24.1 mt/yr as shown in Table 4.

no reported landing of deepwater shrimp fishing since the 1970s and none is expected to occur in 2012 or 2013. Therefore, it is highly unlikely that catch would approach the ACL anytime in the foreseeable future and it is unlikely that the Guam deepwater shrimp stock complex would experience overfishing during the 2012 or 2013 fishing years. The Council recommended the same ACL for fishing years 2012 – 2015 and catch has never exceeded the ACL. The Council reaffirmed this ACL recommendation for the 2016 – 2018 fishing years at its 160th meeting held June 25 – 27, 2014.

2.1.4.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the Guam deepwater shrimp stock complex and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the FEP of the Mariana Archipelago which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.1.4.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for Guam deepwater shrimp stock complex would be set equal to the ACL recommended by the Council or 48,488 lb. This ACL is equal to the ABC recommended by the SSC and is 91% of the MSY of 53,116 lb/yr (24.1 mt/yr) estimated by Moffitt and Polovina (1987). The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.1.4.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for the Guam deepwater shrimp stock complex would be set at 90% of the 48,488 lb ABC recommended by the SSC or 43,639 lb. This ACL is 82% of the MSY of 53,116 lb (24.1 mt/yr) estimated by Moffitt and Polovina (1987). The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.2 Development of the Alternatives for Crustaceans ACLs - Slipper Lobster

Lobsters are harvested on a small scale throughout the inhabited islands of the Pacific Islands Region and are comprised primarily of species belonging to the families Palinuridae (spiny lobsters) and Scyllaridae (slipper lobsters). The FEPs for the American Samoa Archipelago, the Mariana Archipelago, and the Hawaii Archipelago include two species of spiny lobster (*Panulirus marginatus* and *P. penicillatus*), and all species of slipper lobsters belonging to the family Scyllaridae as management unit species.

Generally, adult lobsters are typically found on rocky substrates in association with coral reef ecosystems that provide shelter as well as a diverse and abundant supply of food items. Some species can be found on rocky substrates in well-protected areas, in crevices and under rocks, while others inhabit the rocky shelters in the windward surf zones of oceanic reefs.

In 1999, the Council developed and NMFS approved essential fish habitat (EFH) designations for adult and juvenile lobsters (as well as Kona crab) as the bottom habitat from the shoreline to a depth of 100 m or 0-50 fathoms (see section 3.4 for more information about EFH designations). This EFH designation corresponds to the definition of coral reef ecosystem in the FEPs for American Samoa, the Mariana Archipelago (including Guam and the CNMI) and Hawaii. Table 5 lists the estimate area of coral reef ecosystem habitat in the main Hawaiian Islands, American Samoa, Guam and the CNMI as reported in Hunter (1995) and WPFMC (2001).

Table 5. Estimated Coral Reef Habitat in the Pacific Islands Region*

Island Area	Area of Coral Reef Ecosystem Habitat (0-100 m) in km^2
Main Hawaiian Islands	2,535
American Samoa	296
Guam	179
CNMI	579

*Coral reef habitat, as defined in this table, is based on the definition in western Pacific regional fishery ecosystem plans and includes "bottom habitat from the shoreline to a depth of 100 m (0-50 fathoms)."
Source: Hunter (1995); WPFMC (2001)

Comprehensive information on target, non-target stocks, bycatch, protected species and conservation and management measures for lobster fisheries can be found in the American Samoa Archipelago FEP (WPFMC 2009a), the Hawaii Archipelago FEP (WPFMC 2009b) and the Mariana Archipelago FEP (WPFMC 2009c).

The SSC and Council developed the ABC and ACL recommendations for slipper lobsters in accordance with the Magnuson-Stevens Act and Federal regulations at 50 CFR §665.4 that implement the ACL specification mechanism of the FEPs described in Section 1. The following section summarizes the data, methods, and procedures considered in SSC and Council deliberations as described in the Council's ACL specification document (WPFMC 2011). A full report of the 116th SSC and 160th Council meeting deliberations can be found on the Council website at: www.wpcouncil.org. ACL specifications and AMs for spiny lobsters were considered

in a separate EA beginning in 2015. As a result, ACLs and AMs for spiny lobster fisheries will not be covered in this EA.

2.2.1 Hawaii Slipper Lobster ACL Alternatives

In Hawaii, fisheries for lobsters target the two species of spiny lobster and several species of slipper lobsters, although two species, the common slipper lobster (*Scyllarides squammosus*) and the ridgeback slipper lobster (*Scyllarides haanii*) are the principle species harvested. Gear types used in Hawaii's lobster fisheries include traps, nets and hand harvest, with the latter being the preferred method in recent years and accounting for nearly 80 percent of reported landings between 1994 and 2004 (Kelly and Messer, 2005).

Between 1966 and 2010, slipper lobster landings ranged from about 0-2,395 lb/year with between 4 and 12 commercial participants. There are currently no Federal crustacean permits issued for lobsters in the MHI. Table 6 summarizes the reported commercial landing of slipper lobster landings between 1966 and 2010.

There is no information on the amount of non-commercial slipper lobster harvest in the MHI. Some non-commercial slipper lobster harvest is noted from shore-based creel census and telephone intercept surveys.

Table 6. Annual reported commercial landings of slipper lobsters in the main Hawaiian Islands (1966-2015)

Fishing Year	Slipper Lobster Total Landings (lb)
1966	0
1967	0
1968	0
1969	105
1970	0
1971	89
1972	0
1973	0
1974	100
1975	100
1976	47
1977	0
1978	160
1979	129
1980	119
1981	277
1982	152
1983	85
1984	687
1985	1,878

Fishing Year	Slipper Lobster Total Landings (lb)
1986	2,395
1987	287
1988	416
1989	498
1990	34
1991	160
1992	66
1993	42
1994	45
1995	97
1996	765
1997	387
1998	917
1999	107
2000	192
2001	114
2002	58
2003	40
2004	36
2005	0
2006	0
2007	70
2008	78
2009	102
2010	10
2011	5
2012	24
2013	67
2014	141
2015	0

Source: WPFMC 2011 and WPFMC 2016.

NMFS/Council Estimation of OFL

There is no OFL estimate for slipper lobsters in Hawaii.

SSC's Calculation of ABC

There is no MSY estimate for slipper lobsters in Hawaii.[7] At the 116th SSC meeting, the SSC recommended that, for species with no MSY estimates, the ABC be set in accordance with the

[7] Amendment 1 to the Fishery Management Plan for Crustacean Fisheries of the Western Pacific Region (WPFMC 1983) provides an estimate of optimum yield for MHI lobsters as being 15-30,000 lobsters annually. However, the basis for this estimate is unknown. Using an estimate of 2 lb/lobster (Kelly and Messer, 2005), an OY of 15-30,000

Tier 5 ABC control rule as described in the FEP of the Hawaii Archipelago. See Section 1 for a description of the Council's default ABC control rule for Tier 5 data poor stocks.

In defining "Recent Catch" to apply in the ABC control rule, the SSC recommended using the 75th percentile of the long term catch history for MHI slipper lobster as the definition of "Recent Catch." The 75th percentile is the value of an array (in this case, the amount of catch in terms of pounds) below which 75% of the observations may be found. This is a non-parametric approach, that is, a distribution-free method and does not rely on assumptions that the data are drawn from a given probability distribution. Referring to discussions at the 107th SSC meeting, the SSC noted that the insular fishery catch vs. time-series data usually display considerable inter-annual variability; therefore, non-parametric measures are a better way to summarize such data compared to averages (Chambers et al. 1983,Cleveland 1993).

The SSC noted that the inter-quartile range (25-75th percentile) is a standard non-parametric measure that may be used to summarize data with considerable inter-annual variability, and determined that using the 75th percentile of long-term catch for Tier 5 stocks was more appropriate than the median long-term catch (or 50th percentile) as described in the Tier 5 control rule because using the 50th percentile is likely to result in ABC being attained 50% of the time.

Based on this approach and rationale, the SSC recommended the ABC for slipper lobster in the MHI be set based on 1 x the 75th percentile of the long term catch history (Figure 2). Specifically, the SSC set the ABC for slipper lobsters at 280 lb.

The SSC determined a multiplier of 1 was warranted in both calculations of ABC because there are numerous state regulations to conserve lobster populations in both the MHI and the NWHI, including size limits (Hawaii Administrative Rule Title 13, Subtitle 4, Chapter 89 §13-89-1), and numerous restricted fishing areas including Fishery Management Areas, Marine Life Conservation Districts, State Marine Refuges and Natural Area Reserves.

lobsters would yield between 30,000 and 60,000 pounds of lobsters annually. The SSC did not rely on this data in setting ABC.

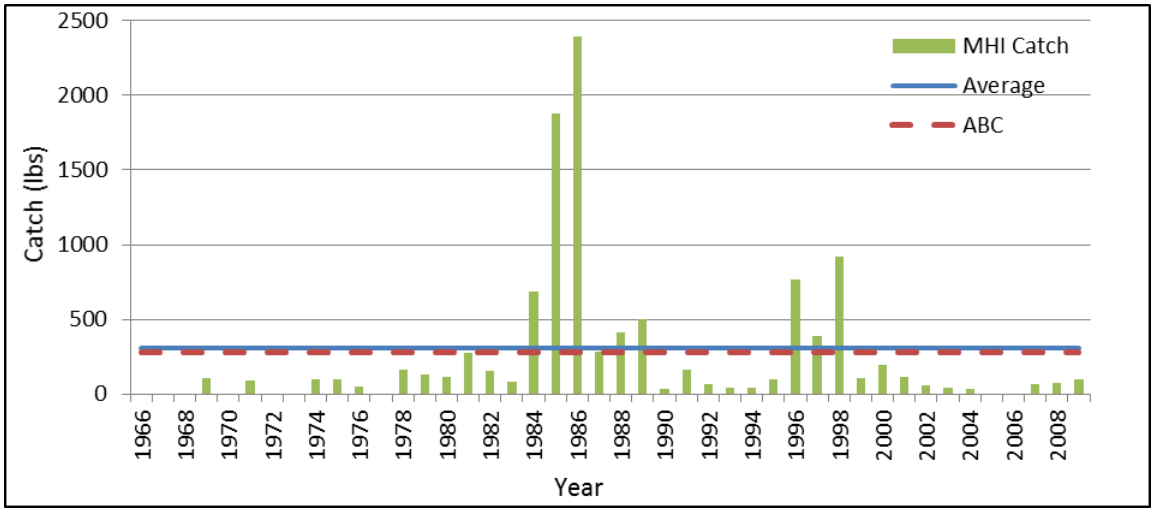

Figure 2. Average reported commercial landings of slipper lobster in the MHI (1966-2008) compared to the recommended acceptable biological catch (ABC)

Source: WPFMC 2011

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council recommended setting the ACL for MHI slipper lobster stock complex equal to the SSC recommended ABC of 280 lb. The Council did not recommend reducing the slipper lobster ACL from the ABC for social, economic, ecological considerations or management uncertainty because there are numerous regulations implemented by the State of Hawaii that limit lobster harvest and provide protection to lobster populations. The Council recommended the same ACL for fishing years 2012 – 2015 and catch has never exceeded the ACL. The Council reaffirmed this ACL recommendation for the 2016 – 2018 fishing years at its 160th meeting held June 25 – 27, 2014.

2.2.1.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the Hawaii slipper lobster stock complex and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the FEP of the Hawaii Archipelago, which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.2.1.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the Hawaii slipper lobster stock complex would be set equal to the ACL recommended by the Council which is 280 lb. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS

would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.2.1.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACLs for Hawaii slipper lobster stock complex would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 252 lb. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.2.2 American Samoa Slipper Lobster ACL Alternatives

According to landings records, slipper lobsters in American Samoa are not exploited. However, an SSC member from American Samoa reported at the 116th SSC meeting, that some slipper lobsters are harvested but the catch is not identified to the species level in the DMWR fishery's monitoring creel survey programs. There are currently no Federal crustacean permits issued for lobster harvest in American Samoa and most of the harvest is believed to be from territorial waters.

NMFS/Council Estimation of OFL

There is no OFL estimate for slipper lobsters in American Samoa.

SSC's Calculation of ABC

There is no MSY estimate for slipper lobsters in American Samoa. Additionally, there is no catch information and, therefore, this precludes the use of the Tier 5 ABC control rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating an ABC for the American Samoa slipper lobster stock complex.

First, SSC recognized that essential fish habitat (EFH) designation for juvenile and adult slipper lobsters in American Samoa included all bottom habitat from the shoreline to a depth of 100 m (see section 3.4 for EFH designations). Next, the SSC noted that American Samoa contains approximately 296 km² of lobster EFH as shown in Table 5. The SSC then developed an estimate of slipper lobster density based on the slipper lobster density estimated for Hawaii (the only area that has specifically documented harvesting of slipper lobster). To do this, the SSC applied the 75th percentile of slipper lobster catch from the main Hawaiian Islands (MHI) which is 280 lb, and a MHI lobster EFH area of 2,535 km², and calculated that there are approximately 0.11 spiny lobsters per km² of EFH in the MHI. Using this spiny lobster density as a proxy for slipper

lobsters, and applying the ratio of 0.11 lobsters per EFH area to American Samoa, the SSC calculated the ABC for American Samoa slipper lobster stock complex to be 33 lb.

American Samoa Slipper Lobster ABC Proxy Equation:

(280 lb lobsters /2,535 km^2) * 296 km^2 = 33 lbs

Although the SSC expressed concern about undocumented slipper lobster landings, it did note that the species is a small proportion of total lobster landings. The SSC also noted that American Samoa regulations prohibit the harvest of berried females (i.e., female lobsters with eggs) for both species (American Samoa Administrative Code, Title 24, Chapter 9, V. 24.0935 and 24.0936) and the extensive protected areas on Tutuila and in the Rose Atoll Monument. An additional regulation is the prohibition of the use of spears or snagging devices to harvest lobsters (American Samoa Administrative Code, Title 24, Chapter 9, V. 24.0935).

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council recommended setting the ACLs for the American Samoa slipper lobster stock complex equal to the SSC-recommended ABC of 30 lb. The Council did not recommend reducing the ACLs from the ABCs in consideration of social, economic, ecological considerations or management uncertainty as described in the American Samoa FEP. While setting the ACLs equal to the ABCs allows for no precaution in the fishery, the Council noted there is currently only a small commercial fishery occurring in territorial waters, thus the Council does not expect the continued harvest to adversely impact lobster populations. The Council also noted that numerous regulations are already in place in American Samoa territorial waters that provide protection to the lobster stock populations.

2.2.2.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the American Samoa slipper lobster stock complex and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the FEPs, which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.2.2.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for American Samoa's slipper lobster stock complex would be set equal to the ACL recommended by the Council, which is 30 lb. This is equal to the ABC recommended by the SSC. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that

stock complex in the subsequent fishing year, or other measures, as appropriate. These are the same ACL and AM as in the past four fishing years.

2.2.2.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for American Samoa's slipper lobster stock complex would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 27 lb. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.2.3 CNMI Slipper Lobster ACL Alternatives

The CNMI lobster fishery primarily targets spiny lobsters which are harvested by hand, with scuba or by free diving. This fishery occurs almost exclusively inside of three nautical miles of the inhabited southern islands of Saipan, Tinian and Rota although, anecdotal information indicates that in the northern islands on the reef surrounding Farallon de Medinilla, bottomfish fishermen anchored overnight occasionally dive for lobsters (WPFMC 2011; NMFS and WPFMC 2009). Slipper lobster catches have only recently been reported within the past several years with catches of 7 lb, 371 lb and 165 lb reported in 2007, 2008 and 2009 (WPacFIN unpublished data). There are currently no Federal crustacean permits issued for lobster harvest in the CNMI.

NMFS/Council Estimation of OFL

There is no OFL estimate for slipper lobsters in the Mariana Archipelago.

SSC's Calculation of ABC

There is no MSY estimate for slipper lobsters in the CNMI. Additionally, there are only three years of available catch information and, therefore, this precludes the use of the Tier 5 ABC control rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating an ABC for the CNMI slipper lobster stock complex.

First, SSC recognized that essential fish habitat (EFH) designation for juvenile and adult slipper lobsters in the CNMI included all bottom habitat from the shoreline to a depth of 100 m (see section 3.4 for EFH designations). Next, the SSC noted that the CNMI contains approximately 579 km² of lobster EFH as shown in Table 5. The SSC then developed an estimate of slipper lobster density based on the slipper lobster density estimated for Hawaii (the only area that has specifically documented harvesting of slipper lobster). To do this, the SSC applied the 75th percentile of slipper lobster catch from the MHI (which is 280 lb), and a MHI lobster EFH area

of 2,535 km², and calculated that there are approximately 0.11 spiny lobsters per km² of EFH in the MHI. Using this spiny lobster density as a proxy for slipper lobsters, and applying the ratio of 0.11 lobsters per EFH area to the CNMI, the SSC calculated the ABC for the CNMI slipper lobster stock complex to be 64 lb, but rounded the ABC downward to 60 lb.

CNMI Slipper Lobster ABC Proxy Equation:

(280 lb slipper lobsters/2,535 km^2) * 579 km^2 (estimated EFH) = 64 lb

Additional sources of assurance that overfishing is not occurring for slipper lobsters in the CNMI, there is a significant reservoir of biomass in the uninhabited islands and monument, a closed area of shallow reef off Farallon de Medinilla that provides habitat for lobsters, and territorial regulations that provide protection to lobsters less than 3 inches, berried females, as well as prohibit any harvest mechanism other than by hand (DFW Fishing Regulations, Part 3, Section 50.1).

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council recommended setting ACL for the CNMI slipper lobster stock complex equal to the SSC- recommended ABC, which is 60 lb. The Council did not recommend reducing ACL from ABC for social, economic, ecological considerations or management uncertainty as described in the Mariana Archipelago FEP. While setting ACL equal to ABC allows for no precaution in the fishery, the Council noted there is currently only a small commercial fishery occurring in CNMI waters. The Council also noted that numerous regulations are already in place in CNMI territorial waters that provide protection to the lobster stock populations.

2.2.3.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the CNMI slipper lobster stock complex and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the Mariana Archipelago FEP, which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.2.3.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the CNMI's slipper lobster stock complex would be set equal to the ACL recommended by the Council, which is 60 lb. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward

adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate. These are the same ACL and AM as in the past 4 fishing years.

2.2.3.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for the CNMI's slipper lobster stock complexes would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 54 lb. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate. This is a 6 lb reduction from the past 4 years.

2.2.4 Guam Slipper Lobster ACL Alternatives

Little is known about Guam's crustacean fisheries. Most fishing for crustaceans around Guam occurs in territorial waters in a subsistence or recreational context. There are no documented landings of slipper lobsters in Guam. Additionally, there are currently no Federal crustacean permits issued for lobster harvest in Guam.

NMFS/Council Estimation of OFL

There is no OFL estimate for slipper lobsters in Guam.

SSC's Calculation of ABC

There is no MSY estimate for slipper lobsters in Guam. Additionally, there is no catch information and, therefore, this precludes the use of the Tier 5 ABC control rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating the ABC for the Guam slipper lobster stock complex.

First, the SSC recognized that essential fish habitat (EFH) designation for juvenile and adult slipper lobsters in Guam included all bottom habitat from the shoreline to a depth of 100 m (see section 3.4 for EFH designations). Next, the SSC noted that Guam contains approximately 179 km² of lobster EFH as shown in Table 5. The SSC then developed an estimate of slipper lobster density based on the slipper lobster density estimated for Hawaii (the only area that has specifically documented harvesting of slipper lobster). To do this, the SSC applied the 75th percentile of slipper lobster catch from the MHI (which is 280 lb), and a MHI lobster EFH area of 2,535 km², and calculated that there are approximately 0.11 spiny lobsters per km² of EFH in the MHI. Using this spiny lobster density as a proxy for slipper lobsters, and applying the ratio of 0.11 lobsters per EFH area in Guam, the SSC calculated the ABC for the Guam slipper lobster stock complex to be 20 lb.

Guam Slipper Lobster ABC Proxy Equation:

(280 lb slipper lobsters /2,535 km^2 (EFH in Hawaii) * 179 km^2 (EFH in Guam) = 20 lbs

The SSC determined a multiplier of 1 was warranted for slipper lobsters because of the various Guam territorial laws that aid in maintaining the slipper lobster biomass, including commercial harvest size restrictions and a prohibition on berried females (9 G.A.R. §12401). Additionally, Guam implemented measures for personal harvest of slipper lobsters, including no taking of berried females, size restrictions, and gear restrictions (9 G.A.R. §12402).

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council recommended setting the ACL for the Guam slipper lobster stock complex equal to the SSC- recommended ABC of 20 lb. The Council did not recommend reducing ACL from ABC for social, economic, ecological considerations or management uncertainty as described in the Mariana Archipelago FEP. While setting the ACL equal to ABC allows for no precaution in the fishery, the Council noted there is currently only a small commercial fishery occurring in Guam waters. The Council also noted that numerous regulations are already in place in Guam territorial waters that provide protection to the lobster stock populations.

2.2.4.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the Guam slipper lobster stock complex and AMs would not be necessary. However, this alternative would not be in compliance with the Magnuson-Stevens Act or the provisions of the FEPs, which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.2.4.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for Guam's slipper lobster stock complex would be set equal to the ACL recommended by the Council which is 20 lb. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate. These are the same ACL and AM as in the past 4 fishing years.

2.2.4.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for Guam's slipper lobster stock complex would be set at 90% of the ABC recommended by the SSC. This would result in ACLs of 2,430 lb and 18 lb,

respectively. The ACL would be specified annually for fishing years 2016–2018. As an AM, the Council would determine as soon as possible after the fishing year whether an ACL for any stock or stock complex had been exceeded. If landings of a stock or stock complex exceed the specified ACL in a fishing year and adversely affected the sustainability of the stock or stock complex, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. NMFS would implement the Council's recommended action, recewhich could include a downward adjustment to the ACL for that stock complex in the subsequent fishing year, or other measures, as appropriate.

2.3 Alternatives for Crustaceans - Kona Crab ACLs and AMs

Kona crab (*Ranina ranina*), sometimes referred to as the "spanner crab" or "frog crab," is the only species within its genus and is commercially harvested over much of its range in the equatorial Pacific. Currently, among the U.S. Pacific Island areas, Kona crab fishing only occurs in Hawaii. The fishery is relatively small with around 26–50 participants annually in recent years (Table 8). Fishing for Kona crab is conducted by setting strings of baited circular shaped nets on sandy bottom habitats for an average soak time of one hour (Kennelly and Craig 1989). Nets are set during day-long trips from small boats from 10-12 m in length (Brown 1985). The net frames are built from ½ cm wire approximately 1 meter across. This frame is then covered in 1-2 layers of small gauge mesh netting which entangles the legs or claws of the crabs. There is some variation in size and type of material used to construct tangle nets (Onizuka 1972; Kennelly and Craig 1989). Upon retrieval, crabs are untangled and the nets reset.

Very little is known about the life history of Kona crab. The crabs are dioecious (i.e., the species has separate male and female individuals) and displays sexual dimorphism, with males growing to a much larger size than females (Uchida 1986). Fishermen are readily able to distinguish the sexes of adult crabs.

Current Federal and state fishery regulations for Kona crab fishery

Currently, there are no Federal permits or reporting requirements for Kona crab harvests in the EEZ around Hawaii or other Pacific Island areas. In Hawaii, fishermen are required to have a State of Hawaii Commercial Marine License (CMLs) to harvest Kona crab for commercial purposes. This allows the Council, NMFS and the State of Hawaii to monitor commercial catches. Annual landings records are available in Hawaii from 1950 through 2015 (Table 8). As of 2006, the State of Hawaii prohibits retention of female crabs. The State has also established a minimum size for male crabs of 4 inches (carapace length). Female crabs and undersized male crabs must be returned to the ocean if they are caught in nets.

2.3.1 Hawaii Kona Crab ACL and AM Alternatives

What follows is a chronological account of ACL and AM recommendations for Hawaii Kona crab.

Development of the Council's original recommendation for Hawaii Kona crab ACLs and AMs in 2012–2013

At the 108th SSC meeting from October 17–19, 2011, the SSC recommended that, for species with no MSY estimates, the ABC be set in accordance with the Tier 5 ABC control rule as described in the Hawaii Archipelago FEP. See Section 1 for a description of the Council's default ABC control rule for Tier 5 data poor stocks. In defining "Recent Catch" to apply in the ABC control rule, the SSC recommended using the 75th percentile of the available catch history for Kona crab as the definition of "Recent Catch." At the time the available catch history included data from 1950-2008. Based on this approach, the SSC recommended the ABC for the Kona crab fishery in Hawaii be set based on 1 x the 75th percentile of the long term catch history (Figure 3). Specifically, the SSC calculated the ABC for Kona crab to be 27,560 lb, but rounded ABC upward to 27,600 lb.

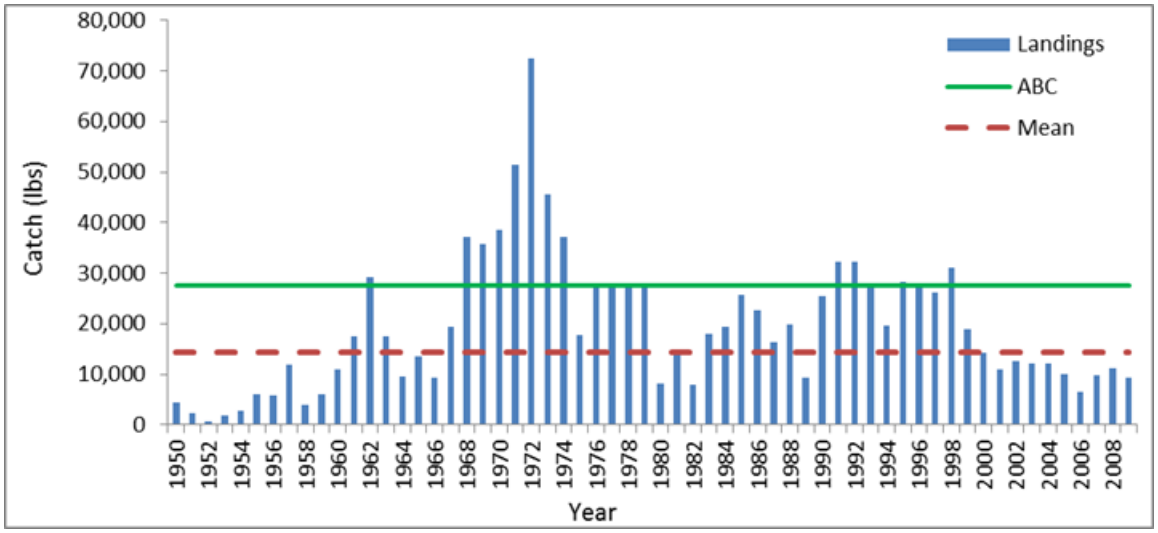

Figure 3. Average catch of Kona crab in the MHI (1950-2008) compared to ABC

Source: WPFMC (2011)

The SSC determined a multiplier of 1 was warranted for Hawaii Kona crab because there is no long-term decline in harvest over the last 30 years and there are numerous Hawaii state regulations to conserve Kona crab resources including restrictions on taking of female Kona crab (Hawaii Revised Statutes §188-58.5), and minimum size restrictions, seasonal closures (May-August), and gear restrictions (e.g. no spearing Kona crab, minimum net mesh size) (Hawaii Administrative Rule Title 13, Subtitle 4, Chapter 89 §13-95-52).

Table 7. History of ACL and AM recommendations for Hawaii Kona crab

Year	Council Recommended ACL	NMFS Implemented AM	Total Catch (lb)	# of CML holders
2011	N/A	N/A	10,883	51

Year	Council Recommended ACL	NMFS Implemented AM	Total Catch (lb)	# of CML holders
2012*	27,600	Post-season review	8,404	42
2013	27,600	Post-season review	9,625	29
2014	27,600	Post-season review	3,067	30
2015	27,600	Post-season review	2,332	26
2016**	27,600	Post-season review		
2017**	27,600	Post-season review		
2018**	27,600	Post-season review		

* 2012 is the first year the fishery was subject to ACLs/AMs. ** Proposed ACLs and AMs

Development of the Council's 2014 recommendation for Hawaii Kona crab ACLs and AMs for fishing years 2015–2018

At the 116th SSC meeting from June 17–19, 2014 and the 160th Council meeting from June 25–27, 2014, the Council and its advisory body developed 2015–2018 ABC and ACL recommendations for the Hawaii Kona crab fishery in accordance with the Magnuson-Stevens Act and Federal regulations at 50 CFR §665.4. The following section summarizes the data, methods, and procedures considered in SSC and Council deliberations. A full report of the 116th SSC and 160th Council deliberations can be found on the Council website at: www.wpcouncil.org.

The Council and the SSC considered any new information since the 2011 EA prior to making a recommendation for the 2015–2018 ACLs in 2014. The SSC recommended that the ABCs of the fishing year 2014 be rolled over for fishing year 2015 to 2018 for species/species complexes that have no new scientific information, no new catch data, and for which catches in the past years did not exceed the ACL, which included Kona crab.

According to the SSC in their final report of the 116th SSC meeting: "Regarding Hawaii Kona crab, although there are some new catch data available, re-calculating the ABC using the Tier 5 ABC control rule (i.e., ABC=75th percentile of catch history) would result in a ratchet-down effect since the recent catches are below the ACLs. The same ratchet-down effect would occur in re-calculating ABC for these species in American Samoa, Guam and the CNMI using a catch per area of habitat ratio, based on updated Hawaii data. The SSC further recommends that these MUS be designated as ecosystem components and that monitoring be improved in case a commercial fishery develops."

Considering the SSC's advice, in June 2014, the Council recommended that the Hawaii Kona crab ACLs and AMs for fishing years 2015 through 2018 remain the same as 2014 (WPFMC 2014). The Council developed their ACL and AM recommendations according to the process described in the FEP of the Hawaii Archipelago and Federal regulations at 50 CFR 665.4.

Development of the Council's 2015 recommendation for Hawaii Kona crab ACLs and AMs for fishing years 2016–2018

In 2015, the Council recommended AMs for the Hawaii Kona crab fishery that were subsequently implemented by NMFS (80 FR 52415, August 31, 2015). Specifically, under the current AMs, NMFS and the Council compare the estimated stock or stock complex's running three-year average catch to the ACL. For example, in 2015, NMFS and the Council used the average landings of Kona crab reported in 2013, 2014, and 2015 to compare fishery performance against the 2015 ACL. For the 2016 fishing year, NMFS and the Council would use the average catch of fishing years 2014, 2015, and 2016 to evaluate fishery performance against the 2016 ACL. A similar comparison would be made for fishing years 2017 and 2018.

Recent and historical fishery performance

Participation in the fishery varies from year to year. Over the past 15 years, the number of CML holders in the Hawaii Kona crab fishery has steadily declined from 85 commercial fishermen in 2000, to a low of 26 fishermen in 2015. In the last three years, there were 30 or fewer CML holders participating in the fishery (see Table 8). A substantial amount (30–75%) of Hawaii Kona crab catches are from the EEZ or Federal waters (NMFS 2011).

Table 8. Annual reported commercial landing of Kona crab in the MHI (1950-2015)

Fishing Year	Number of Fishery Participants (CML holders)	Kona Crab Total Landing (lb)
1950	10	5,984
1951	17	3,440
1952	12	1,209
1953	10	1,564
1954	14	2,047
1955	14	3,926
1956	28	5,781
1957	26	11,195
1958	23	8,761
1959	20	4,259
1960	17	9,430
1961	15	15,288
1962	19	30,409
1963	26	21,019
1964	28	12,688
1965	26	11,421
1966	22	10,033

Fishing Year	Number of Fishery Participants (CML holders)	Kona Crab Total Landing (lb)
1967	30	17,444
1968	25	26,419
1969	29	35,955
1970	30	35,042
1971	40	43,576
1972	41	69,331
1973	32	62,515
1974	49	40,552
1975	59	24,616
1976	59	26,577
1977	55	23,168
1978	61	31,675
1979	54	28,976
1980	42	10,390
1981	50	17,858
1982	52	8,625
1983	53	11,206
1984	68	17,216
1985	75	21,918
1986	83	27,598
1987	73	22,131
1988	50	17,750
1989	35	13,116
1990	39	18,810
1991	46	23,641
1992	73	36,714
1993	67	25,894
1994	71	24,040
1995	77	22,866
1996	88	30,595
1997	89	29,033
1998	87	29,210
1999	92	25,500
2000	85	17,070
2001	62	10,128
2002	64	11,912
2003	52	12,669
2004	51	12,785
2005	51	11,904
2006	39	9,399
2007	33	5,690
2008	37	13,305
2009	44	7,987

Fishing Year	Number of Fishery Participants (CML holders)	Kona Crab Total Landing (lb)
2010	40	11,807
2011	51	10,883
2012	42	8,404
2013	29	9,625
2014	30	3,067
2015	26	2,332

Source: Landings data from (HDAR 2016) State of Hawaii, Dept. of Land and Natural Resources Division of Aquatic Resources.

New information on the fishery – a stock assessment of Hawaii Kona Crab (Thomas et al. 2015)

Thomas et al. (2015) prepared a stock assessment for the Hawaii-based Kona crab fishery. The stock assessment used data from 1948–2009. Thomas et al. (2015) standardized commercial Kona crab catch per unit effort data (CPUE) for fishing years 1948-2009 using a generalized linear model (GLM). In order to account for different management regimes during the historical time frame, the authors divided the data among three periods: 1948–1998 (unregulated crab fishery); 1998–2006 (no-take of crabs during bottomfish fishing trips); and 2006–2009 (male-crab only fishery). The authors then applied the GLM CPUE results and landings information into a generalized production model (GPM) to estimate stock abundance, fishing mortality, and biomass.

Despite having data extending back to 1948, the authors only used commercial landings data from 1970 through 2006 since they believed that fishermen underreported landings by as much as 50 percent before 1970. Additionally, the fishery switched to a male-only retention fishery in 2006, as a result of new regulations passed by the Hawaii Division of Aquatic Resources (http://dlnr.hawaii.gov/dar/fishing/fishing-regulations/marine-invertebrates/). Effort data used in Thomas et al. (2015) did not include any recreational fishery landings information.

Based on the results of the model runs, Thomas et al. (2015) concluded that Hawaii Kona crab stocks had reached an overfished status in 2006, and were likely still overfished in 2010. Further, Thomas et al. (2015) produced biomass projections for 2010-2030 based on their GPM. They produced biomass estimates under three fishing scenarios. They assumed constant annual commercial landings (males and females combined) of zero lb, 7,000 lb, and 8,000 lb. At a zero-pound harvest rate, the authors predicted that Kona crab stocks would recover from overfished levels (<50 percent of B_{MSY}) after 2015. At a 7,000-pound annual commercial harvest rate, the authors estimated that Kona crab biomass would increase above 50 percent of B_{MSY} by 2030, but explained that there was a chance that stock biomass could decline to zero lb by 2020. At an 8,000-pound harvest rate, the authors predicted that the Hawaii Kona crab stock biomass could reach zero lb by 2020. In their discussion, Thomas et al. (2015) acknowledge that their 2010–2030 stock status projections do not account for the effects of a male-only fishery (after September 2006) and, as a result, the projections are associated with a high degree of uncertainty.

Thomas et al. (2015) also describe that a lack of recreational landings information introduces a significant amount of uncertainty into their stock assessment. The authors caution that male-only crustacean fisheries may not benefit stocks and cite several examples where male-only crustacean fisheries did not increase stock productivity. For example, the authors speculated that release of female crabs could be associated with increased mortality of female crabs. Further, the authors provided details of Kona crab biology that could indicate the potential for stock productivity declines as a result of fisheries removing large males from the population. Thomas et al. (2015) also provides information about how large-scale environmental changes (e.g. Pacific Decadal Oscillation, El Nino) may affect crustacean stock productivity. Finally, Thomas et al. (2015) provide evidence of localized stock depletion and correlate stock abundance negatively with proximity to large human population centers. The authors provide evidence that Kona crab populations in harder to access fishing grounds (e.g., Penguin Bank, coral reef areas) show less evidence of exploitation (i.e., larger crabs).

CIE Review of the Kona Crab Stock Assessment (Hall 2015)

In December 2015, a reviewer from the Center for Independent Experts (CIE) reviewed Thomas et al. (2015). Hall (2015) provided NMFS and, therefore, the Council, with useful analyses and critiques of the data and methodology used in Thomas et al. (2015).

Hall (2015) concurred with Thomas et al.'s (2015) conclusion that based on the data and models used, Hawaii Kona crab stocks had declined below 50 percent of B_{MSY} (i.e., the stock was overfished in 2006). Furthermore, Hall concurred with the conclusion that the stocks probably had not recovered above 50 percent of B_{MSY} by 2010. Hall (2015) agreed that the overall methodology in Thomas et al. (2015) was sound, but cautioned that managers need to consider quantifiable and unquantifiable uncertainties in the data and methodologies if using Thomas et al. (2015) for management purposes.

Hall et al. (2015) cite several data gaps and uncertainties with Thomas et al.'s 2015 stock assessment including:

- No information on Hawaii Kona crab stock structure (i.e., there is a lack of information on interrelatedness of subpopulations);
- How the authors resolve data discrepancies and accounted for discarded information introduces errors into the conclusions;
- No assessment of the accuracy of the landings data (introduces errors into the conclusions);
- No reliable information exists for recreational fishery landings;
- No estimates of discard biomass;
- Models used by the authors did not consider discard mortality rates;
- The GPM could not estimate stock status commercial landings data from 2007 through 2010, making the 2010–2030 stock projections unreliable; and
- No fishery-independent data exists for the Hawaii Kona crab fishery to use for stock assessments.

Hall (2015) evaluated the methods used by Thomas et al. (2015) to calculate standardized CPUE and assess the Hawaii Kona crab stock. Overall, Hall (2015) found that Thomas et al. (2015)

used sound methods for producing standardized CPUEs and assessing stocks from 1970–2006. One minor criticism in Hall (2015) was that a GLM did not account for differences among individual fishermen's CPUEs, which, in small fisheries such as the Hawaii Kona crab fishery, can greatly affect CPUE estimates, and suggested that a mixed-effects model would better account for differing CPUEs among individual fishermen. Although considered by Hall to be a minor problem, this can result in unfounded conclusions.

To estimate stock sizes in fishing years 2010–2030, Thomas et al. (2015) applied male-only commercial landings information (2007-2009) to their GPM, which is inappropriate because the model assumes male and female harvest of Kona crabs. The effects on crab stocks of a male-only Kona crab fishery differ greatly from the effects of a keep-all fishery. According to Hall (2015), applying post-2006 commercial Kona crab landings data to the GPM in Thomas et al. (2015) did not produce credible results (Hall 2015). Hall further pointed out that using male-only commercial landings data for the 2007–2009 period may underestimate stock productivity because Thomas et al. (2015) developed their model assuming higher female mortality rates than may be occurring during this time period.

PIFSC response to Kona crab stock assessment and CIE review (Appendix C)

After reviewing the Thomas et al. (2015) stock assessment and the CIE review by Hall (2015), and acting upon the request from the Council, NMFS requested additional review from PIFSC. As described in Appendix C, PIFSC confirmed that reported commercial landings from 2007–2009 only represent landings of male Kona crabs. PIFSC confirmed that the production model used by Thomas et al. does not account for mortality associated with discarded females. PIFSC further confirmed that no reliable information exists on female catch rates, discards, or mortality rates. PIFSC explained that disentangling female crabs from nets may cause injuries and lead to high female discard mortality rates. While the PIFSC review echoed concerns similar to Hall (2015), it also noted that the stock assessment provided useful scientific information about stock status within the last decade. PIFSC agreed with other reviewers that further work is needed to provide advice on the current status of the population in more recent years.

Recent fishery information available to NMFS and the Council since the Thomas et al. (2015) stock assessment

Based on the most recent data available, fishermen in Hawaii reported commercial Kona crab landings (males only) ranging from 2,332 to 11,807 lb from 2009 through 2015 (Table 8). Based on the table, fewer than 50 fishery participants are typically active in the commercial Kona crab fishery in Hawaii and catches vary from year to year. None of the annual reported landings exceeded the ACL (27,600 lb) during this period. Hawaii Kona crab landings the last five years have averaged 6,862 lb, well below the recent and proposed ACL of 27,600 lb.

Commercial catches in 2008–2013 met or exceeded the Kona crab catch mortality thresholds (8,000 lb male and female crabs) that Thomas et al. (2015) predicted would cause the Hawaii Kona crab stock to collapse in 2020, if fished consistently at that level. We note that the projection is not validated in the observed fishery landings, although both the amount of participants and landings were down in 2014 and 2015 (Table 8). Both Hall (2015) and NMFS

PIFSC note that the stock projections beyond 2006 in Thomas et al. (2015) involve high degrees of uncertainty, and both expert reviews concluded that the stock projections beyond 2006 probably do not accurately describe current Hawaii Kona crab stock size or structure. Both Hall (2015) and PIFSC conclude that managers need more current and specific information to clarify current Hawaii Kona crab stock status since the accuracy of Thomas et al. (2015) projections beyond 2006 (10 years ago) are inaccurate because they don't account for harvest of males only, female crab survival upon release (a better stock status outcome) or female mortality upon release (a worse stock status outcome), and because early estimates of production may have been artificially inflated.

At the 122nd Meeting of the Council's Scientific and Statistical Committee (SSC) from March 8–10, 2016, PIFSC scientists summarized the results of the CIE review. NMFS reported that while the CIE reviewer concluded that the basic approach was justified, he noted that there had been significant management strategy change that now governs the Kona crab fishery and that the non-commercial catch had not been estimated or considered in the assessment. The CIE reviewer supported the conclusion that based on the criteria before him, it appears the Kona crab stock had been overfished in 2006 and that there were many uncertainties about the current status of the stock. PIFSC and the CIE reviewer expressed concern about the impacts of the 2006 Hawaii State regulation establishing a prohibition on retention of female Kona crabs since little is known about sex ratios and how they might bias the stock assessment and what the impact might be from post-release mortality of females due to injury or predation. PIFSC is planning to study these issues and complete a benchmark stock assessment for Hawaii Kona crab in 2018. After hearing the presentation, the SSC did not recommend a modification to the Hawaii Kona crab ACL.

Council Consideration of Kona Crab Stock Assessment

At its 165th meeting, the Council considered the 2015 stock assessment, the CIE review, the PIFSC response to the CIE review, and the report of the 122 SSC. Based on this information, the Council did not find that the 2015 stock assessment by Thomas et al. contained reliable information upon which to modify its 2016-2018 Hawaii Kona crab ACL recommendations made at the 160th Council meeting. The Council did, however, recommend additional funding support to research post-release survival of Kona crab and methods for improving survival.

Without a current biomass estimate, neither the Council nor NMFS could determine fishery management parameters (e.g., maximum sustainable yield MSY) and, therefore, the Council recommended Hawaii Kona crab fishery should remain classified as a Tier 5 (data poor) fishery and the ABC control rule should be used to determine appropriate ACLs. Using the Tier 5 approach, the Council recommended ACL is to be equal to the acceptable biological catch (ABC) set by the Council's SSC in accordance with the Tier 5 ABC control rule as described in the Fishery Ecosystem Plan for the Hawaii Archipelago (77 FR 6019, February 7, 2012).

NMFS conclusion upon consideration of new information, CIE review, Council recommendations, and PIFSC input

NMFS has considered all of the new information about the Hawaii Kona crab fishery. NMFS recognizes that, while there are data gaps and methodological concerns with the 2015 stock assessment, it does contain, as noted by PIFSC, useful scientific information on the status of the stock over the last decade. NMFS notes that the stock assessment, although flawed, should be considered when setting an ACL. However, because the Council did not account for this information with other relevant information in recommending the 2016 Hawaii kona crab ACL, NMFS will not set an ACL for this stock in 2016, and, instead, will direct the Council to review the available information again at its March 2017 meeting and work with its Scientific and Statistical Committee, as well as PIFSC, to consider all the information in order to set a biological catch and annual catch limit for the stock consistent with the MSA for fishing year 2017.

2.3.1.1 Alternative 1: No Action

Under this alternative, NMFS would not specify an ACL for Hawaii Kona crab and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the FEPs, which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.3.1.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Council ACL Recommendation

Under this alternative, NMFS would specify an ACL and establish AMs for the Hawaii Kona crab stock for the 2016 fishing year which runs from January 1 through December 31. The proposed ACL would be 27,600 lb for Hawaii Kona crab, the same ACL that was previously proposed and specified in fishing years 2012–2015. Each fishing year, catches of Hawaii Kona crab would be counted towards the ACL for the stock based on catch data collected by local resource management agencies through their respective fishery monitoring programs, and by NMFS through Federal logbook reporting. Under this alternative, NMFS expected to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.3.1.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for Hawaii Kona crab would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 24,840 lb.

Under this alternative, NMFS expected to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.3.2 American Samoa Kona Crab ACL Alternatives

There is no record of any fishery for Kona crab in American Samoa. However, due to their documented presence in the territory, Kona crab is included in the crustacean management unit of the American Samoa FEP. Currently, there are no Federal permit requirements for Kona crab in the EEZ around American Samoa. The fishery is subject to an ACL and AMs.

NMFS/Council Estimation of OFL

There is no OFL estimate for Kona crab in American Samoa.

SSC's Calculation of ABC

There is no MSY estimate for Kona crab in American Samoa. Additionally, the lack of catch information precludes the use of the Tier 5 ABC control rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating the ABC for Kona crab in American Samoa.

First, the SSC recognized that the essential fish habitat (EFH) designation for juvenile and adult Kona crab in American Samoa includes all bottom habitats from the shoreline to a depth of 100 m (see section 3.4 for EFH designations). Next, the SSC noted that American Samoa contains approximately 296 km² of Kona crab EFH as shown in Table 5. Applying the 75th percentile of Kona crab catch from the MHI (which is 27,600 lb), and using the MHI Kona crab estimated EFH area of 2,535 km², the SSC determined that this would result in 10.88 Kona crabs per km² of EFH in the MHI. Applying the ratio of 10.87 Kona crabs per EFH area in American Samoa, the SSC calculated the ABC for American Samoa Kona crab to be 3,222 lb, but rounded ABC downward to 3,200 lb.

American Samoa Kona Crab ABC Proxy Equation:

(27,600 lb Kona crab /2,535 km^2 estimated Kona crab EFH in Hawaii) * 296 km^2 (estimated American Samoa Kona crab EFH) = 3,222 lb

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council recommended setting the ACL for American Samoa Kona crab equal to the SSC recommended ABCs of 3,200 lb. The Council did not recommend reducing ACL from ABC for social, economic, ecological considerations or management uncertainty as described in the American Samoa Archipelago FEP. The Council recommended the ACL for fishing years 2015–2018. The Council also recommended the same AM be extended through 2018.

2.3.2.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for American Samoa Kona crab and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.3.2.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the American Samoa Kona crab fishery would be set equal to the ACL recommended by the Council which is 3,200 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.3.2.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for the American Samoa Kona crab fishery would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 2,880 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.3.3 CNMI Kona Crab ACL Alternatives

There is no record of any fishery for Kona crab in the CNMI. However, due to their documented presence, they are included in the crustacean management unit of the Mariana Archipelago FEP. Currently, there are no Federal permit requirements for Kona crab in the EEZ around the CNMI.

NMFS/Council Estimation of OFL

There is no OFL estimate for Kona crab in the CNMI.

SSC's Calculation of ABC

There is no MSY estimate for Kona crab in the CNMI. Additionally, the lack of catch information precludes the use of the Tier 5 ABC control rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating the ABC for the Kona crab fishery in the CNMI.

First, the SSC recognized that essential fish habitat (EFH) designation for juvenile and adult Kona crab in the CNMI includes all bottom habitats from the shoreline to a depth of 100 m (see section 3.4 for EFH designations). Next, the SSC noted that the CNMI contains approximately 579 km² of Kona crab EFH as shown in Table 5. Applying the 75th percentile of Kona crab catch from the MHI which is 27,600 lb, and an estimated MHI Kona crab EFH area of 2,535 km², the SSC determined that this would result in 10.88 Kona crabs per km² of EFH in the MHI. Applying the ratio of 10.88 Kona crabs per EFH area in the CNMI, the SSC calculated the ABC for the CNMI Kona crab to be 6,303 lb, but rounded the ABC downward to 6,300 lb.

CNMI Kona crab ABC Proxy Equation:

(27,600 lb Kona crab /2,535 km^2 estimated Kona Crab EFH in Hawaii) * 579 km^2 (estimated Kona crab EFH in the CNMI) = 6,303 lb

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council recommended setting the ACL for the CNMI Kona crab fishery equal to the SSC-recommended ABC of 6,300 lb. The Council did not recommend reducing ACL from ABC for social, economic, ecological considerations or management uncertainty as described in the Mariana Archipelago FEP. The Council recommended the ACL for fishing years 2015–2018. The Council also recommended the same AM be extended through 2018.

2.3.3.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the CNMI Kona crab fishery and AMs would not be necessary. However, this alternative would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.3.3.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the CNMI Kona crab fishery would be set equal to the ACL recommended by the Council which is 6,300 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.3.3.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for the CNMI Kona crab fishery would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 5,670 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.3.4 Guam Kona Crab ACL Alternatives

There is no record of any fishery for Kona crab in Guam. However, due to their documented presence, they are included in the crustacean management unit of the Mariana Archipelago FEP. Currently, there are no Federal permit requirements for Kona crab in the EEZ around the Guam.

NMFS/Council Estimation of OFL

There is no OFL estimate for Kona crab in Guam.

SSC's Calculation of ABC

There is no MSY estimate for Kona crab in Guam. Additionally, the lack of catch information precludes the use of the Tier 5 ABC control rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating the ABC for the Kona crab fishery.

First, SSC recognized that essential fish habitat (EFH) designation for juvenile and adult Kona crab in Guam included all bottom habitats from the shoreline to a depth of 100 m (see section 3.4 for EFH designations). Next, the SSC noted that Guam contains approximately 179 km² of Kona crab EFH as shown in Table 5. Applying the 75th percentile of Kona crab catch from the MHI, which is 27,600 lb, and an estimated MHI Kona crab EFH area of 2,535 km², the SSC determined that this would result in 10.88 Kona crabs per km² of EFH in the MHI. Applying the ratio of 10.88 Kona crabs per EFH to the estimated Kona crab EFH area in Guam, the SSC calculated the ABC for the Guam Kona crab fishery to be 1,948 lb, but rounded ABC downward to 1,900 lb.

Guam Kona crab ABC Proxy Equation:

(27,600 lb Kona crab in Hawaii fishery /2,535 km^2 estimated Hawaii Kona crab EFH) * 179 km^2 (estimated Guam Kona crab EFH) = 1,948 lb

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council recommended setting the ACL for the Guam Kona crab fishery equal to the SSC-recommended ABC of 1,900 lb. The Council did not recommend reducing the ACL from the ABC for social, economic, ecological considerations or management uncertainty as described in the Mariana Archipelago FEP. The Council recommended the ACL for fishing years 2015–2018. The Council also recommended the same AM be extended through 2018.

2.3.4.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the Guam Kona crab fishery and AMs would not be necessary. However, this alternative would not be in compliance with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.3.4.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the Guam Kona crab fishery would be set equal to the ACL recommended by the Council which is 1,900 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.3.4.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for the Guam Kona crab fishery would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 1,729 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4 Development of the Alternatives for Precious Corals

Precious corals managed under the FEPs for Hawaii, American Samoa and the Mariana Archipelago (including Guam and the CNMI) include three species of black coral belonging to the genus *Antipathes*, three species of pink coral belonging to the genus *Corallium*, and several species of gold and bamboo corals. Pink, gold and bamboo corals are typically found at depth ranges between 350 to 1,500 m, while black coral occurs at considerably shallower depths around 100 m. All species are found on solid substrate and are slow growing, with low rates of mortality and recruitment. Table 9 lists the common and scientific names of all western Pacific precious coral management unit species.

Table 9. Western Pacific Precious Coral Management Unit Species

Common Name	Scientific Name
Black corals	*Antipathes dichotoma*[1], *Antipathes grandis, Antipathes ulex*
Pink corals	*Corallium secundum, Corallium regale, Corallium laauense*
Bamboo corals	*Lepidisis olapa, Acanella* sp.
Gold corals	*Gerardia* sp., *Callogoria gilberti, Narella* sp., *Calyptrophora* sp.

[1] *Antipathes dichotoma* was recently renamed *Antipathes griggi* by the scientific community

Each FEP treats precious coral beds as distinct management units. Classification of beds include: Established (appraisal of the MSY are reasonably precise), Conditional (optimum yields estimated on the basis of bed characteristics relative to established beds), Refugia (set aside for baseline studies and possible reproductive reserves), or Exploratory (unexplored portions of the EEZ). Federal regulations require permit and logbook reporting for each category of coral bed and beds are subject to harvest quotas which may be taken on an annual or biennial basis as shown in Table 10. Additionally, regulations allow only the use of selective gear methods to harvest precious corals and further limit harvest through minimum size restrictions on pink coral and bamboo coral. Currently, a moratorium on gold coral harvest is in place throughout the Pacific Islands through June 30, 2018, due to uncertainty in estimates of age and growth parameters (78 FR 32181, May 29, 2013). Additionally, fishing is prohibited at the Westpac Bed due to its status as a refugium. These prohibitions serve as the functional equivalent of an ACL of zero. The fishing year for precious corals begins on July 1 and ends June 30, the following year.

Precious corals are not being harvested in any island area except in the MHI where the fishery is limited to black coral harvests in the Auau channel. Fewer than three participants are currently active in the Hawaii black coral fishery; therefore, fishery information is confidential and can only be reported in aggregate years, except for years during which there have been three or more participants. Fishing for other precious corals (pink, bamboo, and gold) is not currently conducted in Hawaii. One company used two one-man submersibles to survey and harvest pink

and gold corals at depths between 400 and 500 meters in the MHI during 1999 and 2001; however, they did not continue their operations after that time and the actual harvests cannot be reported here to protect the confidentiality of the proprietary fishery information (WPFMC 2009b).

Table 10. Current harvest quotas for precious coral permit areas

Name of Bed	Type of Bed	Harvest Quota (kg)	Harvest Timeframe
Auau Channel (MHI)	Established	Black – 5,000	2
Makapuu bed (MHI)	Established	Pink – 2,000	2
		Gold (zero)	
		Bamboo – 500	
180 Fathom Bank (NWHI)	Conditional	Pink – 222	1
		Gold (zero)	
		Bamboo – 56	
Brooks Bank (NWHI)	Conditional	Pink – 444	1
		Gold (zero)	
		Bamboo – 111	
Kaena Point	Conditional	Pink – 67	1
		Gold (zero)	
		Bamboo – 17	
Keahole Point	Conditional	Pink – 67	1
		Gold (zero)	
		Bamboo – 17	
Westpac	Refugia	All (zero)	1
U.S. EEZ around American Samoa, Guam, the CNMI and Hawaii other than Established, Conditional or Refugia beds	Exploratory Area	1,000 per area (all species combined, except black coral	1

Comprehensive information on target, non-target stocks, bycatch, protected species and conservation and management measures for precious coral fisheries can be found in the American Samoa Archipelago FEP (WPFMC 2009a), the Hawaii Archipelago FEP (WPFMC 2009b) and the Mariana Archipelago FEP (WPFMC 2009c).

The SSC and Council developed the ABC and ACL recommendations for precious corals in accordance with the Magnuson-Stevens Act and Federal regulations at 50 CFR §665.4 that implement the ACL specification mechanism of the FEPs described in Section 1. The following section summarizes the data, methods, and procedures considered in SSC and Council deliberations as described in the Council's ACL specification document (WPFMC 2011). A full report of the 116th SSC and 160th Council deliberations can be found on the Council website at: www.wpcouncil.org.

2.4.1 Hawaii Precious Corals ACL Alternatives

2.4.1.1 Black Coral – Auau Channel Established Bed

The ongoing collection of black coral from depths of 30–100 meters by scuba divers has continued in Hawaii since black coral beds were discovered off of Lahaina, Maui, in the late 1950s, although harvest levels have fluctuated with changes in demand. Since 1980, virtually all of the black coral harvested around the Hawaiian Islands has been taken by hand from a bed located in the Auau Channel. Most of the harvest has come from State of Hawaii waters; however, a portion of the black coral bed in the Auau Channel is located in the EEZ.

The current harvest quota for black coral in the Auau Channel is 5,000 kg (11,000 lb) which may be taken during any part of a two year fishing year cycle. Landings, almost exclusively from State waters, have been reported for black coral between 1982 and 2015; however, annual landings data cannot be reported because of the low number of active participants (fewer than three).
Table 11 summarizes total landings and average annual landings for black corals in the MHI for three decadal periods, 1982-1989, 1990-1999, and 2000-2010. Landing information is summarized in roughly 10 year intervals to protect confidentiality as fewer than three vessels participated in the fishery during most years. The data present landings from both inshore and offshore areas. For the most recent ten-year period for which data is available and allowed to be reported, 2000-2010, approximately 5,587 lb of black coral were landed annually. There are no Federal permits issued for black coral harvest in the Auau Channel and all of the recent harvest is occurring in State waters.

Table 11. Total and Average Annual Landings of Black Coral in Hawaii (1982-2010)

Years (Grouped)	Total Landing (lb) / year (average)
1982-1989	1,084
1990-1999	2,868
2000-2010	5,587

Source: Hawaii Division of Aquatic Resources (in WPFMC 2011)

NMFS/Council Estimation of OFL for Black Coral – Auau Channel Established Bed

There is no estimate of OFL provided for any black coral in Hawaii.
SSC's Calculation of ABC for Black Coral – Auau Channel Established Bed

The most current estimate of MSY for black coral in the Auau Channel is provided by Grigg (2004) which is 3,750 kg/yr (8,250 lb/yr). Based on this estimate, the current harvest quota for black coral in the Auau Channel is 5,000 kg (11,000 lb) which may be taken during any part of a two year fishing year cycle.

At 116th SSC meeting, the SSC considered the MSY estimate provided by Grigg (2004) including the current status of participation in the fishery, and average annual landings for 2000-2010 relative to the existing biennial harvest quota of 5,000 kg (11,000 lb). The SSC determined that the black coral fishery in the MHI can be regarded as Tier 4 because MSY is known, but

there is little harvest. Therefore, consistent with the Tier 4 ABC control rule described in the FEP of the Hawaii Archipelago which requires the ABC be set equal to 0.91*MSY, the SSC calculated ABC to be 3,413 kg/yr (7,508 lb/yr) and rounded the ABC downward to 7,500 lb). As explained in the FEP of the Hawaii Archipelago, the application of this control rule would result in a fishing mortality rate of 0.70 F_{MSY}, which would maximize yield while minimizing biomass impacts, and account for scientific uncertainty.

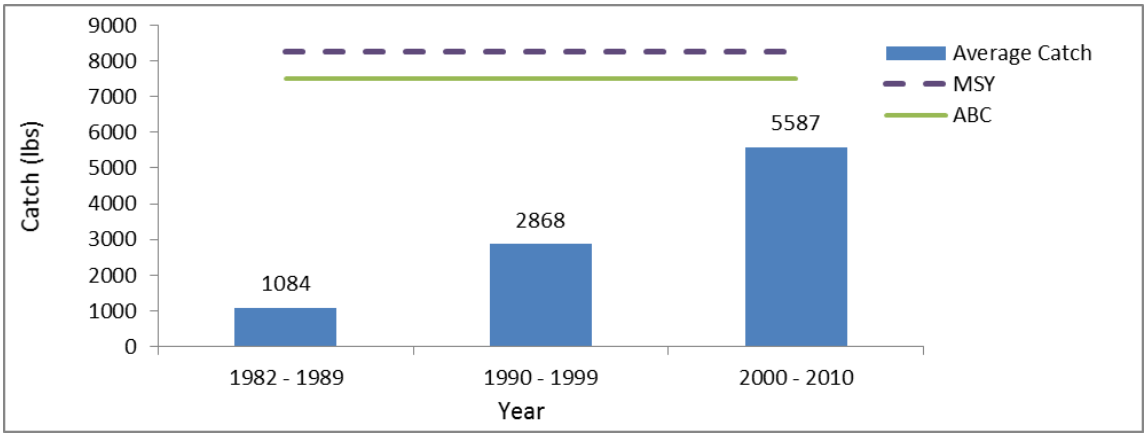

Figure 4. Average annual catch of black coral in the MHI (1982-2010) compared to the SSC-recommended acceptable biological catch (ABC) Source: WPFMC 2011

Council ACL Recommendation for Black Coral – Auau Channel Established Bed

At its 160th meeting held June 25-27, 2014, the Council considered the SSC-recommended ABC of 7,500 lb/yr; however, the Council ultimately recommended maintaining the current harvest quota of 5,000 kg (11,000 lb) as the ACL. The Council further noted that while the current harvest quota may be taken over a two-year period, ACLs must be specified annually. Therefore, the Council recommended the ACL for the Hawaii black coral fishery in the Auau Channel Bed be set at 2,500 kg/yr or 5,500 lb/yr for fishing years 2015 through 2018. The ACL is thus 2,000 lb lower than SSC recommended ABC and 100 lb lower than average annual harvest of black coral from the Auau Channel Bed for the period 2000-2010 of approximately 5,600 lb shown in Table 11.

2.4.1.1.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for the black coral fishery in the Auau Channel of the MHI, and AMs would not be necessary. While the implementing regulations of the FEP of the Hawaii Archipelago already provide for a harvest quota of 5,000 kg (11,000 lb) that may be taken over a two year period, this management system would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.4.1.1.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for the black coral fishery in the Auau Channel, MHI, would be set equal to the ACL recommended by the Council, which is 2,500 kg (5,500 lb). This ACL would be equal to the current harvest quota if it were to be applied on an annual basis and is 2,000 lb lower than the SSC-recommended ABC of 7,500 lb (3,413 kg/yr). NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.1.1.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for the black coral fishery in the Auau Channel would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 6,750 lb (3,068 kg). This ACL would be 1,250 lb higher than the harvest quota of 2,500 kg (5,500 lb per year) if it were to be applied on an annual basis. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.1.2 Pink, Gold Coral, and Bamboo Coral – Established Bed and Conditional Beds

Fishing for other precious corals (pink, bamboo and gold) is not currently conducted in Hawaii. One company used two one-man submersibles to survey and harvest pink and gold corals at depths between 400 and 500 meters in the MHI during 1999 and 2001; however, they did not continue their operations after that time and the actual harvests cannot be reported here in order to protect confidential information (WPFMC 2009b).

Estimates of MSY, including a description of calculation methods for pink, bamboo and gold coral at the Makapuu Established Bed, are provided in the FEP of the Hawaii Archipelago (WPFMC 2009b) and summarized in Table 12.

Table 12. MSY Estimates for Precious Corals in the Makapuu Bed

Species (common name)	MSY (kg/yr)	Method of calculation
Corallium secundum (pink)	1,185	Beverton and Holt Cohort production model
Corallium secundum (pink)	1,148	Gulland model
Gerardia spp. (gold)	313	Gulland model
Lepidisis olapa (bamboo)	285	Gulland model

Source: WPFMC 2009b

Due to ecological considerations, MSY estimates were reduced for ecological considerations and thus, the rounded down MSY estimates or optimum yields (OY) for Makapuu Bed pink coral, gold coral and bamboo coral were set at 1,000 kg/yr, 300 kg/yr and 250 kg/yr, respectively (WPFMC 2009a). Additionally, as stated previously, a moratorium on gold coral harvest is currently in place throughout the Pacific Islands through June 30, 2018.

While OYs for pink and bamboo corals were specified on an annual basis, the Makapuu Bed harvest quotas listed in Table 10 are expressed as a two-year quota because it was considered economically disadvantageous to utilize the expensive specialized equipment required for selective harvesting of precious coral for only part of each year on only one coral bed. The more flexible biennial schedule allows the quota to be taken during any part of a two year period and makes it easier for harvesters to deploy in other areas once the two-year Makapuu Bed quota has been met (WPFMC 2009b).

Harvest quotas for pink, bamboo and gold coral at Hawaii's four Conditional Beds have been extrapolated based on bed size as compared with that of the Makapuu Established Bed using the following formula described in the FEP of the Hawaii Archipelago (WPFMC 2009b).

$$\frac{\text{MSY for Makapuu Bed}}{\text{Area of Makapuu Bed}} = \frac{\text{MSY for Conditional Bed}}{\text{Area of Conditional Bed}}$$

Framework Amendment 1 to the Fishery Management Plan for Precious Coral Fisheries of the Western Pacific Region (WPFMC (2001) estimates the area of the Makapuu Established Bed as 3.60 km². For the Conditional Beds, WPFMC (2001) estimates the areas as follows: 180 Fathom Bank (0.8 km²), Brooks Bank (1.6 km²), and Kaena Point and Keahole Point (0.24 km²). Based on rounded down MSY (or OY) of 1,000 kg/yr for pink coral and 250 kg/yr for a bamboo coral at the Makapuu bed, and applying the formula above, WPFMC (2001) estimates OY for all Conditional beds as shown in Table 13 which are the harvest quotas listed in Table 10, except for pink and bamboo coral at Makapuu where the quota was doubled to 2,000 kg and may be taken over two year period.

Table 13. Estimated area and OY for pink and bamboo coral in Established and Conditional beds

Bed	Pink Coral OY			Bamboo Coral OY		
Makapuu Established Bed	$\frac{1{,}000\text{ kg}}{3.60\text{ km}^2}$	x 3.60 km²	= 1,000 kg	$\frac{250\text{ kg}}{3.60\text{ km}^2}$	x 3.60 km²	= 250 kg
180 Fathom Conditional Bed	$\frac{1{,}000\text{ kg}}{3.60\text{ km}^2}$	x 0.8 km²	= 222 kg	$\frac{250\text{ kg}}{3.60\text{ km}^2}$	x 0.8 km²	= 56 kg
Brooks Bank Conditional Bed	$\frac{1{,}000\text{ kg}}{3.60\text{ km}^2}$	x 1.6 km²	= 444 kg	$\frac{250\text{ kg}}{3.60\text{ km}^2}$	x 1.6 km²	= 111 kg
Kaena Point Conditional Bed	$\frac{1{,}000\text{ kg}}{3.60\text{ km}^2}$	x 0.24 km²	= 67 kg	$\frac{250\text{ kg}}{3.60\text{ km}^2}$	x 0.24 km²	= 17 kg
Keahole Point Conditional Bed	$\frac{1{,}000\text{ kg}}{3.60\text{ km}^2}$	x 0.24 km²	= 67 kg	$\frac{250\text{ kg}}{3.60\text{ km}^2}$	x 0.24 km²	= 17 kg

NMFS/Council Estimation of OFL for Pink, Bamboo and Gold Corals – Established Bed and Conditional Beds

There is no estimate of OFL provided for pink, bamboo or gold coral in Hawaii.

SSC's Calculation of ABC for Pink, Bamboo and Gold Corals – Established Bed and Conditional Beds

In calculating ABC for pink coral at the Makapuu Established Bed, at its 116th meeting the SSC relied on a revised estimate of MSY for pink coral reported in Grigg (2002). Specifically, Grigg (2002) estimated an MSY for pink coral at the Makapuu bed of 1,500 kg/year which is 30% greater than the initial MSYs shown in Table 14, and 50% higher than the current OY and of 1,000 kg/yr. In calculating ABC for bamboo coral at the Makapuu Established bed, the SSC relied on the initial MSY estimate of 285 kg/yr and not the OY of 250 kg/yr which was used to specify the existing harvest quota.

The SSC then applied these MSY values into the formula provided above to extrapolate an MSY proxy for pink coral and bamboo coral at the four Conditional Beds (180 Fathom Bank, Brooks Bank, Kaena Point and Keahole Point). However, the SSC did not use the true size of the bed areas to apply in this formula as it was unaware of these values at the time.

Instead, for each bed, the SSC used the estimated size of the permit area provided in 50 CFR 665. Specifically, the regulations define the permit areas for Makapuu Bed, 180 Fathom Bank, and Brooks Bank to include the area within 2 nm of a specified point. Based on the formula, Area = πr^2, the SSC determined the area for these three precious coral beds to be approximately 12.57 nm² whereas, WPFMC (2001) defines the true area of these beds to be 3.60 km², 0.8 km², and 1.6 km², respectively. Additionally, the regulations define the size of the permit areas for Kaena and Keahole Points to include the area within 0.5 nm of a specified point. Applying the formula, Area = πr^2, the SSC determined the bed areas for Kaena and Keahole precious coral beds to be 0.79 nm² whereas, WPFMC (2001), defines the true area for both Keahole and Kaena as 0.24 km². Table 14 provides the results of the SSC's MSY proxy calculations.

Table 14. SSC's MSY proxies for pink and bamboo coral at Established and Conditional Beds

Bed	Pink Coral			Bamboo Coral		
Makapuu Established Bed	$\frac{1{,}500 \text{ kg}}{12.57 \text{ nm}^2}$	x 12.57 nm²	= 1,500 kg	$\frac{285 \text{ kg}}{12.57 \text{ nm}^2}$	x 12.57 nm²	= 285 kg
180 Fathom Conditional Bed	$\frac{1{,}500 \text{ kg}}{12.57 \text{ nm}^2}$	x 12.57 nm²	= 1,500 kg	$\frac{285 \text{ kg}}{12.57 \text{ nm}^2}$	x 12.57 nm²	= 285 kg
Brooks Bank Conditional Bed	$\frac{1{,}500 \text{ kg}}{12.57 \text{ nm}^2}$	x 12.57 nm²	= 1,500 kg	$\frac{285 \text{ kg}}{12.57 \text{ nm}^2}$	x 12.57 nm²	= 285 kg
Kaena Point Conditional Bed	$\frac{1{,}500 \text{ kg}}{12.57 \text{ nm}^2}$	x 0.79 nm²	= 94 kg	$\frac{285 \text{ kg}}{12.57 \text{ nm}^2}$	x 0.79 nm²	= 18 kg

Bed	Pink Coral			Bamboo Coral		
Keahole Point Conditional Bed	1,500 kg / 12.57 nm²	x 0.79 nm²	= 94 kg	285 kg / 12.57 nm²	x 0.79 nm²	= 18 kg

The SSC then determined that deepwater precious coral fishery for pink and bamboo corals in the MHI can be regarded as Tier 4 because the MSY/MSY proxy is known, but there is no harvest. Therefore, consistent with the Tier 4 control rule described in the FEP of the Hawaii Archipelago which requires ABC be set equal to 0.91*MSY, the SSC calculated ABC as shown in Table 15.

Table 15. SSC recommended ABCs for pink and bamboo coral at Established and Conditional Beds

Bed	Pink Coral		Bamboo Coral	
	MSY Proxy	ABC = *0.91*MSY*	*MSY Proxy*	ABC =*0.91*MSY*
Makapuu Established Bed	1,500 kg	1,400 kg	285 kg	260 kg
180 Fathom Conditional Bed	1,500 kg	1,400 kg	285 kg	260 kg
Brooks Bank Conditional Bed	1,500 kg	1,400 kg	285 kg	260 kg
Kaena Point Conditional Bed	94 kg	85 kg	18 kg	16 kg
Keahole Point Conditional Bed	94 kg	85 kg	18 kg	16 kg

However, because the SSC did not use the actual size of each bed in its calculation of MSY proxies, the values represented in Table 15 above may not be the best available scientific information. For this reason, NMFS has recalculated MSY proxies consistent with the intent of the SSC's recommendation using the actual size of each bed and described by WPFMC (2001). Table 16 provides the results of the corrected MSY proxy calculations conducted by the NMFS.

Table 16. NMFS's corrected MSY proxies for pink and bamboo coral at Established and Conditional Beds

Bed	Pink Coral			Bamboo Coral		
Makapuu Established Bed	1,500 kg / 3.60 km²	x 3.60 km²	= 1,500 kg	285 kg / 3.60 km²	x 3.60 km²	= 285 kg
180 Fathom Conditional Bed	1,500 kg / 3.60 km²	x 0.8 km²	= 333 kg	285 kg / 3.60 km²	x 0.8 km²	= 63 kg
Brooks Bank Conditional Bed	1,500 kg / 3.60 km²	x 1.6 km²	667 kg	285 kg / 3.60 km²	x 1.6 km²	= 127 kg
Kaena Point Conditional Bed	1,500 kg / 3.60 km²	x 0.24 km²	= 100 kg	285 kg / 3.60 km²	x 0.24 km²	= 19 kg
Keahole Point	1,500 kg / 3.60 km²	x 0.24 km²	= 100 kg	285 kg	x 0.24 km²	= 19 kg

Bed	Pink Coral	Bamboo Coral		
Conditional Bed		3.60 km²		

Additionally, consistent with the SSC's recommendation, NMFS also re-applied the Tier 4 control rule to the corrected MSY proxy values shown in Table 16 above and re-calculated the ABCs for Hawaii pink and bamboo corals in the Established and Conditional Beds as shown in Table 17.

Table 17. NMFS recalculated ABCs for pink and bamboo coral at Established and Conditional Beds

Bed	Pink Coral		Bamboo Coral	
	MSY Proxy	ABC = *0.91*MSY*	*MSY Proxy*	ABC =*0.91*MSY*
Makapuu Established Bed	1,500 kg	1,365 kg	285 kg	259 kg
180 Fathom Conditional Bed	333 kg	303 kg	63 kg	57 kg
Brooks Bank Conditional Bed	667 kg	607 kg	127 kg	116 kg
Kaena Point Conditional Bed	100 kg	91 kg	19 kg	17 kg
Keahole Point Conditional Bed	100 kg	91 kg	19 kg	17 kg

Council ACL Recommendation for Pink, Bamboo and Gold Corals – Established Bed and Conditional Beds

At its 160th meeting held June 25-27, 2014, the Council considered the SSC' recommended ABC shown in Table 17, but recommended maintaining the current harvest quotas as provided in Table 10, as they did not see a need to increase catch limits given no activity in the fishery for the past decade. The Council further noted that while the current harvest quota of 2,000 kg of pink coral and 500 kg or bamboo coral at Makapuu may be taken over a two year timeframe, ACLs must be specified annually. Therefore, the Council recommended ACL for pink coral and bamboo coral at Makapuu be set at one half of the current two year quota and recommended ACL for these species be set at 1,000 kg/yr and 250 kg/yr, respectively. The harvest quotas for pink and bamboo coral at all other beds are annual, thus the recommended ACL remain identical to the current harvest quotas as presently shown in Table 10. Table 18 provides the Council's recommended ACLs for pink and bamboo coral at Established and Conditional Beds in relation to the NMFS-corrected ABC.[8]

[8] Currently, a moratorium on gold coral harvest is in place throughout the western Pacific through June 30, 2018 (78 FR 32181, May 29, 2013). Additionally, fishing is prohibited at Westpac Bed due to its status as a refugium. These prohibitions serve as functional equivalent of an ACL of zero.

Table 18. NMFS corrected ABC and Council recommended ACL for pink and bamboo coral at Established and Conditional Beds

Bed	Pink Coral ABC *(0.91*MSY)*	Council Recommended ACL	Bamboo Coral ABC *(0.91*MSY)*	Council Recommended ACL
Makapuu Established Bed	1,365 kg	1,000 kg	259 kg	250 kg
180 Fathom Conditional Bed	303 kg	222 kg	57 kg	56 kg
Brooks Bank Conditional Bed	607 kg	444 kg	116 kg	111 kg
Kaena Point Conditional Bed	91 kg	67 kg	17 kg	17 kg
Keahole Point Conditional Bed	91 kg	67 kg	17 kg	17 kg

2.4.1.2.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for pink or bamboo coral in any Established or Conditional Bed and AMs would not be necessary. While the implementing regulations of the FEP of the Hawaii Archipelago already provide for a bank specific harvest quotas as listed in Table 10, this management system would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Additionally, the moratorium on harvesting gold coral would remain in place through June 30, 2018. Alternative 1 serves as the baseline for the environmental effects analysis.

2.4.1.2.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACLs for pink or bamboo coral in Established and Conditional Beds would be set equal to the ACLs recommended by the Council which are equal to the current harvest quotas as shown in Table 10. As previously noted, the current harvest quota for pink of 2,000 kg and the current harvest quota for bamboo coral of 500 kg at the Makapuu Bed may be taken over a two year timeframe. Therefore, to comply with the ACL requirement, the Council recommended the ACLs for pink coral and bamboo coral at the Makapuu Bed be set at one half of the current two year quota and recommended the ACL for these species be set at 1,000 kg/yr and 250 kg/yr, respectively. Like Alternative 1 the moratorium on harvesting gold coral would remain in place through June 30, 2018 and would serve as the functional equivalent of an ACL of zero. Each of the proposed ACLs is lower than the ABCs as recalculated by NMFS and shown in Table 17. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation, or new information is provided that would result in a change to the ACL.

Council Recommended AM

Pursuant to 50 CFR 665.4, when an ACL for any stock or stock complex is projected to be reached, based on best available information, NMFS would restrict fishing for that stock or stock complex in Federal waters around the applicable U.S. EEZ to prevent the ACL from being exceeded. The restriction may include, would not be limited to closure of the fishery, closure of specific areas or restriction in effort (76 FR 37286, June 27, 2011). However, in-season restrictions are not possible for the pink or bamboo coral fishery at this time because catch statistics are generally not available until at least six months after the data has been collected (see Section 2.3 of the 2011 EA (NMFS 2011) for more details on data collection). For this reason, NMFS proposes to implement the Council's recommended AM which requires the Council to conduct a post-season accounting of the annual catch of the pink or bamboo coral fishery as soon as possible after the catch data for the most recent year is available, compute the average of the past 3 years' catch, and evaluate the average relative to its ACL. This is the same AM NMFS specified for the pink or bamboo coral fishery in 2015 (80 FR 52415, August 31, 2015). If the three-year running average landings of the pink or bamboo coral fishery exceed the specified ACL in a fishing year, the Council would take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage.

Under the AMs, NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock or stock complex in the subsequent fishing year, or other measures, as appropriate. Additionally, as a performance measure specified in the FEP of the Hawaii Archipelago, if the ACL is exceeded more than once in a four year period, the Council is required to re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness.

2.4.1.2.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACLs for pink and bamboo corals in Established and Conditional Beds would be set at 90% of their ABC values. Like Alternative 1 the moratorium on harvesting gold coral would remain in place through June 30, 2018 and would serve as the functional equivalent of an ACL of zero. Table 19 shows the ACL values for each bed under this alternative relative to their ABC values. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

Table 19. ACLs at 90% of ABC for pink and bamboo coral at Established and Conditional Beds

Bed	Pink Coral ABC	Proposed ACL at 90% of ABC	Bamboo Coral ABC	Proposed ACL at 90% of ABC
Makapuu Established Bed	1,365 kg	1,229 kg	259 kg	233 kg
180 Fathom Conditional Bed	303 kg	273 kg	57 kg	51 kg
Brooks Bank	607 kg	546 kg	116 kg	104 kg

Bed	Pink Coral ABC	Proposed ACL at 90% of ABC	Bamboo Coral ABC	Proposed ACL at 90% of ABC
Conditional Bed				
Kaena Point Conditional Bed	91 kg	82 kg	17 kg	15 kg
Keahole Point Conditional Bed	91 kg	82 kg	17 kg	15 kg

2.4.1.3 Pink, Gold and Bamboo Corals in the Hawaii Exploratory Area

Hawaii Exploratory areas (denoted as X-P-H) include coral beds, other than Established, Conditional or Refugia Beds within the EEZ. Currently there is a 1,000 kg limit for all deep water precious corals combined (all species except black coral) in the Hawaii Exploratory Area. The limit of 1,000 kg/year was determined with the goal of reducing the risk of overfishing a newly discovered bed while at the same time being large enough to provide economic incentive for fishers to engage in exploratory fishing (WPFMC 1979). There was no statistical basis for determining the limit, but instead it was based on Council judgment that 1,000 kg/yr should be sufficient incentive for exploratory fishing while posing little risk of overfishing (WPFMC 1979). The 1,000 kg/yr harvest quota in Hawaii represents about one-third of the estimated MSY for the precious coral species in all Established and Conditional beds while being large enough to offer an economic incentive for exploration (WPFMC 1979). Two fishing expeditions for precious corals occurred in the Hawaii Exploratory Area in the mid- to late 1980s (WPFMC 2009b). However, no activity has occurred since then. In 2011, NMFS issued two Federal permits for fishing in the Hawaii Exploratory Area (X-P-HI); however, no trips have been made.

NMFS/Council Estimation of OFL

There is no estimate of OFL provided for precious corals the Exploratory Area around Hawaii.

SSC's Calculation of ABC

At its 116th meeting, the SSC recommended ABC be maintained at the current annual harvest quota of 1,000 kg/yr for pink and bamboo corals in the Hawaii Exploratory Area, and further recommended that this ABC be applicable to the EEZ around Hawaii.

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council considered the SSC' recommended ABC and recommended maintaining the current harvest quota of 1,000 kg/yr for pink, and bamboo corals in the Exploratory Area around Hawaii. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.1.3.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for pink, bamboo and gold coral for the Exploratory Area around Hawaii and AMs would not be necessary. While the implementing regulations of the FEP of the Hawaii Archipelago already provide for 1,000 kg/yr harvest quota for all precious corals (except black coral) in the Hawaii Exploratory Area, this management system would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis. Additionally, under the baseline, gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.1.3.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the pink and bamboo coral ACLs in the Hawaii Exploratory Area would be set equal to the 1,000 kg/yr ACL recommended by the Council. This ACL would be equal to the current harvest quotas and is equal to the SSC recommended ABC. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.1.3.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the pink and bamboo coral ACLs in the Hawaii Exploratory Area would be set at 90% of the ABC recommended by the SSC resulting in an ACL of 900 kg. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.2 American Samoa Precious Corals ACL Alternatives

2.4.2.1 Black Coral in American Samoa

There has never been a black coral fishery in American Samoa and no information on the species' presence or distribution in the territory. However, they are included in the management unit of the American Samoa FEP as it is reasonable that they may be found there. Federal permits are not required to harvest black coral in American Samoa.

NMFS/Council Estimation of OFL

There is no estimate of OFL provided for black coral in American Samoa.

SSC Calculation of ABC

There is no estimate of MSY for black coral in American Samoa. Additionally, there is no catch information available which precludes the use of the Tier 5 Control Rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating ABC for American Samoa black coral.

The MSY proxy was based on comparing available black coral habitat in Auau Channel of the MHI (Auau Channel, 241.7 nmi^2) and Hawaii's coastline length (653 nm) to the coastline length of American Samoa (69 nm). Using this ratio allowed NMFS to estimate the potential available area for black coral habitat in American Samoa (25.5 nmi^2).

American Samoa black coral habitat proxy Equation:
(241.7 nmi^2 / 653nmi) * 69 nm = 25.5 nmi^2

The ratio of Hawaii black coral MSY (8,250 lbs) and habitat area in Hawaii (241.7 nmi^2) was then compared to potential habitat area in American Samoa, resulting in a potential MSY proxy of 872 lbs.

American Samoa black coral MSY proxy equation:
(8250 lbs / 241.7 nmi^2) * 25.5 nmi^2 = 872 lbs

This crude estimation does not take into account differences in available shelf habitat. For example, American Samoa does not have the shelf area afforded by Penguin Banks in Hawaii, which includes the Auau Channel. Thus, this MSY is likely an overestimation. The SSC then determined that the black coral fishery in American Samoa can be regarded as Tier 4 because MSY/MSY proxy is known, but there is no harvest. Therefore, consistent with the Tier 4 control rule described in the American Samoa FEP which requires the ABC be set equal to 0.91*MSY, the SSC calculated the black coral ABC as 794 lbs and rounded this value down to 790 lbs.

2.4.2.1.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for black corals in American Samoa and AMs would not be necessary. However, this would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.4.2.1.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for black corals in American Samoa equal to the 790 lb ACL recommended by the Council which is equal to the SSC's recommended ABC. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.2.1.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for black corals in American Samoa would be set at 90% of the ABC recommended by the SSC. This would result in a black coral ACL of 711 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.2.2 Pink, Gold and Bamboo Coral in the American Samoa Exploratory Area

Exploratory areas (X-P-AS) include the EEZ around American Samoa, as there are no known precious coral beds in the Territory. However, precious coral MUS are known to exist in the American Samoa EEZ, thus a fishery could possibly develop. The American Samoa Exploratory Area (X-P-AS) has a 1,000 kg/year limit of all species combined except black coral. The limit of 1,000 kg/year was developed with the goal of reducing the risk of overfishing a newly discovered bed while at the same time being large enough to provide economic incentive to engage in exploratory fishing (WPFMC 1979). There was no statistical basis for determining the limit, but instead was based on Council judgment that 1,000 kg/year should be sufficient incentive for exploratory fishing while posing little risk to overfishing (WPFMC 1979). No Federal permit has ever been issued for precious coral fishing in the American Samoa Exploratory Area (X-P-AS).

NMFS/Council Estimation of OFL

There is no estimate of OFL provided for precious corals the exploratory area around American Samoa.

SSC's Calculation of ABC

At its 116th meeting, the SSC recommended the American Samoa black coral ABC be maintained at the current annual harvest quota of 1,000 kg/yr.

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council considered the SSC-recommended ABC and recommended maintaining the current harvest quota of 1,000 kg/yr for black corals harvested from the Exploratory Area around American Samoa. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.2.2.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for pink, bamboo and gold coral for the exploratory are around American Samoa and AMs would not be necessary. While the implementing regulations of the American Samoa FEP already provide for 1,000 kg/yr harvest quota for all precious corals (except black coral) in the American Samoa Exploratory Area, this management system would not comply with the Magnuson-Stevens Act or the provisions of the

FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis. Additionally, under the baseline, gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.2.2.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACLs for pink and bamboo corals in the American Samoa Exploratory Area would be set equal to the 1,000 kg/yr ACL recommended by the Council. This ACL would be equal to the current harvest quotas and is equal to the SSC-recommended ABC. Like Alternative 1, gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.2.2.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for pink and bamboo corals in the American Samoa Exploratory Area would be set at 90% of the ABC recommended by the SSC resulting in an ACL of 900 kg. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.3 CNMI Precious Corals ACL Alternatives

2.4.3.1 Black Coral in the CNMI

There has never been a black coral fishery in the CNMI and no information on the species' presence or distribution in the Commonwealth. However, black corals are included in the management unit of the Mariana Archipelago FEP as it is reasonable that they may be found there. Federal permits are not required to harvest black coral in the CNMI.

NMFS/Council Estimation of OFL

There is no estimate of OFL provided for black corals in the CNMI.

SSC Calculation of ABC

There is no estimate of MSY for black corals in the CNMI, Additionally, there is no catch information available and this precludes the use of the Tier 5 Control Rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating the ABC for CNMI black coral.

The CNMI black coral MSY proxy was based on comparing available black coral habitat in Auau Channel of the MHI (Auau Channel, 241.7 nmi^2) and Hawaii's coastline length (653 nm) to the coastline length of the CNMI (179 nm). Using this ratio allowed NMFS to estimate the potential available area for black coral habitat in the CNMI (66.3 nmi^2).

CNMI black coral habitat proxy equation:
(241.7 nmi^2 / 653nmi) * 179 nm = 66.3 nmi^2)

The ratio of Hawaii black coral MSY (8,250 lbs) and habitat area in Hawaii (241.7 nmi^2) was then compared to potential habitat area in the CNMI, resulting in a potential MSY proxy of 2,261 lb.

CNMI black coral MSY proxy equation:
(8,250 lb / 241.7 nmi^2) * 66.3 nmi^2 = 2,261 lb

This crude estimation does not take into account differences in available shelf habitat. For example, the CNMI does not have the shelf area afforded by Penguin Banks in Hawaii, which includes the Auau Channel. Thus, this MSY is likely an overestimation. The SSC then determined that the black coral fishery in the CNMI can be regarded as Tier 4 because MSY/MSY proxy is known, but there is no harvest. Therefore, consistent with the Tier 4 control rule described in the Mariana Archipelago FEP which requires the ABC be set equal to 0.91*MSY, the SSC calculated the CNMI black coral ABC as 2,058 lb and rounded this value up to 2,100 lb.

2.4.3.1.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for black coral in the CNMI and AMs would not be necessary. However, this would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.4.3.1.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for black corals in the CNMI would be equal to the 2,100 lb ACL recommended by the Council which is equal to the SSC's recommended ABC. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.3.1.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for black corals in the CNMI would be set at 90% of the ABC recommended by the SSC. This would result in an ACL of 1,890 lb.

2.4.3.2 Pink, Gold and Bamboo Coral in the CNMI Exploratory Area

The CNMI Exploratory Area (X-P-CNMI) includes the EEZ around the CNMI, as there are no known precious coral beds in the Commonwealth. However, precious coral MUS are known to exist there and there has been a report of pink corals being harvested prior to World War II (WPFMC 2009c).

The CNMI Exploratory Area (X-P-CNMI) has a 1,000 kg/year limit of all deepwater precious coral species combined except black coral. The limit of 1,000 kg/year was developed with the goal of reducing the risk of overfishing a newly discovered bed, while at the same time being large enough to provide economic incentive to engage in exploratory fishing (WPFMC 1979). There was no statistical basis for determining the limit, but instead was based on Council judgment that 1,000 kg/year should be sufficient incentive for exploratory fishing while posing little risk to overfishing (WPFMC 1979). No Federal permit has ever been issued for precious coral fishing in the CNMI Exploratory Area (X-P-CNMI).

NMFS/Council Estimation of OFL

There is no estimate of OFL provided for precious corals the Exploratory Area around the CNMI.

SSC's Calculation of ABC

At its 116th meeting, the SSC recommended the CNMI pink and bamboo coral ABCs be maintained at the current annual harvest quota of 1,000 kg/yr.

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council considered the SSC-recommended ABC and recommended maintaining the current harvest quota of 1,000 kg/yr for pink and bamboo corals in the Exploratory Area around the CNMI. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.3.2.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for pink, bamboo and gold coral for the exploratory are around the CNMI and AMs would not be necessary. While the implementing regulations of the Mariana Archipelago FEP already provide for 1,000 kg/yr harvest quota for all precious corals (except black coral) in the CNMI exploratory area, this management system would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis. Additionally, under the baseline, gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.3.2.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACLs for pink and bamboo corals in the CNMI Exploratory Area would be set equal to the 1,000 kg/yr ACL recommended by the Council. This ACL would be equal to the current harvest quotas and is equal to the SSC-recommended ABC. Like Alternative 1, gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL

for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.3.2.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACLs for pink and bamboo corals in the CNMI Exploratory Area would be set at 90% of the ABC recommended by the SSC resulting in an ACL of 900 kg. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.4 Guam Precious Corals ACL Alternatives

2.4.4.1 Black Coral in Guam

There has never been a black coral fishery in Guam and no information on the species' presence or distribution in the Territory. However, black corals are included in the management unit of the Mariana Archipelago FEP as it is reasonable that they may be found there. Federal permits are not required to harvest precious coral in Guam.

NMFS/Council Estimation of OFL

There is no estimate of OFL provided for black corals in Guam.

SSC Calculation of ABC

There is no estimate of MSY for black corals in Guam, Additionally, there is no catch information available, and this precludes the use of the Tier 5 Control Rule. Therefore, the SSC at its 116th meeting developed a proxy for calculating the ABC for Guam black corals.

The MSY proxy was based on comparing available black coral habitat in Auau Channel of the MHI (Auau Channel, 241.7 nmi^2) and Hawaii's coastline length (653 nm) to the coastline length of the Guam (58 nm). Using this ratio allowed NMFS to estimate the potential available area for black coral habitat in Guam (21.5 nmi^2).

Guam estimated black coral habitat equation:
(241.7 nmi^2 / 653nmi) * 58 nm = 21.5 nmi^2

The ratio of Hawaii black coral MSY (8,250 lb) and habitat area in Hawaii (241.7 nmi^2) was then compared to potential habitat area in Guam, resulting in a potential MSY proxy of 733 lb.

Guam black coral MSY proxy equation:
(8,250 lb / 241.7 nmi^2) * 21.5 nmi^2 = 733 lb

This crude estimation does not take into account differences in available shelf habitat. For example, Guam does not have the shelf area afforded by Penguin Banks in Hawaii, which includes the Auau Channel. Thus, this MSY is likely an overestimation. The SSC then determined that the black coral fishery in Guam can be regarded as Tier 4 because MSY/MSY proxy is known, but there is no harvest. Therefore, consistent with the Tier 4 control rule described in the Mariana Archipelago FEP which requires the ABC be set equal to 0.91*MSY, the SSC calculated the Guam black coral ABC as 667 lb and rounded this value up to 700 lbs.

2.4.4.1.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for black corals in Guam and AMs would not be necessary. However, this would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis.

2.4.4.1.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for black corals in Guam would be equal to the 700 lb ACL recommended by the Council which is equal to the SSC's recommended ABC. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.4.1.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for black corals in Guam would be set at 90% of the ABC recommended by the SSC. This would result in a black coral ACL of 630 lb. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.4.2 Pink, Gold and Bamboo Corals in the Guam Exploratory Area

The Guam Exploratory Area (X-P-Guam) includes EEZ waters around Guam, as there are no known precious coral beds in the Territory. However, precious coral MUS are known to exist there and have been collected in government surveys (WPFMC 2009c). The Guam Exploratory Area has a 1,000 kg/year limit for all species combined except black coral. The limit of 1,000 kg/year was developed with the goal of reducing the risk of overfishing a newly discovered bed, while at the same time being large enough to provide economic incentive to engage in exploratory fishing (WPFMC 1979). There was no statistical basis for determining the limit, but instead, it was based on Council judgment that 1,000 kg/year should be sufficient incentive for exploratory fishing while posing little risk to overfishing (WPFMC 1979). No Federal permit has ever been issued for precious coral fishing in the Guam Exploratory Area (X-P-Guam).

NMFS/Council Estimation of OFL

There is no estimate of OFL provided for pink, bamboo, and gold corals the Exploratory Area around Guam.

SSC's Calculation of ABC

At its 116th meeting, the SSC recommended the pink and bamboo corals ABCs be maintained at the current annual harvest quotas of 1,000 kg/yr.

Council ACL Recommendation

At its 160th meeting held June 25-27, 2014, the Council considered the SSC-recommended ABC and recommended maintaining the current harvest quota of 1,000 kg/yr for pink and bamboo corals harvested in the Exploratory Area around Guam. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.4.2.1 Alternative 1: No Management Action

Under this alternative, NMFS would not specify an ACL for pink, bamboo and gold coral for the Exploratory Area around Guam and AMs would not be necessary. While the implementing regulations of the Mariana Archipelago FEP already provide for a 1,000 kg/yr harvest quota for all precious corals (except black coral) in the Guam Exploratory Area, this management system would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Alternative 1 serves as the baseline for the environmental effects analysis. Additionally, under the baseline, gold coral would continue to be subject to a fishing moratorium until June 30, 2018.

2.4.4.2.2 Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, the ACL for pink and bamboo corals harvested from the Guam Exploratory Area would be set equal to the 1,000 kg/yr ACL recommended by the Council. This ACL would be equal to the current harvest quotas and is equal to the SSC recommended ABC. Like Alternative 1, gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

2.4.4.2.3 Alternative 3: ACL equal to 90% of ABC

Under this alternative, the ACL for pink and bamboo corals harvested from the Guam Exploratory Area would be set at 90% of the ABC recommended by the SSC resulting in an ACL of 900 kg. Gold coral would continue to be subject to a fishing moratorium until June 30, 2018 and would serve as the functional equivalent of an ACL of zero. NMFS expects to specify the same ACL for fishing years 2017 and 2018, unless the Council modifies its recommendation or new information is provided that would result in a change to the annual catch limit.

Under the AMs, NMFS would implement the Council's recommended action, which could include a downward adjustment to the ACL for that stock or stock complex in the subsequent fishing year, or other measures, as appropriate. Additionally, as a performance measure specified in the FEP of the Mariana Archipelago, if the ACL is exceeded more than once in a four year period, the Council is required to re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness.

2.5 Alternatives Not Considered in Detail

2.5.1 Specification of ACLs for PRIA Crustaceans and Precious Corals

Although required by the PRIA FEP, ACLs would not be specified for any crustacean or precious coral MUS in the PRIA because commercial fishing is prohibited by Presidential Proclamation 8336, which established the Pacific Remote Island Marine National Monument (74 FR 1565, January 12, 2009). There is no crustacean or precious coral habitat beyond the monument boundaries in any PRIA EEZ. ACLs for non-commercial crustacean and precious coral fisheries within the boundaries of the PRIA monument may be developed in the future through a separate action in accordance with Proclamation 8336, if the Secretary of Commerce determines non-commercial fishing can be allowed and managed as a sustainable activity. Therefore, until such determination is made and there is a need to consider this further, NMFS does not intend to specify ACLs for precious corals or crustacean fisheries within the PRIA. This is the functional equivalent of an ACL of zero for all crustacean and precious coral MUS in the PRIA.

2.5.2 Specification of ACLs for Gold Coral in Hawaii Established and Conditional Beds

Currently, a moratorium on gold coral harvest is in effect throughout the Pacific Islands through June 30, 2018, due to uncertainty in estimates of the age and growth (78 FR 32181, May 29, 2013). Therefore, ACLs will not be specified for gold coral in any established or conditional bed in Hawaii as the current moratorium serves as a functional equivalent of an ACL of zero. While the proposed action would specify a limit of 1,000 kg for all deepwater precious corals combined (except black coral) in the exploratory areas around American Samoa, Guam, the the CNMI and Hawaii, the current moratorium would preclude the harvest of gold coral in the exploratory areas through June 30, 2018. Additionally, due to its status as a refugium, the harvest of all precious corals is prohibited at Westpac Bed. Therefore, NMFS does not propose to specify an ACL for any precious coral within the Westpac Bed because the existing prohibition already serves as a functional equivalent of an ACL of zero.

2.5.3 Specification of In-Season AMs

To prevent ACLs from being exceeded, Federal regulations implementing western Pacific FEPs in 50 CFR 665.4 state that when any ACL is projected to be reached, the Regional Administrator shall inform permit holders that fishing for that stock will be restricted on a specified date. Restrictions may include, but are not limited to, closing the fishery, closing specific areas, changing bag limits, or otherwise restricting effort or catch. However, near-real time processing of catch information is not possible in any Pacific Island crustacean or precious coral fishery.

Therefore, in-season AMs to prevent an ACL from being exceeded (e.g., fishery closures in Federal waters) are not possible at this time.

While Federal permit and reporting requirements have been implemented for lobster, deepwater shrimp, and precious coral fisheries in Federal waters throughout the U.S. Pacific Islands, there have been few if any permitted vessels for these fisheries in the past decade. When permits were issued, no fishing was conducted. Additionally, any catch that is reported from these fisheries comes primarily from non-Federal waters. Therefore, NMFS will continue to rely primarily on the fishery data collection programs administered by the respective local resource management agencies to obtain catch and effort data for crustacean and precious coral fisheries in the Pacific Islands. However, these agencies presently do not have the personnel or resources to process catch data in near-real time, and so fisheries statistics are generally not available until at least six months after the data has been collected. While the State of Hawaii has the capability to monitor and track the catch of seven preferentially-targeted bottomfish species (i.e., Deep 7 bottomfish) in near real time towards their specified catch limits, additional resources would be required to extend these capabilities to crustacean and precious coral fisheries. Significant resources would also be required to support the establishment of near-real time in-season monitoring capabilities in American Samoa, Guam and the CNMI. Until resources are made available, only AMs that consist of non-in-season management measures are being recommended at this time.

3 Affected Environment and Potential Effects of the Alternatives

This section describes the affected fisheries and fishery resources, other biological and physical resources, and potential effects implementing the alternatives would have on these resources. Climate change and environmental justice are considered, along with potential impacts to fishing communities, special marine areas and other resources, and fishery administration and enforcement.

Overview of Existing Fishery Monitoring

Overview of fishery data collection systems in American Samoa, Guam and the CNMI

In American Samoa, the CNMI and Guam, local resource management agencies, with assistance from NMFS PIFSC Western Pacific Fisheries Information Network (WPacFIN), collect fisheries information through three primary fisheries monitoring programs. They include: 1) the boat-based creel survey program, (2) the shore-based creel survey program, and (3) the commercial purchase system or trip ticket invoice program.

Boat-based creel survey program

The boat-based creel survey program collects catch, effort, and participation data on offshore fishing activities conducted by commercial, recreational, subsistence and charter fishing vessels. Surveys are conducted at boat ports or ramps, and data collection consists of two main components - participation counts (trips) and fisher interviews. Survey days are randomly selected and the number of survey days range from 3-8 per month. Surveys are stratified by

week-days, weekend-days and day- and night-time. Data expansion algorithms are applied by NMFS WPacFIN to estimate 100% "coverage" and are based on port, type of day, and fishing method (Impact Assessment, 2008).

Shore-based creel survey program

The shore-based creel survey program was established to randomly sample inshore fishing trip information and consists of two components - participation counts and fishers interviews. Participation counts are based on a 'bus route' method, with predefined stopping points and time constraints. Survey days are randomly selected, and range from 2-4 times per week. Data expansion algorithms are applied by NMFS WPacFIN to estimate 100% "coverage" and are based on island region, type of day and fishing method (Impact Assessment, 2008). The shore-based creel surveys cover fishing by persons engaged in commercial, recreational, and subsistence fishing activities.

Commercial purchase system

The commercial purchase system or "trip ticket invoice" monitor fish sold locally and collects information submitted by vendors (fish dealers, hotels and restaurants) who purchase fish directly from fishers. Each invoice usually compiles daily trip landings. Only American Samoa has mandatory requirements for vendors to submit invoice reports, the other islands have voluntary programs (Impact Assessment, 2008).

Overview of fishery data collection systems in Hawaii

In Hawaii, the majority of fisheries information is collected from the commercial fishing sector through a mandatory license and monthly reporting system administered by the State of Hawaii. Under State law, anyone who takes marine life for commercial purposes is required to obtain a commercial marine license (CML) and submit a catch report (popularly known as a "C3" form) on a monthly basis. Required information collected includes day fished, area fished, fishing method used, hours fished per method, and species caught (number/pounds caught and released).

Recreational catch information for finfish is also opportunistically collected through the Hawaii Marine Recreational Fishing Survey (HMRFS) and annual catch amounts are reported through NMFS Marine Fisheries Statistics Survey (MRFSS) at http://www.st.nmfs.noaa.gov/st1/index.html. It should be noted that because this survey only includes finfish, no information on crustaceans or precious corals is captured by this survey. A 2006 review of MRFSS by the National Resource Council (NRC) noted that the catch estimation method was not correctly matched with the catch sampling survey design, leading to potential bias in the estimates of finfish catch. In consideration of this finding, the Council in 2006 recommended that MRFSS catch estimates not be used as a basis for management or allocation decisions.

Except for HMRFS data, NMFS WPacFIN obtains all crustacean and precious coral fisheries information in the Pacific Islands, where available, in accordance with cooperative agreements with the State, territorial and Commonwealth fisheries agencies in American Samoa, the CNMI,

Guam, and Hawaii and provides access to this data on their website http://www.pifsc.noaa.gov/wpacfin. Generally, complete data for catches during a calendar year are not available until at least 6 months after the year has ended.

Federal Permit and Reporting Requirements

Pacific Island Crustacean Fisheries

Any vessel used to fish for deepwater shrimp or lobsters in Federal waters around American Samoa, the CNMI, Guam and Hawaii must obtain a Federal permit and submit catch logbooks to NMFS within 72 hours of landing. Crustacean Permit Area 1 includes the EEZ around the Northwestern Hawaiian Islands. Crustacean Permit Area 2 includes the EEZ around the main Hawaiian Islands. Crustacean Permit Area 3 includes the EEZ around American Samoa. Crustacean Permit Area 4 includes the EEZ around the U.S. Pacific Remote Island Areas. Crustacean Permit Area 5 includes the EEZ around Guam and the CNMI.

Federal permits are not required to harvest Kona crab in any Pacific Island area at this time. The affected permit areas for the proposed action are Crustacean Permit Areas 2, 3, and 5.

Pacific Island Precious Coral Fisheries

Any vessel used to fish for black, bamboo, pink, red or gold corals in Federal waters around American Samoa, CNMI, Guam and Hawaii must obtain a Federal permit and submit catch logbooks to NMFS within 72 hours of landing. Permits are required for each category of coral bed as follows: American Samoa Exploratory Area (X-P-AS) includes all coral beds in the EEZ around American Samoa. Guam Exploratory Area (X-P-G) includes all coral beds in the EEZ around Guam. CNMI Exploratory Area (X-P-CNMI) includes all coral beds in the EEZ around the CNMI.

In Hawaii, there are three categories of beds: Established, Conditional and Exploratory. Permits are required for harvesting black coral at the Established Auau Channel bed. Permits are also required to harvest pink and bamboo coral at the Established Makapuu Bed. A permit is required to fish for pink and bamboo corals at each of the following Conditional Beds: 180 Fathom, Brooks Bank, Keahole Point and Kaena Point. Finally, a permit is required to fish for pink and bamboo coral in the Hawaii Exploratory Area (X-P-HI) which includes all coral beds other than Established, Conditional and Refugia (no fishing is allowed at any Refugia Bed) in the EEZ around Hawaii.

Recreational Fisheries

In 2008, NMFS established the National Saltwater Angler Registry Program as part of the Marine Recreational Information Program to improve recreational fisheries information nationwide (73 FR 79705, December 30, 2008). This program requires all recreational fishers in Federal waters that are not otherwise permitted (e.g., through a State CML license, or another Federal permit) to obtain a permit and report catches to NMFS.

3.1 Crustaceans – Deepwater Shrimp Fisheries

Adult deepwater shrimp species of the genus *Heterocarpus* have been reported throughout tropical waters of the Pacific including Hawaii (Clark 1972; Struhsaker and Aasted 1974; Dailey and Ralston 1986; Gooding et al. 1988; Tagami and Barrows 1988; Moffitt and Parrish 1992; Ralston and Tagami 1992; Polovina 1993), Guam (Wilder 1977), Western Samoa (King 1980), and the Northern Mariana Islands (Moffitt 1983; Ralston 1986). They are generally found in benthic deepwater habitats between 200-900 meters in depth, primarily on the steep outer reef slopes that surround the islands and deepwater banks. However, because they are found at such deep depths, accurate descriptions and characterization of preferred habitats are difficult to obtain and virtually non-existent in the scientific literature.

The distribution of these species tends to be stratified by depth with each species occupying different but often overlapping depths (Ralston 1986). Eight species belonging to the genus *Heterocarpus* (*Heterocarpus ensifer, H. laevigatus, H. sibogae, H. gibbosus, H. lepidus, H. dorsalis, H. tricarinatus and H. longirostris*) have been reported from the Western Pacific Region, although *Heterocarpus ensifer* and *H. laevigatus* have been the primary focus of fishery operations and research surveys.

Unlike shallow-water penaeid shrimps, *Heterocarpus* shrimps have a lifespan in excess of a year, and some species such as *H. laevigatus* may have life spans of up to eight years (King, 1993). King suggests that the natural mortality rates of *H. laevigatus* are about 50% per year. He also reports that *H. laevigatus* matures at about 75% of its maximum size or between 4-5 years old. Observations by Dailey and Ralston (1986) suggest that *Heterocarpus* shrimps may be semelparous, i.e., reproducing only once in their lifetime then dying. This semelparity and the relatively long life spans and delayed maturity of some species suggest that *Heterocarpus* shrimps are vulnerable to over-exploitation. Known fishing areas tend to be limited and subject to reduced catch rates following initially high harvests.

Traps made from steel, wire, and/or plastic with conical entrances that allow the shrimp to get into the trap, but not out, are used in the Pacific Islands Region to catch deepwater shrimp. In Hawaii, shrimp trapping vessels have employed large pyramidal traps of about 2 m^3 in volume, setting up to 50 traps per day (Polovina 1993). A gear loss rate of 3.35% was estimated from fishing log data in Hawaii (Tagami and Barrows 1998). There is little information available on the impacts of the lost shrimp fishery traps on habitat and other species. Potential impacts of the traps could include snagging and ghost fishing. Lost traps could also provide habitat for other organisms. The Council and NMFS are aware of this issue and are monitoring the fishery to evaluate whether the impacts are substantial and need to be addressed through future management measures.

Throughout the Pacific, deepwater shrimp fisheries have been sporadic in nature for many reasons (Hastie and Saunders 1992).Gear loss has been a common problem and made many past ventures unprofitable. A second difficulty is the short product shelf life and a history of inconsistent product quality, leading to fluctuating market demand for the shrimp. Lastly, these fisheries generally experience local depletion on known fishing grounds, which leads to much

lower catch rates over time. This localized depletion appears to be short-term and the fishery returns every so often after the resource rebounds.

3.1.1 Hawaii Deepwater Shrimp Fishery, Affected Resources and Potential Effects

3.1.1.1 Affected Target, Non-target and Bycatch Species in Hawaii

Within the Hawaii Archipelago, there are numerous banks and seamounts—with the majority located in the NWHI—that provide depth ranges suitable for the occurrence of deepwater shrimp. *Heterocarpus laevigatus* and *H. ensifer* have been reported in both the MHI and the NWHI (Gooding 1984; Dailey and Ralston 1986; Ralston and Tagami 1992; Moffitt and Parrish 1992). *H. ensifer* is believed to be the most abundant species (Struhsaker and Aasted 1974).

In the MHI, the largest bank in Federal waters is Penguin Bank, which is located to the southeast of Oahu. Trapping surveys in the MHI reported that the exploitable biomass of *H. laevigatus* was greatest at depths between 460 and 640 meters and negligible amounts occurred shallower than 350 meters or deeper than 830 meters (Ralston and Tagami 1992). In the NWHI, the highest catch rates for *H. laevigatus* were made between 500 and 800 meters while the highest catch rates for *H. ensifer* occurred between 350 and 600 meters (Gooding 1984).

Deepwater shrimp resources around Hawaii are thought sufficient only to support a limited local fishery or perhaps periodic heavy pulse fishing (Polovina 1993). Initial high catch rates appear to drop rapidly, trapping depths result in costly gear loss, and markets have not historically been large. Maximum Sustainable Yield (MSY) for deepwater shrimp was estimated for the Hawaiian Islands at 125 mt/yr or 275,575 lb/yr (Tagami and Ralston 1988).

Current impacts of the fishery: target, non-target and bycatch species (baseline)
Based on recent performance of the fishery between years 2000 and 2010, as shown in Table 3, the Hawaii deepwater shrimp fishery had an average annual landing of 18,743 lb of shrimp representing approximately 7% of the estimated 275,575 lb/year MSY. Currently, there is little information about bycatch associated with this fishery, and what is known comes primarily from research sampling in other Pacific island areas such as the CNMI where species such as deepwater eels (*Synaphobranchus* sp.), dogfish sharks and geryonoid crabs have been reportedly caught and discarded (WPFMC 2008). However, research findings did not report whether the bycatch was released alive or dead. Because the fishery is sporadic, NMFS is not aware of concerns about the sustainability of bycatch species in this fishery.

Potential ACLs and Effects of the Proposed Hawaii Deepwater Shrimp ACL and AMs on Target, Non-target and Bycatch Species in Hawaii

<u>Alternative 1: No Management Action</u>

Under the no-action alternative, an ACL would not be specified for the Hawaii deepwater shrimp fishery and AMs would not be necessary. The fishery would continue to catch deepwater shrimp in the manner and at baseline levels described above and catches would continue to be monitored through fisheries monitoring programs administered by Hawaii DAR. The average level of catch

under this alternative is expected to continue as it currently has in recent years with average annual catches between 2000 and 2010 estimated to be 18,743 lb. This level of catch is approximately 7% of MSY (275,575 lb) and is sustainable. There is no information on any bycatch in the Hawaii deepwater shrimp fishery, but NMFS does not have information to indicate bycatch in the fishery is not sustainable or having an effect on biodiversity or food webs of any species. The status of Hawaii deepwater shrimp fishery bycatch would continue to be subject to ongoing discussion and review by the Council.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this Alternative, NMFS would specify an ACL of 250,773 lb of deepwater shrimp caught in the Hawaii EEZ in fishing years 2016 – 2018. This ACL is equal to the ABC recommended by the Council's SSC and is 91% of MSY. Based on past fishery performance in the past decade (recent average annual catches of 18,743 lb) and shown in Table 3, this level of catch is not likely to be attained; however, monitoring would continue and all commercial catches would be reported. The ACL and AM specification would not change the conduct of the fishery in any way. Therefore, NMFS concludes the specification would not result in large or adverse effects on target or non-target stocks or on bycatch species, including should the same ACLs and AMs specifications be made in each of the subsequent 2 years.

Alternative 3: Specify ACL at 90% of ABC

Under this Alternative, NMFS would specify an ACL of 225,695 lb, which is 82% of MSY. This alternative is expected to have impacts similar to Alternative 2 and Alternative 1 because this level of catch is not expected to be attained, and because, with a high ACL and no in-season management measure (e.g., a fishery closure) there would be no change to the way the fishery is conducted. Monitoring would continue and all commercial catches would be reported. NMFS concludes the specification would not result in large or adverse effects on target or non-target stocks or on bycatch species, including should the same ACLs and AMs specifications be made in each of the subsequent 2 years.

Under all alternatives considered, including the proposed action, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL is exceeded and affected the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year. The proposed action would not result in a fishery closure under the two action alternatives. However, the ACL and post-season review of catch relative to the ACL is designed to prevent deepwater shrimp stocks from becoming overfished. The added post season review of catch would also provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications in the future, should changes be necessary.

3.1.1.2 Affected Fishery Participants in Hawaii

Overview of Hawaii's Deepwater Shrimp Fishery

In Hawaii, an intermittent deepwater shrimp fishery began in 1967 (Tagami and Ralston 1988) and continues to vary from year to year with an average of three vessels reporting the catch of deepwater shrimp to the State of Hawaii. Table 3 provides the total and average annual reported commercial landings of deepwater shrimp in Hawaii between 1982 and 2010. Landing information is summarized in approximately 10-year groupings to protect confidential fishery information, as there may have been less than three participants in the fishery during certain years. Individual years in which less than three vessels participated in the fishery cannot be reported.

In general, the fishery is a pulse fishery in which many years see little to no participation. Within the past 10 years, the Hawaii deepwater shrimp fishery has had 10 or fewer participants in any given year. Annual landings data is confidential because the number of participants annually is often 3 or less (Table 3).

While relatively small catches of shrimp have been common in the recent past, the fishery has seen more impressive harvests. For example, landings in 1984 and 1989 were approximately 275,000 lb and 270,000 lb, respectively (WPFMC 2008). The estimated annual ex-vessel value associated with those totals was more than $1 million each year. Currently, there are no Federal crustacean permits issued for deepwater shrimp fishing in Hawaii.

In 2009, the commercial price per pound for deepwater shrimp in Hawaii was $1.68. Based on an average annual landing of 18,743 lb, the annual commercial value of the fishery could be $31,488. Due to data confidentiality restrictions, information on the number of vessels that reported catch to the State of Hawaii in 2009 and the total catch cannot be reported

Potential Effects of the Proposed ACL specification and AM on Hawaii's Deepwater Shrimp Fishery Participants

Alternative 1: No Management Action

Under the No-action Alternative, which is the baseline alternative, the Hawaii deepwater shrimp fishery would not be managed using annual catch limits, accountability measures would not be needed, and fishing would continue to be monitored by Hawaii DAR, NMFS and the Council with fisheries statistics becoming available approximately six months or longer after the data have been initially collected. A low level of fishery participation would likely occur on an intermittent basis as in the past.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify a Hawaii deepwater shrimp ACL of 250,773 lb, on an annual basis for fishing years 2016 – 2018. This ACL is equal to the ABC recommended by the Council's SSC. Between 2000 and 2010, the average annual landing of deepwater shrimp

was 18,743 lb, which is 7% of the proposed ACL. The proposed ACL specifications are substantially higher than recent commercial landings. Catch would not likely exceed the proposed ACLs, and therefore, would not result in a race to fish. Because in-season monitoring, and therefore in-season closure is not possible at this time, the proposed ACLs and AMs are not expected to change the conduct of the fishery, including types of gear, areas fished, effort, or participation.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify a Hawaii deepwater shrimp ACL of 225,695 lb which is 90% of the ABC (250,773 lb) and 82% of MSY. An ACL at this level expected to have impacts that are generally similar to Alternative 2, except that the potential to exceed ACL is slightly higher under Alternative 3. Based on historical landings, is not likely that the fishery would achieve the ACL under this alternative. Because in-season monitoring, and therefore in-season closure is not possible at this time, the proposed ACLs and AMs are not expected to change the conduct of the fishery, including types of gear, areas fished, effort, or participation

Regardless of which action alternative is selected, the AM for the Hawaii deepwater shrimp fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL is exceeded and adversely affected deepwater shrimp stocks, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. Under the current AMs, there is no in-season management measure possible (such as a fishery closure), so fishery participants are not expected to be affected event if an ACL were to be adjusted downward. If management changes were needed, NMFS would evaluate the potential environmental impacts of such actions once details become available.

3.1.1.3 Affected Protected Resources in Hawaii

A number of protected species are documented as occurring in the waters around the Hawaiian Islands and there is the potential for interactions with the crustacean fisheries of the Hawaii Archipelago. The Hawaii crustacean fisheries have been evaluated for impacts on protected resources and are managed in compliance with the requirements of the Magnuson-Stevens Act, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act, and other applicable statutes.

ESA listed species and ESA review of Hawaii Crustacean Fisheries

Table 20 lists endangered or threatened species occurring in the waters around Hawaii. They include a number of whales, the Hawaiian monk seal, and five listed sea turtles. Although there is currently no critical habitat designated for ESA-listed marine species around the main Hawaiian Islands, a proposal to designate portions of the nearshore marine environment around the main Hawaiian Islands as monk seal critical habitat is currently under review.

Table 20. Endangered and threatened marine species and seabirds occurring in the waters of the Hawaiian Archipelago

Common name	Scientific Name	ESA listing status in Hawaii	Occurrence in Hawaii
Listed Sea Turtles			
Green sea turtle – Central North Pacific DPS	*Chelonia mydas*	Threatened DPS	Most common turtle in the Hawaiian Islands. Most nesting occurs in the northwestern Hawaiian Islands. Foraging and haulout in the MHI.
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	Small population foraging around Hawaii and low level nesting on Maui and Hawaii Islands.
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Not common in Hawaii.
Olive ridley sea turtle	*Lepidochelys olivacea*	Threatened	Range across Pacific.
North Pacific loggerhead sea turtle	*Caretta caretta*	Endangered Distinct Population Segment	Not common in Hawaii.
Listed Marine Mammals			
Hawaiian Monk seal	*Neomonachus schauinslandi*	Endangered	Endemic tropical seal. Occurs throughout the archipelago. Population in decline. Critical habitat established.
False Killer Whale, MHI Insular DPS	*Pseudorca crassidens*	Endangered	Rare.
Blue whale	*Balaenoptera musculus*	Endangered	No sightings or strandings reported in Hawaii but acoustically recorded off of Oahu and Midway Atoll.
Fin whale	*Balaenoptera physalus*	Endangered	Infrequent sightings in Hawaii waters.
Sei whale	*Balaenoptera borealis*	Endangered	Worldwide distribution. Primarily found in cold temperate to subpolar latitudes. Rare in Hawaii.
Sperm whale	*Physeter macrocephalus*	Endangered	Found in tropical to polar waters worldwide, most

Common name	Scientific Name	ESA listing status in Hawaii	Occurrence in Hawaii
			abundant cetaceans in the region. Sighted off the NWHI and the MHI.
Listed Sea Birds			
Newell's Shearwater	*Puffinus auricularis newelli*	Threatened	Rare. Breeds only in colonies on the MHI where it is threatened by predators and urban development.
Dark-rumped petrel	*Pterodroma phaeopygia*	Endangered	Rare
Band-rumped storm-petrel	*Oceanodroma castro*	Endangered Hawaii DPS	Rare.
Short-tailed Albatross	*Phoebastria albatrus*	Endangered	Found on Midway in the NWHI.

Applicable ESA Coordination – Hawaii crustacean fisheries

Section 4.2 lists the applicable ESA consultations and other reviews that are briefly described here:
NMFS evaluated Hawaii crustacean fisheries (including deepwater shrimp fisheries) for potential impacts to ESA-listed marine species under NMFS jurisdiction and documented its conclusions in a March 13, 2008, Biological Opinion (BiOp). The BiOp concluded that Hawaii Crustacean fisheries are not likely to adversely affect ESA-listed species (see Table 33).

In a letter of concurrence covering the Fishery Management Plan (FMP) for the Crustacean Fisheries of the Western Pacific, dated April 4, 2008, NMFS determined crustacean fisheries of Hawaii that operate in accordance with regulations implementing the FMP, inclusive of the spiny and slipper lobster fisheries, deepwater shrimp fisheries, and Kona crab fishery were not likely to adversely affect ESA-listed species or habitats.

In 2009, the Council recommended, and NMFS approved, the development of five archipelagic-based fishery ecosystem plans (FEPs) including the Hawaii Archipelago FEP. The FEP incorporated and reorganized elements of the Council's species-based FMPs, including the Crustacean FMP, into a spatially-oriented management plan (75 FR 2198, January 14, 2010). All applicable regulations concerning crustacean fishing were retained through the development and implementation of the FEP for the Hawaii Archipelago.

No substantial changes to the crustacean fisheries around Hawaii have occurred since the FEP was implemented that have required further consultation.

On September 22, 2011, NMFS and the U.S. Fish and Wildlife Service (USFWS) determined that the loggerhead sea turtle population (*Caretta caretta*) is composed of nine distinct population segments (DPS) that constitute ''species'' that may be listed as threatened or endangered under the ESA (76 FR 58868). Specifically, NMFS and USFWS determined that the

loggerhead sea turtles in the North Pacific Ocean, which includes waters around the Hawaii Archipelago, are a distinct population segment (DPS) that is endangered and at risk of extinction.

While the North Pacific DPS of loggerheads may be found in Federal waters in the MHI, their occurrence in Federal waters where the deepwater shrimp fishery operates is extremely rare. Additionally, there have been no reported or observed incidental take of this species in the history of the fishery. Because neither action alternative would modify operations of the Hawaii crustacean fisheries in any way, there is no additional information that would change the conclusions of the 2008 consultation that determined this fishery was not likely to adversely affect ESA-listed species or their habitats.

In 2013, NMFS re-initiated ESA consultation for Hawaii crustacean fisheries in response to the listing of the MHI insular false killer whale DPS as an endangered species under the ESA. The consultation evaluated the effects of all Hawaii crustacean fisheries on all ESA-listed species and designated critical habitat. In a letter of concurrence dated December 5, 2013, NMFS determination that the continued authorization of crustacean fisheries in the Hawaiian Archipelago may affect, but is not likely to adversely affect, endangered or threatened species or designated critical habitat. Specifically, NMFS concluded that effects of the Hawaii crustacean fisheries are expected to be insignificant, discountable or beneficial.

On August 21, 2015, NMFS designated critical habitat for the endangered Hawaiian monk seal in areas where the Hawaii Kona crab fishery fishes (80 FR 50926). Specific areas designated include sixteen occupied areas within the range of the species: ten areas in the Northwestern Hawaiian Islands and six in the MHI. These areas contain one or a combination of habitat types: preferred pupping and nursing areas, significant haul-out areas, and/or marine foraging areas, that will support conservation for the species. Specific areas designated as monk seal critical habitat in the MHI include marine habitat from the 200 m depth contour line, including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor, through the water's edge 5 m into the terrestrial environment from the shoreline between identified boundary points on the Islands of: Kaula, Niihau, Kauai, Oahu, Maui Nui (including Kahoolawe, Lanai, Maui, and Molokai), and Hawaii. In areas where critical habitat does not extend inland, the designation ends at a line that marks mean lower low water. The August 21, 2015, final rule designating monk seal critical habitat in the MHI, triggered consultation on the continuation of Crustacean fisheries in the Hawaiian Islands Archipelago. Given the generalist foraging habits of monk seals, the small number of participants in crustacean fisheries and the small area fished, potential effects to monk seals were expected to be insignificant. In a memo dated March 1, 2016, the consultation concluded with NMFS' finding that Crustacean fisheries are not likely to adversely affect the newly designated Hawaiian monk seal critical habitat, because the effects of the fisheries are expected to be discountable or insignificant.

On April 6, 2016, (81 FR 20058) NMFS published a final rule to list 11 DPS of the green sea turtle (*Chelonia mydas*) under the ESA. Based on the best available scientific and commercial data, and after considering comments on the proposed rule, NMFS determined that three DPS are endangered and eight DPS, including the Hawaiian green sea turtle (Central North Pacific DPS), are threatened. NMFS does not expect the number of green sea turtles taken in the Hawaii Crustacean fisheries to change based on the designation of the DPS. The 2016 rule supersedes

the 1978 final listing rule for green turtles and applies the existing protective regulations to the DPS. Critical habitat will be considered in future rulemaking.

On September 30, 2016, the USFWS listed the Hawaii DPS of the band-rumped storm-petrel (*Oceanodroma castro*) as an endangered seabird (81 FR 67786). The deepwater shrimp fishery has never reported interactions with this species and interactions are unlikely.

Effects of alternatives on listed species.

None of the alternatives proposed are expected to change the conduct of the deepwater shrimp fishery in any manner that would result in interactions with protected species in any manner not covered by existing consultations. The fishery is not expected to interact with recently-listed band-rumped storm petrel.

Marine Mammals

Several whales, dolphins and porpoises occur in waters around Hawaii and are protected under the Marine Mammal Protection Act (MMPA. Table 21 provides a list of marine mammals known to occur or reasonably expected to occur in waters around the Hawaiian Archipelago that have the potential to interact with the Hawaii deepwater shrimp fisheries. See Section 4.3 for more information on the MMPA determination.

The deepwater shrimp fishery is not known to have the potential for a large and adverse effect on endangered insular false killer whale DPS. Although these species occur in the area the fishery operates, no reported or observed interactions have occurred. No cetacean entanglements in deepwater shrimp trap lines have been reported or observed to date around Hawaii.

Table 21. Non-ESA-listed marine mammals occurring in Hawaii

Non-ESA-listed marine mammals known to occur or reasonably expected to occur in waters around the Hawaiian Archipelago	
Common Name	**Scientific Name**
Blainville's beaked whale	*Mesoplodon densirostris*
Bottlenose dolphin	*Tursiops truncatus*
Bryde's whale	*Balaenoptera edeni*
Common dolphin	*Delphinus delphis*
Cuvier's beaked whale	*Ziphius cavirostris*
Dall's porpoise	*Phocoenoides dalli*
Dwarf sperm whale	*Kogia sima*
False killer whale	*Pseudorca crassidens*
Fraser's dolphin	*Lagenodelphis hosei*
Killer whale	*Orcinus orca*
Humpback whale	*Megaptera novaeangliae*
Longman's beaked whale	*Indopacetus pacificus*
Melon-headed whale	*Peponocephala electra*

Non-ESA-listed marine mammals known to occur or reasonably expected to occur in waters around the Hawaiian Archipelago	
Common Name	**Scientific Name**
Minke whale	*Balaenoptera acutorostrata*
Pantropical spotted dolphin	*Stenella attenuate*
Pygmy killer whale	*Feresa attenuata*
Pygmy sperm whale	*Kogia breviceps*
Risso's dolphin	*Grampus griseus*
Rough-toothed dolphin	*Steno bredanensis*
Short-finned pilot whale	*Globicephala macrorhynchus*
Spinner dolphin	*Stenella longirostris*
Spotted dolphin	*Stenella attenuata*
Striped dolphin	*Stenella coeruleoalba*

Source: Council website: http://www.wpcouncil.org

On November 28, 2012, NMFS published a final rule to list the Hawaiian insular false killer whale as an endangered DPS under the ESA (77 FR 70915). On August 7, 2013, NMFS modified the March 13, 2008 BiOp to address the listing of the MHI insular false killer whale DPS as an endangered species under the ESA, and concluded that Hawaii crustacean fisheries are not likely to adversely affect this species.

All Hawaii crustacean fisheries, including the Hawaii lobster dive, net and trap fisheries, shrimp trap fishery and Kona crab loop net fishery are listed as a Category III fisher under Section 118 of the MMPA (81 FR 20550, April 8, 2016). A Category III fishery is one with a low likelihood or no known incidental takings of marine mammals. After reviewing the Hawaii crustacean fisheries in the 2016 List of Fisheries, NMFS concluded that all Hawaii Archipelago commercial crustacean fisheries, including the deepwater shrimp fishery, as currently conducted, will not affect marine mammals in any manner not considered or authorized by the commercial fishing take exemption under the MMPA.

Sea Turtles

The breeding populations of Mexico's olive ridley sea turtles (*Lepidochelys olivacea*) are currently listed as endangered, while all other olive ridley populations are listed as threatened. Leatherback sea turtles (*Dermochelys coriacea*) and hawksbill turtles (*Eretmochelys imbricata*) are also classified as endangered. Additionally, the loggerhead (*Caretta caretta*) and green sea turtles (Chelonia mydas) in the North Pacific Ocean were recently identified as a distinct population segment and listed as endangered. The green turtle is most commonly seen in the EEZ waters. Hawksbill turtles are known to nest on the Islands of Hawaii and Maui.

Seabirds

Seabirds found on and around Hawaii that could potentially interact with fisheries are listed in Table 22. The endangered short-tailed albatross is a migratory seabird that has nested in the NWHI and could be present in the waters of the Hawaii Archipelago. Other listed seabirds found

in the region are the endangered Hawaiian dark-rumped petrel (*Pterodroma phaeopygia),* the threatened Newell's shearwater (*Puffinus auricularis newelli*), and the endangered band-rumped storm-petrel Hawaii DPS (*Oceanodroma castro*). Non-listed seabirds known to be present in Hawaii and commonly seen in offshore waters include the black-footed albatross (*Phoebastria nigripes*); Laysan albatross (*P. immutabilis*); wedge-tailed (*Puffinus pacificus*), sooty (*P. griseus*) and fleshfooted (*P. carneipes*) shearwaters, as well as the masked (*Sula dactylatra*), brown (*Sula leucogaster*), and red-footed *(Sula sula*) boobies (or gannets). Seabirds forage in both State and Federal waters, but are not known to and are unlikely to interact with the Hawaii crustacean fisheries. There have been no reports of adverse interactions between the Hawaii crustacean fisheries and migratory seabirds.

Table 22. Seabirds occurring in the Hawaiian Islands

Seabirds of the Mariana Archipelago (R= Resident/Breeding; V= Visitor; Vr=rare visitor; Vc= Common visitor)		
	Common name	***Scientific name***
R	Hawaiian dark-rumped petrel	*Pterodroma phaeopygia (ESA: Endangered)*
R	Newell's shearwater	*Puffinus auricularis newelli (ESA:Threatened)*
R	Band-rumped storm-petrel	*Oceanodroma castro (ESA: Endangered Hawaii DPS)*
R	Short-tailed albatross	*Phoebastria albatrus (ESA: Endangered)*
R	Black-footed albatross	*Phoebastria nigripes*
R	Laysan albatross	*Phoebastria immutabilis*
R	Wedge-tailed shearwater	*Puffinus pacificus*
V	Audubon's shearwater	*Puffinus lherminieri*
Vc	Short-tailed shearwater	*Puffinus tenuirostris (common visitor)*
R	Christmas shearwater	*Puffinus nativitatis*
V	Leach's storm-petrel	*Oceanodroma leucorhoa*
V	Matsudaira's storm-petrel	*Oceanodroma matsudairae*
R	Red-footed booby	*Sula sula*
R	Brown booby	*Sula leucogaster*
R	Masked booby	*Sula dactylatra*
R	White-tailed tropicbird	*Phaethon lepturus*
R	Red-tailed tropicbird	*Phaethon rubricauda*
R	Great frigatebird	*Fregata minor*
R	Sooty tern	*Onychoprion fuscatus*
R	Brown noddy	*Anous stolidus*
R	Black noddy	*Anous minutus*
R	White tern / Common fairy-tern	*Gygis alba*

Source: WPFMC 2009c

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in Hawaii

None of the action alternatives would modify operations of the Hawaii deepwater shrimp fishery in any way, and therefore, none of the action alternatives would be expected to affect endangered

or threatened species or critical habitat in any manner not previously considered in applicable ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season accounting of the catch relative to the ACL, managing the deepwater shrimp fishery using an ACL and AM would not represent a change to fishery management that has been in place since 2012. ACLs and AMs are intended to promote long term sustainability of the fishery stock.

The current inability of in-season tracking of catch towards an ACL resulted in the Council not considering an in-season closure. Therefore, regardless of which action alternative is selected, participants in the Hawaii deepwater shrimp fishery would continue to fish as they have in recent years. However, because this fishery is currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the proposed action (Alternative 2) would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources. For the same reasons, none of the action alternatives would result in a change to effects on monk seal critical habitat.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.1.2 American Samoa Deepwater Shrimp Fishery, Affected Resources and Potential Effects

3.1.2.1 Affected Target, Non-target and Bycatch Species in American Samoa

Because of the steepness of Tutuila and the other islands that make up American Samoa, most of the available benthic habitat is composed of fringing coral reefs, a limited reef slope, and a few offshore banks. The islands are fringed by narrow reef flats (50–500 m wide) that drop to a depth of 3 to 6 meters and descend gradually to 40 meters. From this depth, the ocean bottom drops rapidly, reaching depths of 1,000 meters within 1 to 3 kilometers from shore. The following four banks around Tutuila, that are likely areas for deepwater shrimp fishing, have been identified: Taputapu, Mataula, Leone West Banks, and Steps Point (Severance and Franco 1989).

NMFS PIFSC conducted sampling at 10 shrimp trapping stations at depths ranging between 200 and 510 fathoms around American Samoa in 1987 (NOAA Ship Townsend Cromwell cruise 87-01). The gear used was large pyramid single set traps and some *Heterocarpus* were present in every trap haul. Unpublished results from the cruise showed that deepwater shrimp may be more abundant in some places than others, but deepwater shrimp were captured in most of the trap sets (PIFSC unpublished data). There are no available estimates of MSY values for deepwater shrimp in American Samoa because of the lack of fishing and the lack of research.

Potential Effects of the Proposed ACL specification and AM on Target, Non-target and Bycatch Species in American Samoa

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the American Samoa deepwater shrimp fishery and AMs would not be necessary. However, since there has never been a deepwater shrimp fishery in American Samoa, this alternative would have no effect on any marine resource. Catches, if they were to occur, would be collected through fisheries monitoring programs administered by American Samoa DMWR and the status of American Samoa deepwater shrimp would be subject to discussion and review.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 80,000 lb for American Samoa deepwater shrimp in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC. To date, there has never been a fishery for deepwater shrimp in American Samoa. If a fishery were to develop, catch would not likely exceed the proposed ACLs, and therefore, would not result in a race to fish. Because there is no in-season monitoring, and therefore no in-season closure is possible at this time, the proposed ACLs and AMs are not expected to change the conduct of the fishery, including types of gear, areas fished, effort, or participation. With no change in the fishery, the ACLs and AMs would not have large or adverse effects on target, non-target or bycatch species. The ACLs and AMs would provide a more substantial post-season review of the fishery than would occur in the no-action alternative. Over time, the management of deepwater shrimp fisheries with ACLs and AMs, including post-season review, is expected to help ensure long-term sustainability of the resources.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 72,000 lb for American Samoa deepwater shrimp in fishing years 2016 – 2018. The impacts under Alternative 3 would be identical to Alternative 2.

Under all alternatives considered, including the proposed action, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL is exceeded and affects the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council, which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would establish a limit on the amount of fish that may be harvested annually where none previously existed. There is no ability to monitor catches in-season which precludes in-season management measures (such as a fishery closure); however, the post-season review of catch relative to the proposed ACL is part of the management of the fishery and is designed to prevent deepwater shrimp stocks from becoming overfished. The additional level of post season review of the catch would also an

enhanced level of management review of the fishery compared with Alternative 1, and would provide an opportunity for the Council to refine ACL and AM specifications, as needed. Over time, the management of deepwater shrimp fisheries with ACLs and AMs, including post-season review, is expected to help ensure long-term sustainability of the resources.

3.1.2.2 Affected Fishery Participants in American Samoa

No fishing for deepwater shrimp has ever been reported around American Samoa and no Federal permits have ever been issued.

Potential Effects of the Proposed ACL specification and AM on American Samoa's Deepwater Shrimp Fishery Participants

To date, there has not been a deepwater shrimp fishery in American Samoa. Therefore, there is no fishery participant that could be affected by any of the three alternatives considered. If a fishery were to occur, the ACLs and AMs proposed under alternatives 1 and 2 are expected to provide for additional management review of the fishery to promote long-term sustainability in the fishery, which by managing for a sustainable resource, would have a positive effect on fishery participants.

3.1.2.3 Affected Protected Resources in American Samoa

A number of protected species are known or believed to occur in the waters around American Samoa and, therefore, they could potentially interact with the deepwater shrimp fishery. NMFS evaluated the deepwater shrimp fisheries of the Pacific Islands region for effects on protected species and manages these fisheries in compliance with the requirements of the Magnuson-Stevens Act, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), and other applicable statutes. For the reader's interest, more detailed descriptions of these species and their life histories are found in section 3.3.4 of the FEP for the American Samoa Archipelago (WPFMC 2009a) and online on NMFS website (http://www.fpir.noaa.gov/PRD/prd_index.html).

<u>Listed species and ESA review of American Samoa Crustacean and Precious Coral Fisheries</u>

Table 23 identifies species listed as endangered or threatened under the ESA that are known to occur or could reasonably be expected to occur in marine waters around American Samoa which may have the potential to interact with crustacean fisheries. They include a number of whales, five sea turtles, and a seabird species rarely found in the area. There is no critical habitat designated for ESA-listed marine species around American Samoa. The table includes information about consultations completed on the fishery.

On September 22, 2011, NMFS published a final rule determining that the world loggerhead turtle population was comprised of nine distinct population segments (DPS) (five Endangered and four Threatened). The South Pacific Ocean Loggerhead turtle DPS distribution (listed as endangered) overlaps with the EEZ around American Samoa. The DPS nests on beaches from eastern Australia to Tokelau several hundred nm north of American Samoa (NMFS 2009). There

are no records of this species nesting in American Samoa; however, loggerheads do transit the EEZ around American Samoa (Seminoff et al. 2015).

The presence of green turtles, hawksbill turtles, and olive ridley turtles in the EEZ around American Samoa is well-documented (Seminoff et al. 2015).

On April 6, 2016, NMFS and USFWS published a final rule finding that the green sea turtle is composed of 11 DPSs and proposed to replace the current range-wide listing with listing of the DPSs as threatened or endangered (81 FR 20057). The population around American Samoa is part of the Central South Pacific DPS, which is now listed as endangered.

Table 23. Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters round the American Samoa Archipelago and consultations on the crustacean fisheries.

Common name	Scientific Name	ESA listing status in American Samoa	Occurrence in American Samoa
Listed Sea Turtles			
Green sea turtle (laumei enaena and fonu) Central South Pacific DPS	*Chelonia mydas*	Endangered DPS	Frequently seen. Nest at Rose Atoll. Known to migrate to feeding grounds.
Hawksbill sea turtle (laumei uga)	*Eretmochelys imbricata*	Endangered	Frequently seen. Nest at Rose Atoll and Swain's Island.
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Very rare in American Samoa. One recovered dead in experimental longline fishing.
Olive ridley sea turtle	*Lepidochelys olivacea*	Threatened	Uncommon in American Samoa. Three sightings.
South Pacific Loggerhead sea turtle	*Caretta caretta*	Endangered DPS	Not known to occur in American Samoa
Listed Marine Mammals			
Blue whale	*Balaenoptera musculus*	Endangered	No known sightings.
Fin whale	*Balaenoptera physalus*	Endangered	No known sightings.
Humpback whale (tafola or i`a manu)	*Megaptera novaeangliae*	Endangered	Most common during Sept. and October. Southern humpback whales mate and calve from June – Sept.

Common name	Scientific Name	ESA listing status in American Samoa	Occurrence in American Samoa
Sei whale	*Balaenoptera borealis*	Endangered	No known sightings.
Sperm whale	*Physeter macrocephalus*	Endangered	Occurs around American Samoa all months except. Feb. and March.
Listed Sea Birds			
Newell's Shearwater	*Puffinus auricularis newelli*	Threatened	Uncommon visitor
Listed Corals			
None	*Acropora globiceps*	Threatened	Present
None	*A. jacquelineae*	Threatened	Present
None	*A. retusa*	Threatened	Present
None	*A. speciosa*	Threatened	Present
None	*Euphyllia paradivisa*	Threatened	Present
None	*Isopora crateriformis*	Threatened	Present
Listed Sharks			
Scalloped hammerhead shark (Indo-West Pacific DPS)	*Puffinus auricularis newelli*	Threatened DPS	Uncommon visitor

Applicable ESA Coordination – American Samoa Crustacean Fisheries

In a letter of concurrence covering the Fishery Management Plan (FMP) for the Crustacean Fisheries of the Western Pacific, dated September 28, 2007, NMFS determined crustacean fisheries of American Samoa that operate in accordance with regulations implementing the FMP, (including the spiny and slipper lobster fisheries, and potential deep-water shrimp and Kona crab fisheries) were not likely to adversely affect ESA-listed species or their habitats.

In 2009, the Council recommended and NMFS approved the development of five archipelagic-based fishery ecosystem plans (FEPs) including the American Samoa Archipelago FEP. The FEP incorporated and reorganized elements of the Council's species-based FMPs, including the Crustacean Fisheries FMP, into a spatially-oriented management plan (75 FR 2198, January 14, 2010). All applicable regulations concerning crustacean fishing were retained through the development and implementation of the FEP for American Samoa. No substantial changes to the crustacean fishery around American Samoa have occurred since the FEP was implemented that have required further consultation under the ESA.

On July 3, 2014, NMFS published a final rule that listed four distinct population segments (DPSs) of scalloped hammerhead shark under the ESA (79 FR 38213). The threatened Indo-West Pacific DPS is the only DPS that occurs around American Samoa.

On September 10, 2014, NMFS published a final rule that listed 20 species of reef-building corals as threatened under the ESA (79 FR 53852). Of the 20 listed species, six may occur in American Samoa.

In a letter of concurrence covering the American Samoa FEP crustacean fisheries dated April 9, 2015, NMFS determined that continuation of the crustacean fisheries in American Samoa was not likely to adversely affect any threatened or endangered species, including the scalloped hammerhead shark and listed reef-building corals.

Marine Mammals

Several whales, dolphins and porpoises occur in waters around American Samoa and are protected under the MMPA. Table 24 provides a list of marine mammals known to occur or reasonably expected to occur in waters around American Samoa. See Section 4.3 for more information on the MMPA determination.

Table 24. Marine mammals known to occur or reasonably expected to occur in waters around American Samoa

Marine mammals known to occur or reasonably expected to occur in waters around American Samoa	
Common Name	**Scientific Name**
Humpback whale* (tafola or i`a manu)	*Megaptera novaeangliae*
Sperm whale*	*Physeter macrocephalus*
Blue whale*	*Balaenoptera musculus*
Fin Whale*	*Balaenoptera physalus*
Sei whale*	*Balaenoptera borealis*
Blainville's beaked whale	*Mesoplodon densirostris*
Bottlenose dolphin	*Tursiops truncatus*
Bryde's whale	*Balaenoptera edeni*
Common dolphin	*Delphinus delphis*
Cuvier's beaked whale	*Ziphius cavirostris*
Dwarf sperm whale	*Kogia sima*
False killer whale	*Pseudorca crassidens*
Fraser's dolphin	*Lagenodelphis hosei*
Killer whale	*Orcinus orca*
Melon-headed whale	*Peponocephala electra*
Minke whale	*Balaenoptera acutorostrata*
Pygmy killer whale	*Feresa attenuata*

Pygmy sperm whale	*Kogia breviceps*
Risso's dolphin	*Grampus griseus*
Rough-toothed dolphin	*Steno bredanensis*
Short-finned pilot whale	*Globicephala macrorhynchus*
Spinner dolphin	*Stenella longirostris*
Spotted dolphin (Pantropical spotted dolphin)	*Stenella attenuata*
Striped dolphin	*Stenella coeruleoalba*
Longman's beaked whale	*Indopacetus pacificus*

*Species is also listed under the Endangered Species Act.
Sources: NMFS PIRO and PIFSC unpublished data; Council website: http://www.wpcouncil.org

The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S., and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction). On April 8, 2016, NMFS published the 2016 List of Fisheries (LOF) which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). Because there is no deepwater shrimp fishery in American Samoa, NMFS has not classified this potential fishery in its LOF; however, NMFS classifies the similar Hawaii shrimp trap fishery as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, for the purposes of this EA, NMFS concludes that a deepwater shrimp fishery in the American Samoa that may occur would be comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals.

Sea Turtles

There are five Pacific sea turtles designated under the Endangered Species Act (ESA) as either threatened or endangered (Table 23) that occur in waters around American Samoa. Green and hawksbill sea turtles are most likely to frequent nearshore habitat when foraging around American Samoa. The breeding populations of Mexico's olive ridley sea turtles (*Lepidochelys olivacea*) are currently listed as endangered, while all other olive ridley populations are listed as threatened. This species is rare in American Samoa but one dead olive ridley turtle was found to have been injured by a shark and may have recently laid eggs. Leatherback sea turtles (*Dermochelys coriacea*) and hawksbill turtles (*Eretmochelys imbricata*) are also classified as endangered. Loggerhead (*Caretta caretta*) and green (Chelonia mydas) sea turtles in the South Pacific Ocean were recently identified as members of a distinct population segment (South Pacific Ocean) and listed as endangered. These five species of sea turtles are highly migratory, or have a highly migratory phase in their life history (NMFS 2001).

Seabirds of American Samoa

Seabirds found on and around American Samoa that could potentially interact with fisheries are listed in Table 25. There have been no reports of adverse interactions between any American Samoa crustacean fishery and migratory birds.

Table 25. Seabirds occurring in American Samoa

Resident seabirds in American Samoa		
Samoan name	**Common name**	***Scientific name***
ta'i'o	Wedge-tailed shearwater	*Puffinus pacificus*
ta'i'o	Audubon's shearwater	*Puffinus lherminieri*
ta'i'o	Christmas shearwater	*Puffinus nativitatis*
ta'i'o	Tahiti petrel	*Pterodroma rostrata*
ta'i'o	Herald petrel	*Pterodroma heraldica*
ta'i'o	Collared petrel	*Pterodroma brevipes*
fua'o	Red-footed booby	*Sula sula*
fua'o	Brown booby	*Sula leucogaster*
fua'o	Masked booby	*Sula dactylatra*
tava'esina	White-tailed tropicbird	*Phaethon lepturus*
tava'e'ula	Red-tailed tropicbird	*Phaethon rubricauda*
atafa	Great frigatebird	*Fregata minor*
atafa	Lesser frigatebird	*Fregata ariel*
gogouli	Sooty tern	*Onychoprion fuscatus*
gogo	Brown noddy	*Anous stolidus*
gogo	Black noddy	*Anous minutus*
laia	Blue-gray noddy	*Procelsterna cerulea*
manu sina	White tern / Common fairy-tern	*Gygis alba*

Note: An uncommon visitor in American Samoa is the ta'i'o, or Newell's shearwater.
Source: WPFMC 2009a

Newell's shearwater (*Puffinus auricularis newelli*) is listed as threatened under the ESA. Generally known with other shearwaters and petrels as ta`i`o in Samoan, this species breeds only in colonies on the main Hawaiian Islands. Newell's shearwater has been sighted once in American Samoa, but the species has also been observed in other parts of the western and South Pacific. It is considered an uncommon visitor to the archipelago.

Potential Effects of the Proposed ACL and AM specifications on Protected Species in American Samoa

To date, there has not been a deepwater shrimp fishery around American Samoa. None of the alternatives considered is expected to create a fishery or modify any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

Because the proposed action alternatives do not include an in-season fishery closure, none of the alternatives would modify operations of the American Samoa deepwater shrimp fisheries in any way, and there is no additional information that would change the conclusions of previous informal consultations which determined that the American Samoa deepwater shrimp fishery is not likely to adversely affect listed species. Neither alternative would modify the deepwater

shrimp fishery in any way that would require new consultations under the ESA or MMPA. Neither would result in changes to fishing that would affect seabirds.

3.1.3 CNMI Deepwater Shrimp Fishery, Affected Resources and Potential Effects

3.1.3.1 Affected Target, Non-Target Stocks and Bycatch in the CNMI

Shrimp trapping surveys conducted by NMFS at 22 islands and banks in the Mariana Archipelago between 1982 and 1984 reported the presence of all eight species of *Heterocarpus: Heterocarpus ensifer, H. laevigatus* and *H. longirostris* comprised 99 percent of the catch while *H. tricarinatus, H. gibbosus* and *H. sibogae* were rare (Moffitt and Polovina 1987). *H. ensifer* was found at depths between 350-550 m, *H. laevigatus* at depths between 500-900 m, and *H. longirostrus* at depths of 900 m and greater. *H. laevigatus* had the highest CPUE at 2.33 kg/trap and was also recorded as the largest of the shrimp caught, with an average carapace length of 38.2 mm (size range: 13-61mm). Based on an equilibrium yield assessment conducted by NMFS Southwest Fisheries Science Center in 1987, the most current estimate of maximum sustainable yield (MSY) for the deepwater shrimp stock complex in the CNMI is 137.4 mt/yr or 302,830 lb/yr (Moffitt and Polovina 1987) and is presented in Table 4.

Bycatch in CNMI's deepwater shrimp fishery was reported during the commercial operations that occurred between May 1994 and February 1996 and included a few deepwater eels (*Synaphobranchus* sp.) and dogfish sharks. A large number of two species of geryonid crabs were also caught. The crabs are a marketable incidental catch and could contribute to the success of any deepwater shrimp fishery (WPFMC 2008).

Current impacts of the fishery: target, non-target and bycatch species

Currently, there is no fishery for deepwater shrimp in the CNMI. Small amounts of catch were reported in 2001, 2005, and 2006 as local fishermen explored re-invigorating the deepwater shrimp fishery; however this data cannot be reported due to requirements to protect the confidentiality of fishery information. No catches have been reported from local waters since then. Currently, there is little information about bycatch associated with this fishery, and what is known comes primarily from research fishing in the CNMI where species such as deepwater eels (*Synaphobranchus* sp.), dogfish sharks and geryonid crabs have been reportedly caught (WPFMC 2008). However, research findings did not report whether the bycatch was released alive or dead. The sporadic nature of the fishery means that bycatch is considered sustainable in this fishery.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in the CNMI

<u>Alternative 1: No Management Action</u>

Under the no-action alternative, an ACL would not be specified for the CNMI deepwater shrimp fishery and AMs would not be necessary. Based on past fishery performance in the past decade, it is expected that fishing is not likely to occur in 2016 – 2018, as no catch has been reported

since 2006. Catches, if they were to occur, could be similar to the maximum reported catches of approximately 27,000 lb taken between May 1994 and February 1996, 97 percent of which were *Heterocarpus laevigatus.* Catches would continue to be monitored through fisheries monitoring programs administered by CNMI DFW. The status of CNMI deepwater shrimp would continue to be subject to ongoing discussion and review by NMFS and the Council.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 275,575 lb of deepwater shrimp in fishing years 2016 – 2018. This ACL is equal to the ABC recommended by the Council's SSC and is 91% of MSY. The proposed ACL specifications are substantially higher than recent commercial landings. If a fishery were to re-develop, catch would not likely exceed the proposed ACLs, and therefore, would not result in a race to fish. Because no in-season monitoring can be done, and therefore, no in-season closure is possible at this time, the proposed ACLs and AMs are not expected to change the conduct of the fishery, including types of gear, areas fished, effort, or participation.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 247,018 lb of deepwater shrimp, which is 82% of MSY. If a fishery were to re-develop, catch would not likely exceed the proposed ACLs, and therefore, would not result in a race to fish. Because no in-season monitoring can be done, and therefore no in-season closure is possible at this time, the proposed ACLs and AMs are not expected to change the conduct of the fishery, including types of gear, areas fished, effort, or participation.

Under all alternatives considered, including the proposed action, no new monitoring of CNMI deepwater shrimp is required to be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and adversely affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council, which could include a downward adjustment to the ACL in the subsequent fishing year.

The post-season review of catch relative to the proposed ACL is part of the AM designed to prevent the fishery from becoming overfished. The additional level of post season review of the catch would also provide an enhanced level of management review of the fishery compared with Alternative 1, and would provide an opportunity for the Council to refine ACL and AM specifications, as needed. Therefore, the proposed ACL and AMs are expected to promote long-term sustainability in the CNMI deepwater shrimp fishery.

3.1.3.2 Affected Fishery Participants in the CNMI

Overview of CNMI Deepwater Shrimp Fishery

A directed fishery for deepwater shrimp in the CNMI began in mid-1994, but lasted only two years. One of two companies involved stopped fishing in mid-1995, after fishing for a total of 193 days. The fishery is sporadic in nature due to gear loss, short product shelf life, and inconsistent fishery product quality, and due to local depletion that is generally experienced on known fishing grounds which leads to lower catch rates. Between May 1994 and February 1996, 27,000 lb. of deepwater shrimp were landed in the CNMI, with an approximate value of $162,000. Of the species landed, more than 97 percent were *Heterocarpus laevigatus.* The remainder of the catch was comprised of *Heterocarpus ensifer* (WPFMC 2008). A small amount of catch was reported in 2001, 2005, and 2006 as local fishermen explored re-invigorating the deepwater shrimp fishery; however this data cannot be reported in order to protect the confidentiality of fishery data. No catch has been reported from local waters since 2006. There is currently no Federal crustacean permits issued for deepwater shrimp harvest in the CNMI.

Because no landings of deepwater shrimp have been reported since 2006, there is no economic value for this fishery at present.

Potential Effects of the Proposed ACL specification and AM on CNMI's Deepwater Shrimp Fishery Participants

Alternative 1: No Management Action

Under the no-action alternative, which is the baseline alternative, the CNMI deepwater shrimp fishery would not be managed using ACLs, AMs would not be needed, and fishing would continue to be monitored by the CNMI DFW, NMFS, and the Council. Fisheries statistics would become available approximately six months or longer after the data have been initially collected. Fishing could occur on a sporadic basis. Effort and catch would be monitored through permits and logbooks, and voluntary vendor reports.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 275,575 lb of deep water shrimp in fishing years 2016 – 2018. This ACL is equal to the ABC recommended by the Council's SSC. Currently, there is no fishery for deepwater shrimp in the CNMI. Small amounts of catch were reported in 2001, 2005, and 2006 but cannot be reported because of the requirement to protect confidential fishery information. The proposed ACL would be several orders of magnitude higher than this level of catch.

If a fishery were to re-develop, catch would not likely exceed the proposed ACLs, and therefore, would not result in a race to fish. Because no in-season monitoring can be done, and therefore no in-season closure is possible at this time, the proposed ACLs and AMs are not expected to change the conduct of the fishery, including types of gear, areas fished, effort, or participation.

The AM for the CNMI deepwater shrimp fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL were to be exceeded and found to be adversely affecting deepwater shrimp stocks, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available. Management under ACLs and AMs regime is expected to result in long-term sustainability of the fishery.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 247,018 lb which is 90% of the ABC (275,575 lb) and 82% of MSY. An ACL at this level is expected to have impacts that are generally similar to Alternative 2, except that the potential to exceed ACL is slightly higher under Alternative 3. If the ACL were to be exceeded, the post-season review by NMFS and the Council would provide additional evaluation of the reasons the ACL was exceeded, and allow the Council to consider future management adjustments. Because there is no in-season fishery management action, such as a closure, this alternative would not have an effect on fishery participants and fishing would be the same as under Alternative 1. Management under ACLs and AMs regime is expected to result in long-term sustainability of the fishery.

3.1.3.3 Affected Protected Resources in the CNMI

A number of protected species are reported from the waters around the Mariana Islands and there is, therefore, the potential for interactions with the crustacean fisheries of the CNMI. The crustacean fisheries of the Pacific Islands Region have been evaluated for impacts on protected resources and are managed in compliance with the requirements of the Magnuson-Stevens Act, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act, and other applicable statutes. For the reader's interest, additional detailed descriptions of potentially affected protected resources and their life histories can be found in Section 3.3.4 of the FEP for the Mariana Archipelago (WPFMC 2009b).

Listed species and ESA review of the CNMI Crustacean Fisheries

Table 26 identifies species listed as endangered or threatened under the ESA that are known to occur or could reasonably be expected to occur in marine waters around the Mariana Archipelago, including the CNMI, which may have the potential to interact with fisheries. They include a number of whales, five sea turtles, and a seabird. There is no critical habitat designated for ESA-listed marine species around the CNMI.

Table 26. Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters around the Mariana Archipelago (CNMI)

Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters around the Mariana Archipelago (CNMI)			
Common name	**Scientific Name**	**ESA listing status in the CNMI**	**Occurrence in the CNMI**
Listed Sea Turtles			
Green sea turtle Central West Pacific DPS	*Chelonia mydas*	Endangered DPS	Most common turtle in the Mariana Archipelago. Foraging and minor nesting confirmed on Guam, Rota, Tinian and Saipan.
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	Small population foraging around Guam and suspected low level around southern islands of CNMI. Low level nesting on Guam.
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Occasional sightings around Guam. Not known to what extent they are present around Guam and CNMI
Olive ridley sea turtle	*Lepidochelys olivacea*	Threatened	Range across Pacific: not confirmed in the Mariana Archipelago
North Pacific loggerhead sea turtle	*Caretta caretta*	Endangered DPS	No known reports of loggerhead turtles in waters around the Mariana Archipelago
Listed Marine Mammals			
Blue whale	*Balaenoptera musculus*	Endangered	Extremely rare
Fin whale	*Balaenoptera physalus*	Endangered	Infrequent sightings.
Humpback whale - Western North Pacific DPS	*Megaptera novaeangliae*	Endangered DPS	Infrequent sightings. Winter in the CNMI.
Sei whale	*Balaenoptera borealis*	Endangered	Infrequent sightings.
Sperm whale	*Physeter macrocephalus*	Endangered	Regularly sighted; most abundant large cetaceans in the region.
Listed Sea Birds			
Newell's Shearwater	*Puffinus auricularis newelli*	Threatened	Rare visitor

Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters around the Mariana Archipelago (CNMI)			
Common name	**Scientific Name**	**ESA listing status in the CNMI**	**Occurrence in the CNMI**
Listed Sharks			
Scalloped Hammerhead Shark – Indo-West Pacific DPS	*Sphyrna lewini*	Threatened DPS	Common
Listed Corals			
None	*Acropora globiceps*	Threatened	Present
None	*Seriatopora aculeata*	Threatened	Present

Applicable ESA Coordination – CNMI Crustacean Fisheries

In a letter of concurrence covering the Fishery Management Plan (FMP) for the Crustacean Fisheries of the Western Pacific, dated September 28, 2007, NMFS determined crustacean fisheries of the CNMI that operate in accordance with regulations implementing the FMP, inclusive of the spiny and slipper lobster fisheries, deepwater shrimp fisheries, and potential Kona crab fisheries were not likely to adversely affect ESA-listed species or their habitats.

In 2009, the Council recommended and NMFS approved the development of five archipelagic-based fishery ecosystem plans (FEPs) including the Mariana Archipelago FEP. The FEP incorporated and reorganized elements of the Council's species-based FMPs, including the Crustaceans FMP, into a spatially-oriented management plan (75 FR 2198, January 14, 2010). All applicable regulations concerning crustacean fishing were retained through the development and implementation of the FEP for the Mariana Archipelago, including the CNMI. No substantial changes to the crustacean fishery around the CNMI have occurred since the FEP was implemented that have required further consultation.

On July 3, 2014, NMFS published a final rule that listed four distinct population segments (DPSs) of scalloped hammerhead shark under the ESA (79 FR 38213). The threatened Indo-West Pacific DPS is the only DPS that occurs around the CNMI.

On September 10, 2014, NMFS published a final rule that listed 20 species of reef-building corals as threatened under the ESA (79 FR 53852). Of the 20 listed species, two species occur in the Mariana Archipelago.

In a letter of concurrence covering the Marianas FEP crustacean fisheries dated April 29, 2015, NMFS determined that continuation of the crustacean fishery in the CNMI was not likely to adversely affect any threatened or endangered species, including the scalloped hammerhead shark DPS and listed reef-building corals.

Marine Mammals

Several whales, dolphins, and porpoises occur in waters around the CNMI and are protected under the MMPA. Table 27 provides a list of marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago that have the potential to interact with the CNMI crustacean fishery. See Section 4.3 for more information on the MMPA determination for this fishery

Table 27. Marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago (CNMI)

Marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago (CNMI)	
Common Name	**Scientific Name**
Humpback whale*	*Megaptera novaeangliae*
Sperm whale*	*Physeter macrocephalus*
Sei whale*	*Balaenoptera borealis*
Fin whale*	*Balaenoptera physalus*
Blue whale*	*Balaenoptera musculus*
Blainville's beaked whale	*Mesoplodon densirostris*
Bottlenose dolphin	*Tursiops truncates*
Bryde's whale	*Balaenoptera edeni*
Common dolphin	*Delphinus delphis*
Cuvier's beaked whale	*Ziphius cavirostris*
Dwarf sperm whale	*Kogia sima*
False killer whale	*Pseudorca crassidens*
Fraser's dolphin	*Lagenodelphis hosei*
Killer whale	*Orcinus orca*
Longman's beaked whale	*Indopacetus pacificus*
Melon-headed whale	*Peponocephala electra*
Minke whale	*Balaenoptera acutorostrata*
Northern elephant Seal	*Mirounga angustirostris*
Pilot whale	*Globicephala malaena*
Pygmy killer whale	*Feresa attenuate*
Pygmy sperm whale	*Kogia breviceps*
Risso's dolphin	*Grampus griseus*
Rough-toothed dolphin	*Steno bredanensis*
Short-finned pilot whale	*Globicephala macrorhynchus*

Marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago (CNMI)	
Common Name	**Scientific Name**
Spinner dolphin	*Stenella longirostris*
Spotted dolphin	*Stenella attenuate*
Striped dolphin	*Stenella coeruleoalba*

Species is also listed under the Endangered Species Act.
Source: Eldredge 2003, Randall et al. 1975, Pyle and Pyle 2005, Council website: http://www.wpcouncil.org

The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S., and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction). On April 8, 2016, NMFS published the final List of Fisheries (LOF) for 2016 which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). Because there is no deepwater shrimp fishery in the CNMI, NMFS has not classified this potential fishery in its LOF; however, NMFS classifies the similar Hawaii shrimp trap fishery as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, for the purposes of this EA, NMFS concludes that a deepwater shrimp fishery in the CNMI that may occur would be comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals.

In 2008, NMFS also concluded that the CNMI deepwater shrimp fishery, conducted on a small scale and sporadic level as in the mid-1990's, will not affect marine mammals in a manner not considered or authorized by the commercial fishing take exemption under section 118 of the MMPA.

Sea Turtles

There are five Pacific sea turtles designated under the Endangered Species Act (ESA) as either threatened or endangered. Green sea turtles are most likely to frequent nearshore habitat when foraging around Guam and other areas in the Mariana Islands. The breeding populations of Mexico's olive ridley sea turtles (*Lepidochelys olivacea*) are currently listed as endangered, while all other olive 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 (Chelonia mydas) sea turtles were recently identified as part of a distinct population segment (North Pacific Ocean) and listed as endangered. These five species of sea turtles are highly migratory, or have a highly migratory phase in their life history (NMFS 2001).

Based on nearshore surveys conducted jointly between the CNMI–DFW and NMFS around the southern Mariana Islands (Rota and Tinian 2001; Saipan 1999), an estimated 1,000 to 2,000 green sea turtles forage in these areas (Kolinski et al., 2001). Nesting beaches and seagrass beds

on Tinian and Rota are in good condition but beaches and seagrass beds around Saipan have been impacted by hotels, golf courses and general tourist activities. Intensive monitoring in occurred on Saipan at seven beaches from March 4 to August 31, 2009 resulting in 16 green turtle nests documented. Rapid assessments at Rota beaches Okgok and Tatgua on July 12, 2009 yielded 13 nests. On Tinian, from July 22-31, 2009, 36 nests at five beaches were documented (Maison et al. 2010). There have been occasional sightings of leatherback turtles around Guam (Eldredge 2003); however, the extent to which leatherback turtles are present around the Mariana Archipelago is unknown. There are no known reports of loggerhead turtles in waters around the Mariana Archipelago (WPFMC 2009b). Olive ridley sea turtles are believed to occasionally transit the area (Starmer et al. 2005).

On September 22, 2011, NMFS and the U.S. Fish and Wildlife Service (USFWS) determined that the loggerhead sea turtle population (Caretta caretta) is composed of nine distinct population segments (DPS) that constitute ‘‘species’’ that may be listed as threatened or endangered under the ESA (76 FR 58868). Specifically, NMFS and USFWS determined that the loggerhead sea turtles in the North Pacific Ocean, which includes waters around the CNMI, are a distinct population segment (DPS) that is endangered and at risk of extinction. However, because loggerhead sea turtles, inclusive of the North Pacific Ocean DPS, are not known to nest or even transit the waters around the Mariana Archipelago, and because none of the action alternatives would modify operations of the CNMI crustacean fisheries in any way, there is no additional information that would change the conclusions of the September 28, 2007 informal consultation. The informal consultation concluded that the CNMI crustacean fisheries were not likely to adversely affect ESA-listed marine species or their designated critical habitat.

Seabirds

The following seabirds in Table 28 are considered residents of Mariana Archipelago: wedge-tailed shearwater (*Puffinus pacificus*), white-tailed tropicbird (*Phaethon lepturus*), red-tailed tropicbird (*Phaethon rubricauda*), masked booby (S*ula dactylatra*), brown booby (*Sula leucogaster*), red-footed booby (*Sula sula*), white tern (*Gygis alba),* sooty tern (*Onychoprion fuscatus*), brown noddy (*Anous stolidus*), black noddy (*Anous minutus*), and the great frigatebird (*Fregata minor*).

The following seabirds in Table 28 have been sighted and are considered visitors (some more common than others) to the Mariana Archipelago: short-tailed shearwater (*Puffinus tenuirostris* - common visitor), Newell’s shearwater (*Puffinus auricularis*- rare visitor), Audubon’s shearwater (*Puffinus iherminieri*), Leach’s storm-petrel (*Oceanodroma leucorhoa*), and the Matsudaira’s storm-petrel (*Oceanodroma matsudairae*). Of these, only the Newell’s shearwater is listed (as threatened) under the ESA. There have been no sightings of the endangered short-tailed albatross (*Phoebastria albatrus*) in the CNMI although CNMI is within the range of the species’ largest breeding colony at Torishima, Japan (WPFMC 2009b). There are no known interactions between seabirds and any of the Mariana Archipelago crustacean fisheries (WPFMC 2009b).

Table 28. Seabirds occurring in the Mariana Archipelago (CNMI)

Seabirds of the Mariana Archipelago (R= Resident/Breeding; V= Visitor; Vr=rare visitor; Vc= Common visitor)		
	Common name	***Scientific name***
Vr	Newell's shearwater	*Puffinus auricularis newelli* (ESA:Threatened) rare visitor
R	Wedge-tailed shearwater	*Puffinus pacificus*
V	Audubon's shearwater	*Puffinus lherminieri*
Vc	Short-tailed shearwater	*Puffinus tenuirostris* (common visitor)
V	Leach's storm-petrel	*Oceanodroma leucorhoa*
V	Matsudaira's storm-petrel	*Oceanodroma matsudairae*
R	Red-footed booby	*Sula sula*
R	Brown booby	*Sula leucogaster*
R	Masked booby	*Sula dactylatra*
R	White-tailed tropicbird	*Phaethon lepturus*
R	Red-tailed tropicbird	*Phaethon rubricauda*
R	Great frigatebird	*Fregata minor*
R	Sooty tern	*Onychoprion fuscatus*
R	Brown noddy	*Anous stolidus*
R	Black noddy	*Anous minutus*
R	White tern / Common fairy-tern	*Gygis alba*

Source: WPFMC 2009b

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in the CNMI

Although the action alternative would implement ACLs and AMs, without an in-season closure, none of the alternatives would modify operations of the CNMI deepwater shrimp fishery in any way that would be expected to affect endangered or threatened species or critical habitat. Therefore, the existing MMPA and ESA consultations would continue to be applicable.

While Alternatives 2 and 3 would implement ACLs and a post-season review of the catch relative to the ACL, managing the deepwater shrimp fishery for up to three year using an ACL and AM specification regime (Alternative 1) that is intended to promote long term sustainability of the fishery stock. Additionally, there is currently no means of conducting in-season monitoring of catch towards an ACL, and this precludes managers from implementing an in-season closure. This means that participants in the CNMI deepwater shrimp fishery would continue to fish as they do under the current management regime. However, because this fishery is currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the preferred alternative (Alternative 2) would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.1.4 Guam Deepwater Shrimp Fishery Potentially Affected Resources and Potential Effects

3.1.4.1 Potentially Affected Target, Non-target and Bycatch Species in Guam

Shrimp trapping surveys conducted by NMFS at 22 islands and banks in the Mariana Archipelago between 1982 and 1984 reported the presence of all eight species of *Heterocarpus: Heterocarpus ensifer, H. laevigatus* and *H. longirostris* comprised 99 percent of the catch while *H. tricarinatus, H. gibbosus* and *H. sibogae* were rare (Moffitt and Polovina 1987). *H. ensifer* was found at depths between 350-550 m, *H. laevigatus* at depths between 500-900 m, and *H. longirostrus* at depths of 900 m and greater. *H. laevigatus* had the highest CPUE at 2.33 kg/trap (max) and was also recorded as the largest of the shrimp caught, with an average carapace length of 38.2 mm (size range: 13-61mm). Based on an equilibrium yield assessment conducted by NMFS Southwest Fisheries Science Center in 1987, the most current estimate of maximum sustainable yield (MSY) for the deepwater shrimp stock complex in the Guam is 24.1 mt/yr or 53,116 lb/yr (Moffitt and Polovina 1987) and is presented in Table 4. This estimate is based on habitat areas around the Island of Guam and its offshore banks of Galvez and Santa Rosa.

Information on bycatch in Guam shrimp trap fishery is lacking because there has never been a fishery; however, if a fishery were to develop, bycatch could be similar to that of the CNMI research fishing which reported species such as deepwater eels (*Synaphobranchus* spp.), dogfish sharks and geryonid crabs have been reportedly caught (WPFMC 2008). However, research findings did not report whether the bycatch was released alive or dead. Because there is no fishery, there are no concerns about the sustainability of bycatch.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Guam

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the Guam deepwater shrimp fishery and AMs would not be necessary. Catches, if they were to occur, could be similar to the maximum catches of approximately 27,000 lb taken in the CNMI between May 1994 and February 1996. Catches would be tracked through existing fisheries monitoring programs administered by Guam DAWR and the status of Guam's deepwater shrimp stocks would be subject to discussion and review by NMFS and the Council. Fishing for deepwater shrimp would likely be sporadic and not result in overfishing. Based on the past fishery in the CNMI, the potential impacts on non-target (bycatch) species under the no-action Alternative would likely also not result in large adverse effects to potential bycatch stocks of dogfish sharks and eels or geryonid crabs.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 48,488 lb for Guam deepwater shrimp in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC. Although there has never been a deepwater shrimp fishery in Guam, there could be a fishery that begins that would be subject to the ACL and AM requirements. With no in-season closure, the ACLs and AMs would not constrain future fishing; however, managing the fishery with ACLs and AMs is part of an overall management scheme designed to ensure long-term sustainability of the resources.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 43,639 lb for Guam deepwater shrimp in fishing year 2016 – 2018. The impacts under Alternative 3 would be identical to Alternative 2.

Under all alternatives considered, including the proposed action, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL is exceeded and affects the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would establish a limit on the amount of shrimp that may be harvested annually where none previously existed. While fishery managers lack the ability to monitor catch in-season and, therefore, cannot effect a fishery closure to prevent the ACL from being exceeded, the post-season review of catch relative to the proposed ACL is part of the fishery management and is designed to prevent shrimp stocks from becoming overfished. The additional level of post season review of the catch under Alternatives 2 and 3 would provide an enhanced level of management review of the fishery compared to Alternative 1 and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.1.4.2 Affected Fishery Participants in Guam

Overview of Guam's Deepwater Shrimp Fishery

A small-scale fishery for deepwater shrimp occurred in the 1970s, but ended shortly thereafter. No fishing or landings have been reported since. There is currently no Federal crustacean permits issued for deepwater shrimp harvest in Guam and no reports of harvest reported from local waters in recent time.

Potential Effects of the Proposed ACL and AM Specifications on Guam's Deepwater Shrimp Fishery Participants

To date, there has not been a deepwater shrimp fishery in Guam; therefore, there is no fishery participant that could be affected by any of the alternatives considered. However, it is possible for a fishery to occur on an intermittent basis.

Under each alternative, fishery managers would monitor catches. Monitoring would help ensure long-term sustainability of the fishery so there would be a positive effect on fishery participants. Alternatives 2 and 3 would provide additional review of any catches in comparison to the ACL.

However, without an in-season fishery closure, neither of the proposed action alternatives would affect fishing for deepwater shrimps. In general, additional management review of fisheries would promote long-term sustainability of the fishery so there would be a positive effect on fishery participants.

3.1.4.3 Affected Protected Resources in Guam

A number of protected species are reported from the waters around the Mariana Islands and there is, therefore, the potential for interactions with the fisheries of Guam. The crustacean fisheries of the Pacific Islands Region have been evaluated for impacts on protected resources and are managed in compliance with the requirements of the Magnuson-Stevens Act, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act, and other applicable statutes. For the readers' interest, additional detailed descriptions of potentially affected protected resources and their life histories can be found in Section 3.3.3 of the FEP for the Mariana Archipelago (WPFMC 2009b).

Listed species and ESA review of Guam's Crustacean Fisheries

Table 29 identifies species listed as endangered or threatened under the ESA that are known to occur or could reasonably be expected to occur in marine waters around the Mariana Archipelago, including Guam, which may have the potential to interact with fisheries. They include a number of whales, five sea turtles, and a seabird. There is no critical habitat designated for ESA-listed marine species around Guam.

Table 29. Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters around the Mariana Archipelago (Guam)

Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters around the Marina Archipelago (Guam)			
Common name	**Scientific Name**	**ESA listing status in Guam**	**Occurrence in Guam**
Listed Sea Turtles			
Green sea turtle Haggan Betde	*Chelonia mydas*	Threatened	Most common turtle in the Mariana Archipelago. Foraging and minor nesting confirmed

Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters around the Marina Archipelago (Guam)			
Common name	**Scientific Name**	**ESA listing status in Guam**	**Occurrence in Guam**
			on Guam, Rota, Tinian and Saipan.
Hawksbill sea turtle Haggan Karai	*Eretmochelys imbricata*	Endangered	Small population foraging around Guam and suspected low level around southern islands of CNMI. Low level nesting on Guam.
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Occasional sightings around Guam. Not known to what extent they are present around Guam and CNMI
Olive ridley sea turtle	*Lepidochelys olivacea*	Threatened	Range across Pacific:limited occurrence confirmed in the Mariana Archipelago
North Pacific Loggerhead sea turtle	*Caretta caretta*	Endangered Distinct Population Segment	No known reports of loggerhead turtles in waters around the Mariana Archipelago.
Listed Marine Mammals			
Blue whale	*Balaenoptera musculus*	Endangered	Extremely rare
Fin whale	*Balaenoptera physalus*	Endangered	Infrequent sightings.
Humpback whale-Western North Pacific DPS	*Megaptera novaeangliae*	Endangered DPS	Infrequent sightings. Winter in the CNMI.
Sei whale	*Balaenoptera borealis*	Endangered	Infrequent sightings.
Sperm whale	*Physeter macrocephalus*	Endangered	Regularly sighted
Listed Sea Birds			
Newell's Shearwater	*Puffinus auricularis newelli*	Threatened	Rare visitor
Listed Sharks			
Scalloped Hammerhead Shark – Indo-West Pacific DPS	*Sphyrna lewini*	Threatened DPS	Common

Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters around the Marina Archipelago (Guam)			
Common name	**Scientific Name**	**ESA listing status in Guam**	**Occurrence in Guam**
Listed Corals			
None	*Acropora globiceps*	Threatened	Present
None	*A. retusa*	Threatened	Present
None	*Seriatopora aculeata*	Threatened	Present

Applicable ESA Coordination – Guam Crustacean Fisheries

In a letter of concurrence covering the Fishery Management Plan (FMP) for the Crustacean Fisheries of the Western Pacific, dated September 28, 2007, NMFS determined crustacean fisheries of Guam that operate in accordance with regulations implementing the FMP(including the spiny and slipper lobster fisheries, and potential deepwater shrimp and Kona crab fisheries) were not likely to adversely affect ESA-listed species or their habitats.

In 2009, the Council recommended and NMFS approved the development of five archipelagic-based fishery ecosystem plans (FEPs) including the Mariana Archipelago FEP. The FEP incorporated and reorganized elements of the Council's species-based FMPs, including the Crustacean Fisheries FMP, into a spatially-oriented management plan (75 FR 2198, January 14, 2010). All applicable regulations concerning crustacean fishing were retained through the development and implementation of the FEP for the Mariana Archipelago. No substantial changes to the crustacean fishery around Guam have occurred since the FEP was implemented that have required further consultation under the ESA.

On September 22, 2011, NMFS and the US Fish and Wildlife Service (USFWS) determined that the loggerhead sea turtle (*Caretta caretta*) is composed of nine distinct population segments (DPS) that constitute ''species'' that may be listed as threatened or endangered under the ESA (76 FR 58868). Specifically, NMFS and USFWS determined that the loggerhead sea turtles in the North Pacific Ocean, which encompasses waters around Guam, are a distinct population segment (DPS) that is endangered and at risk of extinction. However, because loggerhead sea turtles, inclusive of the North Pacific Ocean DPS, are not known to nest or even transit the waters around the Mariana Archipelago, and because none of the alternatives considered would modify operations of Guam crustacean fisheries in any way, there is no additional information that would change the conclusions of the September 28, 2007 informal consultation. The informal consultation determined that the Guam crustacean fisheries were not likely to adversely affect ESA-listed marine species or their designated critical habitat.

On July 3, 2014, NMFS published a final rule that listed distinct population segments (DPSs) of scalloped hammerhead shark under the ESA (79 FR 38213). The threatened Indo-West Pacific DPS is the only DPS that occurs around Guam. On September 10, 2014, NMFS published a final

rule that listed 20 species of reef-building corals as threatened under the ESA (79 FR 53852). Of the 20 listed species, three are thought to occur in the Mariana Archipelago.

In a letter of concurrence covering the Marianas FEP crustacean fisheries dated April 29, 2015, NMFS determined that continuation of the crustacean fishery in Guam was not likely to adversely affect any threatened or endangered species, including the newly listed DPS of scalloped hammerhead shark (79 FR 38214, July 3, 2014) and newly listed species of reef-building corals (79 FR 53852, September 10, 2014).

Marine Mammals

Several whales, dolphins and porpoises occur in waters around Guam and are protected under the MMPA. Table 30 provides a list of marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago that have the potential to interact with the crustacean fishery. See Section 4.3 for more information on the MMPA determination. A single dugong, listed as endangered, was observed in Cocos Lagoon, Guam in 1975 (Randall et al. 1975). Several sightings were reported in 1985 on the southeastern side of Guam (Eldredge 2003). Since that time, however no reports of dugong sightings have been made.

Table 30. Marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago - Guam

Marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago (Guam)	
Common Name	**Scientific Name**
Humpback whale*	*Megaptera novaeangliae*
Sperm whale*	*Physeter macrocephalus*
Sei whale*	*Balaenoptera borealis*
Fin whale*	*Balaenoptera physalus*
Blue whale*	*Balaenoptera musculus*
Blainville's beaked whale	*Mesoplodon densirostris*
Bottlenose dolphin	*Tursiops truncates*
Bryde's whale	*Balaenoptera edeni*
Common dolphin	*Delphinus delphis*
Cuvier's beaked whale	*Ziphius cavirostris*
Dwarf sperm whale	*Kogia sima*
Dugong*	*Dugong dugong*
False killer whale	*Pseudorca crassidens*
Fraser's dolphin	*Lagenodelphis hosei*
Killer whale	*Orcinus orca*
Longman's beaked whale	*Indopacetus pacificus*
Melon-headed whale	*Peponocephala electra*
Minke whale	*Balaenoptera acutorostrata*

Marine mammals known to occur or reasonably expected to occur in waters around the Mariana Archipelago (Guam)	
Common Name	**Scientific Name**
Pygmy killer whale	*Feresa attenuate*
Pygmy sperm whale	*Kogia breviceps*
Risso's dolphin	*Grampus griseus*
Rough-toothed dolphin	*Steno bredanensis*
Short-finned pilot whale	*Globicephala macrorhynchus*
Sperm whale	*Physeter macrocephalus*
Spinner dolphin	*Stenella longirostris*
Spotted dolphin	*Stenella attenuate*
Striped dolphin	*Stenella coeruleoalba*

*Species is also listed under the Endangered Species Act.
Source: Eldredge 2003, Randall et al. 1975, (Guam DAWR 2005), Council website: http://www.wpcouncil.org

The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S., and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction). On April 8, 2016, NMFS published the final List of Fisheries (LOF) for 2016 which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). Because there is no deepwater shrimp fishery in Guam, NMFS has not classified this potential fishery in its LOF; however, NMFS classifies the similar Hawaii shrimp trap fishery as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, for the purposes of this EA, NMFS concludes that a deepwater shrimp fishery in Guam that may occur would be comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals

Sea Turtles

There are five Pacific sea turtles designated under the Endangered Species Act (ESA) as either threatened or endangered. Green sea turtles are most likely to frequent nearshore habitat when foraging around Guam and other areas in the Mariana Islands. The breeding populations of Mexico's olive ridley sea turtles (*Lepidochelys olivacea*) are currently listed as endangered, while all other olive 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 (Chelonia mydas) sea turtles in the North Pacific Ocean were identified as part of a distinct population segment (North Pacific Ocean) and listed as endangered. These five species of sea turtles are highly migratory, or have a highly migratory phase in their life history (NMFS 2001).

Nesting surveys for green sea turtles have been done on Guam since 1973 with the most consistent data collected between 1990 and 2001 (Cummings 2002). Survey results show nesting in Guam to be generally increasing with 1997 having the most numerous nesting females at 60

(Cummings 2002). From October 1, 2006 through July 31, 2008, 55 green turtle nests were counted at various beaches during opportunistic surveys throughout Guam (Guam DAWR 2009). Aerial surveys done in 1990–2000 also found an increase in green sea turtle sightings around Guam with over 200 turtles counted in 2000 (Cummings 2002). There have been occasional sightings of leatherback turtles around Guam (Eldredge 2003); however, the extent to which leatherback turtles are present around the Mariana Archipelago is unknown. There are no known reports of loggerhead turtles in waters around the Mariana Archipelago (WPFMC 2009b). Olive ridley sea turtles are believed to occasionally transit the area (Starmer et al. 2005).

Seabirds

The following seabirds are considered residents of Mariana Archipelago: wedge-tailed shearwater (*Puffinus pacificus*), white-tailed tropicbird (*Phaethon lepturus*), red-tailed tropicbird (*Phaethon rubricauda*), masked booby (S*ula dactylatra*), brown booby (*Sula leucogaster*), red-footed booby (*Sula sula*), white tern (*Gygis alba),* sooty tern (*Onychoprion fuscatus*), brown noddy (*Anous stolidus*), black noddy (*Anous minutus*), and the great frigatebird (*Fregata minor*). However, According to Wiles (2003), the only resident seabirds on Guam are the brown noddy and the white tern.

The following seabirds in Table 31 have been sighted and are considered visitors (some more common than others) to the Mariana Archipelago; short-tailed shearwater (*Puffinus tenuirostris;* common visitor), Newell's shearwater (*Puffinus auricularis;* rare visitor), Audubon's shearwater (*Puffinus iherminieri*), Leach's storm-petrel (*Oceanodroma leucorhoa*), and the Matsudaira's storm- Petrel(*Oceanodroma matsudairae*). Of these, only the Newell's shearwater is listed as threatened under the ESA. There have been no sightings of the endangered short-tailed albatross (*Phoebastria albatrus*) in Guam although Guam s within the range of the largest breeding colony at Torishima, Japan (WPFMC 2009b).

There are no known interactions between seabirds and any of the Mariana Archipelago crustacean fisheries (WPFMC 2009b).

Table 31. Seabirds occurring in the Mariana Archipelago (Guam)

Seabirds of the Mariana Archipelago (R= Resident/Breeding; V= Visitor; Vr=rare visitor; Vc= Common visitor)		
	Common name	***Scientific name***
Vr	Newell's shearwater	*Puffinus auricularis newelli (ESA:Threatened)*
Vr	Wedge-tailed shearwater	*Puffinus pacificus*
V	Audubon's shearwater	*Puffinus lherminieri*
Vc	Short-tailed shearwater	*Puffinus tenuirostris (common visitor)*
V	Leach's storm-petrel	*Oceanodroma leucorhoa*
Vr	Matsudaira's storm-petrel	*Oceanodroma matsudairae*
Vr	Red-footed booby	*Sula sula*
Vr	Brown booby	*Sula leucogaster*
V	Masked booby	*Sula dactylatra*
Vr	White-tailed tropicbird	*Phaethon lepturus*

Seabirds of the Mariana Archipelago (R= Resident/Breeding; V= Visitor; Vr=rare visitor; Vc= Common visitor)		
	Common name	***Scientific name***
Vr	Red-tailed tropicbird	*Phaethon rubricauda*
Vr	Great frigatebird	*Fregata minor*
Vr	Sooty tern	*Onychoprion fuscatus*
R	Brown noddy	*Anous stolidus*
V	Black noddy	*Anous minutus*
R	White tern / Common fairy-tern	*Gygis alba*

Source: WPFMC 2009b

Potential Effects of the Proposed ACL and AM specifications on Protected Species in Guam

A small-scale fishery for deepwater shrimp occurred in the 1970s, but ended shortly thereafter. No fishing or landings have been reported since. There are currently no Federal crustacean permits issued for deepwater shrimp harvest in Guam and no reports of harvest reported from local waters in recent time. NMFS recognizes that it is possible for fishing to occur for deepwater shrimps around Guam and it could be conducted in much the same way as was done in the CNMI for a limited time. None of the alternatives considered is expected to create a fishery or modify any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.
If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.2 Crustaceans –Slipper Lobster Fisheries

Lobsters are harvested on small scales throughout the inhabited islands of the Pacific Islands Rregion. The most common crustacean harvests include lobster species of the taxonomic groups Palinuridae (spiny lobsters) and Scyllaridae (slipper lobsters). The appearance of the slipper lobster is notably different than that of the spiny lobster. Uchida and Uchiyama (1986) provided a detailed description of the morphology of slipper lobsters (*S. squammosus* and *S. haanii*) and note that the two species are very similar in appearance and are easily confused.

3.2.1 Hawaii Lobster Fishery, Affected Resources and Potential Effects

3.2.1.1 Affected Target, Non-target and Bycatch Species in Hawaii

In Hawaii, fisheries for lobsters target two species of spiny lobster and several species of slipper lobsters, although two species, the common slipper lobster (*Scyllarides squammosus*) and the ridgeback slipper lobster (*Scyllarides haanii*) are the principle species harvested. Gear types used in Hawaii's lobster fisheries include traps, nets and hand harvest, with the latter being the

preferred method in recent years and accounting for nearly 80 percent of reported landings between 1994 and 2004 (Kelly and Messer, 2005).

Current impacts of the fishery: target, non-target and bycatch species

Between 1966 and 2015, slipper lobster landings ranged from about 0–2,395 lb (Table 6). There is currently no Federal crustacean permit issued for lobsters in the MHI. Table 6 summarizes the reported commercial landing of slipper lobster landings between 1966 and 2015.

Hand harvest is the predominate gear employed in this fishery and results in no bycatch. Other gear types such as traps or nets could inadvertently catch other unintended species, but no information on composition or amount bycatch from these gear types is currently available.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Hawaii

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the Hawaii lobster fishery and AMs would not be necessary. The fishery would continue to catch lobsters in the manner and at levels described above and catches would continue to be monitored through fisheries monitoring programs administered by Hawaii DAR and under Federal permits, if required. The current level of catch under this alternative is expected to continue as it currently has in recent years with 2009 catch for slipper lobster being 102 lb. The status of Hawaii lobsters would continue to be subject to ongoing discussion and review by the Council and NMFS. The current level of lobster fishing is considered to be sustainable as there have been no trends showing decreasing catches.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 280 lb for slipper lobsters in Hawaii for fishing years 2016 – 2018. The ACLs are equal to the ABC recommended by the Council's SSC and are set at the 75th percentile of the long-term catch. While MSY for the MHI lobsters are unknown, the impacts of an ACL specification and post-season AM calling for review of the Hawaii slipper lobster harvests are expected to be beneficial because it would establish a limit on the amount that is considered appropriate for long-term sustainability of slipper lobsters and would provide for additional management review of the fishery.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 252 lb for slipper lobster and is expected to have impacts similar to Alternative 2.

Under all alternatives, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and

affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.
The impacts of an ACL specification are expected to be beneficial because it would establish a limit on the amount of lobsters that Is considered appropriate for long-term sustainability of the resource. Although there is no ability to conduct in-season monitoring of catch relative to the proposed ACL, which precludes in-season measures (such as fishery closure) to prevent the ACL from being exceeded; the post-season review of catch relative to the proposed ACL is part of management of the lobster fishery that is designed to prevent lobster stocks from becoming overfished. The additional level of post season review of the catch provided under Alternatives 2 and 3 would provide an enhanced level of management review of the fishery compared with Alternative 1 and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.2.1.2 Affected Fishery Participants in Hawaii

Overview of Hawaii's Lobster Fishery

Prior to 1999, the majority of lobster production was attributed to the Northwestern Hawaiian Island spiny lobster trap fishery. However, since the closure of the NWHI lobster fishery in 1999 and prohibition on commercial fishing in the Marine National Monument in (DATE), fishing is now confined to the main Hawaiian Islands (MHI) and with more than 97% of the total catch of slipper lobsters coming from state waters (WPFMC 2011).

Between 1966 and 2010, slipper lobster landings ranged from about 40-900 lb with 4-12 commercial participants. Table 6 summarizes the reported commercial landing of slipper lobster landings between 1966 and 2010. There is currently no Federal crustacean permit issued for lobsters in the MHI which indicates there is no Federal slipper lobster fishing.

Potential Effects of the Proposed ACL and AM Specifications on Hawaii's Lobster Fishery Participants

<u>Alternative 1: No Management Action</u>

Under the no-action alternative, which is the baseline alternative, the Hawaii lobster fishery would not be managed using ACLs, AMs would not be needed, and fishing would continue to be monitored by Hawaii DAR, NMFS and the Council with fisheries statistics becoming available approximately six months or longer after the data have been initially collected. Lobster fishing is expected to continue to be sustainable as there have been no indications that the stocks are being depleted. Although the fishery has not been reported from Federal waters recently, any fisherman could obtain a permit and harvest slipper lobsters in Federal waters. Harvests are expected to remain low.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 280 lb for slipper lobster in fishing years 2016 – 2018. The ACLs are equal to the ABCs recommended by the Council's SSC and are set at the 75th percentile of the long-term catch.

The AM for the MHI lobster fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL were to be exceeded, NMFS, as recommended by the Council, would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available.

The ACL and AMs would not change the fishery. Effects would be to help provide for long-term sustainability of Hawaii slipper lobster resources which would benefit fishermen.

Alternative 3: Specify ACL at 90% of ABC

Under this Alternative, NMFS would specify an ACL of 252 lb for slipper lobster in fishing years 2016 – 2018. The ACLs are 90% of the ABCs which is 280 lb for slipper lobster. ACLs at this level are expected to have impacts that are generally similar to Alternative 2, except that the potential to exceed ACL is slightly higher under Alternative 3.

The ACL and AMs would not change the fishery. Effects would be to help provide for long-term sustainability of Hawaii slipper lobster resources which would benefit fishermen.

Discussion

Regardless of which action alternative is selected, because there would be no in-season closure, the proposed ACLs and AMs would not result in a change to fishing. The additional post-season review and adjustment to the ACL, as warranted by the effects on fishing on stocks, are designed to promote sustainability of lobster stocks, which, in turn, would benefit fishery participants.

3.2.1.3 Affected Protected Resources in Hawaii

Section 3.1.1.3 describes protected resources that have the potential to interact with the Hawaii slipper lobster fishery. It also describes ESA consultations and MMPA determinations that have been made regarding all crustacean fisheries in Federal waters around Hawaii.

Potential Effects of the Proposed ACL and AM Specifications for the Hawaii Slipper Lobster Fishery on Protected Species in Hawaii

None of the alternatives considered would modify operations of the Hawaii slipper lobster fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season accounting of the catch relative to the ACL, managing the lobster fishery using an ACL and AM would promote long term sustainability of the fishery stock. As fishery managers do not have the ability to conduct in-season tracking of catch towards an ACL, there is no in-season closure being proposed. Therefore, participants in the Hawaii lobster fishery would continue to fish as they do under the current management regime. However, because this fishery is currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, neither of the action alternatives would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected species or change effects on critical habitat.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the Hawaii slipper lobster fishery were found to be occurring in or near areas that are designated as critical habitat in the future, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.2.2 American Samoa Slipper Lobster Fishery, Affected Resources and Potential Effects

3.2.2.1 Affected Target, Non-target and Bycatch Species in American Samoa

Slipper lobsters do not appear in landings records in American Samoa; however, an SSC member from American Samoa reported at the 116th SSC meeting that some slipper lobster are harvested but the catch is not identified to the species level in the DMWR fishery monitoring creel survey programs (i.e., they are listed as “lobsters). There is currently no Federal crustacean permit issued for lobster harvest in Federal waters around American Samoa.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in American Samoa

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the American Samoa lobster fishery and AMs would not be necessary. The fishery would continue to catch lobsters in the manner and at levels described above and catches would continue to be monitored through fisheries monitoring programs administered by American Samoa DMWR. Catch for slipper lobster would remain un-quantified. The status of American Samoa lobsters would continue to be subject to ongoing discussion and review by the Council and NMFS. The current level of lobster fishing is considered to be sustainable as there have been no trends showing decreasing catches or lobster size. Slipper lobster fishing is done through hand collection and there is no known bycatch or non-target catch in this fishery.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 30 lb for slipper lobsters for American Samoa in fishing years 2016 – 2018. This ACL is equal to the ABC. ACL for slipper lobster is based on a proxy developed from Hawaii data and described in Section 2.2.2.

While MSY for American Samoa lobsters is unknown, the impacts of an ACL specification for American Samoa slipper lobster are expected to be beneficial because it would establish a limit related to sustainable harvest levels. An AM would provide additional annual monitoring by the Council and NMFS compared with the no-action Alternative.

This alternative would not change fishing for slipper lobsters around American Samoa, but would result in greater monitoring of catches by the Council than under the no-action alternative. There would be no change to non-target and target stocks.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 27 lb for slipper lobster and is expected to have impacts similar to Alternative 2, except that the ACL would be more likely to be exceeded under Alternative 3.

While MSY for American Samoa lobsters is unknown, the impacts of an ACL specification for American Samoa slipper lobster are expected to be beneficial because it would establish a limit related to sustainable harvest levels. An AM would provide additional annual monitoring by the Council and NMFS compared with the No-action Alternative.
There would be no change to non-target and target stocks.

The American Samoa slipper lobster fishery has been operating with ACLs and AMs since 2012. The proposed ACLs are [similar to?] the 2015 ACL. The same AM has been in place since ____ (year).

The specification on an ACL and AM is not expected to change fishing under either action alternative.

Under both action alternatives considered, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, which could include a downward adjustment to the ACL in the subsequent fishing year.

The effects of an ACL specification are expected to be beneficial because it would establish a limit on the amount of lobster that may be harvested annually. There is no ability to conduct in-season monitoring, which precludes in-season measures (such as a fishery closure) to prevent the ACL from being exceeded; however, the post-season review of catch relative to the proposed ACL is part of fishery management that is designed to prevent the fishery from becoming

overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.2.2.2 Affected Fishery Participants in American Samoa

Overview of American Samoa's Lobster Fishery

Aside for catch, there is no information available on American Samoa's lobster fishery in terms of participation and effort. Spiny lobster (*Panulirus penicillatus*) is the most-often targeted species, and is usually speared at night by free divers who are hunting for finish on the outer reef slope within territorial waters. The number of participants in the fishery is unknown. No economic data is available for slipper lobsters. We assume that slipper lobsters are primarily harvested in territorial waters for personal consumption and that fishermen comply with local restrictions on their harvest. There are likely few commercial fishermen targeting slipper lobsters in Federal waters around American Samoa.

Potential Effects of the Proposed ACL and AM Specifications on American Samoa's Lobster Fishery Participants

Alternative 1: No Management Action

Under the no-action alternative, which is the baseline alternative, the American Samoa lobster fishery would not be managed using ACLs, AMs would not be needed, and fishing would continue to be monitored by American Samoa DMWR, NMFS and the Council with fisheries statistics becoming available approximately six months or longer after the data have been initially collected. Fishing would continue to be at low levels in Federal waters.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 30 lb for slipper lobster in American Samoa in fishing years 2016 – 2018. The ACL for slipper lobster is based on a proxy developed from Hawaii data and described in Section 2.2.2 and is a level of harvest that would be sustainable over the long term.

The AM for the American Samoa lobster fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL is exceeded, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available.

Because there is no fishery closure, specification of the ACL and AM under Alternative 2 is not expected to affect fishing or participation in the fishery and there would be no change from fishing described under the baseline.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 27 lb for slipper lobsters in fishing years 2016 – 2018. The ACLs are 90% of the ABCs which is 30 lb for slipper lobster. ACLs at this level are expected to have impacts that are generally similar to Alternative 2, except that the potential to exceed ACL is slightly higher under Alternative 3.

Because there is no fishery closure, specification of the ACL and AM under Alternative 2 is not expected to affect fishing or participation in the fishery and there would be no change from fishing described under the baseline.

Discussion

Regardless of which action alternative is selected, because there is no in-season closure, the proposed ACL and AM would not result in a change to the manner in which lobster fishing is conducted. The additional post-season review and adjustment to the ACL, as warranted by the effects on fishing on stocks, is designed to promote sustainability of lobster stocks, which, in turn, would benefit fishery participants.

3.2.2.3 Affected Protected Resources in American Samoa

Section 3.1.2.3 describes protected resources that have the potential to interact with the American Samoa lobster fishery. It also describes ESA consultations that have been made regarding all crustaceans, including lobster, fisheries in Federal waters around American Samoa.

On April 8, 2016, NMFS published the final List of Fisheries (LOF) for 2016 which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). However, due to the nature of this fishery as primarily a near-shore hand/spear fishery with relatively small levels of commercial harvest, NMFS has not classified this fishery in its LOF; however, NMFS classifies the similar Hawaii lobster dive, net and trap fisheries as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, for the purpose of this EA, NMFS concludes that the lobster fishery in American Samoa is comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in American Samoa

None of the action alternatives considered would modify operations of the American Samoa lobster fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season accounting of the catch relative to the ACL, managing the lobster fishery using an ACL and AM would be an addition to the current fishery management regime (Alternative 1) that is intended to promote long term sustainability of the fishery stock. Additionally, there is currently no ability to conduct in-season tracking of catch in relation to an ACL which precludes an in-season closure. This means participants in the American Samoa lobster fishery would continue to fish for lobsters as they do under the current management regime. However, because this fishery is currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the proposed action (Alternative 2) would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.2.3 CNMI Lobster Fishery, Affected Resources and Potential Effects

3.2.3.1 Affected Target, Non-target and Bycatch Species in the CNMI

The CNMI lobster fishery primarily targets spiny lobsters which are harvested by hand, with scuba or by free diving. This fishery occurs almost exclusively inside of three nautical miles of the inhabited southern islands of Saipan, Tinian and Rota although, anecdotal information indicates that in the northern islands on the reef surrounding Farallon de Medinilla, bottomfish fishermen anchored overnight occasionally dive for lobsters (WPFMC 2011; NMFS 2009). Slipper lobster catches have only recently been reported within the past several years with catches of 7 lb, 371 lb, and 165 lb reported in 2007, 2008 and 2009, respectively (WPacFIN unpublished data). There is currently no Federal crustacean permit issued for lobster harvest in CNMI and no catch limit on lobsters.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in the CNMI

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the CNMI lobster fishery and AMs would not be necessary. The fishery would continue to catch lobsters in the manner and at levels described above and catches would continue to be monitored through fisheries monitoring programs administered by CNMI DFW. The current level of slipper lobster catch under this alternative is expected to remain small. The status of CNMI lobsters would continue to be subject to ongoing discussion and review by the Council and NMFS. The current level of catch for both species is not likely to result in overfishing as there are no clear trends indicating that lobster stocks in the CNMI have been declining.There are no adverse effects to non-target species or bycatch associated with the CNMI lobster fishery which is target-specific.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 60 lb for slipper lobster in fishing years 2016 – 2018. The ACL for slipper lobster is based on a proxy developed from Hawaii data and described in Section 2.2.3.

Landings of slipper lobsters are beginning to be reported with landings of 371 lb and 165 lb occurring in 2007 and 2008, respectively. Therefore, there is a high potential that the ACLs proposed under this alternative will be exceeded in each of the three years.

While MSY for CNMI lobsters is unknown, the impacts of an ACL specification for CNMI slipper lobster are expected to be beneficial because it would help to establish a limit at which harvests are sustainable.

Given that recent harvests exceed the ACL, it is likely that the ACL will be exceeded. With no-inseason closure, there is not likely to be a change in fishing. The effects of Alternative on slipper lobsters in the CNMI are expected to be no different than under the no-action alternative.

Alternative 3: Specify ACL at 90% of ABC

Under this Alternative, NMFS would specify an ACL of 54 lb for slipper lobster and is expected to have impacts similar to Alternative 2.

Given that recent harvests exceed the ACL, it is likely that the ACL will be exceeded. With no-inseason closure, there is not likely to be a change in fishing. The effects of Alternative on slipper lobsters in the CNMI are expected to be no different than under the no-action alternative.

Regardless of which action alternative is selected, because there is no in-season closure, the proposed ACL and AM would not result in a change to fishing. The additional post-season review and adjustment to the ACL, as warranted by the effects of fishing on stocks, is designed to promote sustainability of lobster stocks, which, in turn, would benefit fishery participants. There would be no change to the impacts of the lobster fishery on non-target species.

3.2.3.2 Affected Fishery Participants in the CNMI

Overview of CNMI's Lobster Fishery

Aside for catch, there is no information available on CNMI's lobster fishery in terms of participation and effort. No economic data is available for slipper lobsters.

Potential Effects of the Proposed ACL and AM Specifications on CNMI's Lobster Fishery Participants

Alternative 1: No Management Action

Under the no-action alternative, which is the baseline alternative, the CNMI lobster fishery would not be managed using annual catch limits, accountability measures would not be needed, and fishing would continue to be monitored by CNMI DFW, NMFS and the Council with fisheries statistics becoming available approximately six months or longer after the data have been initially collected.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 60 lb for slipper lobster in fishing years 2016 – 2018. The ACL for slipper lobster is based on a proxy developed from Hawaii data and described in Section 2.2.3.

Landings of slipper lobsters are beginning to be reported with landings of 371 lb and 165 lb occurring in 2007 and 2008, respectively. Therefore, it is likely that the ACLs proposed under this alternative would be exceeded in each of the three years. With no in-season management measure being proposed, this alternative is not expected to change fishing.

The AM for the CNMI lobster fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL is exceeded, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 54 lb for slipper lobsters in fishing years 2016 – 2018. The ACLs are 90% of the ABCs which is 60 lb for slipper lobster. ACLs at this level are expected to have impacts that are generally similar to Alternative 2, except that the potential to exceed ACL is slightly higher under Alternative 3.

3.2.3.3 Affected Protected Resources in the CNMI

Section 3.1.3.3 describes protected resources that have the potential to interact with the lobster fishery in the CNMI. It also describes ESA consultations that have been made regarding all crustacean, including lobster, fisheries in Federal waters around the CNMI.
On April 8, 2016, NMFS published the 2016 List of Fisheries (LOF) which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). However, due to

the nature of this fishery as primarily a near-shore hand harvest fishery with relatively small levels of commercial harvest, NMFS has not classified this fishery in its LOF; however, NMFS classifies the similar Hawaii lobster dive, net and trap fisheries as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, for the purpose of this EA, NMFS concludes that the lobster fishery in the CNMI is comparable to the Category III classification in Hawaii and is one with a low likelihood of incidentally taking marine mammals.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in the CNMI

None of the alternatives considered would modify operations of the CNMI lobster fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season accounting of the catch relative to the ACL, managing the lobster fishery using an ACL and AM is intended to promote long term sustainability of the fishery stock. Additionally, the current inability of in-season tracking of catch towards an ACL prevents in-season closure ability, meaning participants in the CNMI slipper lobster fishery would continue as described in Alternative 1.

Because this fishery is currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the proposed action (Alternative 2) would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.2.4 Guam Slipper Lobster Fishery, Affected Resources and Potential Effects

3.2.4.1 Affected Target, Non-target and Bycatch Species in Guam

Little is known about Guam's crustacean fisheries. Most fishing for crustaceans around Guam occurs in territorial waters by hand in a subsistence or recreational context. There are no documented landings of slipper lobsters in Guam. Additionally, there is currently no Federal crustacean permit issued for lobster harvest in Guam.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Guam

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the Guam lobster fishery and AMs would not be necessary. The fishery would continue to catch lobsters in the manner and at levels described above and catches would continue to be monitored through fisheries monitoring programs administered by Guam DAWR.

The current level of catch for both species is not likely to result in overfishing as there are no trends indicating that slipper lobster stocks in Guam have been declining.

There are no adverse impacts to non-target species or bycatch associated with the Guam lobster fishery, which is target-specific.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this Alternative, NMFS would specify an ACL of 20 lb for slipper lobsters in fishing year 2016 – 2018. The ACL for slipper lobster is based on a proxy developed from Hawaii data and described in Section 2.2.4.

While MSY for Guam lobsters is unknown, the impacts of an ACL specification for Guam slipper lobster are expected to be beneficial because it would establish a limit on the amount that may be harvested annually. Even without an in-season management measure, lobster harvests on Guam would continue to be subject to local management measures that help ensure the fishery is sustainable.

Because there would be no change to the fishery, effects of Alternative 2 would be the same as under Alternative 1, and harvests of slipper lobsters will continue to be sustainable, despite an ACL that is lower than likely harvests.

There would be no changes to bycatch or non-target species, as there are no issues associated with these in the Guam lobster fishery.

Alternative 3: Specify ACL at 90% of ABC

Under this Alternative, NMFS would specify an ACL of 18 lb for slipper lobster and is expected to have impacts similar to Alternative 2.

Regardless of which action alternative is selected, because there is no in-season closure, the proposed ACL and AM would not result in a change to lobster fishing in Guam. The additional post-season review and adjustment to the ACL, as warranted by the effects of fishing on stocks, is designed to promote sustainability of lobster stocks, which, in turn, would benefit fishery participants.

3.2.4.2 Affected Fishery Participants in Guam

Overview of Guam's Lobster Fishery

Aside from catch, there is no information available on Guam's lobster fishery in terms of participation and effort. The number of participants in the fishery is unknown. No economic data is available for slipper lobsters.

Potential Effects of the Proposed ACL and AM Specifications on Guam's Lobster Fishery Participants

Alternative 1: No Management Action

Under the no-action alternative, which is the baseline alternative, the Guam lobster fishery would not be managed using ACLs, AMs would not be needed, and fishing would continue to be monitored by Guam DAWR, NMFS and the Council with fisheries statistics becoming available approximately six months or longer after the data have been initially collected.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 20 lb for slipper lobster on Guam in fishing years 2016 – 2018. The ACL for slipper lobster is based on a proxy developed from Hawaii data and described in Section 2.2.4.

The AM for the Guam lobster fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL were to be exceeded, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 18 lb for slipper lobster in fishing year 2016 – 2018. The ACLs are 90% of the ABCs which is 20 lb for slipper lobster. ACLs at this level are expected to have impacts that are generally similar to Alternative 2, except that the potential to exceed ACL is slightly higher under Alternative 3.

Regardless of which action alternative is selected, because there is no in-season closure, the proposed ACL and AM would not result in a change to fishing. The additional post-season review and adjustment to the ACL, as warranted by the effects of fishing on stocks, is designed to promote sustainability of lobster stocks, which, in turn, would benefit fishery participants.

3.2.4.3 Affected Protected Resources in Guam

Section 3.2.4.3 describes protected resources that have the potential to interact with the Guam lobster fishery. It also describes ESA consultations that have been made regarding all crustacean, including lobster, fisheries in Federal waters around Guam.

On April 8, 2016, NMFS published the 2016 List of Fisheries (LOF) which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). However, due to the nature of this fishery as primarily a near-shore hand harvest fishery with relatively small levels of commercial harvest, NMFS has not classified this fishery in its LOF; however, NMFS classifies the similar Hawaii lobster dive net and trap fisheries as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, NMFS concludes that the lobster fishery in Guam would be comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in Guam

None of the alternatives considered would modify operations of the Guam lobster fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season accounting of the catch relative to the ACL, managing the Guam lobster fishery is intended to promote long term sustainability of the fishery stocks. However, the current inability of in-season tracking of catch towards an ACL prevents in-season closure ability, meaning participants in the Guam lobster fishery would continue to harvest lobsters as they do under the current management regime. Because this fishery is currently subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the preferred alternative (Alternative 2), would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

If, at any time, the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.3 Crustaceans – Kona Crab Fisheries

3.3.1 Hawaii Kona Crab Fishery, Affected Resources and Potential Effects

3.3.1.1 Affected Target, Non-target and Bycatch Species in Hawaii

The Kona crab, *Ranina ranina*, is found in the MHI and the NWHI at depths from 24 to 115 m. Kona crab fishing in Hawaii usually involves setting strings of baited tangle-nets on sandy bottom habitat for an average soak time of one hour (Kennelly and Craig 1989). Nets are set during day-trips from small boats (10-12 m in length) (Brown 1985). The net frames are built from ½ cm wire approximately 1 meter across. This frame is then covered in 1-2 layers of small gauge mesh netting to entangle the crabs. There is some variation in size and type of material used to construct tangle nets (Onizuka 1972; Kennelly and Craig 1989). Upon retrieval, crabs are untangled; female and undersized crabs are released.

While there are no Federal permit and reporting requirements for Kona crab fishing in the EEZ, fishermen are required to have Hawaii Commercial Marine Licenses (CMLs) for commercial Kona crab harvest. The Kona crab fishery is subject to State regulations that include a prohibition on taking females, no taking of crabs less than 4 inches, and a closed season from June to August. Commercial landings of Kona crab peaked in 1972 with approximately 69,000 lb landed. However, landings have declined since that time with catches between 2010 and 2015 ranging between and 11,807 lb (2010) and 2,332 lb (2015). During this time period, the number of CML holders catching Hawaii Kona crab declined from 40 to 26. Table 8 summarizes Kona crab participation and landings in Hawaii from 1950 to 2015.

By the nature of the fishing method and fishing location on sandy bottoms, the Hawaii Kona crab incidental harvest of non-target species is minimal. Since the State of Hawaii implemented a prohibition on the retention of female Kona crabs, the only bycatch that occurs are regulatory discards of female crabs; however, the level of discards is currently unavailable.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Hawaii

<u>Alternative 1: No Management Action</u>

Under the no-action alternative, an ACL would not be specified for the Hawaii Kona crab fishery and AMs would not be necessary. The fishery would continue to catch Kona crab in the manner and at levels described above and catches would continue to be monitored through fisheries monitoring programs administered by Hawaii DAR. The current level of catch under this alternative is expected to continue as it currently has in recent years with catch ranging between 11,807 lb (2010) and 2,332 lb (2015). Based on existing information, it is uncertain whether catches at these levels would be sustainable or would result in overfishing. The stock status of Hawaii Kona crab would continue to be subject to ongoing discussion and review by the Council and NMFS.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 27,600 lb for Hawaii Kona crab in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is set at the 75th percentile of the long-term catch. The ACL is higher than recent catch levels and is not expected to be exceeded. While MSY for Hawaii Kona crab is unknown, and while the current stock status has not been rigorously analyzed, and is uncertain, establishing a limitation on catch may provide for some conservation of the stock than an unconstrained fishery. The ACL and AM are expected to provide additional management review (compared with Alternative 1) to promote sustainable harvests of Kona crabs. This alternative would not change the effects on non-target species. This alternative would not change effects on regulatory discards of female crabs, which would remain unknown. Based on existing information, it is uncertain whether catches at this level would be sustainable or would result in overfishing.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 24,840 lb and is expected to have impacts similar to Alternative 2. The ACL and AM are expected to provide additional management review (compared with Alternative 1) to promote sustainable harvests of Kona crabs. This alternative would not change the effects on non-target species. This alternative would not change effects on regulatory discards of female crabs, which would remain unknown.

Under both action alternatives, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affects the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of this ACL specification are expected to slightly more beneficial than alternatives 1 and 2 because it would establish a lower limit on the amount of Kona crab that may be harvested annually. However, based on existing information, it is uncertain whether catches at this level would be sustainable or would result in overfishing. While the lack of in-season catch monitoring ability precludes in-season measures (such as a fishery closure) to prevent the ACL from being exceeded, the post-season review of catch relative to the proposed ACL is part of the fishery management that is designed to prevent the Kona crab stock from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed. The proposed ACLs and AMs would not affect bycatch or non-target catch in this fishery.

3.3.1.2 Affected Fishery Participants in Hawaii

Overview of Hawaii's Kona Crab Fishery

Participation in the fishery varies from year to year. Over the past 15 years, the number of CML holders in the Hawaii Kona crab fishery has steadily declined from 85 commercial fishermen in 2000, to a low of 26 fishermen in 2015. In the last three years, there were 30 or fewer CML holders participating in the fishery (see Table 8). A substantial amount (30–75%) of Hawaii Kona crab catches are from the EEZ or Federal waters, which is likely Penguin Bank south east of Oahu (NMFS 2011).

Penguin Bank accounted for more than 50% of the total landings in the fishery from 1950 through 2009; although Penguin Bank accounts for less than 20% of all trips taken for Kona crab, it has a significantly higher CPUE and larger crabs (Thomas 2011). From 2002-2009, only 3 fishers accounted for more than 50% of the trips.

In 2010 (the last year when price data was available), the commercial price per pound for Kona crab in Hawaii averaged $4.82. In that year, there were 40 participants in the fishery. Based on a catch of 11,807 lb, the annual commercial value of the fishery in 2009 was $56,910.

Assuming that three of the 40 participants accounted for half of the total landing in 2010, these fishers would have caught 5,903 lb of Kona crab with a value of $ 9,484 per fisher. Assuming participation and effort of the remaining 37 participants were equal, each would have caught 159 lb of Kona crab valued at $769 per fisher.

Potential Effects of the Proposed ACL and AM Specifications on Hawaii's Kona Crab Fishery Participants

Alternative 1: No Management Action

Under the no-action alternative, which is the baseline alternative, the Hawaii Kona crab fishery would not be managed using annual catch limits, accountability measures would not be needed, and fishing would continue unconstrained and would be monitored by Hawaii DAR, NMFS and the Council with fisheries statistics becoming available approximately six months or longer after the data have been initially collected. Under this alternative, NMFS expects fishing participation would remain relatively low and variable, with no more than 30 participants. NMFS also expects catches to continue as it currently has in recent years, with catch ranging between and 11,807 lb (2010) and 2,332 lb (2015).

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this Alternative, NMFS would specify an ACL of 27,600 lb for Hawaii Kona crab in fishing year 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is set at the 75th percentile of the long-term catch. This ACL is the same ACL NMFS specified for the fishery in each 2012,-2015.. Under this alternative, NMFS does not expect the fishery

would reach the ACL and, therefore, the effects on fishery participants are expected to be similar to Alternative 1.

The AM for the Hawaii Kona crab fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL is exceeded, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available.

Alternative 3: Specify ACL at 90% of ABC

Under this Alternative, NMFS would specify an ACL of 24,840 lb for Hawaii Kona crab in fishing year 2016 – 2018. The ACL is 90% of the ABC which is 27,600 lb. While the ACL under this alternative is lower than that of Alternative 2, NMFS expects an ACL at this level would have impacts that are generally similar to Alternative 2. This is because, based on fishery performance in recent years, NMFS does not expect the fishery would catch 24,804 lb.

3.3.1.3 Affected Protected Resources in Hawaii

Section 3.1.1.3 describes protected resources that have the potential to interact with the Hawaii Kona crab fishery. It also describes ESA consultations and MMPA determinations that have been made regarding all crustacean fisheries in Federal waters around Hawaii.

None of the alternatives proposed are expected to change the conduct of the Hawaii Kona crab fishery in any manner that would result in interactions with protected species in any manner not covered by existing consultations.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in Hawaii

None of the alternatives considered would modify operations of the Hawaii Kona crab fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season accounting of the catch relative to the ACL, managing the Kona crab fishery using an ACL and AM would be an addition to the current fishery management regime (Alternative 1) that is intended to promote long term sustainability of the fishery stock. Additionally, there is currently no means of in-season tracking of catch in relation to an ACL, which precludes the ability to implement an in-season closure. This means participants in the Hawaii Kona crab fishery would continue to fish for Kona crab as they do under the current management regime. However, because this fishery is currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the proposed action (Alternative 2)

would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.3.2 American Samoa Kona Crab Fishery, Affected Resources and Potential Effects

3.3.2.1 Affected Target, Non-target and Bycatch Species in American Samoa

There is no record of any fishery for Kona crab in American Samoa. However, due to their documented presence in the Territory, they are included in the crustacean management unit of the American Samoa FEP. Currently, there are no Federal permit requirements for Kona crab in the EEZ around American Samoa.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in American Samoa

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the American Samoa Kona crab fishery and AMs would not be necessary. There has never been a Kona crab fishery in American Samoa, so currently there is no catch data. If catches did occur, they would be documented through fisheries monitoring programs administered by American Samoa DMWR. Under the no-action Alternative the status of American Samoa Kona crab would continue to be subject to discussion and review by the Council and NMFS. The Kona crab resource in American Samoa is assumed to be healthy and fishing sustainable.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 3,200 lb for American Samoa Kona crab in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is based on a proxy developed from Hawaii data and described in Section 2.3.2.
To date, there has never been a fishery for Kona crab in American Samoa. If a fishery were to develop, however, the ACL is not expected to change the manner in which the fishery would be conducted under the no-Action alternative. The AM does not include a fishery closure, rather a post-season review. Over time, management of a Kona crab fishery in American Samoa with ACLs and the AM is designed to prevent overfishing of the resource.

Effects on Kona crab stocks would be the same as under Alternative 1, and the stock would continue to be healthy and fishing sustainable.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 2,880 lb for American Samoa Kona crab in fishing years 2016 – 2018. The impacts under Alternative 3 would be identical to Alternative 2.

Under both action alternatives, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would establish a limit on the amount of Kona crab that could be harvested annually. There is no ability to monitor in-season catches which precludes in-season measures (such as fishery closure) to prevent the ACL from being exceeded; however, the post-season review of catch relative to the proposed ACL is designed to prevent the Kona crab stock from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.3.2.2 Affected Fishery Participants in American Samoa

Overview of American Samoa's Kona Crab Fishery

There is no record of a fishery for Kona crab in American Samoa.

Potential Effects of the Proposed ACL and AM Specifications on American Samoa's Kona Crab Fishery Participants

To date, there has never been a fishery for Kona crab in American Samoa. Therefore, there is no fishery participant that could be affected by any three alternatives considered.

3.3.2.3 Affected Protected Resources in American Samoa

Section 3.1.2.3 describes protected resources that have the potential to interact with an American Samoa Kona crab fishery should one develop. It also describes ESA consultations that have been made regarding all crustacean, including Kona crab, fisheries in Federal waters around American Samoa.

On April 8, 2016, NMFS published the 2016 List of Fisheries (LOF) which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). Because there is no Kona crab fishery in American Samoa, NMFS has not classified this potential fishery in its

LOF; however, NMFS classifies the similar Hawaii Kona crab loop net fishery as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, NMFS concludes that a Kona crab fishery in American Samoa that may occur would be comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in American Samoa

To date, there has never been a Kona crab fishery around American Samoa. Even if one were to develop, none of the action alternatives to specify an ACL and implement post-season review, are expected to create a fishery or modify the crab fishery or any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

3.3.3 CNMI Kona Crab Fishery, Affected Resources and Potential Effects

3.3.3.1 Affected Target, Non-target and Bycatch Species in the CNMI

There is no record of a fishery for Kona crab in CNMI. However, due to their documented presence, they are included in the crustacean management unit of the Mariana Archipelago FEP. Currently, there are no Federal permit requirements for Kona crab in the EEZ around CNMI.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in the CNMI

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the CNMI Kona crab fishery and AMs would not be necessary. There has never been a Kona crab fishery in CNMI, so currently there is no catch data. If catches did occur, they would be documented through fisheries monitoring programs administered by CNMI DFW. Under the no-action alternative the status of CNMI Kona crab would continue to be subject to discussion and review by the Council and NMFS.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 6,300 lb for CNMI Kona crab in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is based on a proxy developed from Hawaii data and described in Section 2.3.3.

To date, there has never been a fishery for Kona crab in CNMI. If a fishery were to develop, however, the ACL is not expected to change the manner in which the fishery would be conducted under the no-action alternative. The AM does not include a fishery closure, rather a post-season review. Over time, management of a Kona crab fishery in CNMI is designed to prevent overfishing of the resource.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 5,670 lb for CNMI Kona crab in fishing year 2016 – 2018. The impacts under Alternative 3 would be identical to Alternative 2.

Under both action alternatives, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affect the sustainability of the Kona crab stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would establish a limit on the amount of Kona crab that may be harvested annually where none previously existed. There is no ability to monitor in-season catches which precludes in-season measures (such as fishery closure) to prevent the ACL from being exceeded; however, the post-season review of catch relative to the proposed ACL is part of the management of the fishery and is designed to prevent the Kona crab stock from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.3.3.2 Affected Fishery Participants in the CNMI

Overview of CNMI's Kona Crab Fishery

There is no record of any fishery for Kona crab in the CNMI.

Potential Effects of the Proposed ACL and AM Specifications on CNMI's Kona Crab Fishery Participants

To date, there has never been a Kona crab fishery in the CNMI. Even if one were to develop, none of the action alternatives to specify an ACL and implement post-season review, are expected to create a fishery or modify the crab fishery or any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

3.3.3.3 Affected Protected Resources in the CNMI

Section 3.1.1.3 describes protected resources that have the potential to interact with a Kona crab fishery in the CNMI should a fishery develop. It also describes ESA consultations that have been made regarding all crustacean, including Kona crab, fisheries in Federal waters around the CNMI.

On April 8, 2016, NMFS published the 2016 List of Fisheries (LOF) which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). Because there is

no Kona crab fishery in the CNMI, NMFS has not classified this potential fishery in its LOF; however, NMFS classifies the similar Hawaii Kona crab loop net fishery as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, NMFS concludes that a Kona crab fishery in the CNMI that may occur would be comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in the CNMI

To date, there has never been a Kona crab fishery around the CNMI. Even if one were to develop, none of the action alternatives to specify an ACL and implement post-season review, are expected to create a fishery or modify the crab fishery or any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

3.3.4 Guam Kona Crab Fishery, Affected Resources and Potential Effects

3.3.4.1 Affected Target, Non-target and Bycatch Species in Guam

There is no record of any fishery for Kona crab in Guam. However, due to their documented presence, they are included in the crustacean management unit of the Mariana Archipelago FEP. Currently, there are no Federal permit requirements for Kona crab in the EEZ around Guam.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Guam

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for the Guam Kona crab fishery and AMs would not be necessary. There has never been a Kona crab fishery in Guam, so currently there is no catch data. If catches did occur, they would be documented through fisheries monitoring programs administered by Guam DAWR. Under the no-action Alternative the status of Kona crab would continue to be subject to discussion and review by the Council and NMFS.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 1,900 lb for Guam Kona crab in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is based on a proxy developed from Hawaii data and described in Section 2.3.4.

To date, there has never been a fishery for Kona crab in Guam, and consequently there would be no impacts to target, non-target or bycatch species from establishment of an ACL and AM for the fishery. If a fishery were to develop, however, the ACL is not expected to change the manner in which the fishery would be conducted under the no-Action alternative. The AM does not

include a fishery closure, rather a post-season review. Over time, management of a Kona crab fishery in Guam is designed to prevent overfishing of the resource.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 1,729 lb for Guam Kona crab in fishing years 2016 – 2018. The impacts under Alternative 3 would be identical to Alternative 2.

Under both action alternatives, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would establish a limit on the amount of Kona crab that may be harvested annually where none previously existed. There is no ability to monitor in-season catches which precludes in-season measures (such as fishery closure) to prevent the ACL from being exceeded; however, the post-season review of catch relative to the proposed ACL is part of the management of the fishery and is designed to prevent the Kona crab stock from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.3.4.2 Affected Fishery Participants in Guam

Overview of Guam's Kona Crab Fishery

There is no record of any fishery for Kona crab in Guam.

Potential Effects of the Proposed ACL and AM Specifications on Guam's Kona Crab Fishery Participants

To date, there has never been a fishery for Kona crab in the Guam. Therefore, there is no fishery participant that could be affected by any three alternatives considered.

3.3.4.3 Affected Protected Resources in Guam

Section 3.1.1.4 describes protected resources that have the potential to interact with a Guam Kona crab fishery should a fishery develop. It also describes ESA consultations that have been made regarding all crustacean, including Kona crab, fisheries in Federal waters around Guam.

On April 8, 2016, NMFS published the 2016 List of Fisheries (LOF) which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). Because there is

no Kona crab fishery in Guam, NMFS has not classified this potential fishery in its LOF; however, NMFS classifies the similar Hawaii Kona crab loop net fishery as Category III fishery under Section 118 of the MMPA, as the fishery is one with a low likelihood or no known incidental takings of marine mammals. Therefore, NMFS concludes that a Kona crab fishery in Guam that may occur would be comparable to the Category III classification in Hawaii and would be one with a low likelihood of incidentally taking marine mammals.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in Guam

To date, there has never been a Kona crab fishery around Guam. Even if one were to develop, none of the action alternatives to specify an ACL and implement post-season review, are expected to create a fishery or modify the crab fishery or any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

3.4 Precious Corals

In general, Pacific Island precious corals share several ecological characteristics: they lack symbiotic algae in tissues (they are ahermatypic) and most are found in deep water below the euphotic zone; they are suspension feeders (they require external water motion to bring them food); and many are fan shaped to maximize contact surfaces with particles or microplankton in the water column.

All precious corals are slow growing and are characterized by low rates of mortality and recruitment. Natural populations are relatively stable, and a wide range of age classes is generally present. This life history pattern (longevity and many year classes) has two important consequences with respect to exploitation. First, the response of the population to exploitation is drawn out over many years. Second, because of the great longevity of individuals and the associated slow rates of turnover in the populations, a long period of reduced fishing effort is required to restore the ability of the stock to produce at the MSY if a stock has been over exploited for several years.

Precious corals MUS are taxonomically classified as members of the phylum Cnidaria, which includes all of the corals, hydroids, jellyfish and sea anemones. Within the Cnidaria, precious corals are placed in the class Anthozoa, which includes the corals, soft corals and sea anemones, all characterized by having a relatively complicated gut compared with other cnidarians. Living tissues are composed of polyps, each with a mouth surrounded by tentacles. Some species are composed of a single polyp while others are colonies of many polyps.

Within the Anthozoa, precious corals are members of three orders in two subclasses: 1) subclass Octocorallia (or Alcyonaria), order Gorgonacea and 2) subclass Hexacorallia (or Zoantharia), and orders Zoanthidae and Antipathidae. Members of the subclass Octocorallia are characterized by their eight tentacles. All octocorals are colonial, with each colony consisting of numerous polyps growing out of, and constituting the body of, the animal. Octocoral include the pink corals of the genus *Corallium* and the bamboo corals of the genera *Lepidisis* and *Acanella*.

Other anthozoans have their tentacles in multiples of six and are thus termed the Hexacorallia, or hexacorals. Hexacoral MUS include gold corals of the order Zoanthidea and black corals of the order Antipathidae.

Red, pink and bamboo octocorals are of the Order *Gorgonacea*. They are commonly called fan corals because their growth resembles that of a plant, with a main trunk fastened to the substrate, and lateral branching stems which may be in the same plane. Gorgonian colonies are all derived from one another and they are all one gender. The age at reproductive maturity is 12-13 years for *Corallium secundum* (WPFMC 2008).

Adult pink, bamboo and gold corals are found in deep water (100-1500 m) on solid substrate where bottom currents are strong. This is in contrast to black corals, discussed below, which also typically occur on solid substrate, but generally at depths between 30 and 110m.

Zoanthidea are a small group of hearty, solitary, sometimes colonial, anemone-like anthozoans that lack a skeleton. Gold corals (*Gerardia* sp., *Narella* sp., *Calyptrophora* sp., and *Callogoria gilberti*) are Zoantharian corals that belong to the family Parazoanthus. Many are parasitic species that commonly overgrow other gorgonian corals. *Gerardia* seems to prefer overgrowing the bamboo corals (*Acanella* spp.).

The Pacific Islands Region's gold coral fishery is currently dormant, although research on gold coral remains active. Recent research by Roark et al. (2006) suggests that the growth rates and age estimates for pink and gold are significantly slower and older than those used in estimating MSY. Therefore, in 2008, the Council recommended and NMFS implemented a five year moratorium on the harvest of gold coral in the Western Pacific Region (73 FR 47098, August 13, 2008). On May 29, 2013, the moratorium was extended five more years, through June 30, 2018 (78 FR 32181).

3.4.1 Hawaii Black Coral Fishery, Affected Resources and Potential Effects

3.4.1.1 Affected Target, Non-target and Bycatch Species in Hawaii

Grigg and Opresko (1977) reported 14 species of black coral known to occur in Hawaiian waters. Historically, however, commercial fishermen have harvested only three species. *Antipathes dichotoma* (recently renamed *A. griggi*) is the most commonly harvested species accounting for almost 90% of commercial harvest, followed by *A. grandis* (10%), and *A. ulex* (1%). The two major species (*A. dichotoma* and *A. grandis*) are found in coastal waters from Hawaii to Niihau and their range may extend into the NWHI. *A. dichotoma* is found at depths from 30 to 110 m while *A. grandis* occurs at depths from 45 to 110 m. Within their depth ranges, both species can be found highly aggregated on, or under, vertical drop-offs, terraces, or undercut notches. The growth rates for *A. dichotoma* and *A. grandis* have been estimated to be 6.42 cm per year and 6.12 cm per year respectively. Plotting gonad diameter versus colony height, Grigg (1976) estimated the size of reproductively mature *A. dichotoma* colonies to range from 64 to 80 cm. This implies an age at reproduction of 10 to 12.5 year and reproduction may occur annually (Grigg 1976). A large six-foot (1.8 m) tall coral tree is estimated to be between 30 and 40 years old. The oldest black corals observed in the Maui Auau Channel Bed are thought to be 75 years

old, and it is believed that black corals may live even longer. In 2006, growth rates of *A. dichotoma* was estimated using radio-carbon dating indicating growth rates ranged from130 μm/yr to1140 μm/yr (Roark et al. 2006).

There are two known major beds of black coral in Hawaii; the Auau Channel Bed located near Maui, Lanai and Molokai; and the bed off of Kauai. Most of these are located in Hawaii's State waters. However, the largest (the Auau Channel Bed) extends into the EEZ. Since 1980, virtually all of the black coral harvested around the Hawaiian Islands has been taken from the Auau Channel Bed. Most of this harvest has been confined to State waters. The Hawaii Department of Land and Natural Resources (DLNR) estimates that about 85% of the black coral harvested is hand harvested by scuba divers within three miles of the shoreline (WPFMC 2008), perhaps because gear constraints have restricted divers for black coral to relatively shallow waters (75 m or less) (Grigg 2002).

Black coral harvesters employ selective methods when harvesting black corals. Divers use SCUBA gear to reach the black coral resource. Hand held tools are used to remove the black coral from its base rock and float bags are used to bring the harvested black coral to the surface. Therefore, there is virtually no bycatch in this fishery except species that may be attached to the base of a coral tree.

The current harvest quota for black coral in the Auau Channel is 5,000 kg (11,000 lb) which may be taken during any part of a two year fishing year cycle. For the most recent time period (2011-2015), approximately 1,840 lb of black coral were landed annually (Table 11).

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Hawaii

Precious coral fisheries are highly target specific and there are no issues related to non-target or bycatch species.

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for black coral in Hawaii. However, the current harvested quota of 5,000 kg (11,000 lb) for the Auau Channel Established Bed would remain. Regulations that allow for this quota to be harvested over two consecutive fishing years would also remain in place. The average level of black coral harvest under this alternative is expected to continue as it currently has in recent years, where the average annual catch between 2000 and 2009 is estimated to be 5,587 lb/yr as shown inTable 11. This level of catch is approximately 68% of MSY (8,250 lb or 3,750 kg) and is sustainable. Catches would continue to be monitored through fisheries monitoring programs administered by Hawaii DAR and the status of Hawaii black coral would continue to be subject to ongoing discussion and review by the Council and NMFS. More recently, harvests of black coral have been in the range of 1,840 lb/year, well below MSY of MSY of 8,250 lb/year; and therefore, sustainable.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 2,500 kg (5,500 lb) for black coral in the Auau Channel Established Bed in fishing years 2016 – 2018. This ACL would be equal to the current harvest quota if it was applied on an annual basis and is 67% of the estimated MSY. An ACL set at this level would also be 2,000 lb lower than the SSC established ABC of 7,500 lb (3,413 kg/yr). Because the ACL would be higher than recent catches (e.g., 1,840 lb/yr), NMFS does not expect the ACL would be reached in fishing years 2016, 2017, or 2017. Even if landings exceed the ACL, landings are expected remain below ABC of 7,500 lb and not exceed MSY of 8,250 lb. For this reason, harvests of black coral are expected to remain sustainable under Alternative 2.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 6,750 lb (3,072 kg) of black coral which is 90% of the SSC established ABC of 7,500 lb (3,413 kg/yr). This ACL would be 1,250 lb greater than the ACLs under Alternative 2. Because the ACL is higher than recent catches (5,587 lb/yr) the fishery has a lower chance of exceeding the ACL compared with Alternative 2.

Under all alternatives considered, including the proposed action, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL is exceeded and affects the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would continue to provide limits to the amount of black coral that may be harvested in Hawaii annually. The inability to conduct in-season monitoring of harvests precludes implementation of in-season measures (such as fishery closure) to prevent the ACL from being exceeded; however, the post-season review of catch relative to the proposed ACL is part of the management of the fishery that is intended to prevent black coral stocks from becoming overfished. The additional level of post season review of black coral harvest that would be provided under the action alternatives would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

Without an in-season management measure, fishing for black coral would not change from fishing that would occur under the no-action baseline; therefore, there would be no change to effects on target stocks from either action alternative.

3.4.1.2 Affected Fishery Participants in Hawaii

Overview of Hawaii's Black Coral Fishery

Black coral harvesters employ selective methods when harvesting black corals. Divers use SCUBA gear to reach the black coral resource. Hand held tools are used to remove the black coral from its base rock and float bags are used to bring the harvested black coral to the surface.

Since 1980, virtually all of the black coral harvested around the Hawaiian Islands has been taken from the Auau Channel Bed. Most of this harvest has been confined to State waters. The Hawaii Department of Land and Natural Resources estimates that about 85% of the black coral harvested is hand harvested by scuba divers within three miles of the shoreline (WPFMC 2008).

The current harvest quota for black coral in the Auau Channel is 5,000 kg (11,000 lb) which may be taken during any part of a two year fishing year cycle. Landings, almost exclusively from State waters, have been reported for black coral between 1982 and 2010; however, data cannot be reported annually because of the low number of active participants (fewer than three). Therefore, to protect confidential fishery information, landing information is summarized in approximately 10-year intervals and shown in Table 11.

In every year since 2010, NMFS has only issued one or two Federal permits for fishing precious corals in Hawaii. As of September 29, 2016, NMFS has issued one Federal permit for fishing for Pacific Island precious corals in the Hawaiian Islands (http://www.fpir.noaa.gov/SFD/SFD_permits_index.html).

Potential Effects of the Proposed ACL and AM Specifications on Hawaii's Black Coral Fishery Participants

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for black coral in Hawaii. However, the current harvested quota of 5,000 kg (11,000 lb) for the Auau Channel Established Bed would remain. Regulations which allow for this quota to be taken over two consecutive fishing years would also remain in place. The average level of catch under this alternative is expected to continue as it currently has in recent years with average annual catch between 2000 and 2009 estimated to be 5,587 lb/yr as shown in Table 11.

This level of catch is approximately 68% of MSY (8,250 lb or 3,750 kg) and is sustainable. Because harvest occurs predominantly in state waters, NMFS does not anticipate any Federal permits would be issued in 2012 and fishing would continue to be monitored by Hawaii DAR, with fisheries statistics becoming available approximately six months or longer after the data has been initially collected.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 2,500 kg (5,500 lb) for black coral in the Auau Channel Established Bed in fishing year 2016 – 2018. This ACL would be equal to the current harvest quota if it was applied on an annual basis and is 67% of the estimated MSY. An ACL set at this level would also be 2,000 lb lower than the SSC recommended ABC of 7,500 lb (3,413 kg/yr). By creating an annual limit, there is a possibility that the ACL could be reached in fishing year 2012.

The AM for Hawaii's black coral fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL is exceeded, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This

could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 6,750 lb (3,072 kg) which is 90% of the SSC recommended ABC of 7,500 lb (3,413 kg/yr). This ACL is expected to have impacts that are generally similar to Alternative 2 except that the potential to exceed ACL is lower under this alternative.

3.4.1.3 Affected Protected Resources in Hawaii

Section 3.1.1.3 describes protected resources that have the potential to interact with the Hawaii black coral fishery.

Applicable ESA and MMPA Coordination – Hawaii precious coral fisheries

In an informal consultation covering the Western Pacific Precious Corals FMP, dated December 20, 2000, NMFS determined precious coral fisheries of Hawaii that operate in accordance with regulations implementing the FMP were not likely to adversely affect ESA-listed species or their habitats. More recently, a February 4, 2008, letter of concurrence opined that the approval and implementation of Amendment 7 to the Precious Corals FMP did not modify fishery operations in a manner that warranted reinitiating consultation.

In 2009, the Council recommended and NMFS approved the development of five archipelagic-based fishery ecosystem plans (FEP) including the Hawaii Archipelago FEP. The FEP incorporated and reorganized elements of the Council's species-based FMPs, including the Precious Corals FMP, into a spatially-oriented management plan (75 FR 2198, January 14, 2010). All applicable regulations concerning precious coral fishing were retained through the development and implementation of the FEP for the Hawaii Archipelago. No substantial changes to the precious coral fisheries around Hawaii have occurred since the FEP was implemented that have required further consultation.

On September 22, 2011, NMFS and the U.S. Fish and Wildlife Service (USFWS) determined that the loggerhead sea turtle population (*Caretta caretta*) is composed of nine distinct population segments (DPS) that constitute ''species'' that may be listed as threatened or endangered under the ESA (76 FR 58868). Specifically, NMFS and USFWS determined that the loggerhead sea turtles in the North Pacific Ocean, which includes waters around the Hawaii Archipelago, are a distinct population segment (DPS) that is endangered and at risk of extinction.

The North Pacific DPS of loggerheads may be found in Federal waters in the MHI. However, given the low level of participation in precious coral fisheries, there have been no reported or observed incidental take of this species in the history of the fishery. Because neither action alternative would modify operations of the Hawaii precious coral fisheries in any way, there is

no additional information that would change the conclusions of the 2008 consultation that determined this fishery was not likely to adversely affect ESA-listed species or their habitats.

In 2013, NMFS re-initiated ESA consultation for Hawaii crustacean fisheries in response to the listing of the MHI insular false killer whale DPS as an endangered species under the ESA. The consultation evaluated the effects of all Hawaii precious coral fisheries on all ESA-listed species and designated critical habitat. In a letter of concurrence dated December 5, 2013, NMFS determination that the continued authorization of precious coral fisheries in the Hawaiian Archipelago may affect, but is not likely to adversely affect, endangered or threatened species or designated critical habitat. Specifically, NMFS concluded that effects of the Hawaii precious coral fisheries are expected to be insignificant, discountable or beneficial.

On August 21, 2015, NMFS designated critical habitat for the endangered Hawaiian monk seal in areas where the Hawaii precious coral fisheries fishes (80 FR 50926). Specific areas designated include sixteen occupied areas within the range of the species: ten areas in the Northwestern Hawaiian Islands and six in the MHI. These areas contain one or a combination of habitat types: preferred pupping and nursing areas, significant haul-out areas, and/or marine foraging areas, that will support conservation for the species. Specific areas designated as monk seal critical habitat in the MHI include marine habitat from the 200 m depth contour line, including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor, through the water's edge 5 m into the terrestrial environment from the shoreline between identified boundary points on the Islands of: Kaula, Niihau, Kauai, Oahu, Maui Nui (including Kahoolawe, Lanai, Maui, and Molokai), and Hawaii. In areas where critical habitat does not extend inland, the designation ends at a line that marks mean lower low water. The August 21, 2015, final rule designating monk seal critical habitat in the MHI, triggered consultation on the continuation of precious coral fisheries in the Hawaiian Islands Archipelago. Given the generalist foraging habits of monk seals, the small number of participants in precious coral fisheries and the small area fished, potential effects to monk seals were expected to be insignificant. In a memo dated March 1, 2016, the consultation concluded with NMFS' finding that precious coral fisheries are not likely to adversely affect the newly designated Hawaiian monk seal critical habitat, because the effects of the fisheries are expected to be discountable or insignificant.

On April 6, 2016, (81 FR 20058) NMFS published a final rule to list 11 DPS of the green sea turtle (*Chelonia mydas*) under the ESA. Based on the best available scientific and commercial data, and after considering comments on the proposed rule, NMFS determined that three DPS are endangered and eight DPS, including the Hawaiian green sea turtle (Central North Pacific DPS), are threatened. NMFS does not expect the number of green sea turtles taken in the Hawaii precious coral fisheries to change based on the designation of the DPS. The 2016 rule supersedes the 1978 final listing rule for green turtles and applies the existing protective regulations to the DPS.

On September 30, 2016, the USFWS listed the Hawaii DPS of the band-rumped storm-petrel (*Oceanodroma castro*) as an endangered seabird (81 FR 67786). Due to harvesting techniques, precious coral fisheries do not interact with seabirds.

On April 8, 2016, NMFS published the final List of Fisheries (LOF) for 2016 which classifies commercial fisheries of the United States into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery with Category 1 being the highest and Category 3 being the lowest (81 FR 20550). Hawaii precious coral fisheries are listed as a Category III fishery, with a low likelihood or no known incidental takings of marine mammals. NMFS concluded that the Hawaii Archipelago precious coral fisheries, as currently conducted, will not affect marine mammals in any manner not considered or authorized by the commercial fishing take exemption under section 118 of the MMPA.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in Hawaii

None of the action alternatives considered would modify operations of the Hawaii black coral fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season accounting of the catch relative to the ACL, managing the black coral fishery using an ACL and AM is intended to promote long term sustainability of the fishery stock. Additionally, the current inability of in-season tracking of catch towards an ACL prevents in-season closure ability, meaning participants in the Hawaii black coral fishery would continue as they do under the no-action alternative. However, because this fishery is currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the proposed action (Alternative 2) would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

3.4.2 Hawaii Pink and Bamboo Fishery, Affected Resources and Potential Effects

3.4.2.1 Affected Target, Non-target and Bycatch Species in Hawaii

To date, beds of pink, gold and/or bamboo corals have been found in eight locations in the EEZ around Hawaii. This number includes two recently discovered beds, one near French Frigate Shoals in the NWHI, and a second on Cross Seamount, approximately 150 nm south of Oahu. Six of the beds have been classified as Established, Conditional or Refugia beds and have bank-specific harvest quotas assigned as discussed in Section 2.4. The remaining area of the EEZ around Hawaii has been classified as the Hawaii Exploratory Area and is subject to a 1,000 kg/yr harvest quota for all precious corals except black corals, which are subject to a separate quota.

Fishing for pink, bamboo, and gold is not currently conducted in Hawaii. One company used two one-man submersibles to survey and harvest pink and gold corals at depths between 400 and 500 meters in the MHI during 1999 and 2001; however, they did not continue their operations after

that time and the actual harvests cannot be reported here because of data confidentiality (WPFMC 2009b). In every year since 2010, NMFS has only issued one or two Federal permits for fishing precious corals in Hawaii. As of September 29, 2016, NMFS has issued one Federal permit for fishing for Pacific Island precious corals in the Hawaiian islands (http://www.fpir.noaa.gov/SFD/SFD_permits_index.html).

Currently, a moratorium on gold coral harvest is in place throughout the western Pacific through June 30, 2018 due to uncertainty in estimates the age and growth (78 FR 32181, May 29, 2013). Additionally, fishing is prohibited at Westpac Bed due to its status as a refugium. These prohibitions serve as functional equivalent of an ACL of zero.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Hawaii

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for precious corals in Hawaii. However, the current harvest quotas for all Established, Conditional and Refugia beds, and the quota of 1,000 kg/yr for the Hawaii exploratory area as listed in

would remain. Additionally, the moratorium prohibiting the harvest of gold coral until June 30, 2018 would also remain in place. Since there has not been a precious coral fishery in Hawaii for over a decade, this alternative would have no effect on any marine resource. Catches, in Federal waters if they were to occur, would be documented through Federal fisheries monitoring programs administered by NMFS and the status of Hawaii precious corals would be subject to discussion and review. While two Federal permits have been, no fishing has been conducted.

Under this alternative, fishing for pink and/or bamboo corals around Hawaii could occur under a Federal permit.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify ACLs for pink, and bamboo corals for each Exploratory and Conditional bed, and the Hawaii exploratory area as shown in Table 18. The ACLs would be identical to the current harvest quotas listed in Table 10 except at the Makapuu Established bed where the ACL would be specified at one half of the current two year quota and would be set at 1,000 kg/yr and 250 kg/yr, respectively. ACLs set at this level would not exceed the estimated MSYs and ABCs shown in Table 16 and Table 17, respectively and would be sustainable. Additionally, the moratorium prohibiting the harvest of gold coral until June 30, 2018, and the zero harvest quotas for Westpac bed would also remain in place and would serve as a functional equivalent of an ACL of zero.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL that is 90% of ABC and is shown in Table 19. For the Hawaii exploratory area, NMFS would specify an ACL of 900 kg. Like under

alternative 2, the current moratorium on gold coral harvest would remain in place through June 30, 2018 and fishing would remain prohibited at Wespac Bed. Because there is no fishery for deepwater precious corals in Hawaii, the impacts under this alternative would be identical to Alternative 2.

Under the action alternatives, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would continue to specify a limit on the amount of coral that may be harvested annually. While Federal permit and reporting requirements are currently in place, and 2 Federal permits have been for the Hawaii exploratory area, no fishing has been conducted. If fishing were to occur, NMFS does not anticipate the ACL would be reached as selective harvesting requirements provide for precision in the amounts harvest; however, the post-season review of catch relative to the proposed ACL is part of fishery management measures intended to prevent precious corals from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery compared to Alternative 1 and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.4.2.2 Affected Fishery Participants in Hawaii

Overview of Hawaii's Pink and Bamboo Coral Fishery

Harvest operations for Hawaii pink and bamboo coral have not occurred since 2000. In every year since 2010, NMFS has only issued one or two Federal permits for fishing precious corals in Hawaii. As of September 29, 2016, NMFS has issued one Federal permit for fishing for Western Pacific precious corals in the Hawaiian islands (http://www.fpir.noaa.gov/SFD/SFD_permits_index.html).

Potential Effects of the Proposed ACL and AM Specifications on Hawaii's Pink and Bamboo Coral Fishery Participants

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for precious corals in Hawaii. However, the current harvest quotas for all Established, Conditional and Refugia beds, and the quota of 1,000 kg/yr for the Hawaii exploratory area as listed in Table 10 would remain. Additionally, the moratorium prohibiting the harvest of gold coral until June 30, 2018 would also remain in place. Under this alternative, catches would be reported under Federal permits reported to NMFS within 72 hours of fishing. In every year since 2010, NMFS has only issued one or two Federal permits for fishing precious corals in Hawaii. As of September 29, 2016, NMFS has

issued one Federal permit for fishing for Western Pacific precious corals in the Hawaiian islands (http://www.fpir.noaa.gov/SFD/SFD_permits_index.html).

NMFS concludes that it is possible for fishing to occur for pink and bamboo coral, but unlikely. Fishing is likely to remain at low levels under the status quo. If fishing were to start, a Federal permit and logbook reports would be required

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify ACLs for pink, and bamboo corals for each Exploratory and Conditional bed, and the Hawaii exploratory area as shown in Table 18. The ACLs would be identical to the current harvest quotas listed in Table 10 except at the Makapuu Established bed where the ACL would be specified at one half of the current two year quota and would be set at 1,000 kg/yr and 250 kg/yr, respectively. Additionally, the moratorium prohibiting the harvest of gold coral until June 30, 2018 and the zero harvest quotas for Westpac bed would also remain in place and would serve as a functional equivalent of an ACL of zero.

In every year since 2010, NMFS has only issued one or two Federal permits for fishing precious corals in Hawaii. As of September 29, 2016, NMFS has issued one Federal permit for fishing for Western Pacific precious corals in the Hawaiian islands (http://www.fpir.noaa.gov/SFD/SFD_permits_index.html). Since the ACL would be essentially identical to the harvest quotas under the no action, the effects on fishery participants would be identical to the no action alternative and is not expected to result in a change to the conduct of the fishery including gear types, areas fished, effort, or participation.

The AM for the Hawaii precious coral fishery would require a post-season review of the catch data to determine whether the ACL was exceeded. If the ACL is exceeded, NMFS, as recommended by the Council would take action to correct the operational issue that caused the ACL overage. This could include a downward adjustment to the ACL in the subsequent fishing year. NMFS cannot speculate on operational measures or the magnitude of the overage adjustment that might be taken; therefore, the fishery and environmental impacts of future actions such as changes to the ACL or AM would be evaluated separately, once details are available.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL that is 90% of ABC and is shown in Table 19. For the Hawaii exploratory area, NMFS would specify an ACL of 900 kg. Like under alternative 2, the current moratorium on gold coral harvest would remain in place through June 30, 2018 and fishing would remain prohibited at Wespac Bed. Because there is no fishery for deepwater precious corals in Hawaii, the effects on fishery participants under this alternative would be identical to Alternative 2. ACLs at this level expected to have impacts that are generally similar to Alternative 2, except that the potential to exceed ACL is slightly higher under Alternative 3.

3.4.2.3 Affected Protected Resources in Hawaii

Section 3.1.1.3 describes protected resources that have the potential to interact with the Hawaii pink and bamboo coral fishery. Section 3.4.1.3 describes applicable ESA and MMPA consultations for the precious coral fisheries of Hawaii.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in Hawaii

None of the alternatives considered would modify operations of the Hawaii pink and bamboo coral fishery in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

While Alternatives 2 and 3 would implement ACLs and a post season review of the catch relative to the ACL and other operational adjustments, as needed based on the potential impacts of fishing on stocks, managing the pink and bamboo coral fishery in Hawaii using an ACL and AM would be an addition to the current fishery management regime (Alternative 1) that is intended to promote long term sustainability of the fishery stocks. Without an in-season fishery closure, participants in the Hawaii pink and bamboo fishery would continue to harvest corals as they would under the current management regime.

However, because the pink and bamboo coral fisheries are currently sustainably managed and subject to conservation measures in accordance with various resource conservation and management laws, and because no change would occur in the way fishing is conducted, none of the alternatives, including the proposed action (Alternative 2) would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

If at any time the fishery, environment, or status of a listed species or marine mammal species were to change substantially, or if the fishery were found to be occurring in or near areas that were designated as critical habitat, NMFS would undertake additional consultation, as required, to comply with requirements of the ESA and the MMPA.

3.4.3 American Samoa Precious Coral Fishery, Affected Resources and Potential Effects

3.4.3.1 Affected Target, Non-target and Bycatch Species in American Samoa

There is no record of any fishery for black, pink, gold or bamboo coral in American Samoa. However, they are included in the precious coral management unit of the American Samoa FEP. No Federal permits have ever been issued for precious coral fishing in American Samoa.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in American Samoa

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for precious corals in American Samoa and the current harvest quota of 1,000 kg for pink, gold and bamboo corals (except black coral) in the American Samoa Exploratory Area would remain. Additionally, the moratorium prohibiting the harvest of gold coral until June 30, 2018 would also remain in place. Since there has never been a precious coral fishery in American Samoa, this alternative would have no effect on any marine resource. Catches, in Federal waters if they were to occur, would be documented through Federal fisheries monitoring programs administered by NMFS and the status of American Samoa precious corals would be subject to discussion and review by the Council and NMFS.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 1,000 kg for pink, gold and bamboo corals in the American Samoa Exploratory Area in fishing years 2016 – 2018. The current moratorium on gold coral would remain in place through June 30, 2018. The ACL is equal to the ABC recommended by the Council's SSC and is identical to the current harvest guideline under Alternative 1.

Additionally, NMFS would also specify an ACL of 790 lb for American Samoa black coral in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is based on a proxy developed from Hawaii data and described in Section 2.4.2.1.

To date, there has never been a fishery for precious corals in American Samoa. However, if a precious coral fishery were to develop the ACLs and AM is expected to provide for continued review of the fishery by the Council and NMFS and, over the long term, is expected to help maintain harvests at sustainable levels.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 900 kg for pink, gold and bamboo corals in the American Samoa Exploratory Area in fishing years 2016 – 2018. The current moratorium on gold coral would remain in place through June 30, 2018. For American Samoa black coral, NMFS would specify an ACL of 711 lb. To date, there has never been a fishery for precious corals in American Samoa. However, if a precious coral fishery were to develop the ACLs and AM is expected to provide for continued review of the fishery by the Council and NMFS and, over the long term, is expected to help maintain harvests at sustainable levels.

Under the action alternatives, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL is were to be exceeded and affect the sustainability of the stock, NMFS would take action to correct the

operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would continue to specify limits to the amount of precious corals that may be harvested annually in American Samoa. While Federal permit and reporting requirements are currently in place, no permits have ever been issued. If fishing were to occur, NMFS does not anticipate the ACL would be reached as selective harvesting requirements provides for precision in the amount of harvest.; however, the post-season review of harvests relative to the proposed ACL is part of the management of the fishery that are intended to prevent precious coral stocks from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.4.3.2 Affected Fishery Participants in American Samoa

Overview of American Samoa's Precious Coral Fishery

There is no record of any fishery for precious corals in American Samoa.

Potential Effects of the Proposed ACL and AM Specifications on American Samoa's Fishery Participants

To date, there has never been a fishery for precious corals in American Samoa. Therefore, there is no fishery participant that would be affected by any of three alternatives considered.

3.4.3.3 Affected Protected Resources in American Samoa

Section 3.1.2.3 describes protected resources that have the potential to interact with an American Samoa precious coral fishery should one develop. However, if a precious coral fishery were to develop in American Samoa, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in American Samoa

To date, there has never been a precious coral fishery around American Samoa. None of the alternatives considered is expected to create a fishery or modify any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

3.4.4 CNMI Precious Coral Fishery, Affected Resources and Potential Effects

3.4.4.1 Affected Target, Non-target and Bycatch Species in the CNMI

There is no record of any fishery for black, pink, gold or bamboo coral in the CNMI. However, they are included in the precious coral management unit of the Mariana Archipelago FEP. No Federal permits have ever been issued for precious coral fishing in the CNMI.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in the CNMI

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for precious corals in CNMI and the current harvested quota of 1,000 kg for pink, gold and bamboo corals (except black coral) in the CNMI exploratory area would remain. Additionally, the moratorium prohibiting the harvest of gold coral until June 30, 2018 would also remain in place. Since there has never been a precious coral fishery in CNMI, this alternative would have no effect on any marine resource. Catches, in Federal waters if they were to occur, would be documented through Federal fisheries monitoring programs administered by NMFS and the status of CNMI precious corals would be subject to discussion and review by the Council and NMFS.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 1,000 kg for pink, gold and bamboo corals (except black coral) in the CNMI exploratory area in fishing year 2016 – 2018. The current moratorium on gold coral would remain in place through June 30, 2018. The ACL is equal to the ABC recommended by the Council's SSC and is identical to the current harvest guideline under Alternative 1.

Additionally, NMFS would also specify an ACL of 2,100 lb for CNMI black coral in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is based on a proxy developed from Hawaii data and described in Section 2.4.3.1. To date, there has never been a fishery for precious corals in CNMI and consequently there would be no impacts to target, non-target or bycatch species from establishment of an ACL and AM for the fishery.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 900 kg for pink, gold and bamboo corals in the CNMI exploratory area in fishing years 2016 – 2018. The current moratorium on gold coral would remain in place through June 30, 2018. For CNMI black coral, NMFS would specify an ACL of 1,890 lb. Because there has never been a fishery for precious corals in the CNMI, the impacts under this alterative would be identical to Alternative 2.

Under all alternatives considered, including the proposed action, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would continue to establish a limit on the amount of precious corals that may be harvested annually. While Federal permit and reporting requirements are currently in place, no permits have ever been issued. If fishing were to occur, NMFS does not anticipate the ACL would be reached as selective harvesting requirements provides for precision in the amount of harvest; however,, the post-season review of catch relative to the proposed ACL is part of the fishery management that is designed to prevent the precious coral fishery from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.4.4.2 Affected Fishery Participants in the CNMI

Overview of CNMI's Precious Coral Fishery

There is no record of any fishery for precious corals in the CNMI.

Potential Effects of the Proposed ACL and AM Specifications on CNMI's Fishery Participants

To date, there has never been a fishery for precious corals in the CNMI. Therefore, there is no fishery participant that would be affected by any of three alternatives considered.

3.4.4.3 Affected Protected Resources in the CNMI

Section 3.1.2.3 describes protected resources that have the potential to interact with a precious coral fishery in the CNMI should one develop. However, if a precious coral fishery were to develop, NMFS would undertake additional consultation as required to comply with requirements of the ESA and the MMPA.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in the CNMI

To date, there has never been a precious coral fishery around the CNMI. None of the alternatives considered is expected to create a fishery or modify any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

3.4.5 Guam Precious Coral Fishery, Affected Resources and Potential Effects

3.4.5.1 Affected Target, Non-target and Bycatch Species in Guam

There is no record of any fishery for black, pink, gold or bamboo coral in Guam. However, they are included in the precious coral management unit of the Mariana Archipelago FEP. No Federal permits have ever been issued for precious coral fishing in the Guam. Precious coral fisheries are target-specific and there are no known bycatch issues with this fishery.

Potential Effects of the Proposed ACL and AM Specifications on Target, Non-target and Bycatch Species in Guam

Alternative 1: No Management Action

Under the no-action alternative, an ACL would not be specified for precious corals in Guam and the current harvest quota of 1,000 kg for pink, gold and bamboo corals in the Guam exploratory area would remain. Additionally, the moratorium prohibiting the harvest of gold coral until June 30, 2018 would also remain in place. Since there has never been a precious coral fishery in Guam, this alternative would have no effect on any marine resource. Catches, in Federal waters if they were to occur, would be documented through Federal fisheries monitoring programs administered by NMFS and the status of Guam precious corals would be subject to discussion and review by the Council and NMFS.

Alternative 2: Specify Council recommended ACL (Status Quo/Preferred)

Under this alternative, NMFS would specify an ACL of 1,000 kg for pink, gold and bamboo corals in the Guam exploratory area in fishing years 2016 – 2018. The current moratorium on gold coral would remain in place through June 30, 2018. The ACL would be equal to the ABC recommended by the Council's SSC and is identical to the current harvest guideline under Alternative 1.

Additionally, NMFS would also specify an ACL of 700 lb for Guam black coral in fishing years 2016 – 2018. The ACL is equal to the ABC recommended by the Council's SSC and is based on a proxy developed from Hawaii data and described in Section 2.4.4.1. To date, there has never been a fishery for precious corals in Guam and, consequently, there would be no impacts to target, non-target or bycatch species from establishment of an ACL and AM for the fishery.

Alternative 3: Specify ACL at 90% of ABC

Under this alternative, NMFS would specify an ACL of 900 kg for pink, gold and bamboo corals in the Guam exploratory area in fishing years 2016 – 2018. The current moratorium on gold coral would remain in place through June 30, 2018. For Guam black coral, NMFS would specify an ACL of 630 lb. Because there has never been a fishery for precious corals in Guam, the impacts under this alterative would be identical to Alternative 2.

Under all alternatives considered, including the proposed action, no new monitoring would be implemented; however, under Alternatives 2 and 3, a post-season review of the catch data would be conducted as soon as possible after the fishing year to determine whether the ACL was exceeded. If the ACL were to be exceeded and affect the sustainability of the stock, NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council, which could include a downward adjustment to the ACL in the subsequent fishing year.

The impacts of an ACL specification are expected to be beneficial because it would continue to place a limit on the amount of precious corals that may be harvested annually. While Federal permit and reporting requirements are currently in place, no permits have ever been issued. If fishing were to occur, NMFS does not anticipate the ACL would be reached as selective harvesting requirements provides for precision in the amount of harvest; however, the post-season review of catch relative to the proposed ACL is part of the fishery management that is designed to prevent precious coral stocks from becoming overfished. The additional level of post season review of the catch would provide an enhanced level of management review of the fishery and would provide an opportunity for the Council to refine ACL and AM specifications, as needed.

3.4.5.2 Affected Fishery Participants in Guam

Overview of Guam's Precious Coral Fishery

There is no record of any fishery for precious corals in the Guam.

Potential Effects of the Proposed ACL and AM Specifications on Guam's Fishery Participants

To date, there has never been a fishery for precious corals in Guam. Therefore, there is no fishery participant that would be affected by any of three alternatives considered.

3.4.5.3 Affected Protected Resources in Guam

Section 3.2.4.3 describes protected resources that have the potential to interact with a precious coral fishery in Guam should one develop. There is no fishery for precious corals in Guam; however, if one were to develop, NMFS would initiate consultation, as required, to comply with requirements of the ESA and the MMPA.

Potential Effects of the Proposed ACL and AM Specifications on Protected Species in Guam

To date, there has never been a precious coral fishery in Federal waters around Guam. None of the alternatives considered is expected to create a fishery or modify any other fishery in a way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in previous ESA or MMPA consultations.

3.5 Potential Effects to Essential Fish Habitat and Habitat Areas of Particular Concern

Essential fish habitat (EFH) is defined as those waters and substrate as necessary for fish 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. In 1999, the Council developed and NMFS approved EFH definitions for management unit species (MUS) of the Bottomfish and Seamount Groundfish FMP (Amendment 6), Crustacean FMP (Amendment 10), Pelagic FMP (Amendment 8), and Precious Corals FMP (Amendment 4) (74 FR 19067, April 19, 1999). NMFS approved additional EFH definitions for coral reef ecosystem species in 2004 as part of the implementation of the Coral Reef Ecosystem FMP (69 FR8336, February 24, 2004). EFH definitions were also approved for deepwater shrimp through an amendment to the Crustaceans FMP in 2008 (73 FR 70603, November 21, 2008).

In 2009, the Council developed and NMFS approved five new archipelagic-based fishery ecosystem plans (FEP). The FEPs incorporated and reorganized elements of the Councils' species-based FMPs into a spatially-oriented management plan (75 FR 2198, January 14, 2010). EFH definitions and related provisions for all FMP fishery resources were subsequently carried forward into the respective FEPs. 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.

Table 32. EFH and HAPC for Western Pacific FEP MUS.

MUS	Species Complex	EFH	HAPC
Bottomfish MUS	**American Samoa, Guam and CNMI bottomfish species:** lehi (*Aphareus rutilans*) uku (*Aprion virescens*), giant trevally (*Caranx ignoblis*), black trevally (*Caranx lugubris*), blacktip grouper *(Epinephelus fasciatus)*, Lunartail grouper *(Variola louti)*, ehu (*Etelis carbunculus*), onaga (*Etelis coruscans*), ambon emperor *(Lethrinus amboinensis)*, redgill emperor *(Lethrinus rubrioperculatus)*, taape (*Lutjanus kasmira*), yellowtail kalekale (*Pristipomoides auricilla*), opakapaka (*P. filamentosus*), yelloweye snapper (*P. flavipinnis*), kalekale (*P. sieboldii*), gindai (*P. zonatus*), and amberjack (*Seriola dumerili*).	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)
	Hawaii bottomfish species: uku (*Aprion virescens*), thicklip trevally (*Pseudocaranx dentex*), giant trevally (*Caranx ignoblis*), black trevally (*Caranx lugubris*), amberjack (*Seriola dumerili*), taape (*Lutjanus kasmira*), ehu (*Etelis carbunculus*), onaga (*Etelis coruscans*), opakapaka (*Pristipomoides filamentosus*), yellowtail kalekale (*P. auricilla*), kalekale (*P. sieboldii*), gindai (*P. zonatus*), hapuupuu (*Hyporthodus quernus*), lehi (*Aphareus rutilans*)	See Amendment 4 for specific EFH descriptions for revised life history stages and shallow, mid, and deep-water complexes.	Kaena Point, Oahu Kaneohe Bay, Oahu Makapuu, Oahu Penguin Bank, Oahu Pailolo Channel, Maui, North Kahoolawe, Hilo, Hawaii (see Amendment 4 for specific locations) Three known areas of juvenile opakapaka habitat: two off Oahu and one off Molokai

MUS	Species Complex	EFH	HAPC
Seamount Groundfish MUS	**Hawaii Seamount groundfish species (50–200 fm):** armorhead (*Pseudopentaceros wheeleri*), raftfish/butterfish (*Hyperoglyphe japonica*), alfonsin (*Beryx splendens*)	**Eggs and post-hatch pelagic life stage:** Pelagic waters 0-600 m depth within the EEZ north of 29° N., and west of 179° W. **Post-settlement life stage:** Benthic or benthopelagic waters from 120 – 600 m depth within the EEZ north of 29° N., and west of 179° W. **Sub-adults and adults:** Benthopelagic waters from 120–600 m depth within the EEZ north of 29° N. and west of 179° W.	All waters from 0–600 m depth within the EEZ north of 29° N., and west of 179° W.
Crustaceans MUS	**Spiny and slipper lobster complex (all FEP areas):** 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
	Deepwater shrimp (all FEP areas): (*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.

MUS	Species Complex	EFH	HAPC
Precious Corals MUS	**Shallow-water precious corals** (10-50 fm) all FEP areas: black coral (*Antipathes dichotoma*), black coral (*Antipathis grandis*), black coral (*Antipathes ulex*) **Deep-water precious corals (150–750 fm) all FEP areas:** Pink coral (*Corallium secundum*), red coral (*C. regale*), pink coral (*C. laauense*), midway deepsea coral (*C.* sp nov.), gold coral (*Gerardia* spp.), gold coral (*Callogorgia gilberti*), gold coral (*Narella* spp.), gold coral (*Calyptrophora* spp.), bamboo coral (*Lepidisis olapa*), bamboo coral (*Acanella* spp.)	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
Coral Reef Ecosystem MUS	**Coral Reef Ecosystem MUS (all FEP areas)**	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 CREFMP, all Pacific remote islands, as well as numerous existing MPAs, research sites, and coral reef habitats throughout the western Pacific

Currently, precious coral fisheries only occur in Hawaii. The proposed ACL specification and AM would not have a direct effect on EFH or HAPC in any of the subject island areas because regulations require precious coral fisheries to use only selective gears such as hand harvest or submersible or remotely operated vehicle technologies which are not known to have large adverse effects on EFH or HAPC for any MUS. None of the alternatives considered are expected to result in substantial changes to the way the precious coral in Hawaii are conducted. Additionally, if precious coral fisheries were to develop in American Samoa, Guam, and CNMI, they would be required to use only selective gear technologies and are likely to be conducted in the same manner as done in Hawaii.

3.6 Potential Effects of the Alternatives on Fishery Administration and Enforcement

3.6.1 Federal Agencies and the Council

The Council in accordance with the approved FEPs currently manages fisheries in Federal waters, and NMFS PIRO is responsible for implementing and enforcing fishery regulations that implement the FEPs. NMFS PIFSC conducts research and reviews fishery data provided through logbooks and fishery monitoring systems administered by state and territorial resource management agencies. The Council, PIRO and PIFSC collaborate with local agencies in the administration of fisheries of the western Pacific through other activities including coordinating meetings, conducting research, developing information, processing fishery management actions, training fishery participants, and conducting educational and outreach activities for the benefit of fishery communities.

NOAA's Office of Law Enforcement (OLE) is responsible for enforcement of the nation's marine resource laws, including those regulating fisheries and protected resources. OLE, Pacific Islands Division oversees enforcement of Federal regulations in American Samoa, Guam, the CNMI and Hawaii and enters into Joint Enforcement Agreements (JEA) with each participating state and territory.

The U.S. Coast Guard's (USCG) Fourteenth District (Honolulu) jurisdiction is the U.S. EEZ as well as the high seas in the Western and Central Pacific. At over 10 million square miles, its area of responsibility is the largest of any USCG District. The USCG patrols the region with airplanes, helicopters, and surface vessels, as well as monitors vessels through VMS. The USCG also maintains patrol assets on Guam.

Potential effects to Federal agencies

The proposed ACL and AM specifications would not require a change to monitoring or collecting fishery data. However, monitoring of catch data towards an ACL would be conducted by PIFSC in collaboration with local resource management agencies, and is expected to result in improved timeliness in processing species specific catch reporting on an annual basis. No changes to the role of law enforcement agents or the U.S. Coast Guard would be required in association with implementing these specifications. The ACL and AM specifications would not result in any change to the fishery that would pose an additional risk to human safety at sea.

3.6.2 Local Agencies

Currently, local marine resource management agencies in each of the four areas are responsible for the conservation and management of fishery resources. These agencies monitor catches through licenses and fishery data collection programs, conduct surveys of fishermen and scientific surveys of fish stocks, establish and manage marine protected areas, provide outreach and educational services, serve on technical committees, and enforce local and Federal resource laws through JEAs, among other responsibilities.

Potential effects to local agencies

The specification of ACLs and AMs for crustacean and precious coral fisheries of American Samoa, Guam, the CNMI, and Hawaii is not expected to result in changes to fishery monitoring by the local resource management agencies, at this time. However, monitoring of catch data for ACL purposes would continue to be conducted by PIFSC in collaboration with local resource management agencies and the requirements to conduct post-season review of catch relative to the ACLs are expected to result in improved timeliness in processing species specific catch reporting on an annual basis.

No change to enforcement activities would be required in association with implementing these specifications because there is no fishery closure recommended for any of the areas. Additionally, the ACL and AM specifications would not result in any change to any fishery and therefore, the proposed specification would not result in additional risk to human safety associated with crustacean fishing or precious coral harvesting in American Samoa, Guam, the CNMI, or Hawaii.

3.7 Environmental Justice

Under the no-action alternative, the continued management of Federal crustacean and precious corals fisheries without ACLs or AMs is not expected to have large adverse environmental effects because the fisheries of the western Pacific region are subject to ongoing regulations that help ensure fishing is sustainable.
Under the action alternatives, the proposed ACLs and AMs would apply to all catches of slipper lobsters, kona crab and precious corals.

Fisheries management programs that are currently in place, and management under either of the action alternatives are intended to provide for sustainability of crustaceans (shrimp, lobsters and kona crab) and precious corals (black, pink and bamboo corals). Sustainable fisheries management helps ensure that marine seafood resources and the human communities that rely on their harvest, are properly managed over the short and long term.

The proposed specifications are not likely result in any large adverse impacts to the environment that could have disproportionately large or adverse effects on members of Environmental Justice communities in American Samoa, Guam, the CNMI, or Hawaii. None of the alternatives would have an adverse effect on sustenance harvests.

3.8 Climate Change

Changes in the environment from global climate change have the potential to affect crustacean and precious coral fisheries. Effects of climate change may include: sea level rise; increased intensity or frequency of coastal storms and storm surges; changes in rainfall (more or less) that can affect salinity nearshore or increase storm runoff and pollutant discharges into the marine environment; increased temperatures resulting in coral bleaching, and hypothermic responses in some marine species (IPCC 2007). Increased carbon dioxide uptake can increase ocean acidity, which can disrupt calcium uptake processes in corals, crustaceans, mollusk, reef-building algae,

and plankton, among other organisms (Houghton et al. 2001;The Royal Society 2005; Caldeira and Wickett 2005; Doney 2006; Kleypas et al. 2006). Climate change can also lead to changes in ocean circulation patterns which can affect the availability of prey, migration, survival, and dispersal (Buddemeier et al. 2004). Damage to coastal areas due to storm surge or sea level rises as well as changes to catch rates, migratory patterns, or visible changes to habitats are among the most likely changes that would be noted first. Climate change has the potential to adversely affect some organisms, while others could benefit from changes in the environment.

The impacts from climate change may be difficult to discern from other impacts; however monitoring of physical conditions and biological resources by a number of agencies would continue to occur and would allow fishery managers to continually make adjustments in fishery management regimes in response to changes in the environment.

Under the no-action alternative, fishing would occur as it has been in the recent past. No ACL or AM would be specified.

As shown in the EA effects analyses above, the ACLs and AMs would not result in a change to any fishery including target species, gear used, areas fished, or effort. This is primarily because there is no in-season management measure (such as a fishery closure) to ensure a fishery does not exceed an ACL. Because the proposed specifications are not expected to result in a change to the manner in which any of the affected fisheries are conducted, neither of the action alternatives would result in a change in greenhouse gas emissions from fishing vessels.

3.9 Additional Considerations

3.9.1 Overall Effects

When compared against recent fishing harvests, most of the proposed ACLs would be higher than recent catches. The ACLs are considered an acceptable level of catch that would prevent overfishing and provide for long-term sustainability of the target stocks. The specifications were developed using the best available scientific information, in a manner that accords with the fishery regulations, and after considering catches, participation trends, and estimates of the status of the fishery resources.

In the few fisheries that recent catches exceed a proposed ACL specification, it is likely that a fishery may exceed an ACL. In these few cases, the resources do not appear to be subjected to overfishing or facing declines. Instead, the assumptions of the models that were used to develop an ACL are likely in need of scientific refinement and further review.

In the case of Kona crabs, as stated above in section 2.3.1, NMFS will be obtaining new information through the revised stock assessment work that is scheduled for 2018. Coordination with fishery scientists, and observations of fishing results in terms of crab size, and the limited size of the fishery, allow NFMS to preliminary conclude that the continued operation of the Kona crab fishery in Hawaii would not result in large, irreversible or irretrievable effects on Kona crab stocks.

Taken together neither the proposed ACLs or the proposed AMs would cause large adverse impacts to resources because the fishery stocks would benefit from post-season data review and comparison of catches against ACLs.

For these reasons, the proposed ACLs and AMs are not expected to result in large, irreversible, or irretrievable impacts to the environment.

3.9.2 Cumulative Effects of the Proposed Action

ACL and AM specifications for other western Pacific fisheries

In addition to the ACLs and AMs for crustacean and precious coral fisheries, NMFS is proposing to implement the Council's ACL and AM recommendations for all other western Pacific fisheries for the 2016 – 2018 fishing years, including bottomfish and coral reef fisheries. NMFS has developed environmental effects analysis documents on the proposed specifications for these fisheries, which can be obtained from NMFS or the Council by request, or at www.regulations.gov using the regulatory identification number (RIN) 0648-XE587.

The proposed ACL and AM specifications considered here would not result in changes to the way the crustacean or precious corals fisheries are conducted, so the proposed ACL and AM specifications do not have an interaction with other fisheries. Such interactions can occur, for example, if an AM calls for an in-season management measure such as a fishery closure. In that case, attainment of an ACL can result in changes in participation, seasonality and fishing intensity. The proposed ACL and AM specifications for precious corals and crustaceans do not include in-season measures and there is no interactions with other ACL and AM specifications.

Foreseeable management actions related to western Pacific fisheries

In the foreseeable future, the Council may re-evaluate the need for conservation and management for Federal crustacean and precious coral fisheries and may recommend NMFS remove certain species from the FEPs and/or re-classify species as "ecosystem component" (EC) species. Under the provisions of the Magnuson-Stevens Fishery Conservation and Management Act, to be considered for possible classification as an EC species, a species should be: 1) a non-target species; 2) a stock that is not determined to be subject to overfishing, approaching overfished, or overfished; 3) not likely to become subject to overfishing or overfished; and 4) generally not retained for sale or personal use. Various methods for categorizing species and EC components have been preliminarily discussed at Council meetings. These include, but are not limited to, species that are caught exclusively or predominately in state/territorial waters, species that occur infrequently in the available time series, species that are non-native to an FEP area, and species associated with ciguatoxin poisoning and are generally discarded.

In accordance with National Standard 1 guidelines found in 50 CFR §600.310(d), EC species are not considered to be "in the fishery" and thus, do not require specification of an ACL. EC species may, but are not required to remain in the FEP for data collection purposes, for ecosystem considerations related to the specification of optimum yield for associated MUS, for consideration in the development of conservation and management measures for a fishery; and/or

to address other ecosystem issues (e.g., such as management of bycatch). However, until such time a particular crustacean or precious coral MUS is classified as an EC species, it will remain in the fishery and be subject to the ACL and AM requirements.

Because the proposed ACL and AM specifications are intended to promote sustainable fisheries, the current specifications would not result in effects that would interact with future determinations regarding whether or not a particular MUS would qualify as an EC species.

NMFS and the Council are currently evaluating the potential for managing aquaculture in Federal waters of the western Pacific region under a Federal permit regime. The proposed action and alternatives would not affect decisions to be made or have impacts to any MUS that could interact with potential future aquaculture projects.

Other foreseeable NOAA/NMFS management actions

NOAA/NMFS does not have foreseeable management actions that are likely to affect the precious corals or crustacean fisheries. There are no other reasonably foreseeable NMFS management actions pending that would be affected by or interact with the specification of ACLs and AMs that would change the environmental effects review.

Past, Present and Reasonably Foreseeable Actions by Others

Numerous activities take place in Federal and State and territorial waters including military and maritime uses, wind and tidal power, communication uses, and conservation activities. Management of fishery harvests using the proposed ACLs and the AMs regimes is not expected to result in changes to fishing activities or have impacts that would be affected by these other activities.

3.10 Other effects

None of the alternatives would have the potential to change any of the fisheries being considered. Therefore, there would be no potential for the alternatives to result in the introduction of or spread of invasive species, or to result in changes to safety for fishery participants.

The continuation of the fisheries under any of the alternatives would not result in concerns regarding predator-prey relationships or biodiversity.

Decisions to establish ACLs and AMs under either of the action alternatives, would not establish precedents or narrow decisions about future specifications. All of the fisheries considered here have been operating under ACL and AM specifications made annually since 2012. The proposed ACLs and AMs would not result in changes to the way any of the fisheries are conducted. Furthermore, because the proposed specifications are intended to and will support ongoing management in fisheries that are considered sustainable, and because the specifications would not result in effects to resources that are having high and adverse effects on stocks, the proposed specifications would not affect the Council or NMFS' ability to establish effective ACLs or AMs in the future.

4 Consistency with Other Applicable Laws

4.1 National Environmental Policy Act

NOAA Administrative Order (NAO) 216-6A, dated April 22, 2016, contains NOAA's policy and procedures for compliance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations in 40 CFR 1500–1508; other related authorities; Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Action;* EO 11988, *Floodplain Management*; and EO 11990, *Protection of Wetlands.* NEPA requires agencies to consider potential effects of proposed agency actions and alternatives on the human environment and allows for involvement of interested and affected members of the public before a decision is made. This environmental assessment (EA) has been written and organized to satisfy the requirements of NEPA and NAO 216-A.

The Regional Administrator of the NMFS Pacific Islands Regional Office (PIRO) will use the information in this EA, including any public input received on a draft EA, to determine whether the proposed ACL specifications and AMs would constitute a major Federal action with the potential to have a significant environmental impact that would require the preparation of an environmental impact statement. If not, the RA would prepare a finding of no significant impact.

4.1.1 Alternatives Considered

Section 2 describes the alternatives considered in the EA. The Council's recommendation forms NMFS' proposed action (Alternative 2).

4.1.2 Affected Environment

Section 3 describes the affected environment. The main focus is the areas in which the crustacean, deepwater shrimp and precious corals fisheries occur in waters of the U.S. EEZ that are open to commercial fishing for these species around American Samoa, CNMI, Guam, and Hawaii.

4.1.3 Effects of the Alternatives

Section 4 describes the expected impacts of the alternatives. The analysis compares the effects of the proposed action against the baseline. This allows NMFS to evaluate whether there would be the potential for significant effects on the fisheries and their target crustacean, precious corals stocks, non-target stocks, bycatch, protected resources, EFH and HAPC, and special resources or management areas. Section 4 considers the direct, indirect, short-term, long-term, and cumulative impacts of the proposed action alternative. Environmental justice and climate change considerations are described in sections 3.7 and 3.8, respectively.

4.1.4 Preparers and Reviewers

National Marine Fisheries Service, Pacific Islands Regional Office (PIRO), Honolulu, Hawaii.

Preparers:

Matthew Dunlap, Resource Management Specialist (Project Lead, Fishery management action; and fishery and environmental effects analysis)
Jarad Makaiau, Fish and Wildlife Administrator

Reviewers:

Phyllis Ha, Resource Management Specialist (NEPA compliance)
Marilyn Luipold, NEPA Coordinator (NEPA compliance)

4.1.5 Coordination with others

The proposed action described in this EA was developed in coordination with various Federal and local government agencies that are represented on the Western Pacific Fishery Management Council. At the 160th Council meeting, the proposed ACL specifications and AMs were deliberated among the following Council member organizations:

- American Samoa Department of Marine and Wildlife Resources
- Guam Department of Agriculture, Division of Aquatic and Wildlife Resources
- Hawaii Department of Land and Natural Resources, Division of Aquatic Resources
- Northern Marina Island Department of Land and Natural Resources, Division of Fish and Wildlife
- U.S. Coast Guard
- U.S. Fish and Wildlife Service
- U.S. Department of State
- A number of Council members are part of the fishing community.

4.1.6 Public Coordination

The development of the proposed ACL and AM specifications for crustacean and precious coral fisheries of American Samoa, Guam, the CNMI, and Hawaii has taken place in public meetings of the SSC and the Council. In addition, the Council advertised the need to focus on Federal annual catch limits in media releases, newsletter articles, and on the Council's website, http://www.wpcouncil.org. Public meetings are listed in Section 1.4, above.

At its 160th meeting, the Council considered and discussed issues relevant to the ACLs and AMs, including the ABC recommendations of the 116th SSC. The 116th SSC and the 160th Council meetings were held June 17-19, 2014, and June 25-27, 2014, respectively. Both meetings were open to the public and advertised through notices in the Federal Register (79 FR 31310, June 2, 2014), and on the Council's website. The public had an opportunity to comment at the meetings on the proposed ACL specifications and AMs and no public comment was provided at either meeting.

On January 18, 2017, NMFS made the draft EA available for a 15-day public review and comment period (82 FR 5517). The public comment ended on February 2, 2017. NMFS received public comments expressing general support for ACL. NMFS did not receive comments on the EA analysis. NMFS will respond to comments in the final rule. NMFS also provided the public with opportunities to comment on proposed ACL specifications and AMs over the previous past 4 years. No public comments have been received on the EA analysis during rulemaking.

4.2 Endangered Species Act

The Endangered Species Act (ESA) provides for the protection and conservation of threatened and endangered species. Section 7(a)(2) of the ESA requires Federal agencies to ensure that any action authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species.

Pursuant to Section 7 of the ESA, NMFS has evaluated the crustacean and precious coral fisheries managed under the western Pacific Fishery Ecosystem Plans for potential impacts on ESA-listed species under the jurisdiction of NMFS. Table 33 summarizes ESA section 7 consultations for these fisheries managed under the FEPs for American Samoa, the Marianas (including Guam and CNMI) and Hawaii. Additional information about the potential effects of the alternatives on listed species is found in chapter 3 of this EA.

Table 33. ESA section 7 consultations for western Pacific crustacean and precious coral fisheries

Fishery	Consultation	NMFS Determination
American Samoa crustacean fisheries	September 28, 2007, Letter of Concurrence	Not likely to adversely affect any ESA-listed species or critical habitat
	April 9, 2015, Letter of Concurrence	
American Samoa precious corals	December 20, 2000, Letter of Concurrence	Not likely to adversely affect any ESA-listed species or critical habitat
	April 9, 2015, Letter of Concurrence	
Main Hawaiian Islands crustacean fisheries	April 4, 2008, Letter of Concurrence	Not likely to adversely affect any ESA-listed species or critical habitat
	December 5, 2013, Letter of Concurrence	
	March 1, 2016, Letter of Concurrence	
Hawaii precious coral fisheries	December 20, 2000, Letter of Concurrence,	Not likely to adversely affect any ESA-listed species or critical habitat
	February 5, 2008, Letter of Concurrence	
	December 5, 2013, Letter of Concurrence	

Fishery	Consultation	NMFS Determination
	March 1, 2016, Letter of Concurrence	
CNMI crustacean fisheries	September 28, 2007, Letter of Concurrence	Not likely to adversely affect any ESA-listed species or critical habitat
	April 29, 2015, Letter of Concurrence	
CNMI precious coral fisheries	December 20, 2000, Letter of Concurrence	Not likely to adversely affect any ESA-listed species or critical habitat
	June 3, 2008, Letter of Concurrence	
	April 29, 2015, Letter of Concurrence	
Guam crustacean fisheries	September 28, 2007, Letter of Concurrence	Not likely to adversely affect any ESA-listed species or critical habitat
	April 29, 2015, Letter of Concurrence	
Guam precious coral fisheries	December 20, 2000, Letter of Concurrence	Not likely to adversely affect any ESA-listed species or critical habitat
	April 29, 2015, Letter of Concurrence	

Because the proposed action is not expected to modify vessel operations or other aspects of any fishery, these consultations would remain valid for the fishery operating under the proposed ACLs specification and AMs for crustacean and precious coral fisheries in American Samoa, Guam, CNMI, and Hawaii . No crustacean or precious coral fishery under any of the alternatives would have an adverse effect on ESA listed species or any designated critical habitats that was not considered in prior consultations, and no further consultation would be required to implement the specification.

4.3 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) prohibits, with certain exceptions, the take of marine mammals in the U.S. and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States. The MMPA gives the Secretary of Commerce authority and duties for all cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions, except walruses). Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries that classifies U.S. commercial fisheries into one of three categories. Specifically, the MMPA mandates that each fishery be classified according to whether it has a frequent, occasional, or remote likelihood of, or no known, incidental mortality or serious injury to marine mammals.

According to the most recent NOAA List of Fisheries,[9] all of the affected crustacean and precious coral fisheries are either classified as a Category III fishery or are conducted in a similar

[9]2016 LOF at: www.nmfs.noaa.gov/pr/interactions/fisheries/2016_list_of_fisheries_lof.html

manner as the classified fisheries. The following is the most recent MMPA category classification information for specific fisheries:

Table 34. Summary of 2016 MMPA categories for affected fisheries in Hawaii*.

Area / Fishery	Gear / fishery 2016 LOF	Category in 2016 LOF
Hawaii		
Hawaii Precious Corals/ Black Coral	HI black coral diving	Category III
Hawaii Deepwater Shrimp	HI shrimp trap	Category III
Hawaii Slipper Lobster	HI lobster diving	Category III
Hawaii Kona Crab/ Other crab fishery	HI crab trap**; HI crab net; HI Kona crab loop net.	Category III

*All other similar fisheries in American Samoa, CNMI, Guam, and Hawaii would be categorized as Category III fisheries under the MMPA, by analogy.
**2016 LOF indicates interactions with humpback whales from the Central North Pacific DPS and Hawaii crab trap gear. Two interactions are described with "Hawaii crab trap" gear in Bradford and Lyman (2015). It is not specified which type of crab trap. Also, the Central North Pacific DPS of humpback whales was de-listed on September 8, 2016 (81 FR 62259).

Category III fisheries are fisheries that have been determined by NMFS to have a remote likelihood of or no known incidental mortality and serious injury of marine mammals (50 CFR 229.20). According to the provisions of the MMPA, vessel owners and crew that are engaged only in Category III fisheries may incidentally take 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).

Given the very low likelihood of Pacific Island precious coral, deepwater shrimp, slipper lobster, or crab fisheries interacting with marine mammals, and because the proposed action would not modify vessel operations or other aspects of these or other fisheries, none of the alternatives would result in interactions with marine mammals in any manner not previously considered or authorized the commercial fishing take exemption under section 118 of the MMPA.

4.4 Coastal Zone Management Act

The Coastal Zone Management (CZM) Act requires NMFS determine 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. NMFS determined that the proposed specifications are consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of American Samoa, Guam, the Northern Mariana Islands, and Hawaii. NMFS submitted this determination dated April 22, 2016, for review by the appropriate agencies under section 307 of the CZMA.

4.5 National Historic Preservation Act

The National Historic Preservation Act (NHPA) requires Federal agencies review all Federally funded and permitted projects that may impact sites listed on or eligible for listing on the National Register of Historic Places. Currently, there are no known sites or historic properties in the EEZ around the main Hawaiian Islands or American Samoa that are listed on or eligible for listing on the National Register of Historic Places. Areas offshore from Guam and the CNMI contain numerous resources related to the War in the Pacific that may be eligible for listing.

None of the affected fisheries are known to have adverse effects on bottom resources and none is likely to damage any historical or cultural resource that may occur in offshore waters including shipwrecks, or War in the Pacific resources. The continued operation of the fisheries under the proposed action would not change the conduct of the precious coral, slipper lobster, crab, or deepwater shrimp fisheries. For these reasons, the proposed action would not affect historic sites listed on, or eligible for, listing on the National Register of Historic Places and no further coordination is required.

4.6 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 proposed action would not establish any new permitting or reporting requirements and therefore it is not subject to the provisions of the Paperwork Reduction Act.

4.7 Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) (5 U.S.C. 601 *et seq.*) requires government agencies to assess and present the impact of their regulatory actions on small entities including small businesses, small organizations, and small governmental jurisdictions. The assessment is done by preparing an Initial Regulatory Flexibility Analysis when impacts are expected. The purpose and need for action is described in Section 1.2. Section 2.0 describes the management alternatives considered to meet the purpose and need for action. Section 3.0 provides a description of the fisheries that may be affected by this action and analyzes environmental impacts of the alternatives considered.

The proposed action would specify an annual catch limit (ACL) for crustacean and precious coral fisheries in American Samoa, Guam, CNMI and Hawaii for fishing years 2016, 2017, and 2018. If the ACL for any of these fisheries is exceeded (considering specifics applicable to each fishery) NMFS would take action to correct the operational issue that caused the ACL overage, as recommended by the Council which could include a downward adjustment to the ACL for that stock or stock complex in the subsequent fishing year, or other measures, as appropriate.

NMFS does not have annual revenue information on a per-vessel basis, but given the relatively small levels of landings for most of the affected fisheries, and total inactivity for others, NMFS assumes all commercial crustacean and precious coral fishery participants where they exist, to be

small entities based on the SBA size standard for defining a small business entity in this industry with average annual receipts less than $4.0 million. The proposed action of specifying ACL and AMs is expected to have little, if any, direct adverse economic impact, as described in the EA and the RIR. There would be no disproportionate economic impacts between large and small entities. Furthermore, there are no disproportionate economic impacts among the universe of vessels based on gear, home port, or vessel length.

4.8 Administrative Procedure Act

All Federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II) which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the Federal Register and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day waiting period from the time a final rule is published until it becomes effective, with rare exceptions.

The specification of ACLs for slipper lobsters, Kona crab and other crabs, deepwater shrimp, and precious corals in American Samoa, CNMI, Guam, Hawaii and implementation of AMs complies with the notice and comment provisions of the APA through the Council's extensive use of public meetings, requests for comments, and consideration of comments in developing ACL recommendations; as well as through the opportunity for the public to comment on a draft EA and the proposed specifications.

Additionally, NMFS will publish a proposed rule announcing the proposed ACL specifications described in this document which will include requests for public comments. After considering public comments, NMFS will publish a final rule which will become effective immediately upon publication.

4.9 Environmental Justice

Executive Order 12898 and White House Council on Environmental Quality guidance instruct agencies to determine whether a proposed Federal action is likely to have disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, or Indian tribes. Where such effects are identified as a result of the proposed action or any alternative, agencies should analyze how environmental and health effects are distributed within the affected community. The memo directed agencies to consider potential effects on sustenance harvests.

The proposed ACLs would apply to everyone that catches shrimp, lobsters, Kona crabs, or precious corals, and no new monitoring is required for the ACL specifications or the AMs to be implemented. The environmental review in this EA establishes that the proposed specifications of ACLs and provisions for post-season harvest reviews as the AMs in the western Pacific Crustacean and precious coral fisheries are not expected to result in a change to the way the fisheries are conducted and the fisheries now do not have large adverse health or environmental effects and do not affect sustenance harvests.

The ACLs and AMs are intended to provide for long-term sustainability of Crustacean MUS and Precious Coral MUS fisheries. Specification of the ACLs and post-season reviews are expected to help in ensuring long term conservation and management of the resources. This would benefit the human communities that rely on them for sustenance. The proposed specifications are not expected to change the fisheries or result in large or adverse environmental effects that could have disproportionately large or adverse effects on members of Environmental Justice communities in American Samoa, Guam, the CNMI, or Hawaii.

4.10 Executive Order 12866

A "significant regulatory action" means any regulatory action that is likely to result in a rule that may –

1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal government or communities;
2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The specification of ACLs for precious coral and crustacean fisheries of the western Pacific has been determined to be not significant under E.O. 12866 because it will not: have an annual effect on the economy of $100M, create a serious inconsistency or otherwise interfere with an action taken or planned by another agency, materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof, or raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

4.11 Information Quality Act

The information in this amendment complies with the Information Quality Act and NOAA standards (NOAA Information Quality Guidelines, September 30, 2002) that recognize information quality is comprised of three elements: utility, integrity, and objectivity. National Standard 2 of the Magnuson-Stevens Act states that an FMP's conservation and management measures shall be based upon the best scientific information available. In accordance with this national standard, this EA and the information used to develop the ACLs and AMs all incorporate the best biological, social, and economic information available to date, including the most recent biological information on, and assessment of the fishery resources and protected resources, and the most recent information available on fishing communities.

The policy choices, i.e., the proposed management measures, contained in this EA and associated specification documents, are supported by the available scientific information. The management measures are designed to meet the conservation goals and objectives of the archipelagic FEPs and the

Magnuson-Stevens Act. The data and analyses used to develop and analyze the measures contained in the information product are presented in this EA, or included in reference citations.

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Western Pacific Crustacean Management Unit Species

American Samoa Crustacean Management Unit Species

Scientific Name	English Common Name	Local Name
Panulirus marginatus	spiny lobster	ula
Panulirus penicillatus	spiny lobster	ula-sami
Family Scyllaridae	slipper lobster	papata
Ranina ranina	kona crab	pa‘a
Heterocarpus spp.	deepwater shrimp	NA

Hawaii Crustacean Management Unit Species

Scientific Name	English Common Name	Local Name
Panulirus marginatus	spiny lobster	ula
Panulirus penicillatus	spiny lobster	ula
Family Scyllaridae	slipper lobster	ula papapa
Ranina ranina	Kona crab	papa‘i kua loa
Heterocarpus spp.	deepwater shrimp	NA

Mariana Crustacean Management Unit Species (CNMI and Guam)

Scientific Name	English Common Name	Local Name (Chamorro/Carolinian)
Panulirus penicillatus	spiny lobster	mahongang
Family Scyllaridae	slipper lobster	pa‘pangpang
Ranina ranina	Kona crab	NA
Heterocarpus spp.	deepwater shrimp	NA

Appendix A Western Pacific Precious Coral Management Unit Species

(This species list applies to American Samoa, Guam, the CNMI and Hawaii)

Scientific Name	English Common Name	Local Name
Corallium secundum	pink coral (also called red coral)	NA
Corallium regale	pink coral (also called red coral)	NA
Corallium laauense	pink coral (also called red coral)	NA
Gerardia spp.	gold coral	NA
Callogoria gilberti	gold coral	NA
Narella spp.	gold coral	NA
Calyptrophora spp.	gold coral	NA
Lepidisis olapa	bamboo coral	NA
Antipathes dichotoma	black coral	NA
Antipathes grandis	black coral	NA
Antipathes ulex	black coral	NA

Appendix B Appendix C: Letter from PIFSC Director Mike Seki to PIRO Regional Administrator Michael Tosatto regarding 2015 Kona crab stock assessment and CIE review

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Fisheries Science Center
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January 20, 2016

Mr. Michael Tosatto
Pacific Islands Regional Administrator
NOAA National Marine Fisheries Service
Pacific Islands Regional Office
1845 Wasp Blvd., Building 176
Honolulu, HI 96818

Dear Mr. Tosatto,

This letter reports on the 2015 assessment results for the Main Hawaiian Islands (MHI) Kona crab (*Ranina ranina*) fishery by Thomas et al. (2015), which was recently reviewed through the Center for Independent Experts (CIE) (Hall 2015). This assessment used Hawaii State commercial fisher- reported data in the form of catch and catch per-unit-effort (CPUE). Data from 1970 through 2006 were used in fitting the combined-sex production model. Starting in 2007, revised Hawaii State fishing regulations prohibited retention of female crabs. Male-only catch data from 2007-2009, and scenarios with future catch starting in 2010 set at 0, 7,000, and 8,000 lbs were used in projections of future stock biomass from 2007 through 2030, without adjustment for male-only reported catch or altered mortality of discarded females starting in 2007.

The CIE review concurred with the assessment's conclusion that, in 2006, the MHI Kona crab population was overfished (defined as biomass less than 50% of B_{MSY}), and that the overfished status was unlikely to have improved by 2010. Biomass in 2006 was estimated to be only 18% of B_{MSY}. The assessment projections indicate the following results under a future combined-sex catch mortality of 0, 7,000, and 8,000 lbs:

Combined-sex catch mortality starting in 2010	Biomass projection result
0 lbs	Biomass will definitely increase, and will become greater than 50% of B_{MSY} by ~2015.
7,000 lbs	Biomass may increase to greater than 50% B_{MSY} by 2030; still a possibility of biomass decline to 0 lbs by ~2020.
8,000 lbs	Biomass likely to decline to 0 lbs by ~2020.

These projections assume the catch mortality was for both males and females, when in reality reported catch starting in 2007 is male-only. This regulation change may have changed the sex ratio in the stock and affected production of Kona crabs starting in 2007. If females survive release, then there may be higher productivity of the stock. However, the Science Center is concerned that female post-release mortality occurs and may be high (Kennelly and Watkins, 1990). If this is true, reported catches starting in 2007 are underestimating catch mortality.

From 2007 through 2012, reported male-only annual catches have ranged from about 8,000 to 11,000 lbs and were slightly lower in 2013 and 2014 (about 8,000 and 3,000 lbs, respectively). If female post-release mortality occurs, then catch mortality is actually higher. The current ACL is 27,600 lbs for male-only catch, and is much higher than the 8,000 lbs of combined-sex catch projected to cause biomass decline or the 7,000 lbs of combined-sex catch that still provides a possibility of biomass decline.

The Center agrees that further work is needed to provide advice on the current status of the population in more recent years, since this stock assessment provides stock status determinations only through 2006. However, this stock assessment provides useful scientific information about stock status within the last decade and the likely result of continued catches since then.

Sincerely,

Dr. Michael Seki, Ph.D.
Director

References:

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Finding Of No Significant Impact

Specification of 2016-2018 Annual Catch Limits and Accountability Measures for Pacific Islands Crustacean and Precious Coral Fisheries

(RIN 0648-XE587)

March 13, 2017

The National Marine Fisheries Service (NMFS) prepared this Finding of No Significant Impact (FONSI) according to the following guidance:

- NMFS Instruction 30-124-1 – Guidelines for the Preparation of a FONSI (July 22, 2005, renewed August 2014);
- National Oceanic and Atmospheric Administration (NOAA) Administrative Order (NAO) 216-6 – Environmental Review Procedures for Implementing the National Environmental Policy Act (NEPA, May 20, 1999);
- NAO 216-6A (April 22, 2016) – Compliance with the National Environmental Policy Act, Executive Orders 12114 (Environmental Effects Abroad of Major Federal Actions), 11988 and 13690 (Floodplain Management), and 11990 (Protection of Wetlands); and
- Council on Environmental Quality (CEQ) significance criteria at 40 CFR 1508.27(b).

NMFS and the Western Pacific Fishery Management Council (Council) prepared the attached environmental assessment "Specification of Annual Catch Limits and Accountability Measures for Pacific Islands Crustacean and Precious Coral Fisheries in Fishing Years 2016 through 2018" (EA) in accordance with NEPA and agency guidelines. The EA analyzes the potential effects of specifying annual catch limits (ACLs) and accountability measures (AMs) for Pacific islands crustacean and precious coral resources for fishing years 2016 through 2018. This FONSI considers the information in the 2017 EA and documents NMFS evaluation of the potential environmental effects of Alternative 2 in 2016–2018, and potentially Alternative 3 in 2017 or 2018, if an ACL is exceeded and the proposed AM is triggered that reduces the ACL by the amount of the overage.

Background

NMFS and the Council manage fishing for precious coral and crustacean management unit species (MUS) in Federal waters (that is, within the U.S. Exclusive Economic Zone, generally 3–200 nm offshore) around the U.S. Pacific Islands through one of four fishery ecosystem plans (FEP) authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).[1] Three of the FEPs are archipelagic-based and include the American

[1] Nearshore waters, generally within three nm of the shoreline around American Samoa, Guam the Northern Mariana Islands and Hawaii are subject to the respective jurisdiction and management authority of the Territory

Samoa Archipelago FEP, the Hawaii Archipelago FEP, and the Mariana Archipelago FEP (which covers fishing in federal waters around Guam and the Commonwealth of Northern Mariana Islands or the CNMI). The fourth FEP covers fishing in federal waters of the U.S. Pacific remote island areas (PRIA) which include Palmyra Atoll, Kingman Reef, Jarvis Island, Baker Island, Howland Island, Johnston Atoll, and Wake Island.

The Magnuson-Stevens Act and Federal regulations implementing the FEPs at 50 CFR 665.4 require NMFS to specify an annual catch limit (ACL) and accountability measures (AM) for adhering to the limit for each stock or stock complex of MUS identified in an FEP, as recommended by the Council, and in consideration of the best available scientific, commercial, and other information about the fishery for that stock or stock complex. Precious coral MUS include several species of black coral, pink or red coral and gold coral. Crustacean MUS include spiny lobsters, slipper lobsters, deep-water shrimp and kona crab.

Federal Action

As recommended by the Council, NMFS proposes to specify ACLs precious coral and crustacean fisheries around American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, and the main Hawaiian Islands (MHI) for fishing year 2016. The fishing year for crustaceans begins January 1 and ends December 31 of each year. The fishing year for precious corals begins on July 1 and ends on June 30 the following year (50 CFR 665.12). Table 1 lists the proposed ACLs for each precious coral and crustacean fishery in each island area.

Table 1. Proposed 2016 ACLs for Precious Coral and Crustacean MUS in each FEP area

Fishery	Proposed ACL
HAWAII	
Deepwater Shrimp	250,773 lb
Slipper Lobster	280 lb
Kona Crab	No ACL proposed
Auau Channel Black Coral	2,500 kg
Makapuu Bed Pink/Bamboo Coral	1,000 lb/250 kg
180 Fathom Bank Pink/Bamboo Coral	222 lb/56 kg
Brooks Bank Pink/Bamboo Coral	444 lb/111 kg
Kaena Point Bed Pink/Bamboo Coral	67 lb/17 kg
Keahole Bed Pink/Bamboo Coral	67 lb/17 kg
Precious Coral Exploratory Area	1000 kg
AMERICAN SAMOA	
Deepwater Shrimp	80,000 lb
Slipper Lobster	30 lb
Kona Crab	3,200 lb

of American Samoa, the Territory of Guam the Commonwealth of the Northern Mariana Islands, and State of Hawaii. Those nearshore waters are not part of the FEP management area.

Fishery	Proposed ACL
Black Coral	790 lb
Precious Coral Exploratory Area	1,000 kg
CNMI	
Deepwater Shrimp	275,570 lb
Slipper Lobster	60 lb
Kona Crab	6,300 lb
Black Coral	2,100 lb
Precious Coral Exploratory Area	1,000 kg
GUAM	
Deepwater Shrimp	48,488 lb
Slipper Lobster	20 lb
Kona Crab	1,900 lb
Black Coral	700 lb
Precious Coral Exploratory Area	1,000 kg

Each fishing year, NMFS would monitor precious coral and crustacean catches from both local state/territorial waters (generally from the shoreline to three mile offshore), and Federal waters and compare cumulative catches with the specified ACLs for each island area. However, NMFS cannot project the date when an ACL might be reached because catch statistics from local state/territorial fisheries are generally not available until at least six months after the data have been collected. Therefore, in-season AMs applied in Federal waters to prevent the ACL from being exceeded (e.g., fishery closures) are not possible in any island area at this time. For this reason, only a post-season AM is possible. Specifically, NMFS and the Council would use the average catch of fishing years 2014, 2015 and 2016 to evaluate fishery performance against the 2016 ACL, the average catch of fishing years 2015, 2016 and 2017 to evaluate fishery performance against the 2017 ACL and so on. After the end of each fishing year, if NMFS and the Council determine the three-year average catch for any MUS exceeded the specified ACL, NMFS would reduce ACL for that MUS in the subsequent fishing year by the amount of the overage.

The proposed action would implement the ACL specifications and AMs described under Alternative 2 in the 2017 EA, and are identical to those NMFS specified in fishing year 2015 (80 FR 52415, August 31, 2015). However, should any fishery exceed the three-year average ACL, the proposed action also calls for reducing the ACL by the amount of the overage in a subsequent year, which would be the ACLs described under Alternative 3 in the 2017 EA. Although the EA analyzes the potential effects of Alternatives 2 and 3 in fishing years 2016 through 2018, NMFS would specify the ACLs annually through proposed and final rulemaking in the *Federal Register*. This would allow interested parties to comment on the proposed ACL each year.

Although recommended by the Council, NMFS does not propose specifying an ACL for Hawaii kona crab. In December 2015, the Center for Independent Experts (CIE) completed a peer review of an October 2015 stock assessment for Hawaii kona crab prepared by the University of California at Santa Barbara, in collaboration with NMFS Southwest Fisheries Science Center.

The assessment results indicate that the Hawaii Kona crab fishery was very likely to be overfished as of 2006 (defined as Biomass less than 50% of B_{MSY}). Both the CIE reviewers and NMFS Pacific Islands Fisheries Science Center (PIFSC) agreed with the stock assessment of the fishery for 2006. However, the CIE reviewers and PIFSC scientists also pointed out the significant amount of uncertainty of the assessment's future projections of the stock's status after 2006, when the State of Hawaii's began a prohibition on landing female crabs. This is because the assessment projections assume catch mortality after 2006 is from both male and female kona crab, when in reality, catch starting in 2007 is male-only due to the State law. PIFSC noted that, while the stock assessment provides useful information on stock status within the last decade and the likely result of continued catches since then, further work is needed to provide advice on the current status of the population in more recent years.

Since 2007, the average annual reported catch of Hawaii kona crab (male-only) is approximately 8,127 lb, with 2,332 lb caught in 2015. NMFS recognizes that, while there are data gaps and methodological concerns with the 2015 Kona crab stock assessment, it does contain, as noted by PIFSC, useful scientific information on the status of the stock over the last decade. NMFS notes that the stock assessment, although it could be improved, should be considered when setting an ACL. However, because the Council did not account for this information with other relevant information in recommending the 2016 Hawaii kona crab ACL, NMFS will not set an ACL for this stock in 2016. Instead, we will direct the Council to review the available information at its June 2017 meeting, and work with its Scientific and Statistical Committee and the PIFSC to consider all the information in order to set an acceptable biological catch and ACL for the stock, consistent with the Magnuson-Stevens Act for fishing year 2017.

NMFS would also not specify an ACL for precious corals and crustacean MUS in Federal waters around the U.S. PRIA. This is because fishing is currently prohibited within 12 nm of emergent land, unless authorized by U.S. Fish and Wildlife Service (USFWS) in consultation with NMFS (See 50 CFR 665.933), and there is no habitat seaward of the 12 nm prohibited fishing area. To date, the USFWS has not initiated consultation with NMFS for fishing it authorizes within 12 nm of the PRIA. Consultations with the USFWS would provide information that NMFS and the Council need to monitor catch and effort in the PRIA, and develop additional fishing requirements if necessary in the future, including catch limits for species that may require them.

Coordination and Public Involvement

The Council developed the proposed action in accordance with the approved ACL mechanism established in the FEPs and implementing Federal regulations at 50 CFR 665.4, and in consideration of the best available scientific, commercial, and other information about the fishery. At its 164th meeting held October 20-22, 2015, the Council considered recommendations from the Science and Statistical Committee's 121st meeting held October 13-14, 2015. All meetings were open to the public and advertised in Hawaii news media, the *Federal Register* (80 FR 57582, September 24, 2015), and on the Council's website. See sections 2.1, 2.2 and Appendix B in the EA for a summary of the respective recommendations of the SSC and Council from these meetings.

At its 166th meeting held from June 6–10, 2016, the Council evaluated the average catch from fishing years 2013–2015 against the 2015 ACLs, and considered recommendations from the SSC's 123rd meeting held May 31–June 2, 2016. All meetings were open to the public and advertised in Hawaii news media, the *Federal Register* (81 FR 30240, May 16, 2016), and on the Council's website.

On January 18, 2017, NMFS made the EA and the proposed specifications available for a 15-day public review and comment period (82 FR 5517). NMFS did not receive comments on the EA.

Significance Analysis

NAO 216-6A's Companion Manual (section 7C) and NMFS Instruction 30-124-1 – Guidelines for the Preparation of a FONSI contain criteria for determining the significance of the impacts of a proposed action. In addition, CEQ regulations state that the significance of an action should be analyzed in terms of both context and intensity. Each criterion listed below is relevant in making a finding of no significant impact and NMFS has considered them individually, and in combination with the others. NMFS analyzed the significance of this action under Alternatives 2 and 3 based on the NAO 216-6A Companion Manual criteria and CEQ context and intensity criteria. These include the following:

1) Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?

No. NMFS does not anticipate the proposed action would result in changes in the conduct of Pacific islands precious coral or crustacean fisheries in any fishing year in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions. This is because outside of Hawaii, there is no fishing for precious corals, kona crab and deepwater shrimp and little fishing for slipper lobsters (EA, section 3). In Hawaii, harvests of crustaceans and precious corals are small, and well below the estimates of Maximum Sustainable Yield, or its proxy, for each stock (EA, section 3). Additionally, no stocks are subject to overfishing or overfished. Thus, setting catch limits that are higher than current levels of catch is not expected to jeopardize the sustainability of any stock.

NMFS does not anticipate that the absence of an ACL for Hawaii kona crab would jeopardize the sustainability of the stock. As described in EA section 2.3, the stock assessment results indicate that the annual commercial harvest rate would need to remain below 7,000 lb for stock biomass to rebuild to the level that produces B_{MSY}. The 2014 kona crab harvest was 3,067 lb, and fell to 2,332 lb in 2015. 2016 data are not yet available. Although NMFS would not specify an ACL for Kona crab in 2017, NMFS expects the annual commercial harvests in the future would to remain below 7,000 lb.

If, at the end of the fishing year, NMFS and the Council determine an ACL was exceeded, the Federal action would require NMFS to reduce the ACL by the amount of the overage in the subsequent fishing year, further reducing the probability of overfishing from occurring. Effects of this downward adjustment are described in the EA in section 3 for Alternative 3. The EA describes that there is not a fishery closure under either alternative 2 or 3, however the added

post season review of catch would also provide an enhanced level of management review of the fishery providing an opportunity for the Council to refine ACL and AM specifications in the future, should changes be necessary.

Additionally, in all four island areas, precious coral and crustacean fisheries do not overlap with other demersal fisheries to a large extent such that ACLs and AMs in any of these fisheries would result in more fishing in other demersal (or pelagic) fisheries (EA sections 3.1 – 3.4).

2) Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?

No. Federal regulations allow only selective and non-destructive gear types to be used in crustacean and precious coral fishing operations. In lobster fisheries, hand harvest and spear are the primary fishing method. For kona crab and deep-water shrimp, traps are employed in specific depths and habitats favorable to those species. For precious coral fisheries only hand harvest, remotely operated vehicles and submersibles are allowed. These gear types are highly selective and result in little to no bycatch (EA, section 3).

NMFS does not expect the proposed action to result in more fishing or greater catches of non-target species. The proposed action would not authorize any new fishing methods with unknown bycatch levels, and NMFS does not anticipate crustacean and precious coral fisheries managed under this action to change the way they are currently conducted (EA sections 3.1 – 3.4). Ongoing fisheries monitoring by the Council's FEP plan teams would help fishery scientists and managers to detect any non-target or bycatch issues and, if any are found, address them in future management measures, as needed.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

No. The proposed action would not have a direct effect on EFH or HAPC in any of the subject island areas because regulations require precious coral fisheries to use only selective gears such as hand harvest or submersible or remotely operated vehicle technologies which are not known to have large adverse effects on EFH or HAPC for any MUS. None of the alternatives considered are expected to result in substantial changes to the way the precious coral fisheries in Hawaii are conducted. Additionally, if precious coral fisheries were to develop in American Samoa, Guam, and CNMI, they would be required to use only selective gear technologies and are likely to be conducted in the same manner as done in Hawaii.

Crustacean fishing primarily involves selective methods such as hand collection or spearing, and do not appear to cause damage to the ocean, coastal habitats, corals, or marine habitats, including designated essential fish habitat (EFH) and habitat areas of particular concern (HAPC) for any species (EA sections 3.1 – 3.4). The FEPs protect corals and other habitat through prohibitions on the use of bottom-set nets, bottom trawls, explosives, and poisons.

NMFS does not expect the proposed action to change the gear types used, areas fished, level of catch or effort, as compared to baseline conditions. The proposed specifications would not result in impacts to the coastal zone that we have not already considered in previous consistency determinations (EA section 4.4). For these reasons, NMFS concludes the proposed action and alternative 3 would not lead to substantial physical, chemical, or biological alterations to ocean and coastal habitats, including designated EFH and HAPC (EA Sections 3.1 – 3.5).

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

No. NMFS knows of no impacts from crustacean or precious coral fishery operations to public health or safety (EA Section 3.6.1). NMFS does not expect the conduct of the fisheries to change in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions as a result of the proposed action. None of the fisheries discussed have exceeded ACLs or the MSY and OFL reference points. The proposed action would not result in a race to fish, or change how and where the fishery operates, and fishing for crustacean or precious coral MUS would not likely result in public health issues. For these reasons, neither the proposed action (Alternative 2) or the fallback alternative in the event of an overage (Alternative 3) would result in substantial adverse impacts on public health or human safety at sea (EA Sections 3.10, 3.6.1, and 4.10).

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

No. To date, there have been no observed or reported interactions between Pacific island crustacean or precious coral fisheries and ESA-listed species. The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S., and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction).

The EA considered information from the April 8, 2016, List of Fisheries (81 FR 20550), which classified Hawaii crab trap, kona crab loop net, shrimp trap, lobster dive, net, and trap fisheries as Category 3 fisheries under Section 118 of the MMPA. A Category 3 fishery is one with a remote likelihood or no known incidental mortality and serious injury of marine mammals. To date, NMFS has not included any crustacean or precious coral fisheries of American Samoa, Guam or the CNMI in the annual List of Fisheries. These fisheries are either very small, or nonexistent, in the Territories. However, the same gear and methods are used, or likely to be used, in these fisheries as the Hawaii crustacean and precious coral fisheries. Currently, there is no information available regarding marine mammal interactions in these fisheries for these island areas as no interactions have been reported or observed. Therefore, NMFS concludes that all present and potential crustacean and precious coral fisheries are Category III, with a low likelihood of incidentally taking marine mammals.

NMFS knows of no impacts from crustacean or precious coral fishing operations interacting with endangered or threatened species, marine mammals or impacting critical habitat of these species, and there are no known or observed interactions between these fisheries and protected species. NMFS evaluated the American Samoa, Guam, CNMI and Hawaii fisheries as authorized and

managed under the FEPs for impacts on protected species (EA sections 3.1 – 3.4). NMFS and other Federal agencies determined that these fisheries comply with the requirements of the Magnuson-Stevens Act, the Marine Mammal Protection Act, the Endangered Species Act, and other applicable laws (EA Section 4).

The proposed action would not modify the conduct of the fisheries. Therefore, NMFS determined that crustacean and precious coral fisheries in American Samoa, Guam, CNMI and Hawaii, as conducted under the proposed action, would not affect listed species in any way not already considered in prior consultations (EA Section 4.2).

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

No. There have been no identified impacts to marine biodiversity and/or predator-prey relationships from crustacean and precious coral fisheries, and this proposed action and alternative 3 would not result in changes to the fisheries. NMFS does not anticipate the proposed action would result in changes in gear types used, areas fished, level of catch or effort, as compared to baseline conditions. Therefore, NMFS expects no substantial impacts on biodiversity or ecosystem function to occur from the proposed ACL specifications (EA section 3.10).

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

No. The analysis in the EA did not reveal any significant social or economic impacts interrelated with natural or physical environmental effects. NMFS does not expect the proposed action or alternative 3 to change fishing operations, and the fisheries currently provide positive social and economic benefits to members of fishing communities (EA sections 3.1 – 3.4). NMFS intends the proposed action to prevent overfishing of crustacean and precious coral stocks while providing positive social and economic benefits to fishermen, buyers, and the fishing communities of American Samoa, the CNMI, Guam and Hawaii (EA section 4.9). The proposed action and Alternative 3 would not change the conduct of the fishery, or result in large or adverse environmental effects that could have disproportionately large or adverse effects on members of environmental justice communities in American Samoa, Guam, the CNMI, or Hawaii (EA section 4.9).

8) Are the effects on the quality of the human environment likely to be highly controversial?

No. By providing for annual review of fishery performance, the proposed action will help ensure long-term sustainability of fishery resources in American Samoa, CNMI, Guam and Hawaii, while allowing for optimal yield. For the current proposed action, NMFS solicited comments on the ACL specifications and AMs and on the draft EA over a 15-day public comment period (82 FR 5517; January 18, 2017). NMFS received three public comments that are addressed in the

final specification. None of the public comments indicated controversy regarding effects on the quality of the human environment.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

No. NMFS does not expect the proposed ACLs and AMs to have an effect on scientific, historic, archeological, or cultural resources. The National Historic Preservation Act requires Federal agencies review all Federally funded and permitted projects that may impact sites listed on or eligible for listing on the National Register of Historic Places. Currently, there are no known sites or historic properties in Federal waters 3 to 200 nm offshore from the main Hawaiian Islands or American Samoa that are listed, or eligible for listing, on the National Register of Historic Places. Areas offshore from Guam and the CNMI contain numerous resources related to the War in the Pacific that may be eligible for listing (EA section 4.5).

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

No. NMFS considered the proposed action's effects on the human environment and found it does not involve highly uncertain or unknown effects. Fishery landings would not likely exceed the proposed ACLs or MSY and OFL reference points (noting that no ACL is being set for Hawaii kona crab, as described above). Managers considered the risk of overfishing when setting each ACL. Additionally, the proposed action would not affect target and non-target stocks, protected resources, marine habitats and fishing communities in highly uncertain or unknown ways. The Council and NMFS have managed these fisheries with ACLs and AMs for several years. The EA documents past fishery performance and concludes catches would not exceed the new ACLs. The proposed action and Alternative 3 would not change the conduct of Pacific Islands crustacean and precious coral fisheries in terms of gear types used, areas fished, or catch and effort levels compared to baseline conditions (EA multiple sections). For these reasons, NMFS concludes that the proposed action and Alternative 3 would not result in highly uncertain effects or involve unique or unknown risks.

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

No. NMFS considered the cumulative effects of the proposed action in light of other past, present and reasonably foreseeable future actions. None of the proposed ACLs or AMs would conflict with or reduce the efficacy of existing resource management by local resource management agencies, NMFS, or the Council. The proposed ACL specifications and AMs would also not conflict with ACL and AM specifications for other fisheries in any of the other archipelagic areas, because the ACLs apply to specific fishery resources. NMFS does not anticipate that the proposed ACLs and AMs would result in a change to any fishery in any of the areas. Specifically, NMFS does not anticipate that participants in one fishery would change their fishing practices and target different management unit species (MUS) adversely affecting the stock status of MUS in another fishery (EA Section 3).

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

No. None of the affected fisheries are known to have adverse effects on bottom resources and none is likely to damage any historical or cultural resource that may occur in offshore waters including shipwrecks, or War in the Pacific resources. The continued operation of the fisheries under the proposed action and Alternative 3 would not change the conduct of the precious coral, slipper lobster, crab, or deepwater shrimp fisheries. For these reasons, the proposed action and Alternative 3 would not affect historic sites listed on, or eligible for, listing on the National Register of Historic Places and no further coordination is required (EA, section 4.5).

13) Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

No. Fishing for crustaceans or precious corals is not known to be a potential vector for spreading invasive species. The proposed action would not change the conduct of the fisheries in terms of gear types used or areas fished compared to baseline conditions. Therefore, specifying new ACLs and AMs would not likely result in the introduction or spread of non-indigenous species (EA Section 3).

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

No. NMFS needs to implement the proposed action to comply with the provisions of the Magnuson-Stevens Act and Federal regulations at 50 CFR 665.4. Since 2012, NMFS has specified ACLs and AMs for Pacific Islands MUS. The proposed action and Alternative 3 would not establish any new precedent. Operating the fisheries under ACLs and AMs would not result in a decision in principle about future considerations because resource management agencies would continue to monitor the fisheries, even without an ACL specification. Each year, NMFS and the Council would evaluate catches against the ACL and may reduce the ACL in a subsequent year to mitigate any ACL overages. The proposed ACLs and AMs are intended to help provide for sustainable harvests of precious corals and crustacean resources over the short and long term. The proposed ACLs and AMs would not result in narrowing future options.

15) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

No. The Council developed the recommended ACLs and AMs in a public process in accordance with the provisions of the Magnuson-Stevens Act, the FEPs, and in coordination with fishery scientists, managers, other resource managers, and other interested parties, and found no violation of law (EA Section 1.4). NMFS also provided additional opportunities for public review and comment on the proposed action and the draft EA. NMFS received three public comments that are addressed in the final rule. Additionally, NMFS evaluated the proposed action for compliance with the Magnuson-Stevens Act, the Endangered Species Act, and the Marine

Mammal Protection Act, and other applicable Federal laws and did not find that the proposed action would threaten a violation of these laws (EA Section 4).

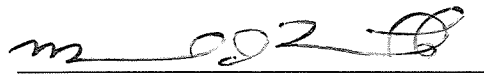
16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

No. In section 3.9.2 of the EA, NMFS evaluated the potential for cumulative effects of the proposed action on target and non-target stocks, considering the specification of ACLs and AMs for American Samoa, CNMI, Guam, and Hawaii crustacean and precious coral MUS from 2016 through 2018, and the related, yet separate, ACL and AM specifications for other FEP fisheries, foreseeable future Federal fishery management actions, other NOAA actions, and other considerations. The analysis found that the proposed action is not expected to result in cumulative impacts that could have a substantial effect on target and non-target species. See answers to questions #2 and # 11.

NMFS considered the effects of the proposed action on climate change, and climate change impacts on the proposed action (EA section 3.8). We do not expect climate change to adversely affect the effectiveness of the proposed action in providing for sustainable levels of fishing for crustacean and precious coral MUS. Recent catches relative to the current estimates of MSY and OFL informed the development of the proposed action and Alternative 3 (EA, section 2) and both recent catches and expected catches are expected to be sustainable for the short and long term (EA, section 3). Monitoring of the physical conditions and biological resources by a number of agencies would continue to occur and would allow fishery managers to continually make adjustments in fishery management regimes in response to changes in the environment (EA, section 3.8). Neither alternative is would result in a change to the conduct of the fisheries, so no change in greenhouse gas emissions is expected (EA, section 3.8).

Determination

In view of the information presented in this document and the analysis contained in the supporting EA, I have determined that the proposed action, described as Alternative 2, and Alternative 3 would not significantly impact the quality of the human environment as described above and in the supporting EA. In addition, NMFS has addressed all beneficial and adverse impacts of the proposed action to reach the conclusion of no significant impact. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.



Michael D. Tosatto
Regional Administrator

3/13/17
Date