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Final Environmental Assessment

Specification of Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in U.S. Pacific Island Territories in 2015 and 2016, including a Regulatory Impact Review

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Abstract

The National Marine Fisheries Service (NMFS) proposes to specify a catch limit of 2,000 metric tons (mt) of longline-caught bigeye tuna for each of the pelagic longline fisheries of American Samoa, Guam and the Northern Mariana Islands in 2015. Without this catch limit, the U.S. territories would not be subject to a limit because international measures adopted by the Western and Central Fisheries Commission (WCPFC) for bigeye tuna do not apply to Small Island Developing States (SIDS) or to Participating Territories (PT) to the WCPFC. The WCPFC treats each U.S. territory as a PT. NMFS also proposes to authorize each U.S. territory to allocate up to 1,000 mt of its 2,000-mt bigeye tuna limit to a U.S. longline fishing vessel or vessels (holding a valid permit issued under Title 50, Code of Federal Regulations, Section 665.801 (50 CFR 665.801)) identified in a valid specified fishing agreement with a U.S. territory. NMFS would attribute the catches of bigeye tuna made by vessels identified in a valid specified fishing agreement to the U.S. territory to which the agreement applies in accordance with the procedures set forth in 50 CFR 665.819. Funds received under a specified fishing agreement are applied toward fisheries development projects identified in a territorial marine conservation plan (MCP). NMFS would monitor catches of bigeye tuna caught by the longline fisheries of each U.S. territory, including catches made by U.S. longline vessels operating under specified fishing

agreements. When NMFS projects a territorial catch or allocation limit would be reached, NMFS would, as an accountability measure (AM), prohibit the retention of longline-caught bigeye tuna by vessels in the applicable U.S. territory (if the territorial catch limit is projected to be reached), and/or by vessels operating under the applicable specified fishing agreement (if the allocation limit is projected to be reached). Recognizing that the WCPFC did not adopt big eye tuna limits for PTs or SIDS, the Western Pacific Fishery Management Council recommended the proposed catch and allocation limits and AM in accordance with the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific (Pelagic FEP) and implementing federal regulations at 50 CFR 665.819. The proposed 2015 catch and allocation limits and AM are identical to those NMFS specified in 2014 (79 FR 64097, October 28, 2014).

NMFS prepared this environmental assessment (EA) to evaluate the potential environmental impacts of the proposed catch and allocation limit specifications in fishing years 2015, and potentially again in 2016. The draft EA analyzes the following two alternatives for catch and allocation limit specifications in detail:

1. Alternative 1: No specification of catch or allocation limits (No Management Action); and
2. Alternative 2: Specify for each U.S. participating territory, a 2,000-mt catch limit and 1,000-mt allocation limit in 2015 and 2016 (Status Quo/Council and NMFS preferred).

Based on the status determination criteria set forth in the Pelagic FEP, bigeye tuna in the Western and Central Pacific Ocean (WCPO) is currently subject to overfishing due to international overfishing, but is not overfished. To address the overfishing status of this stock, the WCPFC has adopted several conservation and management measures (CMM) to reduce fishing mortality of bigeye tuna in longline and purse seine fisheries by certain WCPFC member countries. A recent evaluation of the current bigeye tuna measure, CMM 2013-01, conducted by the science provider to the WCPFC indicates that the full implementation of this measure is expected to end overfishing of WCPO bigeye tuna by 2032.

The analysis in the EA indicates that the level of catch allocated under the proposed action (Alternative 2) would be consistent with the objective of CMM 2013-01 in ending overfishing by 2032, which continues in CMM 2014-01. Therefore, the proposed catch and allocation limits and AM are not expected to result in adverse effects on the long-term sustainability of bigeye tuna. The analysis in this EA also indicates that the proposed action is not expected to result in adverse effects on the sustainability of other non-target species, bycatch species, protected species, or adversely affect marine habitats.

Copies of this EA and final rule are found under RIN 0648-XD998 at www.regulations.gov, or by contacting the responsible official or Council at the above addresses.

Environmental Assessment

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Acronyms and Abbreviations

APA	Administrative Procedure Act
BET	Bigeye tuna
BiOp	Biological Opinion
CCM	Cooperating members, non-members, and participating territories of the WCPFC
CFCAA	Consolidated and Further Continuing Appropriation Act of 2012
CMM	Conservation and management measure
CPUE	Catch per unit of effort
Convention	Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean
Council	Western Pacific Regional Fishery Management Council
DPS	Distinct Population Segment
EA	Environmental assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement

EPO	Eastern Pacific Ocean
ESA	Endangered Species Act
FAD	Fish aggregation device
FEP	Fishery ecosystem plan
FMP	Fishery management plan
FR	*Federal Register*
HAPC	Habitat Areas of Particular Concern
HLA	Hawaii Longline Association
HMS	Highly migratory species
ITS	Incidental Take Statement
IATTC	Inter-American Tropical Tuna Commission
lb	Pound(s)
MBTA	Migratory Bird Treaty Act
MCP	Marine Conservation Plan
MMPA	Marine Mammal Protection Act
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum sustainable yield
mt	Metric ton(s)
MUS	Management unit species
nm	Nautical mile(s)
NMFS	National Marine Fisheries Service
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
Pelagic FEP	Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region
PIFSC	Pacific Islands Fisheries Science Center
PIRO	Pacific Islands Regional Office
PMUS	Pelagic management unit species
PRIA	Pacific Remote Island Areas
PT	Participating Territory
RFMO	Regional fisheries management organization
Section 113	Section 113 of the Consolidated and Further Continuing Appropriation Act of 2012
SIDS	Small Island Developing States
SPC-OFP	Secretariat of the Pacific Community – Oceanic Fisheries Program
UNCLOS	United Nations Law of the Sea Convention, 1982
USFWS	U.S. Fish and Wildlife Service
VMS	Vessel monitoring system
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WPSFF	Western Pacific Sustainable Fisheries Fund
WPFMC	Western Pacific Fishery Management Council

1 Background Information

1.1 Overview of Bigeye Tuna Management in the Western and Central Pacific Ocean

The National Marine Fisheries Service (NMFS) and the Western Pacific Fishery Management Council (Council) manage fishing for bigeye tuna (*Thunnus obesus*) and other pelagic management unit species (PMUS) in federal waters of the Exclusive Economic Zone (EEZ or federal waters; generally 3-200 nautical miles or nm from shore) around American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI) and Hawaii, and on the high seas through the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region (Pelagic FEP) as authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. § 1801 *et seq.*).

Bigeye tuna is an important component of tuna fisheries throughout the Pacific Ocean and is harvested predominantly by purse seine and longline fleets. In the western and central Pacific Ocean or WCPO (generally west of 150° W. long.) bigeye tuna has been experiencing overfishing since 2004 (69 FR 78397, December 30, 2004), but is not considered overfished according to stock status determination criteria described in the Pelagic FEP (WPFMC 2009). To reduce fishing mortality of bigeye tuna in the WCPO, the Western and Central Pacific Fisheries Commission (WCPFC) has developed and agreed upon several conservation and management measures (CMMs), including catch and effort limits that are applicable to longline and purse seine fisheries of WCPFC member countries (See Appendix A). For the purpose of WCPFC membership, the United States is a full WCPFC member, while the U.S. Territories of American Samoa and Guam and the CNMI are each a Participating Territory (PT) to the WCPFC (hereafter, U.S. participating territory). The U.S. Participating Territories have limited participation rights at WCPFC, as described by Article 43 of the *Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean* (WCPF Convention) and the WCPFC's Rules of Procedure.

The most recent CMM for WCPO bigeye tuna, CMM 2014-01, builds off of previous CMMs and includes an objective to "*ensure that the fishing mortality rate for bigeye tuna will be reduced to a level no greater than* F_{MSY} (i.e., $F/F_{MSY} \leq 1.0$)*."* With respect to longline fisheries, CMM 2014-01 specifies a bigeye tuna longline catch limit for certain WCPFC members, including the United States.[1] CMM 2014-01 also clarifies that catch limits do not apply to members that caught less than 2,000 mt in 2004. Because the U.S. territories did not land more than 2,000 mt of bigeye tuna, the U.S. longline catch limit set forth in CMM 2014-01 does not apply to the U.S. participating territories.

CMM 2014-01 also directed each WCPFC member country that caught less than 2,000 mt of bigeye in 2004 to ensure that its catch does not exceed 2,000 mt in 2014, 2015, 2016 and 2017.

[1] Under CMM 2014-01, the U.S. longline bigeye limit for 2015 and 2016 is 3,554 mt and 3,345 mt for 2017. This limit is only applicable to longline fisheries in Hawaii and the West Coast of the United States. The limit does not apply to longline fisheries of the U.S. participating territories, as they are each treated as separate "flag-state" members for the purpose of WCPFC decisions. The U.S. longline bigeye tuna limit each year from 2009 through 2013 under previous CMMs was 3,763 mt.

Paragraph 7 of CMM 2014-01 makes clear, however, that nothing in CMM 2014-01 shall prejudice the rights and obligations of SIDS and PTs seeking to develop their domestic fisheries. This provision of CMM 2014-01 addresses Article 30 of the WCPF Convention. Specifically, Article 30 of the WCPF Convention recognizes the special needs of SIDs and PTs, and provides that CMMs should take into account that SIDS and PTs are economically vulnerable and heavily dependent on their fisheries, and should not be placed at a disadvantage in developing their fisheries as a result of measures intended to reduce the impact on tuna and other fish stocks by more developed nations. In giving effect to paragraph 7 and Article 30, the 2,000 mt bigeye limit is not applied to SIDS and PTs, which includes the U.S. participating territories. Thus, there are no current WCPFC-agreed upon catch limits or fishing effort for bigeye tuna in longline fisheries of SIDS and PTs, including American Samoa, Guam and the CNMI.

To develop their fisheries, many SIDS and PTs have entered into vessel chartering agreements with other WCPFC member countries in accordance with CMM 2012-05. Vessel chartering arrangements[2] are a common tool for fisheries development in the WCPO where one nation-party has vessels to offer and the other nation-party has available resources or an allocation of a resource (e.g., bigeye tuna) that it needs assistance in harvesting. Typically, vessel chartering often involves a WCPFC member with a developed fishery entering into a chartering agreement with a SID or PT, which allows vessels of the WCPFC member to fish on behalf of the SID or PT, with catches being attributed to the SID or PT, and not to the WCPFC member. For more information on the role of the WCPFC in the conservation and management of bigeye tuna and other highly migratory species, and CMMs applicable to U.S. longline fisheries, see Appendix A.

1.2 Amendment 7 to the Pelagic FEP and 2014 Territorial Specifications

In November 2011, the U.S. Congress passed the Consolidated and Further Continuing Appropriations Act of 2012 or CFCAA (Pub. Law 112-55, 125 Stat. 552 *et seq*.). Section 113 of the CFCAA (hereafter Section 113) authorized American Samoa, Guam and the Northern Mariana Islands to use, assign, allocate and manage their catch and effort for highly migratory fish stocks (HMS), including Pelagic MUS, through fishing arrangement with U.S. vessels permitted under the Pelagic FEP to support fisheries development in the U.S. territories. Section 113 also directed the Council to recommend an amendment to the Pelagic FEP and associated regulations to implement Section 113 under the authority of the Magnuson-Stevens Act.

Consistent with Section 113, the Council in 2014, developed and NMFS approved Amendment 7 to the Pelagic FEP (WPFMC and NMFS 2014). Amendment 7 established a process under the authority of the Magnuson-Stevens Act to specify catch and/or effort limits for pelagic fisheries in American Samoa, Guam and the CNMI (hereinafter the U.S. participating territories), as recommended by the Council. The process also allows NMFS to authorize the government of each U.S. participating territory to allocate a portion of its catch or fishing effort limit of pelagic management unit species to a U.S. fishing vessel permitted under the Pelagic FEP through specified fishing agreements to support fisheries development in the U.S. participating territories. Regulations implementing Amendment 7 became effective on October 24, 2014.

[2] Because specified fishing agreements established in Amendment 7 to the Pelagic FEP described in Section 1.2 are not nation to nation agreements, they are not vessel chartering agreements as intended under CMM 2012-05.

In accordance with regulations implementing Amendment 7, NMFS in 2014, specified a catch limit of 2,000 metric tons (mt) of longline-caught bigeye tuna for pelagic fisheries of each U.S. participating territory, and authorized each U.S. territory to allocate up to 1,000 mt of its 2,000-mt bigeye tuna limit to a U.S. longline fishing vessel or vessels identified in a specified fishing agreement (79 FR 64097, October 28, 2014). In that year, the CNMI government entered into a single specified fishing agreement with Quota Management, Inc. (a corporation representing vessels permitted in the Hawaii longline fishery), authorizing Hawaii-based longline vessels identified in that agreement to harvest up to 1,000 mt of the CNMI's 2,000 mt bigeye quota. The agreement also required Quota Management, Inc. to make a monetary contribution to the WP SFF.

Amendment 7 also established criteria that a specified fishing agreement must satisfy, which include among other requirements, that agreements identify those vessels subject to the agreement, and that such vessels land fish in the territory, or deposit funds into the Western Pacific Sustainable Fisheries Fund (WP SFF). Pursuant to Section 204(e)(4) of the Magnuson-Stevens Act, funds deposited into the WP SFF may be used for the implementation of a marine conservation plan (MCP)[3]. See 50 CFR 665.819 for regulations implementing Amendment 7 to the Pelagic FEP.

When operating under a valid specified fishing agreement, federal regulations (50 CFR 665.819) require NMFS to attribute bigeye tuna catches made by vessels identified in the agreement to the territory to which the agreement applies seven days before the U.S. longline bigeye limit[4] is projected to be reached, or upon the effective date of the agreement, whichever is later. Catches of bigeye tuna made by Hawaii longline vessels identified in a specified fishing agreement are not reported to the WCPFC under the U.S. bigeye tuna limit.

By entering into a specified fishing agreement with Hawaii longline vessels, funds were deposited into the WP SFF and made available to support fisheries development projects identified in the American Samoa MCP (77 FR 58813, September 24, 2012), the Guam MCP (79 FR 47095, August 12, 2014), the CNMI MCP (79 FR 43399, July 25, 2014), and the Pacific Remote Island Areas MCP (79 FR 44753, August 1, 2014). Thus, specified fishing agreements may benefit all U.S. participating territories, not just the territory to which the agreement applies. For more information on the territorial catch and allocation limit process, see Amendment 7 to the Pelagic FEP (WPFMC and NMFS 2014), and implementing federal regulations at 50 CFR 665.819.

1.3 Purpose and Need for Action

The purpose of this action is to establish a bigeye tuna catch and an allocation limit for longline fisheries of each U.S. territory (American Samoa, Guam and the CNMI), and that will help to support the development of fisheries in those territories consistent with Amendment 7 to the

[3] MCPs are developed by the Governors of each U.S. participating territory and describe planned marine conservation projects that may include, but are not limited to, development and implementation of sustainable marine resource development projects, fisheries monitoring and enforcement activities, and scientific research.
[4] The U.S. longline bigeye tuna limit for 2014 was 3,763 mt.

Pelagic FEP and fishery development provisions of the Magnuson-Stevens Act. The proposed catch limit is needed as a proactive management action for U.S. territories because they are not currently subject to a limit under WCPFC CMMs and the Council determined this action would prevent the potential for uncontrolled harvest of bigeye tuna in territorial longline fisheries in the future.

The proposed allocation limit is needed at this time because the U.S. participating territories do not currently harvest substantial amounts of bigeye tuna, and yet desire to responsibly develop their fisheries. Allowing each U.S. participating territory to allocate a portion of its bigeye tuna catch limit at a level that is consistent with the objective of CMM 2014-01 - to reduce fishing mortality of bigeye tuna to a level no greater than F_{MSY}, (i.e., $F/F_{MSY} \leq 1$) - provides support for NMFS-approved fisheries development projects identified in each U.S. participating territory's MCP.

1.4 Proposed Action

Under the proposed action, NMFS would specify a catch limit of 2,000 mt of longline-caught bigeye tuna for each U.S. participating territory in 2015, as recommended by the Council. NMFS would also authorize each U.S. territory to allocate and transfer up to 1,000 mt of its 2,000 mt bigeye tuna limit to a U.S. longline fishing vessel(s) permitted under the Pelagic FEP and identified in a specified fishing agreement applicable to the territory. The criteria a specified fishing agreement must meet, and the process for attributing longline caught bigeye tuna made by vessels of the U.S. participating territories and U.S. vessels identified in an approved specified fishing agreement shall follow the procedures codified in 50 CFR 665.819.

NMFS will monitor catches of longline-caught bigeye tuna by the longline fisheries of each U.S. territory, including catches made by U.S. longline vessels operating under specified fishing agreements. When NMFS projects a territorial catch or allocation limit would be reached, NMFS would, as an AM, prohibit the retention of longline-caught bigeye tuna by vessels in the applicable U.S. territory (if the territorial catch limit is projected to be reached), and/or by vessels operating under specified fishing agreements (if the allocation limit is projected to be reached). Pursuant to federal regulations at 50 CFR 664.819, if NMFS determines catch made by vessel(s) identified in a specified fishing agreement exceeds the allocated limit, NMFS will attribute any overage of the limit back to the U.S. or U.S. participating territory to which the vessel(s) is registered and permitted. The proposed action is identical to the action NMFS approved and implemented in 2014 (79 FR 64097, October 28, 2014).

Prior to recommending catch and allocation limits for 2016, the Council shall review the 2015 territorial catch and allocation limits and evaluate whether allocation of catch in 2016 is consistent with the Pelagic FEP, Magnuson-Stevens Act, WCPFC decisions (e.g., CMM 2014-01), and other applicable laws.

1.5 Decision to be Made

After considering public comments on the proposed action and alternatives considered, and after considering the potential environmental impacts of the proposed action and the no-action

alternative, NMFS may specify catch and allocation limits and AMs for pelagic longline fisheries of American Samoa, Guam and the CNMI for the 2015 fishing year. NMFS will also use the information in this EA to consider the impacts of the proposed action and alternatives during the 2016 fishing year. NMFS will supplement this analysis, as appropriate, following the Council's recommendation of catch and allocation limits for 2016. Finally, the Regional Administrator of the NMFS Pacific Islands Regional Office (PIRO) will also use the information in this EA to make a determination as to whether the selected catch and allocation limits and AM specifications of the proposed action would constitute a major federal action significantly affecting the quality of the environment to warrant the preparation of an environmental impact statement.

1.6 Public Involvement

At its 162nd meeting held March 16-18, 2015, the Council considered and discussed issues relevant to bigeye tuna catch and allocation limits for the U.S. participating territories, including the most recent 2014 stock assessment, the recommendations of the Council's Scientific and Statistical Committee (SSC) made at the 118th SSC meeting held March 10-12, 2015, and other relevant information. Both meetings were open to the public and publicized in the Hawaii media, the *Federal Register* (80 FR 9440, February 23, 2015), and on the Council's website. Longline fishermen in attendance at the Council meeting provided public comment in support for the proposed action. There were no other public comments made. Reports of the 162nd Council meeting and the 118th SSC meetings can be obtained from the Council. On August 24, 2015, NMFS published the proposed specifications, and request for public comments on the action and the draft EA (80 FR 51193); the comment period ended September 8, 2015. NMFS received comments from individuals, businesses, and non-governmental organizations on the proposed specifications and on the draft EA. NMFS considered public comments in finalizing the EA and in making its decision on the proposed action, and responds to comments in the final specification.

2 Description of the Alternatives Considered

This section describes the alternative longline bigeye tuna catch and allocation limits for American Samoa, Guam and the CNMI for 2015, and potentially 2016 and the expected fishery outcomes that would occur under each alternative. Table 1 provides a comparison of the features of the Alternatives considered and possible fishery outcomes.

Features Common to all Alternatives

On July 23, 2015, NMFS published an interim final rule to implement U.S. bigeye tuna catch limit specifications applicable to the U.S. longline fleet for 2015, 2016 and 2017, as set forth in CMM 2014-01 (80 FR 43634). As noted in the rule, the bigeye tuna limit is 3,502 mt for 2015[5],

[5] Under CMM 2014-01, the applicable longline bigeye tuna catch limit for the United States in 2015 is 3,554 mt. The CMM also requires that any catch overage in a given year shall be deducted from the catch limit for the following year. This overage provision was also in CMM 2013-01, the predecessor to CMM 2014-01, and continues to pertain in formulating the catch limit for 2015. NMFS determined that the 2014 bigeye tuna catch limit was exceeded by 52 mt, and thus under the terms of the CMM the proposed catch limit for 2015 is 3,502 mt.

3,554 mt for 2016 and 3,345 mt for 2017. In accordance with federal regulations at 50 CFR Part 300, Subpart O, the limit applies only to bigeye tuna caught by longline gear in the WCPO (generally west of 150° W. long.) and does not apply to bigeye tuna caught by longline gear in the eastern Pacific Ocean or EPO (generally east of 150° W. long.).

Consistent with WCPFC decisions and articles of the Convention applicable to SIDS and PTs, U.S. longline vessels that are not subject to this restriction under NMFS' regulations include vessels that land bigeye tuna in a U.S. territory and vessels that have an American Samoa and Hawaii longline permit (dual AS/HI longline permitted vessel) and land in Hawaii, provided the fish was not caught in the U.S. EEZ around Hawaii. Additionally, if the proposed action described in this document is approved, bigeye tuna caught by the eligible U.S. longline vessels fishing under a specified fishing agreement with a U.S. territory would not be counted towards the U.S. bigeye tuna limit. Rather, in accordance with 50 CFR Part 300, Subpart O, catches of bigeye tuna by these vessels are attributed to the applicable U.S. participating territory under the specified fishing agreement to which the vessel is associated.

Based on 2015 levels of bigeye tuna catch by vessels to which the limit applies, NMFS forecasted the 2015 U.S. bigeye tuna limit was reached on August 5, 2015 and prohibited the retention of longline caught bigeye tuna in the WCPO through the end of the year (80 FR 44883, July 28, 2015). If 2015 level of catch is repeated in 2016, the bigeye tuna limit of 3,554 mt may be reached in August 2016. Once the prohibitions are in effect, Hawaii longline vessels that target bigeye tuna in the WCPO and who are not operating under a valid specified fishing agreement with a U.S. territory, may begin targeting swordfish, or shift fishing effort for bigeye tuna into the eastern Pacific Ocean or EPO (generally east of 150° W. long.). In the EPO, the Inter-American Tropical Tuna Commission (IATTC) has established a bigeye tuna limit of 500 mt, but the limit only applies to vessels greater than 24 m in length. Currently, only 34 out of approximately 140 vessels in the Hawaii longline fishery are greater than 24 m, although most vessels participate in the swordfish fishery. These vessels would be subject to the EPO limit. During a restriction on bigeye tuna in the WCPO, Hawaii longline vessels could also stop fishing until after January 1, 2016.

2.1 Alternative 1: No Specification of Territorial Catch or Allocation limits (No Action)

Under Alternative 1, NMFS would not specify a bigeye tuna catch or allocation limit for any U.S. participating territory in 2015 or in 2016.

Expected Fishery Outcome

Under Alternative 1, longline fisheries of American Samoa, Guam, and the CNMI would not be subject to a bigeye tuna catch limit in 2015 or 2016; they would also not be able to allocate any catch under a specified fishing agreement. Based on recent past fishery performance, vessels operating in the longline fisheries of American Samoa are expected to catch 521 mt of bigeye tuna in 2015 and 2016.[6] This is the average level of catch for the period 2011-2014. No bigeye

[6] The 521 mt represents catch from the dual AS/HI longline permitted vessels fishing on the high seas (394 mt average 2011-2014 level catch) and catch from vessels possessing an American Samoa permit fishing within the American Samoa EEZ (127 mt average 2011-2014 level catch).

tuna is expected to be caught by longline vessels in CNMI or Guam in 2015 or 2016 because as of today there are currently no active longline fisheries based in those islands (see Table 11). High operating costs associated with vessel-docking along with poor market access may be contributing factors to the lack of longline fishing in the Marianas (WPFMC and NMFS 2014).

Vessels operating in the Hawaii longline fishery are expected to catch 3,502 mt of bigeye tuna in 2015 and 3,554 mt in 2016 under the U.S. bigeye tuna limit set forth in CMM 2014-01 (80 FR 43634, July 23, 2015). These vessels would also not be subject to allocation of bigeye tuna catches from the U.S. territories under specified fishing agreements.

Under Alternative 1, the expected bigeye tuna catch for 2015 would be 4,023 mt, which represents the combined catch of bigeye tuna by the longline fisheries of the U.S. territories, American Samoa (521 mt), Guam (0 mt) and the CNMI (0 mt), plus the anticipated catch by the U.S. longline fisheries from Hawaii (3,502 mt) (521 + 0 + 0 + 3,502 = 4,023 mt). In 2016, the expected catch under Alternative 1 would be 4,075 mt, which represents the combined catch of the U.S. territories, American Samoa (521 mt), Guam (0 mt), and CNMI (0 mt) and the U.S. longline fisheries from Hawaii (3,554 mt) (521 + 0 + 0 + 3,554 = 4,075 mt).

Without any Council-recommended specifications for catch and allocation limits for the U.S. participating territories, there would be no basis to enter into specified fishing agreements. The U.S. participating territories could not allocate bigeye tuna catch to eligible U.S. longline vessels permitted under the FEP and no funds would be available for deposit into the Western Pacific Sustainable Fisheries Fund in 2015 or 2016. As a consequence, there would be less monetary resources available to fund fishery development projects identified in an approved territorial MCP, and fewer opportunities for fisheries development by the U.S. participating territories, including improvements to existing fishery infrastructure.

2.2 Alternative 2: Specify for each U.S. participating territory a 2,000-mt catch limit and 1,000-mt allocation limit in 2015 and 2016 (Status Quo/Council and NMFS Preferred)

Under Alternative 2, NMFS would implement the Council's recommendation by specifying a catch limit of 2,000 mt or 4,409,240 lb of bigeye tuna for each U.S. participating territory in each year for 2015 and 2016. NMFS would also authorize the three U.S. territories to each allocate up to 1,000 mt or 2,204,620 lb of their 2,000 mt bigeye limit to FEP-permitted longline vessels identified in a specified fishing agreement with a U.S. territory. The Council's recommended specifications for 2015 are identical to the bigeye tuna catch and allocation limit specifications NMFS implemented in 2014 (79 FR 64097, October 28, 2014). Under this alternative, NMFS would not specify catch or allocation limits for other PMUS for 2015 or 2016 because the Council did not recommend such specifications for other pelagic species.

Expected Fishery Outcome

Under Alternative 2, longline fisheries in the U.S. participating territories would each be subject to a 2,000-mt catch limits for bigeye tuna. This catch limit is currently more restrictive than those agreed to by the WCPFC for SIDS and PTs in CMM 2014-01, which places no limits on SIDS and PTs (see Section 1.1). Under Alternative 2, each U.S. participating territory would also be

authorized to allocate up to 1,000 mt of its 2,000 mt bigeye tuna catch limit to FEP-permitted longline vessels under specified fishing agreements. Specified fishing agreements under this Alternative would support responsible fisheries development in the U.S. participating territories by providing funds for territorial MCPs.

Like Alternative 1, no bigeye tuna is expected to be caught by longline vessels in CNMI or Guam in 2015 or 2016 because there are currently no active longline fisheries based in those islands. In American Samoa, bigeye tuna catches by longline vessels possessing an American Samoa limited access permit are expected to be similar to the average annual catch in 2011-2014, which was approximately 521 mt annually. Therefore, limiting the amount of bigeye tuna a U.S. participating territory could allocate to 1,000-mt ensures that a sufficient amount of quota would remain available for Territory longline fishery participants.

Based on 2015 levels of bigeye tuna catch by vessels to which the limit applies, NMFS forecasted the 2015 U.S. bigeye tuna limit was reached on August 5, 2015 and prohibited the retention of longline caught bigeye tuna in the WCPO through the end of the year (80 FR 44883, July 28, 2015). If 2015 level of catch is repeated in 2016, the bigeye tuna limit of 3,554 mt may be reached in August 2016.

Once the prohibition occurs, NMFS expects territorial governments and/or vessels in the Hawaii longline fishery will seek to negotiate a specified fishing agreement to allocate a portion of a territory's 1,000 mt limit. Because federal regulations prohibit a vessel from being identified in more than one specified fishing agreement at a time, nearly all longline fishing vessels operating from Hawaii agreed to enter into a single specified fishing agreement with the CNMI in 2014, which allowed those vessels access to 1,000 mt of CNMI's 2,000 mt limit in 2014. No other specified fishing agreement was made in 2014.

When operating under a valid specified fishing agreement, federal regulations at 50 CFR § 665.819 require NMFS to attribute bigeye tuna catches made by vessels identified in the agreement to the territory to which the agreement applies seven days before the U.S. limit is projected to be reached, or upon effective date of the agreement, whichever is later. Catches of bigeye tuna made by longline vessels identified in a specified fishing agreement are not counted toward the U.S. bigeye tuna limit because the vessels are fishing under the territory's established limit.

NMFS cannot predict the number of specified fishing agreements that the U.S. participating territories and eligible longlines vessels will negotiate and submit to NMFS in 2015 and 2016. Additionally, because bigeye tuna in the WCPO is currently subject to overfishing, this EA evaluates the range of impacts to the WCPO bigeye tuna stock and other fishery resources based on the Council's recommendation that one, two or three specified fishing agreements could potentially be authorized. Thus, under Alternative 2, there are four distinct possible fishery outcomes.

2.2.1 Expected Outcome A: One Specified Fishing Agreement

Under Outcome A, NMFS anticipates a single specified fishing agreement. Like Alternative 1, vessels operating in the longline fisheries of American Samoa are expected to catch 521 mt of bigeye tuna in 2015 and 2016. This is the average level of catch for the period 2011-2014. As previously discussed, no bigeye tuna is expected to be caught by longline vessels in CNMI or Guam in 2015 or 2016 (see Table 11). Vessels operating in the Hawaii longline fishery are also expected to catch 3,502 mt of bigeye tuna in 2015 and 3,554 mt in 2016. These limits reflect the U.S. bigeye tuna limit set forth in CMM 2014-01 (80 FR 43634, July 23, 2015). As noted in Section 1.1., the U.S. bigeye limit is applicable to U.S. longline vessels operating in the WCPO; the limit does not, however, apply to the longline fisheries of the U.S. participating territories.

With one specified fishing agreement, the expected bigeye tuna catch for 2015 would be 5,023 mt. This amount represents the combined catch of bigeye tuna by the longline fisheries of the U.S. territories, American Samoa (521 mt), Guam (0 mt), and CNMI (0 mt), plus the allocation limit of 1,000 mt, and the anticipated catch by the U.S. longline fisheries from Hawaii (3,052 mt) (521 + 0 + 0 + 3,502 + 1,000 = 5,023 mt). In 2016, applying the same formula for the U.S. territories, the allocation under one agreement, and the U.S. catch limit for 2016, the combined catch would be 5,075 mt (521 + 0 + 0 + 3,554 + 1,000 = 5,075 mt).

2.2.2 Expected Outcome B: Two Specified Fishing Agreements

Under Outcome B, NMFS anticipates two specified fishing agreements. Like Alternative 1, vessels operating in the longline fisheries of American Samoa are expected to catch 521 mt of bigeye tuna in 2015 and 2016. This is the average level of catch for the period 2011-2014. As previously discussed, no bigeye tuna is expected to be caught by longline vessels in CNMI or Guam in 2015 or 2016 (see Table 11). Vessels operating in the Hawaii longline fishery are also expected to catch 3,502 mt of bigeye tuna in 2015 and 3,554 mt in 2016. These limits reflect the U.S. bigeye tuna limit set forth in CMM 2014-01 (80 FR 43634, July 23, 2015). As noted in Section 1.1., the U.S. bigeye limit is applicable to U.S. longline vessels operating in the WCPO; however, the limit does not apply to the longline fisheries of the U.S. participating territories.

Under two specified fishing agreements, the expected bigeye tuna catch for 2015 would be 6,023 mt. This amount reflects the combined catch of bigeye tuna by the longline fisheries of the U.S. territories, American Samoa (521 mt), Guam (0 mt), and CNMI (0 mt), as well as the allocation limits of 2,000 mt, and the anticipated catch by the U.S. longline fisheries from Hawaii (3,502 mt) (521 + 0 + 0 + 3,502 + 2,000 = 6,023 mt). In 2016, using the same catch data for the U.S. territories, the allocation under two agreements (2,000 mt), and the U.S. catch limit for 2016, the combined catch would be 6,075 mt (521 + 0 + 0 + 3,554 + 2,000 = 6,075 mt).

2.2.3 Expected C: Three Specified Fishing Agreements and Partial Utilization of Territorial Limits

Under Outcome C, NMFS anticipates three specified fishing agreements. Like Alternative 1, vessels operating in the longline fisheries of American Samoa are expected to catch 521 mt of bigeye tuna in 2015 and 2016.This is the average level of catch for the period 2011-2014). As previously discussed, no bigeye tuna is expected to be caught by longline vessels in CNMI or Guam in 2015 or 2016 (see Table 11). Vessels operating in the Hawaii longline fishery are also expected to catch 3,502 mt of bigeye tuna in 2015 and 3,554 mt in 2016. These limits represent the U.S. bigeye tuna limit contained in CMM 2014-01 (80 FR 43634, July 23, 2015). As noted in Section 1.1., this limit is applicable to U.S. longline vessels operating in the WCPO, but it does not apply the longline fisheries of the U.S. participating territories.

With three specified fishing agreements, the expected bigeye catch for 2015 would be 7,023 mt. This amount is the expected combined catch of bigeye tuna by the longline fisheries of the U.S. territories, American Samoa (521 mt), Guam (0 mt), and CNMI (0 mt), the allocation of 3,000 mt under the specified fishing agreement, and the expected catch by longline vessels based in Hawaii (3,502) (521 + 0 + 0 + 3,502 + 3,000 = 7,023 mt). In 2016, using the same data for the U.S. territories, the allocation under three agreements (3,000 mt), and the U.S. catch limit for 2016 (3,554 mt), the combined catch would be 7,075 mt (521 + 0 + 0 + 3,554 + 3,000 = 7,075 mt).

2.2.4 Expected Outcome D: Three Specified Fishing Agreements and Full Utilization of Territorial Limits

Under Outcome D NMFS anticipates three specified fishing agreements. Outcome D also assumes that all three U.S. territories - American Samoa, Guam and CNMI - would each catch 1,000 mt of bigeye tuna (3,000 mt) in 2015 and 2016, and each territory would also allocate their 1,000 mt of bigeye tuna under three specified fishing agreements (3,000 mt). It is also expected that catch of 3,052 mt would be made by the Hawaii longline fishery in 2015 and 3,554 mt in 2016, which represent the U.S. bigeye tuna limit for U.S. longliners under CMM 2014-01 (80 FR 43634, July 23, 2015); the limits do not apply to the U.S. territories.

Under Outcome D, the expected catch of bigeye tuna in 2015 would be 9,502. This amount is obtained by adding the full use of the territory's non-allocated limit (3,000 mt), the allocation from three specified agreements (3,000 mt) and the catch from the U.S. longliners from Hawaii (3,052 mt) (3,000 mt + 3,000 + 3,052 = 9,502 mt). In 2016, assuming the same figures for the U.S. territories but using the U.S. longline limit of 3,554, the combined catch would be 9,554 mt (3,000 + 3,000 + 3,554 = 9,554 mt).

Under Outcomes A through D, it is not expected that the longline fisheries based in Hawaii and the U.S. participating territories would change the manner in which they fish, including gear types used, species targeted, area fished, seasons fished, or intensity of fishing. Additionally, the effort of these fisheries is not expected to be higher than historical levels due to existing regulatory constraints, including catch limits and limited entry programs.

2.3 Alternatives Initially Considered but Rejected from Further Analysis

At its 162nd meeting held March 16-18, 2015, in Honolulu, Hawaii, the Council considered and discussed an alternative that would establish a catch limit of 2,000 mt of longline caught bigeye tuna for each U.S. participating territory in each 2015 and 2016, but limit the amount a territory could allocate to 750 mt. Because the impacts of an allocation limit of 750 mt or lower for each U.S. territory already falls within the range of the outcomes under Alternative 2, this alternative was rejected from detailed consideration in this EA.

of the features of the alternatives.

Alternative 1:	**Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory**			
No Action ***No catch and allocation limits for U.S. territories, and no fishing agreements***	***Outcome A*** ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
2015: None 2016: None.	2015: 2,000 mt 2016: 2,000 mt	Same as in Outcome A	Same as in Outcome A	Same as in Outcome A
2015: None 2016: None.	2015: 1,000 mt 2016: 1,000 mt	Same as in Outcome A	Same as in Outcome A	Same as in Outcome A
2015: None 2016: None.	2015: If the territorial longline BET catch limit is projected to be reached, NMFS would prohibit the retention of longline-caught BET by vessels in the applicable U.S. territory; if the longline BET allocation limit is projected to be reached, NMFS would	Same as in Outcome A	Same as in Outcome A	Same as in Outcome A

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A *1 fishing agreement and 1,000 mt allocation*	***Outcome B*** *2 fishing agreement and 2,000 mt allocation*	***Outcome C*** *3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories*	***Outcome D*** *3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories*
		longline-caught BET by vessels operating under specified fishing agreements. 2016: Same as in 2015.			
Other Applicable Limits and AMs not Part of the Proposed Action					
WCPFC-adopted longline BET catch limit applicable to longline fisheries of the U.S. participating territories in 2015 and 2016:	2015: None 2016: None.	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change
WCPFC-adopted longline BET catch limit applicable to the U.S. longline fishery (Hawaii) for 2015 and 2016:	2015: 3,502 mt 2016: 3,554 mt	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change
AMs to ensure the WCPFC-adopted longline BET catch limit is not exceeded and to correct overages if they occur in 2015 and 2016:	2015: If the BET catch limit is projected to be reached, NMFS would prohibit the retention of longline-caught BET by U.S. longline vessels	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A *1 fishing agreement and 1,000 mt allocation*	***Outcome B*** *2 fishing agreement and 2,000 mt allocation*	***Outcome C*** *3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories*	***Outcome D*** *3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories*
Date the WCPFC-adopted longline BET catch limit is expected to be reached and catch restricted	2015: August 5, 2016: Potentially, same as 2015	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change
Expected Fishery Outcomes					
Expected number of specified fishing agreements	2015: None 2016: None	2015: 1 2016: 1	2015: 2 2016: 2	2015: 3 2016: 3	2015: 3 2016: 3
Expected amount of longline-caught BET that would be allocated to the U.S. (Hawaii) longline fishery:	2015: None 2016: None.	2015: 1,000 mt 2016: 1,000 mt	2015: 2,000 mt 2016: 2,000 mt	2015: 3,000 mt 2016: 3,000 mt	2015: 3,000 mt 2016: 3,000 mt
Expected amount of BET caught by U.S. (Hawaii) longline vessels in 2015 and 2016:	2015: 3,502 mt 2016: 3,554 mt	2015: 4,502 mt 2016: 4,554 mt	2015: 5,502 mt 2016: 5,554 mt	2015: 6,502 mt 2016: 6,554 mt	2015: 6,502 mt 2016: 6,554 mt
Expected amount of BET caught by longline vessels in the U.S. participating territories in 2015 and 2016:	2015: 521 mt 2016: 521 mt	2015: No change 2016: No change	2015: No change 2016: No change	2015: No change 2016: No change	2015: 3,000 mt 2016: 3,000 mt

Topic	Alternative 1:	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
	No Action ***No catch and allocation limits for U.S. territories, and no fishing agreements***	***Outcome A*** ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
Expected amount of BET caught by U.S. (Hawaii) and U.S. territory longline vessels combined in 2015 and 2016:	2015: 4,023 mt 2016: 4,075 mt	2015: 5,023 mt 2016: 5,075 mt	2015: 6,023 mt 2016: 6,075 mt	2015: 7,023 mt 2016: 7,075 mt (U.S. territories not fully utilizing their BET catch limit)	2015: 9,502 mt 2016: 9,554 mt (U.S. territories fully utilizing their BET catch limit)
Date the allocation limit would be reached	2015: Not applicable 2016: Not Applicable	2015: Mid-October 2016: Mid-October	2015: Mid-December 2016: Mid-December	2015: Not expected to be reached 2016: Not expected to be reached	2015: Not expected to be reached 2016: Not expected to be reached
Date a territorial catch limit would be reached	2015: Not applicable 2016: Not Applicable	2015: No limit expected to be reached 2016: No limit expected to be reached	2015: No limit expected to be reached 2016: No limit expected to be reached	2015: No limit expected to be reached 2016: No limit expected to be reached	2015: No limit expected to be reached 2016: No limit expected to be reached

3 Description of the Affected Environment

3.1 Target and Non-Target Stocks

This section identifies the pelagic management unit species (PMUS) managed under the Pelagic FEP that are harvested in longline fisheries of American Samoa, Guam, the CNMI and Hawaii, which includes several species of tuna, billfish and sharks shown in Table 2. This section also briefly summarizes the overfishing and overfished status of PMUS where known. For a comprehensive discussion of the biology and life history of PMUS, see the Pelagic FEP (WPFMC 2009).

The Pelagic FEP (WPFMC 2009) includes criteria for overfishing and overfished status determinations. Overfishing occurs when the fishing mortality rate (F) for one or more years is greater than the maximum fishing mortality threshold (MFMT), which is the fishing mortality rate that produces MSY (F_{MSY}). Thus, if the F/F_{MSY} ratio is greater than 1.0, overfishing is occurring. A stock is considered overfished when its biomass (B) has declined below the minimum stock size threshold (MSST), the level which jeopardizes the capacity of the stock to produce MSY on a continuing basis (B_{MSY}). The $B_{MSST} = (1\text{-}M)B_{MSY}$, where M is the natural mortality rate of the stock, or one half of B_{MSY}, whichever is greater. For example, if the natural mortality rate of a stock is 0.35, $B_{MSST} = 0.65*B_{MSY}$. Thus, if the B/B_{MSY} ratio falls below 0.65, the stock is overfished. If a stock has a natural mortality rate of 0.6, MSST is set at the default of $0.5*B_{MSY}$ (because 1- 0.6 = 0.4, and 0.5 is greater than 0.4). For such a stock, the stock is overfished when the B/B_{MSY} ratio falls below 0.5.

Table 2. Stock status of PMUS under the Pelagic FEP.

Species	Stock	Overfishing?	Overfished?
Bigeye tuna (*Thunnus obesus)*	Pacific-wide	Yes in WCPO	No in WCPO
		No in EPO	No in EPO
Yellowfin tuna (*Thunnus albacares)*	Western Central Pacific	No	No
	Eastern Pacific	No	No
Skipjack tuna (*Katsuwonus pelamis*)	Western Central Pacific	No	No
Albacore (*Thunnus alalunga)*	North Pacific	No	No
	South Pacific	No	No
Pacific bluefin tuna (*Thunnus orientalis*)	Pacific	Yes	Yes
Swordfish *(Xiphias gladius)*	Western Central North Pacific	No	No
	Eastern Pacific	Yes*	No
Striped marlin (*Kajikia audax*)	Western Central North Pacific	Yes	Yes
Blue marlin (*Makaira nigricans*)	Pacific	No	No
Blue shark (*Prionace glauca*)	North Pacific	No	No

Species	Stock	Overfishing?	Overfished?
Oceanic whitetip shark (*Carcharhinus longimanus*)	Pacific	Unknown	Unknown
Shortfin mako shark (*Isurus oxyrinchus*)	North Pacific	Unknown	Unknown
Longfin mako shark (*Isurus paucus*)	North Pacific	Unknown	Unknown
Mahimahi (*Coryphaena* spp.)	Pacific	Unknown	Unknown
Wahoo (*Acanthocybium solandri*)	Pacific	Unknown	Unknown
Opah (*Lampris* spp.)	Pacific	Unknown	Unknown
Pomfret (family Bramidae)	Western Pacific	Unknown	Unknown

Source: http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html; accessed 6/12/2015.
* On June 18, 2015, NMFS determined swordfish in the North Pacific Ocean is comprised of two stocks, the western and central north Pacific stock and the eastern Pacific stock, and that the latter is now subject to overfishing, but not overfished.

3.1.1 Bigeye Tuna

Bigeye tuna is considered a Pacific-wide stock, but recently has been assessed separately in the WCPO and EPO. The most recent stock assessment for WCPO bigeye tuna was completed in 2014 and covers bigeye tuna from Indonesia in the far western Pacific, to the 150° W in the central Pacific Ocean (Harley et al., 2014). The 2014 stock assessment further separates fishing areas into six regions, and evaluates biomass and fishing mortality information and trends within the regions. The regions with the highest impact to bigeye tuna in the WCPO are Regions 3 and 4 – representing 88 percent of bigeye tuna fishing mortality (WCPFC 2011a). Regions 3 and 4 comprise the tropical equatorial zone between 20° N and 10° S, and where the area between 10° N and 10° S is distinguished as the core zone for the tropical tuna longline and purse seine fisheries (Figure 1). The majority of fishing effort by the U.S. longline fishery operating out of Hawaii occurs north of 20° N in Region 2. Moreover, 98% of bigeye tuna caught by this fishery occurs north of 10° N, which area is above the core equatorial zone of the heaviest purse seine and longline fishing (NMFS unpublished data).

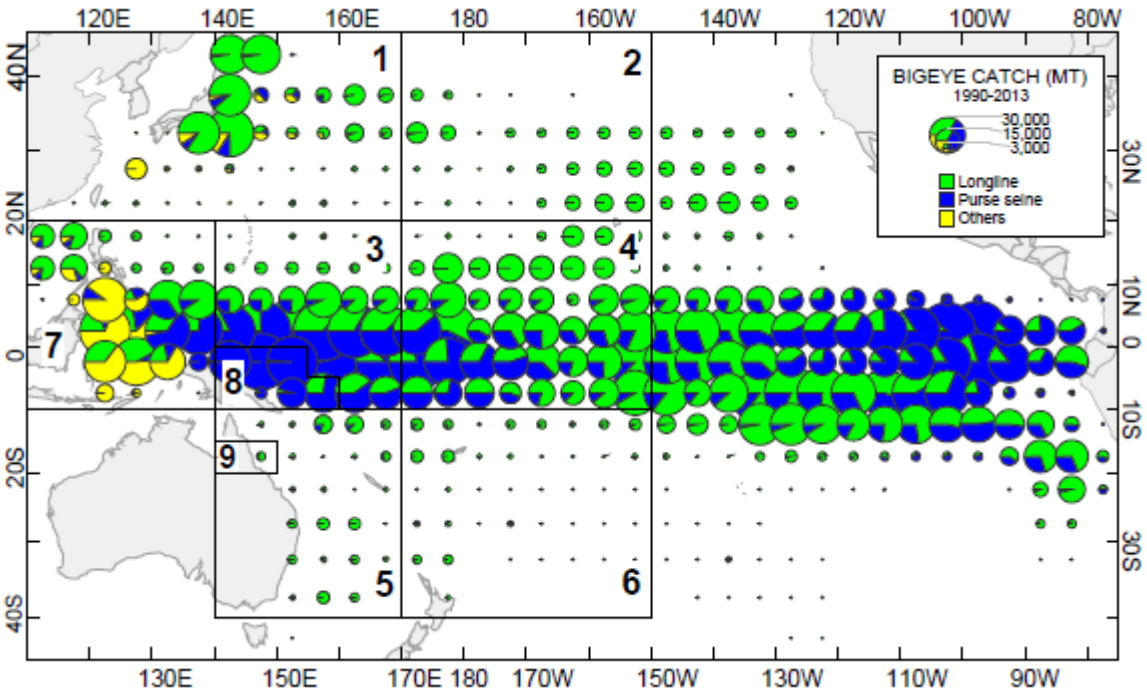

Figure 1. Distribution of cumulative bigeye tuna catch from 1990-2013 by 5-degree squares of latitude and longitude and by fishing gear.

Note: The six-region spatial stratification used in stock assessment for the Western and Central Pacific Convention Area (WCP–CA) is shown. Longline catches of bigeye tuna in the eastern Pacific may not be fully covered. The Hawaii deep-set longline fishery fishes in Regions 2 and 4.

Source: Williams and Terawasi 2014.

The majority of fishing effort by the Hawaii longline fishery occurs north of above 20° N in Region 2, and further 98% of bigeye tuna caught by the Hawaii longline fishery comes from north of 10° N and outside of the core equatorial zone of heavy purse seine and longline fishing (NMFS unpublished data; NMFS PIFSC 2013). As shown in Figure 2, the estimated impact of bigeye tuna catches in Region 2 is much lower than Regions 3 and 4, where the majority of catch occurs. The WCPFC Scientific Committee has recognized the disparity in impacts to the stock between evaluated regions in the stock assessment and has recommend that the WCPFC consider adopting spatial management measures to address overfishing of bigeye tuna (WCPFC 2011a).

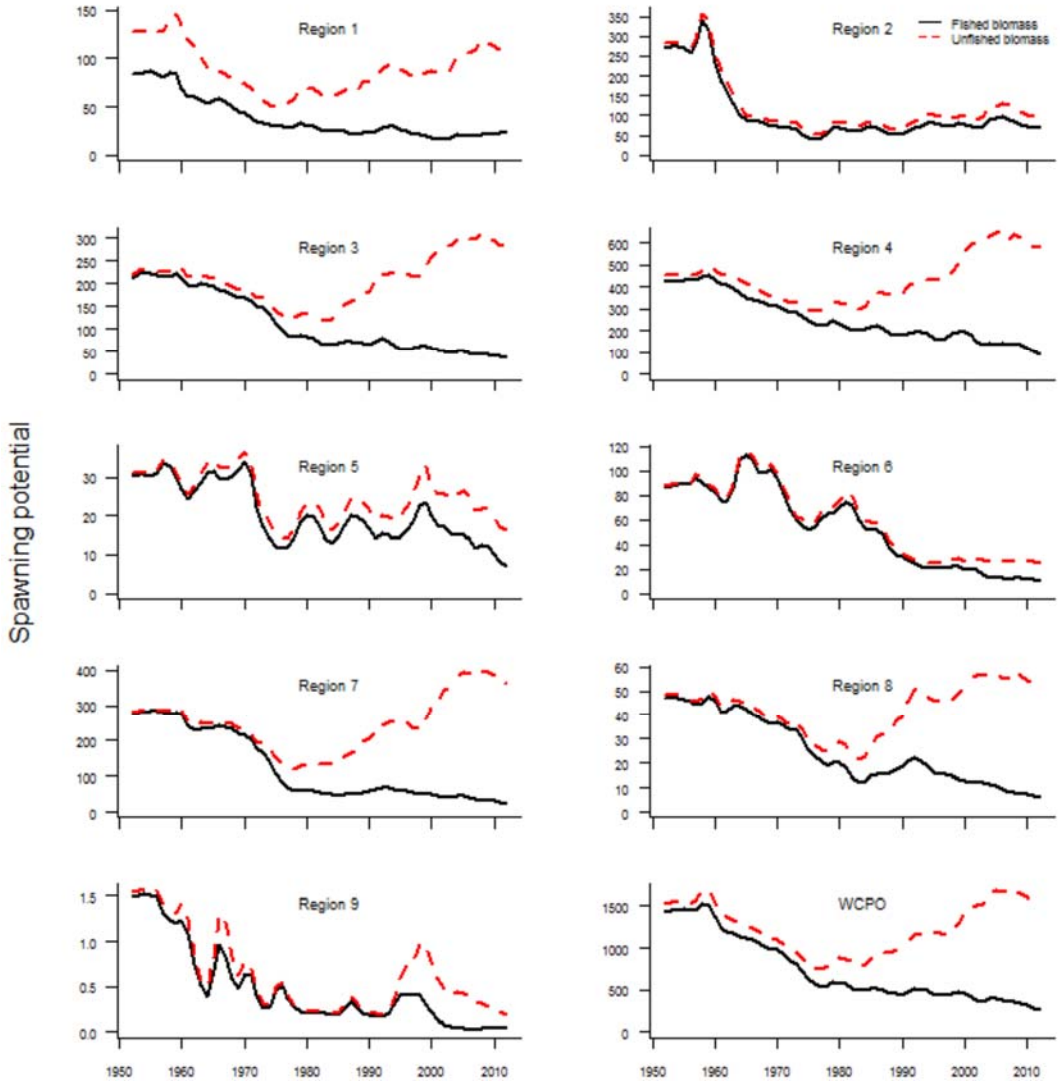

Figure 2. Estimated total biomass trajectories of bigeye tuna in the WCPO with biomass trajectories that would have occurred in the absence of fishing.
Source: Harley et al. 2014.

<u>WCPO Stock Status</u>

In July 2014, the Secretariat of the Pacific Community (SPC) prepared a new stock assessment for bigeye tuna in the WCPO using data through 2012 (Harley et al. 2014). The 2014 stock assessment updates the previous stock assessment prepared by the SPC in 2011 (Davis et al. 2011). The 2014 stock assessment applies a two tiered model analysis, with one model providing reference points based on the averages for the period 2008-2011 (latest), while the second model provides reference points for 2012 (current). The 2014 stock assessment also includes several additional sensitivity model runs not run in the 2011 stock assessment.

With respect to recent fishing mortality levels (F) compared to levels associated with MSY (F_{MSY}), under both model tiers, the reference case model (i.e., most plausible model) estimates

F/F_{MSY} = 1.57. This is an increase from the F/F_{MSY} of 1.46 estimated in the 2011 stock assessment by Davis et al. (2011). For the "latest" model tier, additional sensitivity models provide F/F_{MSY} estimates ranging from 1.27 to 1.95, while for the "current" model tier, F/F_{MSY} estimates range from 1.22 to 2.14. Both model tiers and additional sensitivity runs indicate that the stock is still subject to overfishing, as defined by the Council and NMFS under the Pelagic FEP. In addition, the 2014 stock assessment also estimates a new MSY of 108,520 mt compared to 74,993 mt estimated in the 2011 stock assessment (Davis et al. 2011). The increase in MSY is attributed to (1) higher average recruitment in recent years, (2) refinements in the 2014 stock assessment to reduce bias in the spawner-recruitment relationship, and (3) increased catches in recent years by purse seine fisheries.

Based on this information, the Science Committee of the WCPFC at its July 2014 meeting, recommended that fishing mortality on WCPO bigeye tuna be reduced by 36% from the average levels for 2008–2011. This reduction in fishing mortality would be expected to return the fishing mortality rate to F_{MSY} (i.e., F/F_{MSY}= 1.0).

With respect to recent spawning biomass levels (SB) compared to spawning biomass at MSY (SB_{MSY}), under both model tiers, the reference case model indicates SB/SB_{MSY} = 0.77. This is a decrease from the SB/SB_{MSY} ratio of 1.08 in the 2011 stock assessment. Additional sensitivity models provide SB/SB_{MSY} estimates ranging from 0.62 to 1.01. Based on a revised estimated natural mortality rate of 0.5 for bigeye tuna, the minimum stock size threshold (MSST) for bigeye tuna in the WCPO is $0.5*B_{MSY}$. Therefore, the 2014 stock assessment indicates WCPO bigeye tuna is not overfished as defined by the Council and NMFS under the Pelagic FEP. The stock is subject to overfishing, but is not overfished.

The Science Committee of the WCPFC noted at its July 2014 meeting a reduction in fishing mortality of at least 36% from the average levels for 2008–2011 should allow spawning biomass to rebuild above the WCPFC's established limit reference point of $SB/SB_{F=0}$ = 0.20 over a period of time. Williams and Terawasi (2014) report that preliminary total WCPO bigeye catch catches for 2013 was 158,622 mt or 6% lower than in 2012. One tentative conclusion from this report is that the WCPFC conservation and management measures are beginning to reduce fishing mortality on WCPO bigeye tuna.

In 2012, the most recent year of data available in the assessment, total bigeye tuna catch by all U.S. longline fisheries in Hawaii, American Samoa, Guam and the CNMI was 5,162 mt (Tables 10 and 11), or less than 5 percent of the estimated MSY of 108,520 mt. Of the 5,162 mt, the longline fishery based in Hawaii accounted for 3,660 mt, with an additional 771 mt allocated by American Samoa through a specified fishing agreement. In 2012, vessels possessing both an American Samoa longline permit and a Hawaii longline permit (dual AS/HI longline permitted vessel) fishing on the high seas accounted for 567 mt, while vessels possessing an American Samoa permit only and fishing solely in the American Samoa EEZ accounted for 164 mt. There was no reported catch of bigeye tuna from longline fisheries in Guam or CNMI.

EPO Stock Status

Aires-da-Silva and Maunder (2013) conducted the most recent stock assessment for bigeye tuna in the EPO. The results indicate a recent recovery trend for bigeye tuna (2005-2010), subsequent to IATTC tuna conservation resolutions initiated in 2004. Recruitment estimates have been variable since 1975. There were very high peaks in recruitment indices corresponding with the major El Niño events in 1983 and 1998. Recent recruitment indices are predominantly below average. Aires-da-Silva and Maunder (2013) conclude that bigeye tuna in the EPO is not overfished ($B/B_{MSY} = 1.02$), and overfishing is not occurring ($F/F_{MSY} = 0.97$). The 2013 IATTC stock assessment for bigeye tuna in the EPO concludes overfishing is not occurring. The current status in the EPO is considerably more pessimistic if a stock recruitment relationship is assumed, if a higher value is assumed for the average size of the older fish, and if lower rates of natural mortality are assumed for adults (WCPFC 2013a). The most recent estimate of MSY for bigeye tuna in the EPO is 106,706 mt (Aires-da-Silva and Maunder 2013). In 2010, the year of the assessment, total bigeye tuna catch by all U.S. longline fisheries in the EPO was 1,356 mt (NMFS unpublished data, Preliminary 2014 U.S. Part 1 annual report to the WCPFC), or approximately 1.3 percent of the estimated MSY. The IATTC and Secretariat of the Pacific Community, Oceanic Fisheries Program (SPC-OFP) are planning to conduct a Pacific-wide bigeye stock assessment in 2015.

3.1.2 Yellowfin Tuna

The most recent stock assessment of yellowfin in the WCPO by Davies et al. (2014) using data up to 2012 concluded that for the most plausible range of models, the fishing mortality based reference point **(**F_{2012}/F_{MSY}) is estimated to be 0.72, and on that basis, it is concluded that overfishing is not occurring. The corresponding biomass based reference points, current spawning biomass to spawning biomass at MSY (SB_{2012}/SB_{MSY}) were estimated to be above 1.0 at 1.24 and, therefore, the stock is not in an overfished state. Davies et al. (2014) estimate WCPO yellowfin MSY at 586,400 mt. In 2012, the year of the assessment, total yellowfin tuna catch by all U.S. longline fisheries in the WCPO was 1,196 mt (Table 10), less than 1 percent of the estimated MSY.

3.1.3 Skipjack Tuna

The most recent assessment of skipjack tuna in the WCPO was conducted in 2014 (Rice et al. 2014) using data up to 2012. The estimates of current fishing mortality to fishing mortality at MSY (F_{2011}/F_{MSY}) =0.62 indicate that overfishing of skipjack is not occurring in the WCPO. Nor is the stock in an overfished state with spawning biomass to spawning biomass at MSY (SB_{2011}/SB_{MSY}) = 1.81. Fishing pressure and recruitment variability (which is influenced by environmental conditions) will continue to be the primary influences on stock size and fishery performance. Rice et al. (2014) estimate MSY at 1,532,000 mt. In 2012, the year of the assessment, total skipjack tuna catch by all U.S. longline fisheries in the WCPO was 490 mt (Table 10), less than 1 percent of the estimated MSY.

3.1.4 North Pacific Albacore

The most recent stock assessment of North Pacific albacore, which uses data through 2012 (ISC 2014a), indicates that overfishing is not occurring ($F_{2010\text{-}2012}/F_{MSY}$) = 0.52. Applying the average of the ten historically lowest spawning biomass (SB) estimates which is 117,835 mt, and the SB at MSY of 49,680 mt, the ratio of SB/SB_{MSY} is 2.3 indicating the stock is not overfished. The 2014 stock assessment estimated MSY at 105,571 mt. In 2012, the year of the assessment, total North Pacific albacore tuna catch by all U.S. longline fisheries in the north Pacific was 660 mt (NMFS unpublished data, Preliminary 2014 U.S. Part 1 annual report to the WCPFC), or less than 1 percent of the estimated MSY. Of this 660 mt, 480 mt was caught in the WCPO (Table 10).

3.1.5 South Pacific Albacore

The most recent stock assessment of South Pacific albacore was conducted by Hoyle et al. (2012) using data up through 2010. Results indicate the stock is not subject to overfishing F/F_{MSY} =0.21 and the stock is not overfished ($SB_{2007\text{-}2010}/SB_{MSY}$ = 2.56. Most of the longline albacore catch is taken in a latitudinal band between 10 and 40° S. The South Pacific albacore stock is currently not overfished and overfishing is not occurring. Current biomass is sufficient to support current levels of catch. However, any increases in catch or effort are likely to lead to declines in catch rates in some regions, especially for longline catches of adult albacore, with associated impacts on vessel profitability. At its 10th regular session held August 6-14, 2014, in Majuro, Republic of Marshall Islands, the WCPFC Science Committee recommended that albacore longline fishing mortality be reduced to maintain economically viable catch rates. The 2012 stock assessment estimated MSY at 99,085 mt. In 2012, the year of the assessment, total south Pacific albacore catch by all U.S. longline fisheries was 3,147 mt (Table 10), or approximately 3.2 percent of the estimated MSY.

3.1.6 Pacific Bluefin Tuna

Pacific bluefin tuna is considered a single North Pacific-wide stock. In December 2012, the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC) completed their assessment of the status of Pacific bluefin tuna using data through 2011, and concluded that the stock is still experiencing overfishing and is now overfished (ISC 2014b). In April 2013, NMFS determined the same status due to the very low biomass and very high fishing mortality determined by the ISC stock assessment. The ISC assessment estimated the current SB of 22,606 mt to be about 3.6 percent of the unfished SB of 633,468 mt. Current SB is far below that associated with MSY (124,498 mt) and is near historic low levels. NMFS has worked with the Western Pacific and Pacific Councils to develop domestic regulations to address relative domestic fishery impacts. NMFS has also worked with both Councils and the State Department to ensure that effective management measures should be adopted by the WCPFC and IATTC for 2015 and beyond. In 2012, the year of the assessment, total Pacific Bluefin tuna catch by all U.S. longline fisheries was 7 mt (Table 10), less than one percent of the estimated MSY.

3.1.7 North Pacific Swordfish

In 2014, the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) completed a stock assessment for North Pacific swordfish using data through 2012 (ISC 2014c). Based on the best scientific information available, the swordfish population in the North Pacific is comprised of two stocks, separated by a roughly diagonal boundary extending from Baja California, Mexico, to the Equator. These are the Western Central North Pacific Ocean (WCNPO) stock, distributed in the western and central Pacific Ocean, and the EPO stock, distributed in the eastern Pacific Ocean.

WCNPO stock

The results of the 2014 assessment support the conclusion that the WCNPO stock is not subject to overfishing because $F_{2012}/F_{MSY} = 0.58$, and is not overfished because $B_{2012}/B_{MSY} = 1.20$. The 2014 stock assessment estimated MSY for the WCNPO stock at 14,920 mt. In 2012, the most recent year of data available in the assessment, NMFS estimates total catch of swordfish in the WCPO (west of 150 degrees W. long.) by all U.S. longline fisheries was 900 mt (Table 10), or approximately 6 percent of the estimated MSY.

EPO stock

The results of the 2014 assessment support a conclusion that the EPO stock is now subject to overfishing because $F_{2012}/F_{MSY} = 1.11$, but is not overfished because $B_{2012}/B_{MSY} = 1.87$. The 2014 stock assessment estimated MSY for the EPO stock at 5,490 mt. Based on federal logbook records, the 2012 catch of swordfish by the U.S. longline vessels operating within the boundary of the EPO stock was approximately 4 mt, less than 1 percent of the estimated MSY (PIFSC unpublished data). Thus, overfishing of the EPO stock is due to excessive international fishing pressure and the IATTC and WCPFC have inadequate measures in place to address the issue. On June 18, 2014, NMFS informed the Western Pacific and Pacific Fishery Management Councils of their obligations under Section 304(i) of the Magnuson-Stevens Act to develop within one year, recommendations to the Secretary of State and Congress for international actions to end overfishing and domestic regulations to address the relative impact of the U.S. domestic fleet on the stock.

3.1.8 North Pacific Striped Marlin

The results of a 2012 stock assessment (ISC 2012) support a conclusion that the stock is subject to overfishing because the fishing mortality F/F_{MSY} is > 1.0 (1.25) and the spawning biomass (938 mt) is lower than the minimum stock size threshold (MSST) of 1,628 mt. The 2012 stock assessment estimated MSY at 5,378 mt.

At its 10th regular session held August 6-14, 2014, in Majuro, Republic of Marshall Islands, the WCPFC Science Committee has indicated that reducing fishing mortality would likely increase spawning stock biomass and may improve the chances of higher recruitment. CMM 2010-01 for North Pacific striped marlin requires members and cooperating non-members to limit striped marlin catches by all gears from their highest catches from 2000-2003, and then further reduce

catches by 10 percent in 2011, 15 percent in 2012, and 20 percent in 2013. The SIDS and PTs are exempt from catch limits under the North Pacific striped marlin measure. The highest striped marlin catch by the U.S. (i.e., Hawaii's fisheries) is 571 mt. Thus, a 20 percent reduction from 571 mt is 457 mt. The Hawaii longline fishery catches more than 90 percent of the total North Pacific striped marlin.

In 2014, total striped marlin catch by all U.S. longline fisheries in the North Pacific Ocean was 426 mt (NMFS unpublished data, Preliminary 2014 U.S. Part 1 annual report to the WCPFC), or approximately 8 percent of the estimated MSY. This level of catch is below the WCPFC-agreed upon limit of 457 mt as proscribed in CMM 2010-01.

3.1.9 Blue Marlin

A 2013 stock assessment by the ISC Billfish Working Group (ISC 2013), which uses data through 2011 concluded Pacific blue marlin is not experiencing overfishing ($F_{2011}/F_{MSY} = 0.72$). Applying the 2011 spawning biomass (SB) estimates of 24,990 mt, and the SB at MSY of 19,430 mt, the ratio of SB/SB_{MSY} is 1.28 indicating the stock is not overfished. In 2012, the year of the assessment, total blue marlin catch by all U.S. longline fisheries in the WCPO was 313 mt (Table 10), or approximately 1.6 percent of the estimated MSY.

3.1.10 North Pacific Blue Shark

The results of the 2014 assessment (SPC 2014a) support a conclusion that the blue sharks in the North Pacific is not subject to overfishing because $F_{2012}/F_{MSY} = 0.34$, and is not overfished because $SB_{2012}/SB_{MSY} = 1.62$ The 2014 stock assessment estimated MSY at 73,600 mt. In 2012, the year of the assessment, total blue shark catch by all U.S. longline fisheries in the North Pacific was 18 mt (Table 10), or less than 1 percent of the estimated MSY.

3.1.11 Shortfin Mako Shark

Recent abundance indices and median size analyses for shortfin mako in the WCPO have shown no clear trends; therefore, there is no apparent evidence of the impact of fishing on this species in the WCPO. Most previously published stock status studies are also inconclusive. Ongoing issues of concern for the WCPO are: 1) a previously published study suggesting stock reduction in the northwest Pacific using virtual population analysis; 2) the high vulnerability of shortfin mako to longline fishing; and 3) the potential for collateral targeting in directed fishing for blue sharks in the North Pacific. In 2012, total blue shark catch by all U.S. longline fisheries in the North Pacific was 50 mt (Table 10).

3.1.12 Oceanic Whitetip Shark

A 2012 stock assessment for oceanic whitetip shark indicates that it is likely overfished and experiencing overfishing (Rice and Harley 2012a). Recent analysis of four different datasets for the WCPO oceanic whitetip sharks show clear, steep and declining trends in abundance indices for this species. Analysis of two of these datasets for median lengths confirmed that oceanic whitetip sizes decreased significantly until samples became too scarce for meaningful analysis.

Given the strong evidence for the depleted state of the oceanic whitetip population in the WCPO, stock assessment studies may clarify but will not alter the case for further conservation and management action. The assessment by Rice and Harley (2012a) conclude that current catches are lower than the MSY (2,001 mt versus 2,700 mt), but this is not surprising given the estimated stock status and fishing mortality. The greatest impact on the stock is attributed to bycatch from the WCPO longline fishery, with lesser impacts from the target longline activities and purse seining in the WCPO. Given the bycatch nature of fishery impacts, mitigation measures provide the best opportunity to improve the status of the oceanic whitetip population.

Despite the data limitations, model runs indicate that the WCPO oceanic whitetip shark stock is currently overfished and overfishing is occurring relative to commonly used MSY-based reference points and depletion-based reference points. Management measures to reduce fishing mortality and to rebuild spawning biomass through non-retention have been agreed to under CMM 2011-04, but mitigation to avoid capture was not recommended. In 2012, the year of the assessment, total oceanic white tip shark catch by all U.S. longline fisheries was 1 mt (Table 10).

3.1.13 Silky sharks

Silky sharks have a restricted habitat range compared to the other WCPFC key species but within this range, they dominate both longline and purse seine catches. The assessment by Rice and Harley (2012b) conclude that current catches are higher than the MSY (5,950 mt versus 1,885 mt), further catch at current levels of fishing mortality would continue to deplete the stock below MSY. The greatest impact on the stock is attributed to bycatch from the longline fishery, but there are also significant impacts from the associated purse seine fishery, which catches predominantly juvenile individuals, the fishing mortality from the associated purse seine fishery is above F_{MSY}. Given the bycatch nature of fishery impacts, mitigation measures provides the best opportunity to improve the status of the silky shark population. The stock assessment was presented to the 8th WCPFC Science Committee. Due to concerns over the data conflict and potential biases in the silky shark assessment, it was not possible to provide management advice based on the assessment. However, noting that some basic fishery indicators (e.g., mean lengths and some CPUE series) are showing declines in recent years, the Science Committee recommended no increase in fishing mortality on silky sharks. In 2012, the year of the assessment, total silky hark catch by all U.S. longline fisheries was 0 mt (Table 10).

3.2 U.S. Longline Fisheries in the WCPO, including Fisheries of the U.S. Territories

3.2.1 Mariana Archipelago Longline Fisheries

The area where longline fishing vessels based in CNMI and Guam historically have operated is the U.S. EEZ around the Northern Mariana Islands and Guam. Historically, fewer than three longline companies have actively fished in EEZ waters around Guam and the CNMI. For this reason catch and effort information is confidential. Since 2011, there has been no longline fishing activities around CNMI or Guam and no longline fishing activities are expected to occur in 2015 or 2016.

3.2.2 American Samoa Longline Fishery

The longline fishery based in American Samoa is a limited access fishery with a maximum of 60 vessels under the federal permit program. Vessels range in size from under 40 to over 70 ft long. The fishery primarily targets albacore for canning in the local Pago Pago cannery, although the fishery also catches and retains other tunas (e.g., bigeye, yellowfin, and skipjack), and other pelagic management unit species (PMUS) (e.g., billfish, mahimahi, wahoo, oilfish, moonfish (opah), and sharks) for sale and home consumption. The target depth for albacore tuna is approximately 100–300 m (WPFMC 2009).

3.2.2.1 Longline Fishing Area

The area where American Samoa fishing vessels generally operate includes the EEZ around American Samoa, the EEZs of countries adjacent to American Samoa and on the high seas (Figure 3). Based on fishing patterns since NMFS began observer coverage in April 2006, the fishery may make longline sets between 155° W and 180° W and from 1° S to 32° S, with the majority of fishing occurring within the EEZ around American Samoa (NMFS 2010; NMFS Observer Program, unpublished). Additionally, about 16 American Samoa longline limited access permit holders also hold Hawaii longline limited access permits, the latter of which allows them to fish in the EEZ around Hawaii and land fish in Hawaii. Some of these fishermen may operate in both areas during a given fishing year. As previously noted, these vessels have an exception to fishery restrictions on the retention on bigeye tuna in the WCPO and may continue to land fish in Hawaii if NMFS restricts fishing in the WCPO due to the 2015 or 2016 WCPO bigeye tuna limit being reached.

3.2.2.2 Fishing Participation

As previously mentioned, NMFS manages the American Samoa pelagic longline fishery as a limited access fishery with a maximum of 60 vessel permits based on vessel length as follows:

- Class A Permits – vessels less than or equal to 40 ft
- Class B Permits – vessels over 40 ft to 50 ft
- Class C Permits – vessels over 50 ft to 70 ft
- Class D Permits – vessels over 70 ft

The limited access program also caps the maximum number of permits for each vessel size class that results in a limit of 60 vessels in the fishery. NMFS has fixed the maximum number of available permits for the fishery at 16 permits for Class A vessels, five permits for Class B vessels, 12 for Class C vessels, and 27 for Class D vessels. Since the permit program's inception, active participation in the fishery is primarily the larger Class C and D vessels. Based on 2013 data, a total of 22 longline vessels were actively participating in the fishery, including 1 Class A vessel, 0 Class B vessels, 7 Class C vessels and 14 Class D vessels. Table 3 provides the annual number of vessels permitted to participate in the fishery and number of vessels actively fishing between 2006 and 2013. As of June 2015, 2014 data is not yet available.

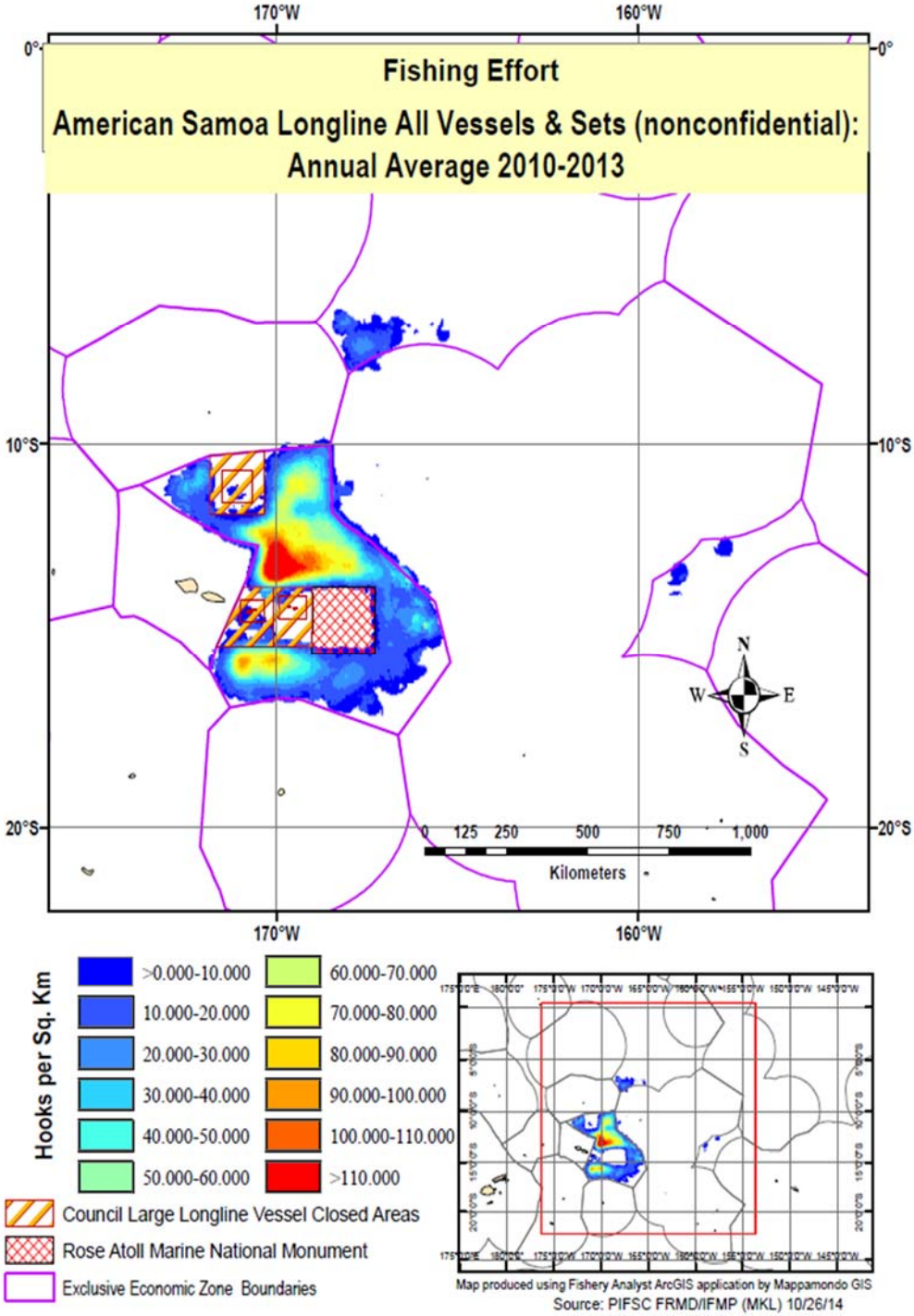

Figure 3. Locations of fishing effort by the American Samoa longline fleet, 2010-13.

Table 3. Number of permitted and active vessels in the American Samoa longline fishery, 2006-2013.

Year	Class A <40 ft		Class B 40.1–50 ft		Class C 50.1–70 ft		Class D >70 ft	
	Issued	*Active*	*Issued*	*Active*	*Issued*	*Active*	*Issued*	*Active*
2006	21	3	5	0	10	6	24	19
2007	18	2	6	0	9	5	26	22
2008	17	1	6	0	9	5	26	22
2009	1	1	1	1	8	5	26	22
2010	12	1	0	0	12	5	26	20
2011	12	1	1	0	12	5	27	18
2012	5	3	5	0	11	8	27	14
2013	5	1	5	0	11	7	26	14

Sources: http://www.pifsc.noaa.gov/wpacfin/as/Data/Pelagic/apel24main.htm (accessed 2/9/15); http://www.pifsc.noaa.gov/wpacfin/as/Data/Pelagic/apel25main.htm (accessed 2/9/15).

3.2.2.3 Fishing Effort

Amendment 11 to the FMP for the Pelagic Fisheries of the Western Pacific Region established the American Samoa Longline Limited Entry Program, and NMFS implemented the program (70 FR 29646, May 24, 2005). Although the American Samoa longline limited entry program allows for up to 60 vessels, the number of vessels actively participating in the fishery annually has ranged from 22 to 29. The year 2007 saw the greatest amount of participation and effort in the fishery since the limited entry program was established when 29 of 59 permitted vessels participated and made 377 trips, deployed 5,920 sets with 17.6 million hooks, and landed 14.3 million lb of PMUS valued at $14.2 million. Since that time, fishery statistics across all categories have generally declined. Based on fishery logbook data from 2013, only 22 of 47 permitted American Samoa pelagic longline vessels participated in the fishery. These 22 active vessels made 96 trips, deployed 3,393 sets with 10.1 million hooks, and landed 6.3 million lb of PMUS valued at $6.7 million (Table 4). Table 5 provides a breakdown of longline catch composition by certain species for 2006-2013. Albacore accounts for at least 70 percent of the annual PMUS landings. As of June 2015, complete 2014 data for these parameters from PIFSC WPacFIN are not yet available.

Table 4. American Samoa longline fishery effort, landings, and revenue 2006–2014.

Year	Permitted Vessels	Active Vessels	Trips	Sets	Hooks (millions)	Total PMUS Landings (million pounds)	Revenue (in $million)
2006	60	28	329	5,069	14.264	12.0	$11.7
2007	59	29	375	5,920	17.554	14.4	$14.2
2008	58	28	280	4,754	14.444	9.7	$9.7
2009	36	26	195	4,916	15.085	10.7	$10.7
2010	50	26	265	4,540	13.184	10.8	$10.7

Year	Permitted Vessels	Active Vessels	Trips	Sets	Hooks (millions)	Total PMUS Landings (million pounds)	Revenue (in $million)
2011	52	24	276	3,894	11.074	7.5	$8.8
2012	48	26	211	4,226	12.115	9.2	$10.0
2013	47	22	104	3,411	10.183	6.1	$6.7
2014*	55	22	196	2,745	7.655	NA	NA
Mean	51.67	25.67	247.89	4,386	12.84	10.05	NA

Sources: http://www.pifsc.noaa.gov/wpacfin/as/Pages/as_data_2.php (accessed 6/25/15); http://www.pifsc.noaa.gov/wpacfin/as/Data/ECL_Charts/ae3bmain.htm (accessed 6/25/15);
*NMFS Pacific Islands Fisheries Science Center (PIFSC), Draft 2014 Annual Report; NA=not available

Table 5. Estimated total longline landings of pelagic management unit species in pounds.

Year	Tunas					Other PMUS
	Albacore	Bigeye	Yellowfin	Skipjack	Other Tuna	
2006	9,211,809	442,964	1,096,059	470,411	574	866,398
2007	11,440,920	509,563	1,396,468	365,280	359	599,287
2008	7,831,589	274,482	749,824	359,567	89	431,782
2009	8,655,948	353,778	866,631	343,713	197	497,752
2010	8,716,711	387,431	975,801	251,511	502	452,853
2011	5,146,518	392,198	1,204,700	246,602	359	463,597
2012	7,055,590	383,022	828,483	637,501	1,131	365,543
2013	4,688,558	187,645	931,280	144,284	377	356,228

Source: http://www.pifsc.noaa.gov/wpacfin/as/Pages/as_data_5.php (accessed 6/25/15)
Note: Other PMUS include billfish, mahimahi, wahoo, oilfish, moonfish/opah, and sharks. A complete list appears in 50 CFR 665.800.

3.2.2.4 Non-Target Species and Bycatch in the American Samoa Longline Fishery

Table 6 shows the number of fish kept and released in the American Samoa longline fishery during 2013. Overall, 12 percent of the total catch was released, with skipjack tuna having one of the highest numbers released. Fishermen released nearly all sharks and oilfish. Fish are released for various reasons including quality, size, handling and storage difficulties, and as well as marketing issues. However, catch rates and total catches of some pelagic MUS, such as the billfishes and mahimahi that typically occur closer to the surface, may have been reduced by fishing with gear at 100 m and deeper, which was mandated in 2011 through gear configuration requirements (50 CFR 665.819).

Table 6. American Samoa longline fishery bycatch in 2013

Species	Number Kept	Number Released	Percent Released
Skipjack tuna	11,230	420	3
Albacore tuna	118,414	335	0
Yellowfin tuna	19.087	232	1
Bigeye tuna	4,181	126	3
Tunas (unknown)	21	0	0
TUNAS SUBTOTAL	**152,933**	**1,095**	**1**
Mahimahi	1,854	598	24
Black marlin	3	8	73
Blue marlin	497	842	63
Striped marlin	108	149	58
Wahoo	5,868	1,235	17
Sharks (all)	40	3,850	99
Swordfish	181	108	37
Sailfish	50	232	82
Spearfish	57	816	93
Moonfish	98	274	74
Oilfish	69	6,762	99
Pomfret	73	767	91
NON-TUNA PMUS SUBTOTAL	**8,898**	**15,641**	**64**
Pelagic fishes (unknown)	3	1,756	100
TOTAL PELAGICS	**161,834**	**18,492**	**10**

Source: WPFMC (in prep., draft 2013 Pelagic Annual Report).
Note: Percent released for a species is calculated from the number released for that species divided by the total number of that species caught, plus the number of that species released.

3.2.3 Hawaii Longline Fisheries

Domestic longline fishing around Hawaii consists of two separately managed fisheries. The deep-set fishery targets primarily bigeye tuna (*Thunnus obesus*) and occasionally yellowfin tuna (*Thunnus albacares*) in the U.S. EEZ surrounding the Hawaiian Islands and on the high seas. The shallow-set fishery targets swordfish (*Xiphias gladius*) to the north of the Hawaiian Islands. NMFS and the Council manage the fisheries under a single limited access program. The program allows a maximum of 164 transferable permits.

3.2.3.1 Longline Fishing Area

Deep-set Fishery

Fishing locations may vary seasonally based on oceanographic conditions, catch rates of target species, and management measures, among others. The deep-set fishery operates in the deep, pelagic waters around the Hawaiian archipelago throughout the year, mostly within 300-400 nm

(556-741 km) of the MHI. However, federal regulations prohibit longline fishing from waters as close as 25 to 75 nm from the shoreline to minimize the potential for gear conflicts with small boat fisheries and interactions with protected species. (Figure 4). Some fishing also occurs in the U.S. EEZ around Pacific Remote Island Areas of Kingman Reef and Palmyra Atoll (5° N. lat.). In general, deep-set longline vessels operate out of Hawaii ports, with the vast majority based in Honolulu and a few in Hilo. Infrequently, deep-set trips originate from other ports such as Long Beach or San Francisco, California, or Pago Pago, American Samoa, and then fishermen land their catches in Hawaii. Fishermen departing from California begin fishing on the high seas, outside of the U.S. EEZ. Fishermen departing from American Samoa usually begin fishing near the Equator or farther north in the North Pacific where they expect higher catch rates of bigeye tuna.

Shallow-set Fishery

The area of operation of the Hawaii shallow-set fishery includes EEZ waters and areas of the high seas between 180° - 125° W and 17° - 45° N (Figure 5). For both the deep and shallow set fisheries, federal regulations also prohibit the longline vessels from operating within any marine national monument, including monument areas encompassing the U.S. EEZ around Johnston Atoll, and Jarvis and Wake Islands, and specific areas in the EEZ around Hawaii to minimize potential for gear conflicts and interactions with protected marine species. Specifically, fishing is prohibited within 50 nm of the Northwestern Hawaiian Islands and between 25 and 75 nm around the main Hawaiian Islands.

3.2.3.2 Fishing Participation

As previously mentioned, NMFS manages Hawaii's deep-set and shallow-set longline fishery under a single limited access fishery with a maximum of 164 vessel permits. NMFS has issued all 164 permits; however, not all 164 permits are being actively used. Based on 2014 logbook data, 140 permitted vessels conducted longline fishing activities, of which 139 vessels actively participated in the deep set fishery. Of these vessels, about 34 are greater than 24 m in length, although most vessels participate in the swordfish fishery. In the event NMFS restricts fishing in the WCPO and the EPO due to the U.S. bigeye tuna catch limit being reached, some of these vessels would not be able to fish for bigeye tuna in either zone. However, the remaining 105longline vessels less than 24 m could still fish in the EPO for the remainder of the year, as the restriction in the EPO would not apply to vessels less than 24 m.

Based on 2014 logbook data, 140 permitted vessels conducted longline fishing activities, of which about 20 vessels actively participated in the shallow-set swordfish fishery. These vessels also may occasionally make deep-set tuna trips.

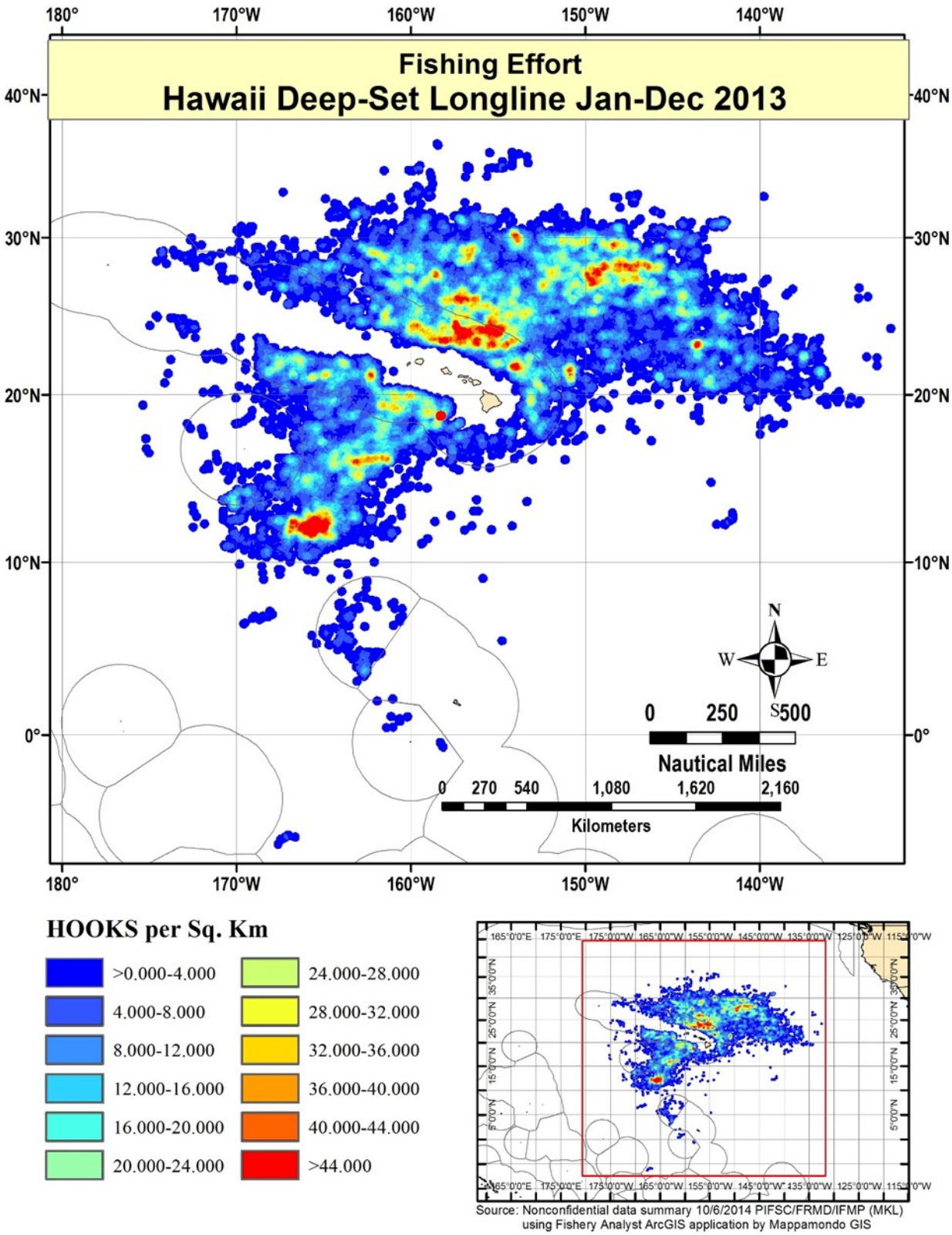

Figure 4. Locations of fishing effort by the Hawaii deep-set longline fleet, 2013.

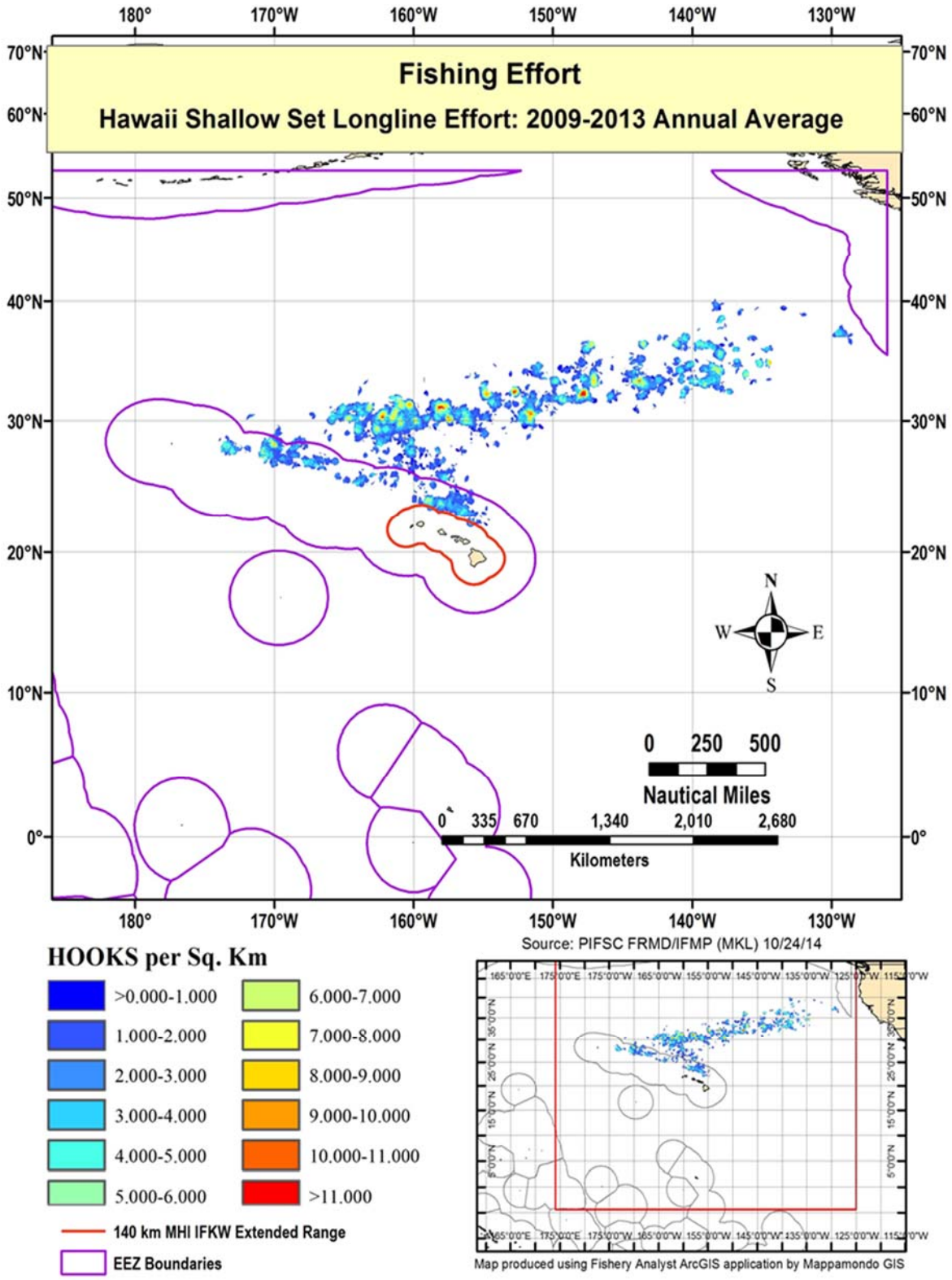

Figure 5. Locations of fishing effort by the Hawaii shallow-set longline fleet, 2009-2013, and the extended range of the MHI IFKW DPS.

3.2.3.3 Fishing Effort

From 2004-2012, the annual number of vessels that participated in the deep-set fishery has remained relatively stable, ranging from 124 to 129, with a slight increase in 2013 to 135 vessels and 139 vessels in 2014. Based on final 2014 logbook data, the 139 deep-set longline vessels made 1,350 trips with 17,777 sets and deployed 45.5 million hooks (Table 7). In 2014, the 20 shallow-set longline vessels made 81 trips with 1,338 sets and deployed 1.48 million hooks (NMFS 2015a). All but one swordfish vessel also made at least one deep-set trip in 2014.

Table 7. Number of active longline vessels and fishing effort in the Hawaii deep-set fishery, 2004-2013 (includes WCPO and EPO).

Year	Vessels making deep-sets	Deep-set fishing effort (hooks)	Deep-set fishing effort (trips)	Deep-set fishing effort (sets)
2004	125	31,913,246	1,522	15,902
2005	124	33,663,248	1,590	16,550
2006	127	34,597,343	1,541	16,452
2007	129	38,839,377	1,588	17,815
2008	127	40,083,935	1,532	17,885
2009	127	37,770,913	1,402	16,810
2010	122	37,244,432	1,360	16,085
2011	129	40,766,334	1,462	17,173
2012	128	43,965,781	1,356	18,069
2013	135	46,919,110	1,383	18,772
2014	139	45,464,747	1,350	17,777

Source: http://www.pifsc.noaa.gov/fmb/reports.php, accessed on 6/29/2015.

3.2.3.4 Revenue

In 2012, the Hawaii deep-set longline fishery landed approximately 23 million pounds of pelagic MUS valued at approximately $88 million dollars. In 2013, the fishery landings increased to 24.6 million pounds while value decreased slightly to $85 million due to a lower average price per lb. The shallow-set fishery landed 2.8 million pounds of pelagic MUS in 2012 decreasing to 2.4 million pounds in 2013. Total revenues followed a similar trend with a value of $6 million in 2012 dropping to $1.3 million in 2013. Detailed catch statistics and economic data from the Hawaii's longline fisheries are provided in Table 8. Currently longline revenue data is not available for 2014.

Table 8. Hawaii commercial pelagic landings, revenue, and average price by species for the Hawaii-based deep-set and shallow-set longline fisheries, 2012 and 2013.

	Deep-set longline						Shallow-set longline					
	2012			2013			2012			2013		
	Pounds Kept (1000 lbs)	Revenue ($1000)	Avg. Value ($/lb)	Pounds Kept (1000 lbs)	Revenue ($1000)	Avg. Value ($/lb)	Pounds Kept (1000 lbs)	Revenue ($1000)	Avg. Value ($/lb)	Pounds Kept (1000 lbs)	Revenue ($1000)	Avg. Value ($/lb)
Tuna PMUS												
Albacore	1,421	$ 3,339	$ 2.35	699	$ 1,545	$ 2.26	26	$ 23	$ 0.90	15	$7	$ 2.10
Bigeye tuna	12,741	$ 62,285	$ 4.89	14,067	$ 62,718	$ 4.41	75	$ 365	$ 4.87	44	$194	$ 5.32
Bluefin tuna	1	$ 3	$ 3.05	1	$ 3	$ 5.71	0	$ -	$ -	0	$0	$ -
Skipjack tuna	541	$ 432	$ 0.80	497	$ 403	$ 0.85	1	$ -	$ -	0	$0	$ -
Yellowfin tuna	1,886	$ 7,670	$ 4.07	1,525	$ 6,832	$ 4.19	29	$ 155	$ 5.33	22	$123	$ 5.34
Tuna PMUS Subtotal	16,590	$ 73,730	$ 4.44	16,789	$ 71,501	$ 4.26	130	$ 543	$ 4.18	82	$324	$ 3.95
Billfish PMUS												
Swordfish	566	$ 1,614	$ 2.85	666	$ 1,750	$ 2.54	2,508	$ 5,143	$ 2.05	2,164	$2,680	$ 2.79
Blue marlin	630	$ 1,074	$ 1.70	831	$ 997	$ 1.50	26	$ 23	$ 0.90	17	$20	$ 1.15
Striped marlin	596	$ 1,344	$ 2.26	829	$ 1,248	$ 1.34	25	$ 59	$ 2.36	34	$46	$ 1.24
Spearfish	354	$ 649	$ 1.83	465	$ 585	$ 1.27	5	$ 5	$ 1.02	4	$4	$ 1.94
Other Marlins	21	$ 34	$ 1.60	27	$ 17	$ 2.60	0	$ -	$ -	0	$0	$ -
Billfish PMUS Subtotal	2,168	$ 4,716	$ 2.18	2,818	$ 4,596	$ 1.63	2,564	$ 5,230	$ 2.04	2,219	$2,750	$ 1.24
Other PMUS												
Mahimahi	889	$ 2,256	$ 2.54	847	$ 1,943	$ 2.16	46	$ 91	$ 1.97	42	$104	$ 2.39
Ono (wahoo)	366	$ 1,116	$ 3.05	459	$ 1,243	$ 2.75	1	$ 3	$ 3.05	1	$2	$ 2.16
Opah (moonfish)	1,574	$ 3,210	$ 2.04	2,075	$ 3,186	$ 1.55	17	$ 5	$ 0.30	11	$1	$ 2.98
Oilfish	537	$ 832	$ 1.55	548	$ 405	$ 0.71	24	$ 32	$ 1.31	12	$2	$ 0.46
Pomfrets (monchong)	682	$ 2,034	$ 2.98	1,015	$ 2,367	$ 2.20	5	$ 2	$ 0.41	1	$1	$ 3.18
PMUS Sharks (whole weig	150	$ 116	$ 0.77	106	$ 97	$ 1.38	26	$ 10	$ 0.39	14	$5	$ 0.85
Other PMUS Subtotal	4,198	$ 9,565	$ 2.28	5,050	$ 9,242	$ 1.83	120	$ 142	$ 1.19	82	$115	$ 1.41
Other pelagics	20	$ 37	$ 1.83	14	$ 24	$ 1.79	0	$ -	$ -	0	$ -	$ -
Total pelagics	22,976	$ 88,046	$ 3.83	24,670	$ 85,363	$ 3.46	2,815	$ 5,917	$ 2.10	2,383	$ 3,189	$ 1.34

Source: WPFMC (in prep., draft 2013 Pelagic Annual Report).

3.2.3.5 Non-Target Species and Bycatch in the Hawaii Longline Fishery

NOAA Fisheries 2011 U.S. National Bycatch Report (NMFS 2011) provides an estimate of the total bycatch in terms of pounds discarded, with data through 2005 (Table 9). In 2005, the total percent of catch released for all species combined in the Hawaii longline fisheries was 26.77 percent. Generally, most marketable species such as tuna and billfish have low discard rates. Although striped marlin and other miscellaneous pelagic catch such as mahimahi, blue fin tuna, and wahoo are not directly targeted, these species are highly marketable and also have low rates of discard, less than 5 percent. In general, sharks caught are discarded. Blue shark and other sharks are not marketable, and therefore a high percentage of those species are discarded alive. However, a relatively higher proportion of mako and some thresher sharks are kept since there is a market for their meat.

3.2.4 Bigeye Tuna Catches by U.S. Longline Vessels in the Pacific

U.S. longline catches of pelagic MUS in the Pacific are principally made by the Hawaii longline fishery and secondarily by the American Samoa longline fishery. As described earlier, CNMI and Guam's longline fisheries are not currently active.

Table 10 shows the total catches of pelagic MUS in the WCPO by U.S. Hawaii and U.S. territorial longline fisheries from 2011-2014. Table 11 provides a detailed breakdown of U.S. longline catches of bigeye tuna in the WCPO by U.S. longline fisheries based on data in Table 10.

Table 12 shows the total catches of bigeye tuna by gear type including contributions by the U.S. longline fishery as a percentage of: the WCPO longline bigeye tuna catch (6%), the total EPO longline bigeye tuna catch (3%), the total WCPO bigeye tuna catch (3%), total EPO bigeye tuna catch (1%), and the total Pacific-wide bigeye tuna catch (2%), respectively.

Table 9. Total weight of discards, landings, and total catch in the Hawaii deep-set and shallow-set longline fisheries in 2005.

Species	Discards (pounds)			Percent of bycatch total for both deep- and shallow-set	Landings pounds	Total Catch pounds	Total in metric tons	Discards as percent of Total Catch
	Deep set	Shallow set	Total					
Albacore	8,027	15,928	23,955	0.28%	662,000	685,955	311.1	3.49%
Bigeye tuna	128,091	5,986	134,076	1.57%	10,977,000	11,111,076	5,039.9	1.21%
Bignose shark	66	66	132	0.00%		132	0.1	100.00%
Billfishes*	24,738	4,720	29,458	0.35%	473,000	502,458	227.9	5.86%
Black mackerel	55		55	0.00%		55	0.0	100.00%
Black marlin	611	152	763	0.01%		763	0.3	100.00%
Blue shark	4,816,698	822,524	5,639,222	66.22%	66,000	5,705,222	2,587.8	98.84%
Bony fishes	119	2	121	0.00%		121	0.1	100.00%
Bony fishes	258	95	353	0.00%		353	0.2	100.00%
Pomfret	1,168	4	1,173	0.01%	632,000	633,173	287.2	0.19%
Brilliant pomfret	723		723	0.01%		723	0.3	100.00%
Cartilaginous		6,969	6,969	0.08%		6,969	3.2	100.00%
Cookie shark	0	2	2	0.00%		2	0.0	100.00%
Cottonmouth Jacks	49		49	0.00%		49	0.0	100.00%
Crestfish	2,998		2,998	0.04%		2,998	1.4	100.00%
Crocodile shark	6,418	51	6,468	0.08%		6,468	2.9	100.00%
Dolphinfish	37,406	19,418	56,824	0.67%	972,000	1,028,824	466.7	5.52%
Driftfishes	42		42	0.00%		42	0.0	100.00%
Escolar	11,378	12,912	24,291	0.29%		24,291	11.0	100.00%
Galapagos shark	1,325	818	2,143	0.03%		2,143	1.0	100.00%
Great barracuda	8,490	22	8,512	0.10%		8,512	3.9	100.00%
Hammerhead sharks	2,414		2,414	0.03%		2,414	1.1	100.00%

Species	Discards (pounds)			Percent of bycatch total for both deep- and shallow-set	Landings pounds	Total Catch pounds	Total in metric tons	Discards as percent of Total Catch
	Deep set	Shallow set	Total					
Indo-Pacific blue marlin	27,353	11,398	38,751	0.46%	731,000	769,751	349.2	5.03%
Knifetail pomfret	12,932	88	13,020	0.15%		13,020	5.9	100.00%
Longfin mako shark	2,504	278	2,782	0.03%		2,782	1.3	100.00%
Longnose lancetfish	922,036	5,677	927,713	10.89%		927,713	420.8	100.00%
Louvar	0	15	15	0.00%		15	0.0	100.00%
Makos*	2,476	3,331	5,807	0.07%	233,000	238,807	108.3	2.43%
Manta ray	2006	132	2138	0.01%		2138	1.0	100.00%
Ocean sunfish	37,968	5,767	43,735	0.51%		43,735	19.8	100.00%
Oceanic whitetip shark	58,403	38,640	97,043	1.14%		97,043	44.0	100.00%
Oilfish	5,159	2,778	7,937	0.09%	380,000	387,937	176.0	2.05%
Omosudid	269		269	0.00%		269	0.1	100.00%
Opah	0	2,780	2,780	0.03%	1,093,000	1,095,780	497.0	0.25%
Pacific bluefin tuna	0		0	0.00%	1,000	1,000	0.5	0.00%
Pelagic puffer	2,022	146	2,167	0.03%		2,167	1.0	100.00%
Pelagic stingray	38,043	487	38,530	0.45%		38,530	17.5	100.00%
Pelagic thresher shark	2,005	150	2,155	0.03%		2,155	1.0	100.00%
Pompano dolphin	401		401	0.00%		401	0.2	100.00%
Rainbow runner	154		154	0.00%		154	0.1	100.00%
Razorback scabbardfish	2,692		2,692	0.03%		2,692	1.2	100.00%
Roudi escolar	2,388		2,388	0.03%		2,388	1.1	100.00%
Rough pomfret	1,671		1,671	0.02%		1,671	0.8	100.00%

Species	Discards (pounds)			Percent of bycatch total for both deep- and shallow-set	Landings pounds	Total Catch pounds	Total in metric tons	Discards as percent of Total Catch
	Deep set	Shallow set	Total					
Rough triggerfish	4		4	0.00%		4	0.0	100.00%
Sailfish	346		346	0.00%		346	0.2	100.00%
Salmon shark	600	628	1,228	0.01%		1,228	0.6	100.00%
Sandbar shark	3,225	1,082	4,308	0.05%		4,308	2.0	100.00%
Scalloped hammerhead	774		774	0.01%		774	0.4	100.00%
Scalloped ribbonfish	35		35	0.00%		35	0.0	100.00%
Shark	130		130	0.00%		130	0.1	100.00%
Sharks	51,085		51,085	0.60%	15,000	66,085	30.0	77.30%
Sharptail mola	6,217		6,217	0.07%		6,217	2.8	100.00%
Shortbill spearfish	36,218	3,168	39,386	0.46%		39,386	17.9	100.00%
Shortfin mako	156,618	31,522	188,140	2.21%		188,140	85.3	100.00%
Sickle pomfret	4,996	168	5,163	0.06%		5,163	2.3	100.00%
Silky shark	36,035	2,500	38,535	0.45%		38,535	17.5	100.00%
Skipjack tuna	81,196	172	81,368	0.96%	197,000	278,368	126.3	29.23%
Slender mola	34,557	11	34,568	0.41%		34,568	15.7	100.00%
Smooth hammerhead	2,454	930	3,384	0.04%		3,384	1.5	100.00%
Snake mackerel	156,338	686	157,024	1.84%		157,024	71.2	100.00%
Striped marlin	27,278	17,699	44,976	0.53%	1,177,000	1,221,976	554.3	3.68%
Swordfish	23,735	76,785	100,520	1.18%	3,527,000	3,627,520	1,645.4	2.77%
Tapertail ribbonfish	2,546		2,546	0.03%		2,546	1.2	100.00%
Thresher shark	483,539	7,568	491,108	5.77%	73,000	564,108	255.9	87.06%
Tiger sharks	4,310	5,578	9,888	0.12%		9,888	4.5	100.00%

Species	Discards (pounds)			Percent of bycatch total for both deep- and shallow-set	Landings pounds	Total Catch pounds	Total in metric tons	Discards as percent of Total Catch
	Deep set	Shallow set	Total					
Tunas*	20,719	776	21,495	0.25%		21,495	9.7	100.00%
Velvet dogfish	844		844	0.01%		844	0.4	100.00%
Wahoo	13,287	73	13,360	0.16%	458,000	471,360	213.8	2.83%
White shark	93		93	0.00%		93	0.0	100.00%
Yellowfin	86,273	628	86,902	1.02%	1,624,000	1,710,902	776.1	5.08%
Total	7,405,009	1,111,311	8,516,320	100.00%	23,291,000	31,807,320	14,427.6	26.77%

Source: NMFS 2011

Table 10. Longline landings (mt) by species and species group for U.S. longline vessels operating in the WCPFC statistical area, 2011-2014.

	U.S. in North Pacific Ocean				CNMI in North Pacific Ocean				American Samoa in North Pacific Ocean				American Samoa in South Pacific Ocean				Total			
	2014	**2013**	**2012**	**2011**	**2014**	**2013**	**2012**	**2011**	**2014**	**2013**	**2012**	**2011**	**2014**	**2013**	**2012**	**2011**	**2014**	**2013**	**2012**	**2011**
Vessels	140	135	127	128	109	113			18	17	115	114	22	22	25	24	162	157	153	152
Species																				
Albacore, North Pacific	177	265	480	497		23			9	11	115	113					186	298	595	610
Albacore, South Pacific												1,448	2,128	3,147	2,291	1,448	2,128	3,147	2,291	
Bigeye tuna	3,815	3,654	3,660	3,565	1,000	492			245	305	1,338	1,086	82	84	164	178	5,143	4,534	5,162	4,829
Pacific bluefin tuna	0	0	0	0									3	2	7	2	3	3	7	2
Skipjack tuna	167	188	115	158		25			9	9	123	34	112	66	251	108	288	288	490	300
Yellowfin tuna	565	568	576	738		93			31	32	272	144	426	390	348	555	1,023	1,083	1,196	1,437
Other tuna	0	0	0	0		0											0	0	0	0
TOTAL TUNA	**4,725**	**4,674**	**4,831**	**4,958**	**1,000**	**633**			**294**	**357**	**1,849**	**1,376**	**2,071**	**2,671**	**3,916**	**3,135**	**8,090**	**8,335**	**10,596**	**9,469**
Black marlin	1	1	1	1					0	0	0	0		0	2	1	1	1	3	2
Blue marlin	427	305	226	290		20			32	22	50	45	27	31	36	40	486	378	313	375
Sailfish	15	7	5	10		3			0	1	3	2	2	2	1	4	17	12	9	15
Spearfish	162	133	111	169		34			12	9	35	35	1	1	1	5	175	177	147	209
Striped marlin, North Pacific	342	262	209	263		42			14	23	54	68					357	328	263	331
Striped marlin, South Pacific												7	4	7	3	7	4	7	3	
Other marlins	0	1	1	1		0					0		0				1	1	1	1
Swordfish, North Pacific	865	558	862	837		8			15	17	38	22					880	583	900	859
Swordfish, South Pacific												10	11	14	12	10	11	14	12	
TOTAL BILLFISH	**1,812**	**1,266**	**1,414**	**1,570**		**107**			**73**	**72**	**180**	**171**	**47**	**48**	**62**	**64**	**1,932**	**1,493**	**1,656**	**1,805**
Blue shark	0	1	12	9							2	2	1	1	3	2	1	2	18	14
Mako shark	35	31	42	43		3			1	4	8	8	0		0	0	37	39	50	51
Thresher	5	5	9	15		0			1	0	3	3			0	0	6	5	13	18
Other sharks	0	0	0	2							0	0				1	0	0	1	3
Oceanic whitetip shark	0	1										0	0	0		0	0	1		
Silky shark	0	0											0	0	0		0	0	0	
Hammerhead shark																				
Tiger shark																				
Porbeagle																				
TOTAL SHARKS	**41**	**37**	**65**	**69**		**3**			**2**	**5**	**14**	**14**	**1**	**1**	**4**	**4**	**44**	**46**	**83**	**87**
Mahimahi	236	238	288	291		9			15	27	52	52	12	19	11	11	263	293	351	353
Moonfish	385	377	356	309		37			22	35	86	84	1	2	3	3	408	450	445	396
Oilfish	169	171	169	178		28			13	17	59	55	0	1	0	1	182	216	228	233
Pomfret	372	315	215	115		26			19	18	56	33					391	359	270	148
Wahoo	242	154	117	124		17			19	15	39	23	58	87	85	123	319	274	241	270
Other fish	6	9	8	20		0			0	0	1	0	0	0	0	1	6	10	9	21
TOTAL OTHER	**1,410**	**1,263**	**1,154**	**1,036**		**117**			**88**	**113**	**292**	**248**	**72**	**109**	**99**	**137**	**1,570**	**1,602**	**1,545**	**1,421**
GEAR TOTAL	**7,988**	**7,241**	**7,464**	**7,632**	**1,000**	**860**			**457**	**546**	**2,335**	**1,809**	**2,191**	**2,829**	**4,081**	**3,341**	**11,636**	**11,476**	**13,880**	**12,782**

Source: NMFS PIFSC (unpublished data; Preliminary 2014 U.S. Part 1 annual report to the WCPFC)

Table 11. Bigeye tuna catch (mt) by U.S. Hawaii and U.S. Territorial longline fisheries in the WCPO (2011-2014).

Longline Fishery		2014	2013	2012	2011	Ave. 2011-2014
U.S. Hawaii longline permitted vessels	Catch Hawaii longline-permitted vessels applicable to the U.S. bigeye tuna catch limit	3,815	3,654	3,660	3,565	3,674
	Catch allocated to Hawaii longline-permitted vessels from a U.S. territory	1,000[1]	492[1]	771[2]	628[2]	723
American Samoa longline permitted vessels	Catch by dual permitted U.S. Hawaii/American Samoa longline vessels on the high seas	245	305	567	458	394
	Catch by American Samoa longline permitted vessel in the EEZ around American Samoa	82	84	164	178	127
Guam longline vessels		0	0	0	0	0
CNMI longline vessels		0	0	0	0	0
Total Catch		**5,142**	**4,535**	**5,162**	**4,829**	

[1] Catch allocated to Hawaii longline vessels through a specified fishing agreement with the CNMI.
[2] Catch allocated to Hawaii longline vessels through a specified fishing agreement with American Samoa (Source: 79 FR 1354, January 8, 2014).

Source: Table 6, unless otherwise noted

Table 12. Bigeye tuna catch (mt) in the WCPO, EPO, and total combined contribution by U.S. longline vessels (Hawaii) and U.S. territory longline vessels.

Year	WCPO Longline	WCPO Purse seine	Other Fisheries	Total	U.S. LL WCPO	% WCPO LL	% WCPO Total
2007	83,931	49,012	12,536	145,479	5,599	6.67	3.85
2008	84,473	57,795	13,746	156,014	4,781	5.66	3.0
2009	82,108	64,151	13,208	159,467	3,990	4.86	2.5
2010	73,882	55,750	11,211	140,843	4,064	5.50	2.8
2011	77,964	70,737	11,109	159,810	4,829	6.19	3.0
2012	76,599	69,164	15,916	161,679	5,162	6.74	3.2
2013	62,641	82,151	13,870	158,662	4,535	7.24	2.9
mean	80,472	59,489	12,954	152,323	4,709	5.85	3.1

Year	EPO Longline	EPO Purse seine	Other fisheries	Total	U.S. LL EPO	% EPO LL	% EPO Total
2007	29,847	63,451	44	93,342	417	1.40	0.45
2008	26,136	75,028	28	101,192	1,310	5.01	1.29
2009	31,282	76,800	15	108,097	730	2.33	0.68
2010	35,227	57,753	1358	94,338	1,356	3.85	1.44
2011	29,938	57,188	1051	87,177	1,050	3.51	1.20
2012	28,938	68,597	1051	98,586	861	2.98	0.87
2013	30,861	49,104	869	80,834	2056	6.66	2.54
mean	30,228	66,470	592	97,122	954	3.16	0.99

Year	WCPO	EPO	Total	U.S. LL Total	% Total
2007	145,479	93,342	238,821	6,016	2.52%
2008	156,014	101,192	257,206	6,091	2.37%
2009	159,467	108,097	267,564	4,720	1.76%
2010	140,843	94,338	235,181	5,420	2.30%
2011	159,810	87,177	246,987	5,879	2.38%
2012	161,679	98,586	260,265	6,021	2.31%
2013	158,662	80,834	239,496	6,528	2.72%
mean	153,882	97,122	251,004	5,691	2.33%

Source: SPC 2014c; PIFSC unpublished data; Calculations: WPFMC unpublished data.
Note: 2013 catch estimates are provisional. There is no catch of bigeye tuna in the EPO by U.S. territory longline vessels.

3.2.5 Bigeye Tuna Catches by U.S. Purse Seine Vessels in the WCPO

The U.S.-flagged purse seine fleet has been fishing in the WCPO since the early 1980s. The South Pacific Tuna Treaty (SPTT) largely governs the fishing activities of U.S. purse seine vessels in the WCPO. The SPTT manages access of U.S. purse seine vessels to the EEZs of Pacific Islands Parties to the SPTT and provides for technical assistance in the area of Pacific Island Country fisheries development. The SPTT is implemented domestically by regulations (50 CFR 300 Subpart D) issued under authority of the South Pacific Tuna Act of 1988 (SPTA; 16 U.S.C. 973-973r).

From 1997-2010, the U.S. purse seine fleet in the WCPO conducted 6 percent of its effort in the U.S. EEZ, 22 percent on the high seas, and the remainder in the EEZs of Pacific Island Parties to the SPTT (unpublished NMFS data). Participation in the U.S. WCPO purse seine fishery increased from the late 1980s to the mid-1990s, and then gradually decreased until a low of 13 vessels was reached in 2006. The fleet has since increased to about the levels of the mid 1990s, and has been relatively stable for the past five years. The U.S. WCPO purse seine fleet now numbers at 39 vessels.

Skipjack tuna generally account for around 80 percent of the U.S. purse seine catch, yellowfin tuna for about 16 percent, and bigeye tuna for the remaining portion (about 4 percent) (See Table 13; SPC 2014c).

Table 13. Number of vessels and tuna catch (mt) by the U.S. purse seine fleet, 2006-2013.

Year	Vessels	Skipjack		Yellowfin		Bigeye		Total catch
		Catch	%	Catch	%	Catch	%	
2006	13	54335	79	12,238	14	4468	7	68,445
2007	22	69561	78	15,393	16	5319	6	88,736
2008	36	154454	74	44,281	23	7065	3	209,324
2009	39	238389	85	35,979	12	9091	3	281,589
2010	37	197682	81	38,623	16	8040	3	245,524
2011	37	158081	78	25,422	16	11867	6	203,329
2012	38	208381	80	30,721	17	8530	3	259,760
2013	38	205510	81	16,717	14	13476	5	254,348

Source: SPC 2014c. Data for 2012 and 2013 from US Annual Part 1 report to WCPFC.
Note: The SPC has estimated US purse seine catches to be approximately 30% higher than what is reported in the US Annual Part 1 report to the WCPFC.

The trend in the volume of bigeye tuna caught by the U.S. purse seine fleet in the WCPO is provided in Figure 6.

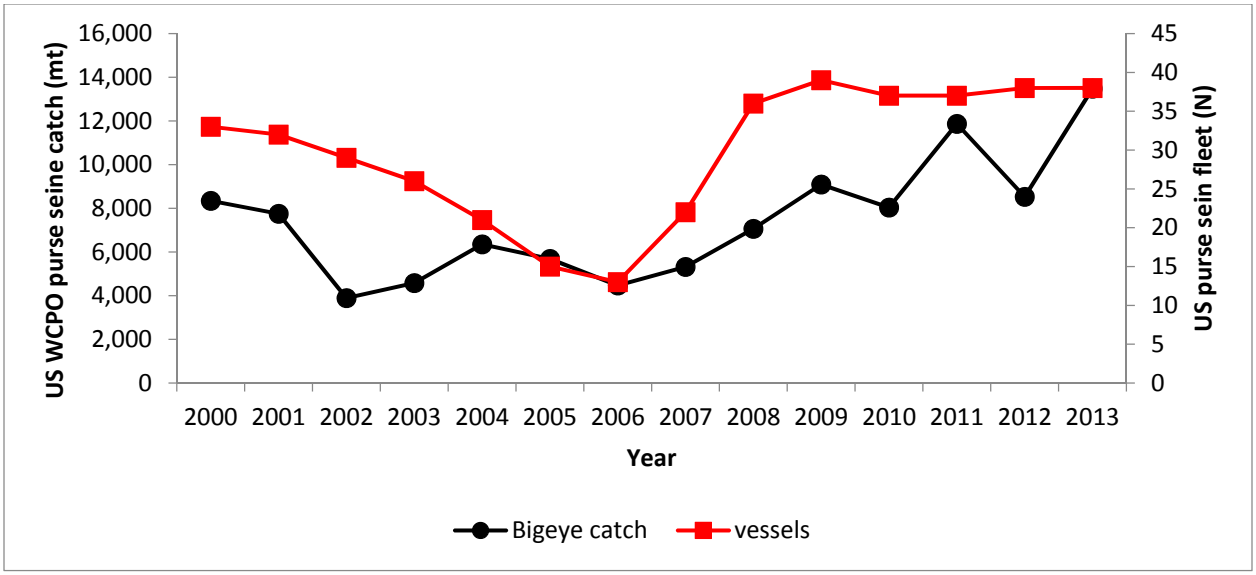

Figure 6. U.S. purse seine fleet size and catch trend of bigeye tuna, 2000-2013.

3.2.6 Fishing Communities

The Magnuson-Stevens Act defines a fishing community as "...a community that is substantially dependent upon or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and fish processors that are based in such communities" (16 U.S.C. § 1802(16)). NMFS further specifies in the National Standard guidelines that a fishing community is "...a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries dependent services and industries (for example, boatyards, ice suppliers, tackle shops)". National Standard 8 of the Magnuson-Stevens Act requires that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and the rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities to (a) provide for the sustained participation of such communities and (b) to the extent practicable, minimize adverse economic impacts on such communities.

In 1999, the Council identified American Samoa, Guam and the Northern Mariana Islands each as a fishing community. The Secretary of Commerce approved this definition on April 19, 2009 (64 FR 19067). In 2002, the Council identified each of the islands of Kauai, Niihau, Oahu, Maui, Molokai, Lanai and Hawaii as a fishing community. The Secretary of Commerce subsequently approved these definitions on August 5, 2003 (68 FR 46112).

3.3 Protected Resources

Longline and other pelagic fishing vessels operating in the western Pacific region and targeting pelagic species have the potential to interact with a range of protected species (such as marine mammals, sea turtles, and seabirds). Table 14 lists the species listed as endangered or threatened under the ESA that have the potential to interact with longline fisheries managed under the Pelagic FEP. This section also provides the number of interactions observed and estimated between protected species and the American Samoa and Hawaii longline fisheries with regard to recent fishing effort.

Species Protected under the Endangered Species Act (ESA)

The ESA provides for the conservation of species that are endangered or threatened, and the conservation of the ecosystems on which they depend. Section 7(a)(2) of the ESA requires each federal agency to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. To "jeopardize" means to reduce appreciably the likelihood of survival and recovery of a species in the wild by reducing its numbers, reproduction, or distribution. When a federal agency's action "may affect" an ESA-listed species, that agency is required to consult formally with NMFS (for marine species, some anadromous species, and their designated critical habitats) or the U.S. Fish and Wildlife Service (USFWS) for terrestrial and freshwater species or their designated critical habitat. The product of formal consultation is the agency's biological opinion (BiOp). Federal agencies are exempt from this formal consultation requirement if they have concluded that an

action "may affect, but is not likely to adversely affect" ESA-listed species or their designated critical habitat, and NMFS or USFWS concur with that conclusion (see ESA section 7 Formal Consultation; 50 CFR 402.14(b)).

The ESA also prohibits the taking[7] of listed species except under limited circumstances. Western Pacific fisheries authorized under the Pelagic FEP operate in accordance with terms and conditions set by ESA consultations, including applicable incidental take statements. The consultations consider the potential interactions of fisheries with listed species, the impacts of interactions on the survival and recovery of listed species, and the protection of designated critical habitat.

As provided in 50 CFR 402.16, NMFS is required to reinitiate formal consultation if:

1. the amount or extent of the incidental take is exceeded;
2. new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in an opinion;
3. the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in the opinion; or
4. a new species is listed or critical habitat designated that may be affected by the action.

Table 14. ESA-listed species with the potential to interact with longline vessels permitted under the Pelagic FEP.

Species	ESA status
Sea Turtles	
Green turtle (*Chelonia mydas*)	Threatened, except for Mexico's Pacific coast nesting population which is Endangered
Hawksbill turtle (*Eretmochelys imbricata*)	Endangered
Leatherback turtle (*Dermochelys coriacea*)	Endangered
North Pacific loggerhead turtle distinct population segment (DPS) (*Caretta caretta*)	Endangered
South Pacific loggerhead turtle DPS (*Caretta caretta*)	Endangered
Olive ridley turtle *(Lepidochelys olivacea*)	Threatened, except for Mexico's nesting population which is Endangered
Marine Mammals	
Blue whale (*Balaenoptera musculus*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Hawaiian monk seal (*Neomonachus schauinslandi*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered

[7] The definition of "take" includes to harass, harm, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.

Species	ESA status
Main Hawaiian Islands insular false killer whale DPS (*Pseudorca crassidens*)	Endangered
North Pacific right whale (*Eubalaena japonica*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*)	Endangered
Seabirds	
Hawaiian dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*)	Endangered
Newell's shearwater (*Puffinus auricularis newelli*)	Threatened
Short-tailed albatross (*Phoebastria albatrus*)	Endangered
Sharks	
Scalloped hammerhead Indo-West Pacific DPS	Threatened
Scalloped hammerhead Eastern Pacific DPS	Endangered
Corals	
Acropora globiceps	Threatened
Acropora jacquelineae	Threatened
Acropora retusa	Threatened
Acropora rudis	Threatened
Acropora speciosa	Threatened
Euphyllia paradivisa	Threatened
Isopora crateriformis	Threatened
Seriatopora aculeata	Threatened

Source: http://www.nmfs.noaa.gov/pr/species/esa/listed.htm, accessed July 15, 2015.

The following identifies the valid BiOps under which western Pacific longline fisheries currently operate. This section summarizes much of the information contained in these documents for the purpose of describing baseline conditions. For further information, refer to the following documents on NMFS' website below, or by contacting NMFS using the contact information at the beginning of the document. http://www.fpir.noaa.gov/DIR/dir_public_documents.html

NMFS. 2001. Biological Opinion on Authorization of Pelagic Fisheries under the Fishery Management Plan for the Pelagic Fisheries of the Western Pacific Region. This BiOp covers longline fisheries in Guam and the CNMI.

NMFS. 2010. Endangered Species Act Section 7 Consultation Biological Opinion on Measures to Reduce Interactions between Green Sea Turtles and the American Samoa-based Longline Fishery-Implementation of an Amendment to the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region.

NMFS. 2012, as amended. Continued operation of the Hawaii-based Shallow-set Longline Swordfish Fishery - under Amendment 18 to the Fishery Management Plan for Pelagic Fisheries of the Western Pacific Region.

USFWS. 2012, Biological Opinion of the U.S. Fish and Wildlife Service for the Operation of Hawaii-based Pelagic Longline Fisheries, Shallow-Set and Deep-Set, Hawaii.

NMFS. 2014, Biological Opinion on Continued Operation of the Hawaii-based Deep-set Pelagic Longline Fishery.

Species Protected under the Marine Mammal Protection Act (MMPA)

The MMPA prohibits, with certain exceptions, the take of marine mammals in the U.S. EEZ 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 authorizes the Secretary to protect and conserve of all cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions, except walruses). The MMPA requires NMFS to prepare and periodically review marine mammal stock assessments. *See* 16 U.S.C. § 1361, *et seq*.

Pursuant to the MMPA, NMFS has promulgated specific regulations that govern the incidental take of marine mammals during fishing operations (50 CFR 229). Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries that classifies U.S. commercial fisheries into three categories, based on relative frequency of incidental mortality and serious injury to marine mammals in each fishery:

- Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing. Annual mortality and serious injury of a stock in a given fishery is by itself responsible for the annual removal of greater than or equal to 50 percent or more of any stock's potential biological removal (PBR) level (i.e., frequent incidental mortality and serious injuries of marine mammals).

- Category II designates fisheries with occasional serious injuries and mortalities incidental to commercial fishing. Annual mortality and serious injury of a stock in a given fishery is, collectively with other fisheries, responsible for the annual removal of greater than 10 percent of any stock's PBR level, and is by itself responsible for the annual removal of between 1 and less than 50 percent, exclusive, of any stock's PBR level (i.e., occasional incidental mortality and serious injuries of marine mammals).

- Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. A Category III fishery is, collectively with other fisheries, responsible for the annual removal of 10 percent or less of any stock's PBR level; or collectively with other fisheries, more than 10 percent of any stock's PBR level, but is by itself responsible for the annual removal of 1 percent or less of PBR level (i.e., a remote likelihood or no known incidental mortality and serious injuries of marine mammals).

The Hawaii deep-set longline fishery is a Category I fishery and the Hawaii shallow-set and American Samoa longline fisheries are Category II fisheries in the 2015 List of Fisheries (79 FR 77919, December 29, 2014). Among other requirements, owners of vessels or gear engaging in a Category I or II fishery are required under 50 CFR 229.4 to obtain a marine mammal authorization to lawfully take incidentally, non-ESA listed marine mammals by registering with NMFS' marine mammal authorization program. The CNMI and Guam longline fisheries are inactive and not designated at this time.

Section 101 (a)(5)(E) of the MMPA requires the Secretary of Commerce to allow the incidental, but not intentional, taking of individuals from marine mammal stocks that are designated as depleted because of a listing as threatened or endangered under the ESA in the course of commercial fishing operations if it is determined that three criteria are met:

1. Incidental mortality and serious injury will have a negligible impact on the affected species or stock;
2. A recovery plan has been developed or is being developed; and
3. Where required under section 118 of the MMPA, a monitoring program has been established, vessels engaged in such fisheries are registered in accordance with section 118 of the MMPA, and a take reduction plan (TRP) has been developed or is being developed for such species or stock.

3.3.1 Sea Turtles

All Pacific sea turtles are listed under the ESA as either threatened or endangered except for the flatback turtle (*Natator depressus*). This species is native to Australia and does not occur in the action area, and thus will not be addressed in this document. In addition to the BiOps listed in the previous section, more detailed information, including the range, abundance, status, and threats of the listed sea turtles, can be found in the recovery plans for each species at the following NMFS websites:

Green turtle: http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_pacific.pdf
Green turtle: http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_eastpacific.pdf
Hawksbill: http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_hawksbill_pacific.pdf
Olive ridley: http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_oliveridley.pdf
Leatherback: http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_leatherback_pacific.pdf
Loggerhead: http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_loggerhead_pacific.pdf

3.3.1.1 Sea Turtle Interactions in Pelagic FEP longline Fisheries

All sea turtles, being air-breathers, are typically found closer to the surface, e.g., in the upper 100 m of the ocean's surface; however, some turtles are also susceptible to deep-set longlining because of deeper foraging behavior. Therefore, sea turtles are vulnerable to longline fishing gear in the Hawaii deep- and shallow-set longline fisheries, American Samoa deep-set longline fishery, Guam and the CNMI longline fisheries. Other pelagic fisheries impacts are primarily limited to the potential for collisions with sea turtles. After considering a range of potential impacts on sea turtles, NMFS, through the 2001, 2010, 2012 and 2014 BiOps listed above, has

determined that the pelagic fisheries of the western Pacific operating in accordance with the Pelagic FEP and implementing regulations, would not jeopardize the survival or recovery of any listed sea turtles.

Within each BiOp, NMFS has authorized a certain level of interactions (incidental take) through incidental take statements (ITS)) for these fisheries. A summary of the BiOp findings and ITS for sea turtles are described for each longline fishery below.

3.3.1.1.1 Sea Turtle Interaction in the Hawaii Deep-set Longline Fishery

On September 19, 2014, NMFS issued a no-jeopardy biological opinion (2014 BiOp) for the deep-set longline fishery, which authorizes over a three-year period, the incidental take of green, leatherback, North Pacific loggerhead, and olive ridley sea turtles (NMFS 2014) shown in Table 15. There are two thresholds for incidental take in the fishery, the estimated number of interactions and the number of interactions that result in mortality over a three year period. The ITS calculated in the 2014 BiOp were based on observed interaction data from 2006 through June 30, 2014 (end of 2nd quarter 2014).

Based on this information, NMFS in its 2014 BiOp concluded that the Hawaii deep-set longline fishery as managed under the Pelagic FEP is not likely to jeopardize the continued existence or recovery of any sea turtle species.

Table 15. The numbers of sea turtles estimated to be captured and/or killed in the Hawaii deep-set longline fishery over three consecutive years (3-year ITS) in the 2014 NMFS biological opinion.

Sea turtle species	3-year Incidental Take Statement in 2014 BiOp	
	Interactions	Mortalities
Green	9	9
Leatherback	72	27
North Pacific Loggerhead	9	9
Olive Ridley	99	96

Sources: McCracken 2012, 2013, 2014; NMFS 2014.

Fishery interactions with protected species are monitored by NMFS, and at least 20 percent of all Hawaii deep-set longline trips are observed by NMFS at-sea observers. NMFS statistically expands the observed take totals, based on observer coverage levels to develop a fleet-wide takes estimate (NMFS 2014). For example, because the fishery is observed at a 20 coverage rate, NMFS multiplies each observed interaction by 5 to estimate interactions at 100% coverage rate.

Table 16 summarizes the fleet-wide sea turtle interaction estimates for the Hawaii deep-set longline fishery from 2005 through the first quarter of 2015. Based on NMFS observer data for the Hawaii deep-set longline fishery for the most recent quarters since the 2014 BiOp was issued (July 1, 2014, start of 3rd quarter 2014 through March 31, 2015, end of 1st quarter 2015), the fishery has not exceeded any ITS for any sea turtle species.

Table 16. Annual sea turtles interactions expanded from observed data to fleet-wide estimates for the Hawaii deep-set longline fishery, 2005-2015.

Year	Sea Turtles			
	Green	Leatherback	N. Pacific Loggerhead	Olive Ridley
2005	0	4	0	17
2006	6	9	0	55
2007	0	4	6	26
2008	0	11	0	17
2009	0	4	0	18
2010	1	6	6	10
2011	5	14	0	36
2012	0	6	0	34
2013	5	15	11	42
2014	15	34	0	39
2015*	0	10	5	35

Source: NMFS 2014 and NMFS observer program annual status reports
http://www.fpir.noaa.gov/OBS/obs_hi_ll_ds_rprts.html
* 2015 estimates based on data from January 1 to March 31 (1st Quarter).

3.3.1.1.2 Sea Turtle Interaction in the Hawaii Shallow-set Longline Fishery

The Hawaii shallow-set longline fishery interacts with several species of sea turtles. The fishery is also managed through several measures to mitigate the potential for interactions and injury if interactions occur. These include training and handling requirements for reducing the severity of interactions, requirements for the fishery to use large circle hooks and mackerel-type fish bait. Additionally, federal regulations require a fishery closure once the fishery reaches the ITS for leatherback and loggerhead sea turtles.

On March 31, 2012, NMFS issued a no-jeopardy biological opinion (2012 BiOp; NMFS 2012) for the shallow-set longline fishery, which authorizes incidental take of loggerhead, leatherback, olive ridley and green sea turtles (NMFS 2014) shown in Table 17. Based on this information, NMFS in its 2012 BiOp concluded that the Hawaii deep-set longline fishery as managed under the Pelagic FEP is not likely to jeopardize the continued existence or recovery of any sea turtle species.

Table 17. The numbers of sea turtles estimated to be captured and/or killed in the Hawaii shallow-set fishery over two consecutive calendar years in NMFS 2012 biological opinion.

Sea turtle species	1-year		2-year	
	Interactions	Mortalities	Interactions	Mortalities
N. Pacific loggerhead	34	7	68	14
Leatherback	26	6	52	12
Olive ridley	2	1	4	2
Green	3	1	6	2

Source: NMFS 2012b.

The NMFS Observer Program monitors incidental interactions on all (100 percent) shallow-set fishing trips. Table 18 summarizes the fleet-wide estimates for the Hawaii shallow-set longline fishery from 2005-2015. Based on observed interactions for the most recent two year period from April 1, 2013 (Start of 2rd quarter 2013) through March 31, 2015 (end of 1st quarter 2015), the fishery has not exceeded any ITS for any sea turtle species.

Table 18. Annual sea turtles interactions expanded from observed data to fleet-wide estimates for the Hawaii shallow-set longline fishery, 2005-2015.

Year	Sea Turtles			
	N. Pacific loggerhead	Leatherback	Olive ridley	Green
2005	12	8	0	0
2006	17	2	0	0
2007	15	5	1	0
2008	0	2	2	1
2009	3	9	0	1
2010	7	8	0	0
2011	12	16	0	4
2012	5	7	0	0
2013	5	7	0	0
2014	13	19	1	1
2015*	8	1	0	0

Source: Source: NMFS 2012b and NMFS observer program annual status reports http://www.fpir.noaa.gov/OBS/obs_hi_ll_ss_rprts.html
* 2015 estimates based on data from January 1 to March 31 (1st Quarter).

3.3.1.1.3 Sea Turtle Interaction in the American Samoa Longline Fishery

On September 10, 2010, NMFS issued a no-jeopardy biological opinion (2010 BiOp) for the American Samoa longline fishery, which authorizes over a three-year period, the incidental take of green, hawksbill, leatherback, and olive ridley sea turtles (NMFS 2010) shown in Table 19.

In the 2010 BiOp, NMFS concluded that the American Samoa longline fishery is not likely to adversely affect loggerhead turtles, sperm whales, or humpback whales and will have no effect on blue, fin, or sei whales. NMFS also concluded that the fishery is not likely to jeopardize the continued existence or recovery of green turtles, hawksbill turtles, leatherback turtles, and olive ridley turtles.

Table 19. The numbers of sea turtles estimated to be captured and/or killed in the American Samoa longline fishery over three consecutive years (3-year ITS) in the NMFS 2010 biological opinion.

Sea turtle species	3-year Incidental Take Statement in 2010 BiOp	
	Interactions	Mortalities
Green turtles	45	41
Hawksbill turtles	1	1
Leatherback turtles	1	1
Olive ridley turtles	1	1

Source: NMFS 2010.

The NMFS Observer Program monitors interactions with approximately 20 percent of all trips observed, although past coverage was less due to lower federal funding. The fishery is required to conduct operations in accordance with a suite of management measures designed to reduce the number and severity of interactions with sea turtles. These include requirements for safe handling and mitigation training of protected species, specific requirements for gear configuration to set gear at a minimum depth of 100 m, and accommodation of observers upon request.

Table 20 provides the observed sea turtle interactions in the American Samoa longline fishery between 2006 and 2014 and the disposition of the species. Since the ITS became effective in 2011, the fishery has interacted with green sea turtles, leatherback sea turtles and olive ridley sea turtles.

Table 20. Number of Sea Turtle Interactions by Species Observed in the American Samoa Longline Fishery from 2006-2014.

	Turtle Species and Release Disposition									
Year	Green		Olive		Loggerhead		Leatherback		Hawksbill	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
2006	-	3	-	-	-	-	-	-	-	-
2007	-	1	-	-	-	-	-	-	-	-
2008	-	1	-	-	-	-	-	-	-	-
2009	-	3	-	-	-	-	-	-	-	-
2010	1	5	1	-	-	-	-	-	-	-
2011	1	10	1	-	-	-	1	1	-	-
2012	-	-	1	-	-	-	1	-	-	-
2013	-	2	1	-	-	-	1	1	-	-
2014	-	2	2	-	-	-	-	-	-	-
2015*	-	-	-	-	-	-	-	3	-	-

Source: http://www.fpir.noaa.gov/OBS/obs_as_ll_rprts.html
* 2015 estimates based on data from January 1 to June 30 (1st and 2nd Quarter).

These observed sea turtle interactions are then expanded by statistical sampling to get an annual estimate for the total number of incidental interactions for all longline fishing trips that landed in that calendar year (Table 21). These levels of take and take-associated mortality exceed the three-year ITS set forth in the 2010 BiOp and triggered the requirement for NMFS to reinitiate consultation under ESA section 7(a)(2) to evaluate the effects of the continuation of the American Samoa longline fishery on these species.

On May 8, 2015, NMFS reinitiated consultation under section 7 of the ESA to evaluate the effects of the American Samoa longline fishery on ESA-listed species, including the effects of the proposed action and other potential changes to the regulations (NMFS 2015). NMFS specifically evaluated the potential effects of the American Samoa longline fishery on leatherback and olive ridley sea turtles, the Indo-West Pacific DPS and the six ESA listed reef corals during the period of consultation, and determined that the fishery is not likely to jeopardize the continued existence of ESA-listed species under NMFS jurisdiction, and would not result in irreversible or irretrievable commitments of resources that would foreclose the formulation or implementation of any reasonable and prudent alternative measure for the fishery. NMFS documented these determinations in memoranda dated May 8, 2015 and July 21, 2015. NMFS expects to complete the consultation in mid-October 2015. A summary of the effects analyses for each species is provided in Section 4.3.1.

Table 21. Annual sea turtles interactions expanded from observed data to fleet-wide estimates for the American Samoa longline fishery, 2011-2015.

Year	Green	Leatherback	Olive Ridley
2011*	8	4	4
2012**	0	6	6
2013**	19	13	4
2014+	11	0	11
2015†	0	16	0
Total	38	39	25
Estimated mortality rate[a]	0.90	0.706	0.29
Estimated 2011–2015 mortality	35	28	8
Annual mean interactions	10	8	7
Estimated annual mortality	9	6	2

*2011 take and expansion for green turtles since September 23, 2011 ITS. Take expansion based on observer coverage. 2011 annual take estimate for leatherback and olive ridleys from McCracken 2015b.
**2012–2013 take expansion from McCracken 2015b.
+2014 take expansion based on observer coverage rate of 19.4% and expansion factor of 5.15.

† 2015 take expansion based on observer coverage rate of 18.75 percent and expansion factor of 5.33.
[a] NMFS determined the estimated mortality rates using criteria from Ryder et al. 2006 and applied them to annual mean interactions from 2011–2015.

NMFS has not designated critical habitat in the action area, so the American Samoa longline fishery would not affect critical habitat.

3.3.1.1.4 Guam and CNMI Longline Fisheries

NMFS concluded a formal consultation and issued a BiOp (2001 BiOp for the pelagic fisheries in the western Pacific on March 29, 2001 (NMFS 2001). In the 2001 BiOp, NMFS examined the impact of Guam and CNMI longline fisheries on endangered species. At the time, there were three permitted longline vessels in Guam and one in the CNMI, but none were active. Although neither of these longline fisheries were active at the time, NMFS utilized fishery information from American Samoa longline fishery to estimate incidental take and mortality of ESA-listed species. The BiOp analyzed the annual effort of longline fishing in the 1998 American Samoa fishery (26 vessels and 2,359 trips). The 2001 BiOp established ITS for sea turtles for the Guam and CNMI longline fisheries and determined that this level of anticipated take is not likely to result in jeopardy to the green turtle, leatherback turtle, loggerhead turtle, or olive ridley turtle under the proposed regulations for the Guam and CNMI longline fisheries. Although this BiOp did not discuss hawksbill sea turtles, they are considered hard shell turtles and are included in the ITS. The BiOp also concludes that the fisheries are not likely to adversely affect ESA-listed marine mammals or critical habitat that has been designated. See Table 22 for the number of sea turtle authorized to be taken in the Guam and CNMI longline fisheries.

Table 22: The number of turtles estimated to be annually taken (captured and/or killed) in the Guam and CNMI longline fisheries in the 2001 biological opinion.

Fishery	Annual Estimated Incidental Take (All Species Combined)	Annual Estimated Incidental Mortality (All Species Combined)
Guam Longline	3 hardshell turtles, 1 leatherback	1 hardshell turtle
CNMI Longline	3 hardshell turtles, 1 leatherback	3 hardshell turtles, 1 leatherback

Source: NMFS 2001.

There were no observed or reported interactions with sea turtles in the CNMI longline fishery (from the two to four vessels that were active from 2008 to 2012). Currently there are no active longline vessels in Guam; therefore, there have been no observed or reported interaction with a

sea turtle. High operating costs associated with vessel-docking along with poor market access may be contributing factors to the lack of longline fishing in the Marianas (WPFMC and NMFS 2014).

3.3.2 Marine Mammals

ESA-listed Marine Mammals

ESA-listed marine mammal species that are that have been observed or may occur in the area where Pelagic FEP fisheries operate include the following species:

- Blue whale (*Balaenoptera musculus*)
- Fin whale (*Balaenoptera physalus*)
- Hawaiian monk seal (*Monachus schauinslandi*)
- Humpback whale (*Megaptera novaeangliae*)
- Main Hawaiian Islands insular false killer whale (*Pseudorca crassidens*)
- North Pacific right whale (*Eubalaena japonica*)
- Sei whale (*Balaenoptera borealis*)
- Sperm whale (*Physeter macrocephalus*)

Detailed information on these species' geographic range, abundance, bycatch estimates, and status can be found in the most recent stock assessment reports (SARs), available online at: http://www.nmfs.noaa.gov/pr/sars/. Additional, recent information may be found in NMFS 2012b and NMFS 2014.

Although blue whales, north Pacific right whales, and sei whales are found within the action area and could potentially interact with the Pelagic FEP fisheries, there have been no reported or observed incidental hookings or entanglements of these species in these fisheries. There are records of fishery interactions with humpback whales and one sperm whale in the Hawaii longline fishery. In addition, NMFS has assigned prorated interactions to the population of MHI insular false killer whales based on interactions with pelagic false killer whales, and on interactions with false killer whales from unknown populations and unidentified blackfish. Interactions with listed marine mammals are described below.

On February 27, 2015, the gear from a Hawaii shallow-set longline vessel entangled a fin whale slightly more than 200 miles from the coast of California. The crew released the animal with no gear attached. NMFS preliminarily determined that this interaction did not result in a serious injury because the crew and NMFS observer were able to disentangle the whale after they cut the mainline. The observer recorded only superficial wounds on the whale, the crew released the whale with no gear attached, and the observer saw the whale diving after release. NMFS previously determined that the shallow-set fishery was not likely to adversely affect fin whales based on the discountable likelihood that a fin whale would be hooked or entangled by the shallow-set fishery or hit by a vessel, and because of the low densities of these whales. However, in response to this event, NMFS reinitiated ESA section 7 consultation to evaluate the potential impacts of Hawaii shallow-set longline fishery on fin whales. Given the long history of 100% observer coverage in the shallow-set fishery and the lack of observed or reported

interaction with a fin whales, NMFS considers the recent interaction an isolated event. Additionally, given the low densities of fin whales in the action area of the shallow-set fishery (Caretta et al 2014), NMFS considers it extremely unlikely that another interaction in the fishery would occur. For these reasons, NMFS determined that the Hawaii shallow-set longline fishery is not likely to adversely affect fin whales and documented its determination in a memorandum of concurrence dated [INSERT DATE].

On April 21, 2015 (80 FR 22304), NMFS published a proposed rule in the Federal Register to reclassify the humpback whale into 14 distinct population segments under the Endangered Species Act (ESA), of which four DPSs would be proposed for listing. The remaining ten DPSs are not proposed for listing, including the Hawaii DPS and the Oceania DPS, which occur in areas where the Hawaii and American Samoa longline fisheries operate, respectively. Please consult the proposed rule for specific details on the proposal.

Non ESA-listed Marine Mammals

Based on research, observer, and logbook data, marine mammals, not listed under the ESA that may occur in the region and that may be affected by the fisheries managed under the Pelagic FEP include the following species:

- Blainville's beaked whale (*Mesoplodon densirostris*)
- Bryde's whale (*Balaenoptera edeni*)
- Bottlenose dolphin (*Tursiops truncatus*)
- Common dolphin (*Delphinus delphis*)
- Cuvier's beaked whale (*Ziphius cavirostris*)
- Dwarf sperm whale (*Kogia sima*)
- False killer whale (*Pseudorca crassidens*) other than the MHI Insular DPS
- 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 fur seal (*Callorhinus ursinus*)
- Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)
- Pantropical spotted dolphin (*Stenella attenuata*)
- Pilot whale, short-finned (*Globicephala macrorhynchus*)
- Pygmy killer whale (*Feresa attenuata*)
- Pygmy sperm whale (*Kogia breviceps*)
- Risso's dolphin (*Grampus griseus*)
- Rough-toothed dolphin (*Steno bredanensis*)
- Spinner dolphin (*Stenella longirostris*)
- Striped dolphin (*Stenella coeruleoalba*)

Detailed information on these species' geographic range, abundance, bycatch estimates, and status can be found in the most recent stock assessment reports (SARs), available online at:

http://www.nmfs.noaa.gov/pr/sars/. Interactions with marine mammals are described in the next section.

3.3.2.1 Marine Mammal Interactions in Pelagic FEP longline Fisheries

3.3.2.1.1 Marine Mammal Interaction in the Hawaii Deep-set Longline Fishery

The Hawaii deep-set longline fishery operates in accordance with NMFS' 2014 BiOp, which requires a minimum of 20 percent observer coverage for the fishery to monitor protected species interactions, including marine mammals. Based on observer data from 2008 through the first quarter of 2015 (January 1-March 31, 2015), the fishery interacted with several species of marine mammals (Table 23). Most of the animals were released injured. Many of these injuries were determined to be "serious injuries," or injuries likely leading to death. False killer whales have interacted with deep-set longline gear more than other marine mammal species and NMFS has implemented changes to the operations of the fishery based on the recommendations of the False Killer Whale Take Reduction Team to reduce incidental interactions. The mitigation requirements include: the use circle hooks, a permanently closed area, and an interaction limit, which, when reached, triggers a southern longline fishing exclusion zone (see 50 CFR 229.37).

There are records of fishery interactions with humpback whales and one sperm whale. In addition, NMFS has assigned prorated interactions to the population of MHI insular false killer whales based on interactions with pelagic false killer whales, and on interactions with false killer whales from unknown populations and unidentified blackfish.

Table 23: Observed marine mammal interactions in the Hawaii deep-set fishery, 2008- first quarter of 2015.

Species	Total Interactions	Released injured	Released dead
Bottlenose dolphin	4	3	1
False killer whale	38	37	1
Pantropical spotted dolphin	1	0	1
Risso's dolphin	2	2	0
Short-finned pilot whale	4	3	1
Sperm whale	1	1	0
Humpback whale	1	1	0
Striped dolphin	1	0	1
Pygmy or dwarf sperm whale	1	1	0
Pygmy killer whale	1	0	1
Rough-toothed dolphin	1	0	1
Unidentified cetacean	10	10	0
Unidentified whale	8	8	0

Note: Protected species interactions for Observer Program Quarterly and Annual Reports are based on vessel arrivals. The tally of an interaction may fall in a year other than the year when the interaction actually occurred.
Source: NMFS Observer Program Annual Status Reports
http://www.fpir.noaa.gov/OBS/obs_qrtrly_annual_rprts.html

Since observer coverage is approximately 20 percent of all deep-set trips per year, NMFS' PIFSC expands the observed interactions statistically to get an annual estimate for the total number of incidental interactions for all deep-set fishing trips that landed in that calendar year. Table 24 provides the extrapolated number of marine mammal interactions estimated to occur with the Hawaii deep-set longline fishery, from 2008 to 2012. These are estimates of all interactions, including those that result in mortality, serious injury, and non-serious injury.

Table 24: Estimated annual marine mammal interactions (including mortalities, and serious and non-serious injuries) with the Hawaii deep-set longline fishery from 2008- first quarter of 2015.

Species	2008	2009	2010	2011	2012	2013*	2014*	5-year Mean *
Blackfish	9	0	3	10	5	N/A	N/A	5.5
Risso's dolphin	2	0	3	0	0	0	0	0.9
Short-finned pilot whale	5	0	0	0	0	5	0	1.0
False killer whale	11	55	19	10	15	20	53	22.1
Pantropical spotted dolphin	3	0	0	0	0	0	0	0.6
Striped dolphin	0	0	0	4	0	0	0	0.8
Bottlenose dolphin	0	5	4	0	0	10	0	1.9
Unidentified cetacean	3	17	12	0	6	10	0	7.6
Sperm whale	0	0	0	6	0	0	0	1.3

Note: "Blackfish" include unidentified whales considered to be either false killer whales or short-finned pilot whales.
*Annual estimates are rounded to whole numbers. Five-year means are based on unrounded annual estimates (2008-2012), so they may differ from a five-year average of the rounded figures. Source: McCracken 2014. McCracken expansions were unavailable for 2013 and 2014; NMFS calculated simple expansions for these years based on percent observer coverage. Source: NMFS Observer Program Annual Status Reports http://www.fpir.noaa.gov/OBS/obs_qrtrly_annual_rprts.html

Because of inter-annual variability in marine mammal interaction rates, NMFS typically evaluates multi-year averages when determining whether those rates exceed sustainable thresholds (e.g., Potential Biological Removal level, or PBR).

The Hawaii deep-set longline fishery incidentally interacts with a number of ESA-listed marine mammals during fishing operations. The 2014 BiOp (sections 5, 6, 7, 8, and 9) includes a detailed analysis of recent levels of interactions between the fishery and ESA-listed humpback whales, sperm whales, and MHI Insular false killer whales (NMFS 2014). This information is incorporated by reference and is briefly summarized here.

On October 10, 2014, NMFS authorized a permit under the MMPA section 101(a)(5)(E), addressing the fishery's interactions with depleted stocks of marine mammals. The permit authorizes the incidental, but not intentional, taking of ESA-listed humpback whales (CNP stock), sperm whales (Hawaii stock), and MHI insular false killer whales. In issuing this permit,

NMFS determined that incidental taking by the Hawaii deep-set and shallow-set longline fisheries will have a negligible impact on the affected stocks of marine mammals.

As previously mentioned, NMFS issued a no-jeopardy BiOp in 2014 for the deep-set longline fishery, authorizing incidental take for humpback whales, sperm whales, and MHI Insular false killer whales (NMFS 2014). Table 25 specifies the thresholds for incidental take in the fishery, which became effective on issuance of the MMPA section 101(a)(5)(E) permit. Based on this information, NMFS in its 2012 BiOp concluded that the Hawaii deep-set longline fishery as managed under the Pelagic FEP is not likely to jeopardize the continued existence or recovery of these ESA-listed marine mammals.

Table 25: The number of ESA-listed marine mammals estimated to be captured and/or killed in the Hawaii deep-set fishery over three consecutive years (3-year ITS) in the NMFS 2014 biological opinion.

Species	Estimated Incidental Take	
	Interactions	Total Mortalities
Humpback whales	6	3
Sperm whales	9	6
MHI Insular FKW	1	0.74

Source: NMFS 2014.

Table 26 summarizes recent interactions between the deep-set longline fishery and ESA-listed marine mammals, based on observed trips in 2011-2014 when the fishery was open year-round.

Table 26. Recent interactions between the Hawaii deep-set longline fishery and ESA-listed marine mammals (with the fishery operating under Specified Fishing Agreements).

Year	Humpback Whale, Central North Pacific (CNP) Stock	Sperm Whale, Hawaii Stock	False Killer Whale, Main Hawaiian Islands Insular Stock (End. DPS)*
2014	1 observed; 5.05 estimated	0	0
2013	0	0	0
2012	0	0	0
2011	0	1 observed; 6.3870 estimated	1 observed; 0.8920 estimated based on pro-ration of observed false killer whales and unidentified blackfish in the insular/pelagic overlap area as defined in section 5.2.3 of the 2014 BiOp

Source: NMFS 2014. (BiOp); *End. DPS = endangered distinct population segment.
Based on NMFS observer data for the Hawaii deep-set longline fishery for the most recent quarters since the 2014 BiOp was issued (July 1, 2014, start of 3rd quarter 2014 through March 31, 2015, end of 1st quarter 2015), the fishery has not exceeded any ITS for any marine mammal species.

3.3.2.1.2 Marine Mammal Interaction in the Hawaii Shallow-set Longline Fishery

Table 27 provides total marine mammal interactions observed in the shallow-set fishery from 2008 through the first quarter of 2015. All trips are observed in the shallow-set fishery; therefore, expansion of the data is not necessary.

Table 27. Total annual marine mammal interactions (including dead, serious injuries, and non-serious injuries) for the Hawaii shallow-set longline fishery, 2008-first quarter 2015.

Species	2008	2009	2010	2011	2012	2013[a]	2014[a]	2015[a]	5-year Mean**
Blackfish*	1	0	0	1	0	0	0	0	0.4
Common dolphin	0	0	0	1	0	0	1	0	0.2
Risso's dolphin	4	3	7	4	0	3	6	2	3.6
Blainville's beaked whale	0	0	0	1	0	0	0	0	0.2
Humpback whale	1	0	0	1	0	0	0	0	0.4
False killer whale	1	1	0	1	1	0	1	0	0.8
Striped dolphin	1	0	2	0	1	0	2	0	0.8
Bottlenose dolphin	0	0	2	2	1	2	4	0	0.8
Rough-toothed dolphin	0	0	0	0	0	1	0	0	
Unidentified cetacean	0	1	1	0	1	0	0	1	0.6
Pygmy or dwarf sperm whale	1	0	0	0	0	0	0	0	0.2
Beaked whale, Mesoplodont	0	0	0	1	0	0	0	0	0.2
Unidentified beaked whale	0	0	0	1	0	2	0	1	0.2
Northern elephant seal	0	0	0	0	0	1	1	0	N/A
Unidentified sea lion	0	0	0	0	0	0	1	0	N/A

Note: * "Blackfish" includes unidentified whales considered to be either false killer whales or short-finned pilot whales. ** Annual estimates are rounded to whole numbers. Five-year means are based on unrounded annual estimates from 2008 through 2012, so they may differ from a five-year average of the rounded figures. Source: McCracken 2014.

[a] Interactions in 2013, 2014, and the first quarter of 2015 are from the NMFS Observer Program Annual Status Reports. Source: http://www.fpir.noaa.gov/OBS/obs_hi_ll_ss_rprts.html.

3.3.2.1.3 Marine Mammal Interactions in the American Samoa Longline Fishery

To date, no humpback, sperm, blue, fin, or sei whale interactions have been observed or reported in the American Samoa longline fishery. Observed marine mammal interactions in the American

Samoa longline fishery from 2006-2014 are shown in Table 28. The target rate for observer coverage is 20 percent of all trips. This is subject to funding limitations and may fluctuate.

Table 28. Number of marine mammal interactions observed in the American Samoa longline fishery, 2006-2014.

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of sets observed	287	410	379	306	798	1,257	662	585	565
Rough-toothed dolphin	0	0	1	0	0	5	0	1	0
Cuvier's beaked whale	0	0	0	0	0	1	0	0	0
False killer whale	0	0	2	0	0	3	0	1	0
Short-finned pilot whale	0	0	0	0	0	0	0	0	1
Unidentified cetacean	0	0	0	0	0	2	0	0	0

Source: NMFS PIRO American Samoa Observer Program 2006-2014 Status Reports.
Note: Protected species interactions for Observer Program Quarterly and Annual Reports are based on vessel arrivals rather than when the interaction occurred. The tally of an interaction may fall in a year other than the year when the interaction actually occurred.

Recent estimates of the total (extrapolated) number of marine mammal interactions in the American Samoa longline fishery are not available. However, based on 2006-2008 data, the total estimated number of serious injuries and mortalities for marine mammals per year in the American Samoa longline fishery is 3.6 rough-toothed dolphins (CV=0.6) and 7.8 false killer whales (CV=1.7) (Carretta et al. 2012).

With no active longline fishery in Guam or the CNMI, there are no interactions with marine mammals reported for the past several years.

3.3.3 Seabirds

ESA-listed Seabirds

The endangered short-tailed albatross, threatened Newell's shearwater, and endangered Hawaiian dark-rumped petrel have ranges that overlap the fishing grounds of the Hawaii longline fisheries. The short-tailed albatross has a range that overlaps the pelagic fisheries operating around the CNMI and Guam. In addition, three other seabirds in the South Pacific were determined to be endangered under the ESA in 2009: the Chatham petrel (*Pterodroma axillaris*), Fiji petrel (*Pseudobulweria macgillivrayi*), and the magenta petrel (*Pterodroma magentae*). However, apart from Newell's shearwater, which was sighted on Tutuila only once in 1993 and considered an accidental visitor, the ranges of the other three species are assumed not to overlap with that of the American Samoa longline fishery or other pelagic fisheries north of the Equator (see sources cited in WPFMC 2011). A comprehensive description of the species' distribution, population status, threats, and recovery strategy can be found in the species' recovery plans.[8] Since NMFS initiated the observer programs in Hawaii in 1994 and American Samoa in 2006,

[8] Available online at: http://ecos.fws.gov/tess_public/TESSWebpageRecovery?sort=1.

there have been no observed interactions between ESA-listed seabird species and the fisheries under the Pelagic FEP.

In 2012, an ESA section 7 consultation with the U.S. Fish and Wildlife Service covering the potential impacts of the Hawaii deep-set and shallow-set fishery on listed seabirds concluded that the Newell's shearwater and the Hawaiian petrel are not affected by the Hawaii deep-set fishery. In addition, USFWS concluded in the USFWS 2012 BiOp that the continued operation of the Hawaii deep- and shallow-set longline fisheries will adversely affect the short-tailed albatross but will not jeopardize its survival and recovery in the wild. No critical habitat has been designated for this species; therefore, none will be affected. The BiOp covering the short-tailed albatross anticipates that two (2) short-tailed albatross in the deep-set fishery and (1) short-tailed albatross in the shallow-set fishery may be taken every five years in the form of injury or death as a result of interactions with fishing activity operating under existing regulations (USFWS 2012). This is an authorized observed level of take and if this level is exceeded, NMFS will be required to reinitiate consultation with the USFWS. Since NMFS initiated the mandatory Hawaii longline observer program in 1994, there have been no observed interactions between ESA-listed seabird species and Hawaii deep-set or shallow-set longline fisheries under the Pelagics FEP.

In an informal consultation, dated May 19, 2011, USFWS concurred with NMFS' determination that the American Samoa longline fishery is not likely to adversely affect the Newell's shearwater. In a separate communication on July 29, 2011, and recorded in a memorandum for the record on the same date, USFWS advised that, because of the lack of overlap between the range of the American Samoa longline fishery and the ranges of Chatham, Fiji, and magenta petrels, the fishery would not affect those petrels.

Seabird interactions have not been reported or observed in the Guam or CNMI longline fisheries. A 2011 ESA section 7 consultation with USFWS determined these fisheries are not likely to adversely affect the Newell's shearwater or the short-tailed albatross. Since 2012, there have been no active longline vessels in Guam or CNMI. Thus, there are no reports of interactions with seabirds.

Non ESA-listed Seabirds

Seabird regulations for the Hawaii longline fisheries were published in the *Federal Register* on December 19, 2005 (70 FR 75075). Deep-set fishing operations north of 23º N latitude are required to comply with seabird mitigation regulations that are intended to reduce interactions between seabirds and Hawaii longline fishing vessels (50 CFR parts 600 and 665). The regulations require that longline fishermen employ a suite of mitigation measures that are specific to side-setting or stern-setting, and may include blue-dyed bait, weighted branch lines, strategic offal discards, setting from the side of the vessel, using a "bird curtain", or a hydraulic line-setting machine, among others. These measures help deter birds from becoming hooked or entangled while attempting to feed on bait or catch. For a complete description of the requirements, see 50 CFR 665.815. These requirements would remain in effect under all Alternatives.

In addition to the ESA-listed seabirds described above, the Hawaii deep-set and shallow-set longline fisheries occasionally interact with other seabirds such as albatrosses, Northern fulmar, and sooty shearwater.

Albatrosses that forage by diving are some of the most vulnerable species to bycatch in fisheries (Brothers et al. 1999). These species are long-lived, have delayed sexual maturity, small clutches and long generation times, resulting in populations that are highly sensitive to changes in adult mortality. Nineteen of the world's 21 albatross species are now globally threatened with extinction according to the IUCN (IUCN 2004, BirdLife 2004), and incidental catch in fisheries, especially longline fisheries, is considered one of the principal threats to many of these species (Veran et al. 2007).

On October 7, 2011, in response to a petition to list the black-footed albatross under the ESA, the USFWS found that the Hawaiian Islands breeding population and the Japanese Islands breeding population of the black-footed albatross are separate DPS, as defined by the DPS policy (76 FR 62503). However, the USFWS also found that neither DPS of the black-footed albatross currently warrants listing under the ESA. The USFWS observed that black-footed albatross bycatch should continue to be minimized by the implementation of effective bycatch minimization measures, and concluded that Hawaii-based longline fishing is not a significant threat to the black-footed albatross.

Table 29 contains the estimated numbers of albatross that have interacted with the Hawaii deep- and shallow-set longline fisheries from 2006 through the first quarter of 2015 based on observed interactions by the NMFS Observer Program. From 2004, observer coverage rates were approximately 20 percent in the deep-set fishery and 100 percent in the shallow-set fishery. The major reduction in the number of interactions was due in most part to requirement that the shallow-set longline fishery begin setting one hour after local sunset and to complete setting one hour before local sunrise. Seabirds likely drown if the interaction occurs during gear deployment (setting), but during gear retrieval (hauling), seabirds may be released alive when fishermen promptly apply seabird handling and release techniques. Based on observer data, nearly all seabirds hooked or entangled in the Hawaii deep-set longline fishery are dead, since interactions presumably occur during the setting.

In addition, from 2004 through the first quarter of 2015, based on observed sets, the deep-set fishery interacted with two red-footed boobies, one brown booby and 42 sooty shearwaters. In the same period, the shallow-set fishery interacted with one northern fulmar, one unidentified shearwater, and three sooty shearwaters (http://www.fpir.noaa.gov/SFD/SFD_seabirds.html).

Table 29. Estimated total number of interactions with albatrosses in the Hawaii deep- and shallow-set longline fisheries, 2006-the first quarter of 2015.

Year	Laysan	Black-footed	Total
2006	73	15	88
2007	85	83	168
2008	124	88	212
2009	139	141	280

Year	Laysan	Black-footed	Total
2010	105	197	302
2011	92	236	328
2012	195	182	377
2013	297	294	591
2014*	99	183	282
2015*	82	137	219

Source: NMFS PIFSC and McCracken 2012, 2013, 2014.
*Estimated total interactions for 2014 and the first quarter of 2015 are based on simple expansions using the observer coverage rate for the deep-set fishery and the number of observed interaction in the shallow-set fishery.
Source: NMFS Observer Program Annual Status Reports.
http://www.fpir.noaa.gov/OBS/obs_qrtrly_annual_rprts.html

Most of the seabird interactions now occur in the deep-set longline fishery (Table 30). Although fewer are caught, a greater percentage of Laysan albatrosses are caught in the shallow-set fishery see Table 31).

Table 30. Estimated total interactions with albatrosses in the Hawaii deep-set longline fishery, 2005-first quarter of 2015.

Year	Laysan	Black-footed	Total
2005	43	82	125
2006	7	70	77
2007	44	77	121
2008	55	118	173
2009	60	110	170
2010	157	66	223
2011	187	73	260
2012	167	136	303
2013	257	236	493
2014*	63	154	217
2015*	76	131	207

Source: NMFS PIFSC and McCracken 2012, 2013, 2014.
*Estimated total interactions for 2014 and the first quarter of 2015 are based on simple expansions using the observer coverage rate for the deep-set fishery and the number of observed interaction in the shallow-set fishery. Source: NMFS Observer Program Annual Status Reports.
http://www.fpir.noaa.gov/OBS/obs_qrtrly_annual_rprts.html

Table 31. Observed albatross interactions in the Hawaii shallow-set longline fishery (2005-the first quarter of 2015).

Year	Laysan	Black-footed	Total
2004	1	0	1
2005	62	7	69
2006*	8	3	11
2007	40	8	48
2008	33	6	39

Year	Laysan	Black-footed	Total
2009	81	30	112
2010	40	38	79
2011*	49	19	68
2012	61	37	98
2013	46	28	74
2014	36	29	65
2015	6	6	12

Note: * NMFS closed the fishery before the end of the year because an annual turtle interaction limit was reached.
Source: NMFS PIRO observer data: http://www.fpir.noaa.gov/OBS/obs_hi_ll_ss_rprts.html

In 2012, the USFWS issued a special permit for the shallow-set fishery under the Migratory Bird Treaty Act (MBTA). This permit authorizes incidental take of certain seabirds in the Hawaii shallow-set fishery over a period of three years (USFWS 2012). The permit and ITS were renewed in 2015 (Table 32).

Table 32. Total incidental take authorized under the three-year MBTA Special Purpose Permit for the Hawaii shallow-set longline fishery.

Species	Authorized incidental take (N)
Black-footed albatross	191 per three years (2015-2017)
Laysan albatross	430 per three years (2015-2017)
Short-tailed albatross	1 (not to exceed 1 per 5 years)
Sooty shearwater	10 per year
Northern fulmar	10 per year

Source: USFWS 2012.

Many seabird species may occur in the area of operation of the American Samoa longline fishery, similar to Hawaii, Guam, and CNMI. Observers have recorded two interactions with unidentified shearwaters and one unidentified frigatebird in the American Samoa longline fishery from 2006-2014.

3.3.4 Scalloped Hammerhead Sharks

On July 3, 2014, NMFS issued a final rule to list under the ESA, the Indo-West Pacific scalloped hammerhead shark distinct population segment (DPS), and the Eastern Pacific scalloped hammerhead shark DPS as threatened and endangered, respectively (79 FR 38213). The Indo-West Pacific DPS includes areas around most of the U.S. Pacific territories and possessions. The Eastern Pacific DPS generally includes the eastern Pacific, east of 140° W. NMFS has not designated critical habitat for these DPSs.

Detailed information on the scalloped hammerhead sharks including the range, abundance, status, and threats to the species can be found in the 2014 BiOp for the deep-set longline fishery (NMFS 2014), the 2014 Status Review Report and the 2014 Final Rule (79 FR 38213).

3.3.4.1 Shark Interactions in the Hawaii Longline Fisheries

Since 2004, NMFS observers placed on Hawaii deep-set longline fishing vessels recorded three incidentally-caught scalloped hammerhead sharks in the area of the threatened Indo-West Pacific DPS south of 10° N., all of which were caught from 2004-2007 (PIRO Observer Program, unpublished data). Based on the three observed and the observer coverage levels in those years, NMFS estimates that the total catch of scalloped hammerheads from the Indo-Pacific DPS was approximately 14, which is about 2 annually (rounded from 1.4) during the 2004-2014 time period (NMFS 2014d). NMFS has no records of any interactions with scalloped hammerhead sharks from the Eastern Pacific DPS. As described in the final rule listing (79 FR 38213, July 3, 2014), the Indo-West Pacific scalloped hammerhead shark DPS is not subject to the take prohibitions in section 9 of the ESA because NMFS has determined that protective regulations under section 4(d) are not deemed necessary and appropriate for the conservation of that species.[9]

The 2014 BiOp analyzed the effects of the Hawaii deep-set longline fishery on the Indo-West Pacific scalloped hammerhead shark DPS and the Eastern Pacific scalloped hammerhead shark DPS (sections 5, 6.8, 7.8, 8.0 and 9.8 of the BiOp), incorporated herein by reference. Based on historical interactions described above, the 2014 BiOp found that the likelihood of interactions with the Eastern Pacific scalloped hammerhead shark DPS is discountable and unlikely to occur as the fishery does not generally operate in the area where this stock is found. Based on this finding, NMFS concluded that the Eastern Pacific DPS of scalloped hammerhead sharks is not likely to be adversely affected by the proposed action.

With respect to the Indo-West Pacific scalloped hammerhead shark DPS, the 2014 BiOp anticipates and authorizes the Hawaii longline fishery to interact with six Indo-Western Pacific scalloped hammerhead sharks, which is expected to result in three mortalities over a three-year period. Although abundance estimates for the entire DPS are unavailable, the effective population size is estimated to be at least 11,280 adults. One mortality represents 0.009% (1/11,280*100=0.00886) of the population. Based on this information, NMFS in its 2014 BiOp concluded that the Hawaii deep-set longline fishery as managed under the Pelagic FEP is not likely to jeopardize the continued existence or recovery of the Indo-West Pacific scalloped hammerhead DPS.

The Hawaii shallow-set longline fishery generally occurs within the range of the Central Pacific DPS of scalloped hammerhead shark; this DPS was not listed under the ESA. The shallow-set fishery does not occur within the range of the Indo-West Pacific DPS; however a portion of the shallow-set fishery does fall within the range of the Eastern Pacific DPS. There have been no recorded or observed takes of hammerhead sharks in either the shallow-set or the deep-set longline fishery in the area of the Eastern Pacific DPS (NMFS Observer Program, unpublished data). In the March 2, 2015 LOC, NMFS concurred with the determination that the continued authorization of the Hawaii shallow-set longline fishery under the Pelagic FEP is not likely to

[9] Section 9 of the ESA prohibits any person subject to the jurisdiction of the United States to take, harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct within the United States, or territorial seas of the United States, or the high seas.

adversely affect the Eastern Pacific scalloped hammerhead shark DPS due to the low risk of interaction between the DPS and the fishery.

3.3.4.2 Shark Interactions in the American Samoa Longline Fishery

The American Samoa longline fishery operates in the range of the Indo-West Pacific DPS and between 2006-2014, observers in the fishery recorded interactions with nine scalloped hammerhead sharks and three unidentified hammerheads. As mentioned above, on May 8, 2015, NMFS recently reinitiated consultation for this fishery and estimates interaction rates for this DPS at 12 scalloped hammerhead sharks annually (NMFS 2015). Based on an observed interaction-associated mortality rate of 40% (NMFS 2015), NMFS estimates 12 interactions could result in up to 4.8 (rounded to 5) mortalities of Indo-West Pacific DPS sharks annually.

The effective population size of the Indo-West Pacific DPS is estimated to be at least 11,280 adults (Miller et al. 2014), therefore five mortalities represent 0.04 percent (5/11,280*100=0.04432) of the population. Based on this level of take, the risk to the scalloped hammerhead shark DPS from the American Samoa longline fishery would be negligible. Consultation was ongoing at the time this document was prepared and the fishery is operating under the authority of sections 7(a)(2) and 7(d) of the ESA.

3.3.5 Corals

ESA-listed Corals

On September 10, 2014, NMFS issued a final rule to list 20 species of corals as threatened under the ESA (79 FR 53851). Fifteen of the newly listed species occur in the Indo-Pacific, and five in the Caribbean. Of those that occur in the Indo-Pacific, only eight are believed to occur in waters under U.S. jurisdiction.

Coral reefs are formed on solid substrate but only within suitable environmental conditions that allow the deposition rates of corals and other reef calcifiers to exceed the rates of physical, chemical, and biological erosion. In the U.S. Pacific Islands, coral reef habitat is generally found immediately within waters from 0-3 nm of shore, although some coral reef habitat can be found further offshore.

In contrast, pelagic fisheries generally operate dozens to a thousand of miles offshore, far away from the islands and coral reef habitat areas, to target pelagic fish species in the water column. With respect to the longline fisheries, federal regulations prohibit longline fishing within 50-75 nm from shoreline of Hawaii and 30 nm from the shoreline of the Northern Mariana Islands. In American Samoa and Guam, federal regulations prohibit all fishing vessels greater than 50 ft in length, including longline vessels from fishing within 50 nm of the shoreline. In the Pacific Remote Islands, federal regulations prohibit all commercial fishing within 50 nm of all islands, including longline fishing.

To access fishing grounds, pelagic fishing vessel have to transit areas where ESA-listed corals may occur. While pelagic troll vessels may deploy surface lures during transit, the activity does not occur in coral reef habitat. Pelagic longline and handline vessels do not deploy gear in transit. Additionally, pelagic fishing activities do not involve anchoring and, therefore, the potential for anchor damage during fishing activities not an issue.

3.3.6 Critical Habitat

3.3.6.1 Leatherback Sea turtle Critical Habitat

On January 26, 2012, NMFS designated critical habitat for leatherback sea turtles off the west coast of the U.S., including areas off WA, OR, and CA (77 FR 4170). Because Hawaii longline vessels in both the deep-set and shallow-set fishery may occasionally transit through the U.S. EEZ to and from west coast ports, NMFS evaluated the fishery for potential effects to leatherback sea turtle critical habitat in both the 2012 BiOp for the shallow-set fishery (NMFS 2012) and the 2014 BiOp for the deep-set fishery (NMFS 2014). Because longline fishing is prohibited by federal law within the EEZ off the west coast, NMFS determined that the deep-set and shallow-set longline fisheries may affect, but are not likely to adversely modify designated critical habitat for leatherback sea turtles.

3.3.6.2 Monk Seal Critical Habitat

On August 21, 2015, NMFS published a final rule (80 FR 50926) designating critical habitat for the Hawaiian monk seal (*Neomonachus schauinslandi*) in the main Hawaiian Islands (MHI) and expanding monk seal critical habitat in the Northwestern Hawaiian Islands (NWHI). NMFS identified features that are essential for the conservation of monk seals, including areas preferred for pupping and nursing, areas that support adequate prey quality and quantity for foraging, and areas for hauling out, resting, or molting. Accordingly, NMFS identified critical habitat in certain areas in the MHI, and around designated islands in the NWHI, to include, generally, from the beach to the 200-m depth contour and the seafloor and the waters and habitat within 10 m of the seafloor. Please consult the final rule for specific critical habitat boundaries.

In response to the critical habitat designation, NMFS reinitiated ESA section 7 consultation to evaluate the potential impacts of Hawaii deep-set and shallow-set longline fisheries on monk seal critical habitat. Because monk seals do not prey on species targeted by the Hawaii's deep-set and shallow-set longline fisheries and due to the fact that longline vessels are prohibited from fishing within 50 to 75 nm around all Hawaiian Islands, NMFS determined that the Hawaii shallow-set and deep-set longline fisheries may affect, but are not likely to adversely modify monk seal critical habitat. NMFS documented its determinations in a memorandum of concurrence dated September 16, 2015.

4 Potential Impacts of the Alternatives

This chapter describes the potential environmental consequences that could result from the Alternatives considered. The analysis relies on the information described in Chapter 3 as the baseline to evaluate the impacts of the proposed action (Alternative 2) and the no management

action (Alternative 1). The environmental resources that are potentially affected include the following: target and non-target species (including bycatch), protected resources, and marine habitat. This chapter also considers the impacts on fishery participants, fishing communities, and enforcement and administration. Table 33 provides comparative outcomes summarizing impacts of each Alternative. Climate change impacts are discussed in the cumulative effects section.

Because catches of bigeye tuna by longline fisheries of American Samoa have remained well below the proposed 2,000 mt limit, and because there are no active longline fisheries in Guam or the CNMI, the proposed catch limit of 2,000 mt applicable to each of the U.S. participating territories is not expected to immediately result in substantial changes in the conduct of territorial longline fisheries, including gear types used, areas fished, level of catch or effort, or fishery development actions. Thus, the primary focus of the impact analysis is the potential environmental impact to the bigeye tuna stock status that may result from the proposed allocation of bigeye tuna catch limits under valid specified fishing agreements.

Changes to fisheries in the U.S. participating territories may occur in the future if the proposed action is approved, and funding provided through specified fishing agreements under this action becomes available to support NMFS-approved fisheries development projects identified in a U.S. participating territory's MCP. However, it would be speculative at this time to attempt to evaluate environmental effects of potential projects without specific information on the type or scope of the project that would be funded. For this reason, potential impacts of future fishery development projects that could be funded are briefly discussed, but not analyzed in detail in this EA. Such projects may be subject to separate environmental review when project details are known.

Table 33. Summary of the Potential Impacts of the Alternatives Considered

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
Expected number of specified fishing agreements	2015: None 2016: None	2015: 1 2016: 1	2015: 2 2016: 2	2015: 3 2016: 3	2015: 3 2016: 3
Expected amount of BET caught by U.S. (Hawaii) and U.S. territory longline vessels in 2015 and 2016:	2015: 4,023 mt 2016: 4,075 mt	2015: 5,023 mt 2016: 5,075 mt	2015: 6,023 mt 2016: 6,075 mt	2015: 7,023 mt 2016: 7,075 mt (U.S. territories not fully utilizing their BET catch limit)	2015: 9,502 mt 2016: 9,554 mt (U.S. territories fully utilizing their BET catch limit)
Impacts to BET	Total BET catch by U.S. (Hawaii) and U.S. territory longline vessels combined would be 4,023 mt in 2015 and 4,075 mt in 2017. Combined with expected reductions in BET catches by foreign fleets under CMM 2013-01, the stock is not expected to be subject to overfishing or overfished in 2032.	Total BET catch by U.S. (Hawaii) and U.S. territory longline vessels combined would be 5,023 mt in 2015 and 5,075 mt in 2017. Combined with expected reductions in BET catches by foreign fleets under CMM 2013-01, the stock is not expected to be subject to overfishing or overfished in 2032.	Total BET catch by U.S. (Hawaii) and U.S. territory longline vessels combined would be 6,023 mt in 2015 and 6,075 mt in 2017. Combined with expected reductions in BET catches by foreign fleets under CMM 2013-01, the stock is not expected to be subject to overfishing or overfished in 2032.	Total BET catch by U.S. (Hawaii) and U.S. territory longline vessels combined would be 7,023 mt in 2015 and 7,075 mt in 2017. Combined with expected reductions in BET catches by foreign fleets under CMM 2013-01, the stock is not expected to be subject to overfishing or overfished in 2032.	Total BET catch by U.S. (Hawaii) and U.S. territory longline vessels combined would be 9,502 mt in 2015 and 9,075 mt in 2017. Combined with expected reductions in BET catches by foreign fleets under CMM 2013-01, the stock is not expected to be subject to overfishing or overfished in 2032.

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
Projected BET F/F_{MSY} ratio in 2032	0.978	0.983	0.987	0.993	1.007
Projected BET SB/SB_{MSY} ratio in 2032	1.580	1.568	1.556	1.545	1.515
Projected BET SB/SB_{MSY} ratio in 2032	1.565	1.555	1.545	1.535	1.510
Impacts to non-target stocks	Catches of non-target stocks by FEP-permitted longline vessels fishing in the WCPO would be reduced by a couple hundred mt to tens of mt per year compared to Alternative 2. When the U.S. longline WCPO bigeye tuna catch limit is reached, Hawaii longline fishing effort would likely move to the EPO, where a similar amount of fish that could have been caught under a	Catches of non-target species would be expected to be tens of metric tons to a couple hundred metric tons greater per year than compared to Alternative 1.	Same as under Potential Outcome A	Same as under Potential Outcome A	Same as under Potential Outcome A

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
	specified fishing agreement would likely be caught in the EPO, albeit under more variable conditions. IATTC manages many of these HMS stocks, including bigeye tuna, separately in the EPO.				
Impacts to fishery participants and fishing communities	Hawaii deep-set longline fishery would likely be subject to restrictions for WCPO bigeye tuna during the year. This could result in potential negative impacts to fishery participants (longer trips to EPO) and Hawaii seafood community (poorer quality fish during winter holiday season), and potential safety at sea considerations when available fishing grounds in EPO are greater distances and	Specifying 2015 and 2016 Territory bigeye specifications would allow for specified fishing agreements that could provide funding for MCP projects, including fisheries development opportunities like infrastructure development, vessel capacity improvements, and fisheries training. Fishing arrangements could help build catch history for the U.S. participating territories	Same as under Potential Outcome A	Same as under Potential Outcome A	Same as under Potential Outcome A

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
	during winter months when weather in North Pacific Ocean is frequently poor. FEP-permitted fisheries would likely operate similar to 2009 and 2010.	in the WCPFC, supporting future recognition of the territories in potential allocation decisions. Hawaii longline fishery participants expected to benefit from entering into specified fishing agreements, allowing them greater flexibility in fishing operations and locations, versus a fishery restriction once the U.S. WCPO bigeye tuna longline limit is reached or fishing farther from the homeport in the EPO.			
Impacts to protected species	All Pelagic FEP managed fisheries would continue to operate within existing ESA and MMPA authorizations.	All Pelagic FEP managed fisheries would continue to operate within existing ESA and MMPA authorizations.	Same as under Potential Outcome A	Same as under Potential Outcome A	Same as under Potential Outcome A

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
	Impacts to protected species from Pelagic FEP managed fisheries expected to be unchanged from baseline levels.	Protected species mitigation measures for Hawaii longline fishery unchanged, and baseline levels of protected species interactions maintained.			
Impacts to administration and enforcement	Administrative costs would be reduced if territory arrangements were not authorized.	Specifying 2015 and 2016 bigeye tuna catch and allocation limits involve administrative costs associated with review of specified fishing agreements, in-season monitoring and attribution of bigeye by vessels operating under fishing agreements to the appropriate territory, and potential costs associated with notifying when a catch or allocation limit is projected to be reached. Enforcement of any restrictions as a result	Same as under Potential Outcome A, with added administrative costs associated with potentially reviewing and approving two specified fishing agreements in one calendar year.	Same as under Potential Outcome A, with added administrative costs associated with potentially reviewing and approving three specified fishing agreements in one calendar year.	Same as under Potential Outcome A, with added administrative costs associated with potentially reviewing and approving three specified fishing agreements in one calendar year.

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
		of reaching a limit, or enforcement of fishing under specified fishing agreements have not typically been substantial and changes to monitoring or increased costs is not expected.			
Impacts to marine habitats and EFH	Longline fishing does not materially affect benthic marine habitat under typical operations. Derelict longline gear may impact marine benthic habitats, especially substrate such as corals if carried by currents to shallow depths. Loss of longline gear during normal fishing operations is not believed to be at levels that result in significant or adverse impacts to EFH, HAPC, or the marine habitat. Adverse	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.

Topic	Alternative 1: No Action *No catch and allocation limits for U.S. territories, and no fishing agreements*	Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory			
		Outcome A ***1 fishing agreement and 1,000 mt allocation***	***Outcome B*** ***2 fishing agreement and 2,000 mt allocation***	***Outcome C*** ***3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D*** ***3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
	impacts from other FEP-permitted fisheries are not expected.				

4.1 Potential Impacts to Target and Non-target Stocks

The analysis of the Alternatives under this topic includes impacts to target and non-target stocks, with a focus on bigeye tuna. As described in Section 3.1, pelagic MUS, including bigeye tuna, is considered to be subject to overfishing when F/F_{MSY} ratio is greater than 1.0 for one year or more. The most recent 2014 assessment, conducted by the Secretariat of the Pacific Community or SPC (Harley et al. 2014), supports a conclusion that the stock is subject to overfishing because $F_{2012}/F_{MSY} = 1.57$. Because the 2014 bigeye tuna stock assessment (Harley et al. 2014) estimates bigeye tuna natural mortality rate at 0.4, the overfished reference point (MSST) for bigeye tuna is set at $0.6*B_{MSY}$ (because 1 minus 0.4 = 0.6), Thus, if the B/B_{MSY} ratio falls below 0.6, the stock is overfished. The 2014 assessment supports a conclusion that the stock is not overfished because $B_{2012}/B_{MSY} =1.20$.

To evaluate the potential impacts of the alternatives on bigeye tuna, Council staff with the assistance from NMFS Pacific Islands Fisheries Science Center (PIFSC) and SPC,[10] conducted an analysis consistent with the methodologies described in the SPC's paper "Evaluation of CMM 2013-01" on bigeye tuna summarized below (SPC 2014d; See Appendix B). In its paper, the SPC uses a stochastic projection model which randomly samples from a range of recruitment values to evaluate the effects of CMM 2013-01 on bigeye tuna stock status, assuming longline catch and purse seine effort limits on bigeye tuna described in the CMM were fully implemented.

<u>Overview of the 2014 SPC Evaluation of CMM 2013-01</u>

At the 11th Regular Session of the WCPFC held December 1-5, 2014, in Apia, Samoa, the SPC presented a stochastic evaluation of the effects of CMM 2013-01 on bigeye tuna stock status assuming the conservation and management measures were fully implemented (SPC 2014d). The SPC noted that this stochastic approach is a superior approach to evaluating the effectiveness of management measures compared to deterministic projections because the stochastic approach incorporates elements of uncertainty and is able to express risks associated with exceeding a limit reference point (SPC 2014d). The SPC presented a projection to 2032 on the status of bigeye tuna based on the stock reaching equilibrium, given the purse seine effort and longline catch under long-term and short-term recruitment assumptions (G. Piling. SPC, pers. comm. February 2015).[11]

The objective of the CMM 2013-01 is to reduce the fishing mortality rate for bigeye tuna to a level no greater than F_{MSY}, i.e., $F/F_{MSY} \leq 1$. This objective is also continued in CMM 2014-01, which superseded CMM 2013-01. To achieve this objective, CMM 2013-01 includes a number of requirements to be implemented over the period 2014-2017, including longline catch limits for certain member countries, seasonal purse seine Fish Aggregation Device (FAD) closures or FAD closures and annual FAD set limits, and a FAD closure on the high seas. In undertaking this evaluation, the SPC analysis assumes full implementation of CMM 2013-01, including the conditional 5 month FAD closure, by all member countries in 2017. For purse seine effort, it is estimated that a FAD closure to 5 months would reduce the 2012 FAD-associated purse seine

[10] The SPC is the scientific services provider of the WCPFC.

[11] A stock is in equilibrium when the number of individuals being removed is equal to the population growth rate, and as such in a stable condition.

effort (and assumed catch) by a factor (scalar) of 0.78. SPC further assumed that unassociated (non-FAD) purse seine effort would rise by an amount equivalent to the associated decrease, thus maintaining the total amount of purse seine effort at the 2012 level.

For longline catches, the SPC analysis assumed that countries with specified annual longline bigeye limits in excess of 2,000 mt would each catch their full annual limit. For the United States, the longline limit adopted by the WCPFC and applied in the analysis is 3,554 mt in 2015 and 2016 and 3,345 mt in 2017. For countries that have bigeye longline catches less than 2,000 mt, and for Small Island Developing States (SIDS) and Participating Territories (PTs) without any specified limits (including the U.S. territories), the SPC assumed that the catches of these fleets would remain at their 2012 levels. There are two stock recruitment[12] scenarios that the SPC considers when conducting stock projections. The two scenarios are:

1) *Long-term* recruitment average (1962-2011)

The long-term recruitment average scenario incorporates older recruitment estimates derived from periods when fishing mortality on bigeye tuna was much lower and attributed primarily to longline fishing (prior to the start of the purse seine fishery). The long-term average recruitment scenario assumes a lower level of recruitment compared to the short-term or recent recruitment scenario.

2) *Short-term or recent average* recruitment (2002-2011).

The recent average recruitment presents higher levels of recruitment after the 1980s with the expansion of FAD-based purse seine fishing in the WCPO. The higher level of recruitment is explained in the 2014 stock assessment as elevated catches of juvenile bigeye tuna. In addition, the dynamics of the ecosystem – the increased fishing mortality of adult bigeye tuna, which preys on juveniles – may have led to more favorable survival rates of juvenile bigeye tuna (Myers and Worm 2003; Sibert et al. 2006, Polovina et al. 2009; Woodworth-Jefcoats et al. 2012).

When these recruitment scenarios were discussed at the WCPFC Science Committee's 6th Regular Session in 2010 in undertaking deterministic projections of bigeye tuna stock status, the committee agreed that the recent recruitment scenario was more appropriate than the long-term recruitment scenario because of the possibility for some bias in the latter's estimate of early recruitment in the bigeye tuna stock assessment (SPC 2014d). While this issue has been alleviated to some degree in the 2014 stock assessment, the SPC believes using the recent recruitment conditions may still be valid. Accordingly, SPC places more weight on the recent average recruitment scenario (2002-2011) because it better reflects current conditions and conditions that are likely to prevail into the near future, where bigeye tuna catches will be from a mixture of purse seine and longline fisheries (WCPFC 2010; WCPFC 2011c; SPC 2014; J. Hampton, SPC-OFP, pers. comm., 2013).

Relying on the short-term recruitment scenario in its analysis, the SPC estimated the median F_{2032}/F_{MSY} value in 2032 would be 0.99, assuming full implementation of CMM2013-01. This

[12] Recruitment is generally referred to as the age or size a fish can be initially caught in a fishery.

analysis demonstrates that bigeye tuna would not be subject to overfishing in 2032. Under the long-term (1962-2011) scenario, the median F_{2032}/F_{MSY} would be 1.44, assuming full implementation of CMM2013-01, and the stock would continue to be subject to overfishing. With respect to spawning biomass and total biomass in 2032, SPC (2014d) did not calculate those values. Based on these projections, fishing mortality would be reduced through 2032, and concomitantly an increase to both the spawning and total biomass estimates. For the full results of the 2014 SPC Evaluation of CMM 2013-01, see Appendix B.

The Council/PIFSC Application of the SPC Stochastic Analysis

Relying on the SPC's stochastic methodology (SPC 2014d), Council staff and PIFSC, with the assistance from the SPC, conducted an evaluation of the two alternatives described in Section 2.2 (hereafter referred to as the Council/PIFSC stochastic analysis). For a description of the Council/PIFSC stochastic analysis, see Appendix C. The Council/PIFSC stochastic analysis applied the SPC (2014d) assumptions for future catch under CMM 2013-01, but assumed various allocation scenarios of bigeye tuna from the U.S. territories under 2015 specified fishing agreements.

The Council/PIFSC stochastic analysis indicates that under the two Alternatives, WCPO bigeye tuna would not be subject to overfishing in 2032 and the stock would not be overfished under the status determination criteria set forth in the Pelagic FEP[13] (See Table 34). Using the distribution of model runs, the Council/PIFSC analysis also provides the level of risk associated with the two Alternatives with respect to overfishing and overfished reference points (See Table 35).

Table 34. Median values of F/F_{MSY}, SB/SB_{MSY}, B/B_{MSY} values in 2032 based on stochastic projections

	2012 Baseline	Alternative 1	Alternative 2			
			Outcome A 1 fishing agreement and 1,000 mt allocation	***Outcome B 2 fishing agreement and 2,000 mt allocation***	***Outcome C 3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D 3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
F/F_{MSY}	0.983	0.978	0.983	0.987	0.993	1.007
SB/SB_{MSY}	1.568	1.580	1.568	1.556	1.545	1.515
B/B_{MSY}	1.554	1.565	1.555	1.545	1.535	1.510
$SB/SB_{F=0}$	0.330	0.332	0.330	0.328	0.326	0.320

Source: NMFS 2015c.

[13] Contrary to the Pelagic FEP, the WCPFC uses a different limit reference point for an overfished status determination and considers bigeye tuna to be overfished when the spawning biomass is below 20 percent of the biomass in absence of fishing ($SB/SB_{F=0}$). However, even under the WCPFC overfished reference point, the stock would not be overfished under Alternative 2 as all spawning biomass projections are above the 0.20 threshold.

Table 35. Level of risk associated with the Alternatives in exceeding the overfishing and overfished reference points under the Pelagic FEP.

Risk	2012 Baseline	Alternative 1	Alternative 2			
			Outcome A 1 fishing agreement and 1,000 mt allocation	***Outcome B 2 fishing agreement and 2,000 mt allocation***	***Outcome C 3 fishing agreement and 3,000 mt allocation and partial utilization of BET limit in U.S. territories***	***Outcome D 3 fishing agreement and 3,000 mt allocation and full utilization of BET limit in U.S. territories***
Risk of overfishing $F/_{FMSY}$ >1.0	40%	37%	40%	43%	45%	55%
Risk of SB/SB_{MSY}<0.6	0%	0%	0%	0%	0%	0%
Risk of B/B_{MSY}<0.6	0%	0%	0%	0%	0%	0%
Risk of $SB/SB_{F=0}$ <0.20[1]	0%	0%	0%	0%	0%	0%

Source: NMFS (in review).

[1] The reference point of $SB/SB_{F=0}$ <0.20, is the overfished limit reference point adopted by the WCPFC and is not the same as the overfished reference point of B/B_{MSY}<0.6 in the Pelagic FEP.

With the exception of Outcome D, none of the other Outcomes under Alternative 2 would result in more than a 45 percent probability of overfishing bigeye tuna. While Outcome D would result in a 55 percent probability of overfishing of WCPO bigeye tuna, this outcome is unlikely to occur. This is because it requires longline fisheries in each of the U.S. territories to each catch 1,000 mt of bigeye tuna (i.e., 3,000 mt combined) in 2015 and 2016. However, as previously discussed, no bigeye tuna is expected to be caught by longline vessels in CNMI or Guam in 2015 or 2016 because there are currently no longline fisheries based in those islands.

TUMAS

In recommending the proposed action, the Council at its 162nd meeting in March 2015, considered the findings of SPC's evaluation of CMM 2013-01 (SPC 2014d). The Council also considered an analysis conducted by its staff using the Tuna Management Simulator (TUMAS) tool based on its prior reliance in Amendment 7 to the Pelagic FEP (WPFMC and NMFS 2014). In 2014, Council staff and PIFSC applied the TUMAS tool to evaluate the potential effects on bigeye tuna stock status as a result of establishing a 2,000 mt limit for each U.S. territory, and allowing each U.S. territory to allocate up to 1,000 mt of bigeye tuna to Hawaii longline vessels (79 FR 64097, October 28, 2014). See WPFMC and NMFS (2014) for information about the 2014 TUMAS analysis.

TUMAS is an online web tool designed to allow users to scale fisheries data under various scenarios and project the status of a particular stock out to 10 years in the future.[14] TUMAS is a deterministic, not a stochastic, model. For the proposed action, the TUMAS tool was used to generate estimates of the relative impact of an additional 1,000 mt, 2,000 mt and 3,000 mt of bigeye tuna on the F/F_{MSY} value to 2017 and in 2022. TUMAS expressed the relative impact of these allocations as relative percent increases to the F/F_{MSY} value for these years. The TUMAS analysis indicated that the proposed action would result in a negligible increase in the F/F_{MSY} values when projected to 2017 and 2022. For full details of the 2015 TUMAS analysis, see Appendix D.

Model Selection

NMFS believes that the Council/PIFSC stochastic analysis is a more appropriate approach to evaluating the impact of the proposed action on future bigeye tuna stock status than TUMAS, because the former can account for uncertainty in future bigeye tuna recruitment and can represent risks associated with exceeding a limit reference point. In other words, the stochastic analysis can better reflect variability in bigeye tuna recruitment, which is an important factor in projecting stock status.

The main difference between TUMAS and the Council/PIFSC stochastic analysis is that TUMAS uses a fixed (deterministic) value for future recruitment derived from the arithmetic average level of estimated recruitment for a particular time period. In the Council/PIFSC stochastic analysis, fluctuations in future recruitment are accounted for through stochastic (random) sampling within the range of historical recruitment value estimates. The various values in the historical recruitment estimates, combined with the assumed values of bigeye catch under CMM 2013-01, are then simulated 200 times, which produce a distribution of stock status outcomes that can be used to evaluate levels of risk associated with breaching a stock status reference point. TUMAS, on the other hand, uses fixed values of historical average recruitment and, therefore, does not provide a distribution of stock status outcomes that can be used to evaluate the potential risk of exceeding a reference point.

In its report, the SPC (2014d) noted that stochastic projections are superior to deterministic projections because stochastic projections incorporate the essential element of uncertainty, where results can then be expressed through potential levels of risk. Conducting stochastic modeling with respect to recruitment is important as it incorporates historic recruitment variability that is associated with environmental conditions and/or stock conditions, which often fluctuate seasonally and within longer, interannual periods (e.g., El Nino). In other words, a stochastic projection using the recruitment variability distributions over time is a more statistically rigorous modeling approach and is superior to using fixed average recruitment values.

For these reasons, NMFS concludes that the Council/PIFSC stochastic analysis provides a statistically better approach for evaluating the potential effects of the proposed action than TUMAS. NMFS, accordingly, relies on the Council/PIFSC stochastic analysis for evaluating the impacts of the Alternatives on the WCPO bigeye tuna stock. The Council/PIFSC stochastic analysis is presented in greater detail in Appendix C.

[14] See: http://www.tumas-project.org/about-tumas

4.1.1 Potential Impacts of Alternative 1 (No Management Action)

Under Alternative 1, NMFS would not specify a bigeye tuna catch or allocation limit for any U.S. participating territory in 2015 or in 2016. Under this alternative, the U.S. longline fishery based in Hawaii would be subject to an annual longline WCPO bigeye tuna limit of 3,502 mt in 2015 and 3,554 mt in 2016. When these limits are reached, NMFS would prohibit catch and retention of longline caught bigeye tuna in the WCPO through the end of the year. Based on 2015 levels of bigeye tuna catch by vessels to which the limit applies, NMFS forecasted the 2015 U.S. bigeye tuna limit was reached on August 5, 2015 and prohibited the retention of longline caught bigeye tuna in the WCPO through the end of the year (80 FR 44883, July 28, 2015). If 2015 level of catch is repeated in 2016, the bigeye tuna limit of 3,554 mt may be reached in August 2016.

Based on historical fishery performance, vessels operating in the longline fisheries of American Samoa are expected to catch 521 mt of bigeye tuna in 2015 and 2016. This is the average level of catch for the period 2011-2014. CNMI and Guam are not expected to have bigeye catch in either 2015 or 2016 because there are currently no active longline fisheries based in those islands (Table 10).

Without specified fishing agreements, the combined 2015 catch of bigeye tuna by the longline fisheries of the U.S. territories American Samoa (521 mt), Guam (0 mt) and the CNMI (0 mt) and the U.S. longline fisheries (3,502 mt) in the WCPO is expected to be 4,023 mt, (521 + 0 + 0 + 3,502 = 4,023 mt). For the 2016 fishing year, the total combined catch is expected to be 4,075 mt, which, when adding the same catch data above for the territories plus the U.S. limit (3,554 mt) for 2016 (521 + 0 + 0 + 3,554 = 4,075 mt). This amount represents approximately a 21 percent reduction from 2012 U.S. longline bigeye tuna catch of 5,162 mt.

4.1.1.1 Potential Impacts to Bigeye Tuna

Under Alternative 1 (No Management Action), the Council/PIFSC stochastic analysis, (Appendix C, Table 3) indicates that the median F_{2032}/F_{MSY} would be 0.978. As shown in Table 35, bigeye tuna catch under Alternative 1 is associated with a 37 percent risk of overfishing. This supports a conclusion that, under Alternative 1, WCPO bigeye tuna would not be subject to overfishing in 2032.

With respect to spawning biomass and total biomass, the analysis indicates that median SB_{2032}/SB_{MSY} and B_{2032}/SB_{MSY} values are projected to be 1.580 and 1.565, respectively. These values are above the MSST of 0.5 and above the level necessary to produce MSY on a continuing basis. As shown in Table 35, bigeye tuna catch under Alternative 1 is associated with a zero percent risk of becoming overfished. This supports a conclusion that under Alternative 1, WCPO bigeye tuna would not be overfished in 2032.

Under Alternative 1, NMFS forecasted the U.S. longline fishery would reach the 2015 WCPO bigeye tuna limit of 3,502 mt on August 5, 2015 (80 FR 44883, July 28, 2015). On this date, NMFS restricted retention of bigeye tuna in the WCPO by longline fishing vessels. However, in accordance with federal regulations at 50 CFR Part 300, Subpart O, the limit does not apply to

bigeye tuna caught by longline gear outside the WCPO, such as in the eastern Pacific Ocean or EPO (generally east of 150° W. long.). The regulations also provide vessels operating in the longline fisheries of the U.S. participating territories with an exception to the restriction. The exception includes vessels that land bigeye tuna in a U.S. territory, vessels included in a specified fishing agreement under 50 CFR 665.819(d), and vessels that have an American Samoa and Hawaii longline permit (dual AS/HI longline permitted vessel) and lands in Hawaii, provided the fish was not caught in the U.S. EEZ around Hawaii. Catches of bigeye tuna by exempted vessels are attributed to the applicable U.S. participating territory to which the vessel is associated in accordance with 50 CFR Part 300, Subpart O. See 50 CFR 300, Subpart O for specific regulations governing the WCPO bigeye tuna limit applicable to vessels of the United States.

During a restriction in the WCPO, U.S. longline vessels based in Hawaii that are not excepted from the restriction are expected to shift effort into the EPO. However, vessels 24 m in length and greater that fish for bigeye tuna in the EPO would be subject to the U.S. EPO bigeye tuna limit of 500 mt established by the IATTC. When the EPO limit is reached, NMFS would restrict retention of bigeye tuna by vessels longer than 24 m. As explained in Section 3.1, bigeye tuna in the EPO is not subject to overfishing or overfished. Therefore, vessels less than 24 m in length can continue fishing for and retaining bigeye tuna, and EPO bigeye tuna stock is not expected to be negatively affected under the No-Action alternative.

During a catch and retention restriction in the WCPO, it is expected that an increased amount of foreign caught bigeye tuna would be imported to Honolulu to fill any market gaps. Bigeye tuna imports to Hawaii show a significant increase in 2012, which suggests that, even when the U.S. longline fishery from Hawaii is not subject to restrictions, imports occur to meet market demand for bigeye tuna (see Figure 7). Increasing foreign imports of bigeye tuna into Hawaii may result in negative impacts on bigeye tuna stocks.

For example, in 2012, foreign bigeye tuna imports into Hawaii increased markedly. This increase is primarily from a 350-percent increase in imports from the Republic of the Marshall Islands (RMI), which has access agreements to foreign longline vessels consisting mostly of Chinese longline vessels (RMI 2014).[15] The access agreements allow Chinese longline vessels to catch bigeye tuna in the EEZ of the RMI. The operational area of the WCPO Chinese longline fleet targeting bigeye is believed to be mostly in Region 4 (see Figure 1), which shows one of the higher impacts on bigeye tuna biomass from fishing. It is believed that the bigeye biomass would be higher in Region 4 in the absence of such fishing (see Figure 2). Additionally, because the Republic of the Marshall Islands is a SID, it does not have a bigeye tuna limit under CMM 2013-01 as continued in CMM 2014-01. Thus, bigeye tuna caught by Chinese longline vessels under access agreements with a SID could be unlimited. The bigeye caught under this access agreement is in addition to the Chinese's longline catch limit of 8,224 mt for 2015 and 2016 under CMM 2014-01. Therefore, a potential consequence of Alternative 1 is that less monitored and less environmentally friendly foreign fisheries targeting bigeye tuna would fill market gaps left by U.S. fisheries that are constrained by federal regulations from fishing to optimum yield (See Chan and Pan, 2012).

[15] See the 2014 Annual Part 1 Report of Marshal Islands to the WCPFC: https://www.wcpfc.int/system/files/AR-CCM-13%20Republic%20of%20the%20Marshall%20Islands%20AR%20Part%201.pdf

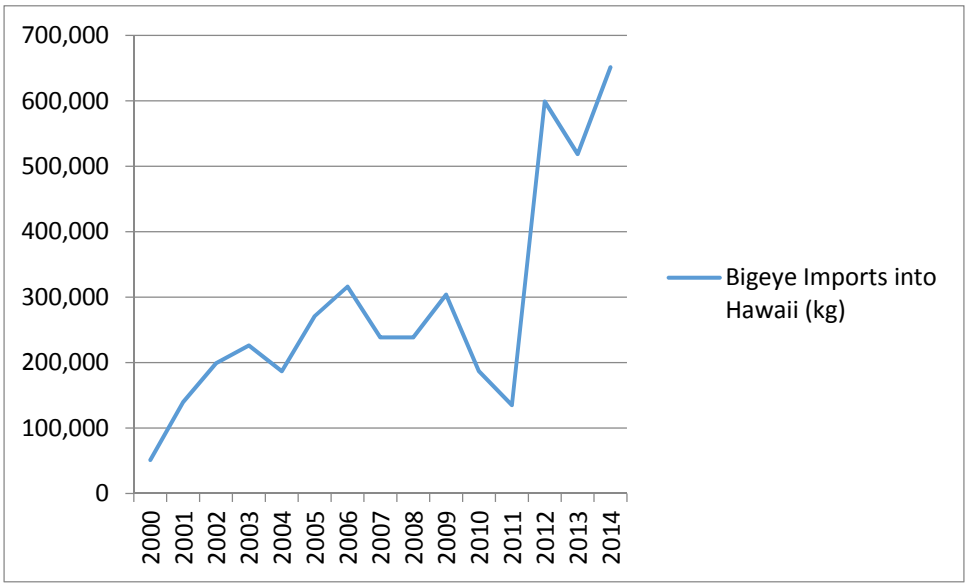

Figure 7. Trend of fresh bigeye tuna imported to Hawaii, 2000-2014.
Source: WPFMC unpublished; data from: https://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/applications/annual-trade-through-specific-us-customs-districts

4.1.1.2 Potential Impacts to Other Non-Target Stocks

CNMI and Guam longline fisheries

As noted in Section 3.2.1, there has been no longline fishing activities around CNMI or Guam since 2011, and no longline fishing activities are expected to occur in 2015 or 2016. High operating costs associated with vessel-docking along with poor market access may be contributing factors to the lack of longline fishing in the Marianas (WPFMC and NMFS 2014). Without an active fishery in Guam or the CNMI, Alternative 1 is not expected to result in changes in the conduct of longline fisheries in Guam or the CNMI in 2015 and 2016, including target or non-target species, area fished, seasonality, or intensity of fishing.

American Samoa longline fishery

As described in Chapter 3.2.2, the largest pelagic fishery in American Samoa is the commercial longline fishery targeting albacore tuna, which is sold to the local Pago Pago canneries. The amount of albacore landed by the American Samoa longline fishery in 2013 was 4,679,946 lb (2,123 mt). The 2013 WCPO catch of south Pacific albacore was estimated at 81,198 mt, thus the American Samoa longline fishery represents approximately 2.6 percent of the total annual south Pacific albacore catch. The stock of south Pacific albacore is healthy; it is not overfished and overfishing is not occurring.

Troll and handline fishing also occurs on a commercial and non-commercial basis in American Samoa, representing relatively small annual catches of yellowfin and skipjack tunas, and other pelagic MUS. Troll and handline fisheries in American Samoa are reported to catch no bigeye

tuna. Catches by the pelagic fisheries are believed to be sustainable and are reviewed annually by the Council, NMFS, and local fishery managers.

There are 60 permits authorized under the American Samoa longline limited entry permit program, split among 4 vessel size categories (Class A (≤ 40.1 ft in length); Class B (40.1-50 ft); Class C (50.1-70 ft); Class D (> 70 ft). Class B, C, and D permit categories are registered with vessels fishing in the EEZ around American Samoa or are dual-permitted and also fishing in the EEZ around Hawaii and adjacent high seas. There are several inactive Class A and B permits. If fisheries development lead to some longline vessels being able to diversify their landings (i.e., in addition to frozen albacore), then catches of yellowfin and bigeye tunas, and other pelagic species may increase under Alternative 1 in the future. The number of vessels that would diversify their catches and the amount of fish and species composition of catches by these vessels are not predictable at this time. However, given that participation is capped under the American Samoa longline limited entry program at 60 permits, overcapitalization of the fleet is not likely, and the catch of target and non-target stocks by the fishery is not expected to substantially increase over baseline levels at this time. For these reasons, there would be no additional large impacts to target or non-target stocks.

NMFS strives to achieve an annual observer coverage rate of 20 percent in the American Samoa longline fishery. Bycatch of non-target species in the fishery is comprised mostly of sharks and other pelagic species, which are not retained due to little or no market value. Bycatch levels are shown in Section 3.2.3. The majority of sharks caught in the fishery are returned alive to the sea. The current level of bycatch is not expected to increase under Alternative 1 even if the fishery diversified. For example, under a diversified longline fishery that benefited from funds derived from specified fishing agreements in terms of vessel upgrades and fresh fish training, bycatch might decrease from baseline levels due to an ability to properly store and land species that otherwise might have been returned to the sea. Due to a historical lack of fresh fish markets in American Samoa, large yellowfin and bigeye tunas are sometimes discarded if caught in the beginning of the fishing trip because fish of such size are not optimal for cannery operations. Now that Tri Marine is established in Pago Pago and offering to buy fresh/frozen tuna for export markets from local American Samoa longline vessels, there is potential that tunas and other Pelagic MUS that otherwise may have been bycatch would be retained and sold. This may likely reduce bycatch levels from historical levels; however, this is also conditional on fleet upgrades (e.g., ice machines) and training (e.g., fresh fish handling).

Hawaii longline fisheries

As described in section 3.2.4, the combined Hawaii longline fishery (deep-set and shallow-set) is the largest fishery in terms of volume and value in Hawaii. The primary target species of the Hawaii longline deep-set fishery is bigeye tuna, but the fishery also lands other secondary non-target and incidentally-caught species of commercial value, including yellowfin tuna, swordfish, striped marlin, blue marlin, mahimahi, wahoo, monchong (pomfret), opah, escolar, and mako shark. Additionally, as the larger of the two longline fisheries, effort for bigeye tuna in the deep-set fishery influences catches of non-target species for the longline fishery as a whole.

It is expected that if the WCPO U.S. longline limit for bigeye tuna were reached, and if catch and retention of bigeye tuna in the WCPO were restricted, a number of Hawaii longline vessels would likely shift fishing effort for bigeye tuna to the eastern Pacific Ocean or EPO, while other vessels may begin targeting swordfish in the WCPO, or stop fishing altogether until January 1, 2016.

If some vessels shift effort for bigeye tuna into the EPO, it is anticipated that the overall catch of non-target stocks by Hawaii longline vessels would likely be reduced compared to 2012 levels shown in Tables 8 and 11. This is because the waters of EPO may not be as productive for bigeye tuna compared to the WCPO as evinced by the amount of fishing effort spent in the WCPO by the Hawaii longline fishery (Figure 4). Therefore, any shift to the EPO is expected to decrease the overall catches of bigeye tuna and other non-target species.

If some vessels shift to targeting swordfish in the WCPO, it is anticipated that the overall catch of non-target stocks by Hawaii longline vessels would also be reduced compared to the 2012 catch levels. This is because only a few vessels would likely undertake costly retrofits and modifications to enter the shallow-set longline fishery. Therefore, the level of catch of non-target stocks are not expected to increase substantially compared to the 2012 or 2013 levels shown in Tables 8 and 11. Additionally, deep-set vessels that do enter the shallow-set fishery would be required to comply with all existing regulations, including gear restrictions, and sea turtle interaction limits. Such regulations are intended to minimize bycatch of non-target species and sea turtles and maintain a sustainable fishery.

Because the Council and NMFS closely monitor catches based on landings data, any such increases of non-target stocks are expected to be detected and subject to additional management measures to ensure fishing, and incidental catch of regulated species, remains within established limits.

Given the limited entry status of the Hawaii longline fisheries (both deep-set and shallow-set), there is a low likelihood of the fisheries expanding under the Alternative 1, and thus substantial increases in catches of target or non-target species are not anticipated under this Alternative. Should NMFS determine that any other target and non-target stocks are overfished or subject to overfishing, and WCPFC management measures appear ineffective, the Council would likely consider recommending future management measures to the Secretary to rebuild the stock or reduce fishing mortality.

4.1.2 Potential Impacts of Alternative 2 (Status Quo/Council and NMFS Preferred)

Under Alternative 2, longline fisheries in the U.S. participating territories would each be subject to a 2,000-mt (4,409,240 lb) catch limits for bigeye tuna. Additionally, each U.S. participating territory would be able to allocate up to 1,000 mt (2,204,620 lb) of its 2,000 mt bigeye tuna catch limit to FEP-permitted longline vessels under specified fishing agreements. Specified fishing agreements under Alternative 2 would support responsible fisheries development in the U.S. participating territories by providing funds for approved MCPs.

Because catch rates of bigeye tuna appear to be higher in 2015 compared to years prior, NMFS forecasted the 2015 U.S. bigeye tuna limit was reached on August 5, 2015 and prohibited the retention of longline caught bigeye tuna in the WCPO through the end of the year (80 FR 44883, July 28, 2015).

NMFS cannot predict the number of specified fishing agreements that the U.S. participating territories may negotiate and submit to NMFS in 2015 and 2016. For this reason, the EA analyses four possible fishery outcomes for Alternative 2, depending on the number of specified fishing agreements that are actually authorized in 2015 and 2016.

4.1.2.1 Potential Impacts to Bigeye Tuna

Outcome A: One specified fishing agreement

Based on the information described in Section 2.2, under one specified fishing agreement, the combined catch of bigeye tuna by the longline fisheries of the U.S. territories (American Samoa, Guam and the CNMI) and the longline fisheries of Hawaii, including catch under one specified fishing agreement is expected to be 5,023 mt in 2015 (521 + 0 + 0 + 3,502 + 1,000 = 5,023 mt), rising to 5,075 mt in 2016 (521 + 0 + 0 + 3,554 + 1,000 = 5,075 mt). This amount represents an 87 mt reduction from 2012 U.S. longline bigeye tuna catch of 5,162 mt.

Under Outcome A, the Council/PIFSC's stochastic analysis using the recent recruitment scenario indicates that the projected median F_{2032}/F_{MSY} = 0.983, median SB_{2032}/SB_{MSY} = 1.568 and median total biomass B_{2032}/B_{MSY} = 1.555. As shown in Table 35, bigeye tuna catch under Outcome A is associated with a 40 percent risk of overfishing and a zero risk of becoming overfished. These values a indicate bigeye tuna would not be subject to overfishing and not overfished in 2032.

Compared to Alternative 1, Alternative 2-Outcome A would result in a slight increase in the fishing mortality rate (F_{2032}/F_{MSY} = 0.983 vs 0.978 under Alternative 1) and a slight decrease in both spawning biomass (SB_{2032}/SB_{MSY} = 1.568 vs 1.580 under Alternative 1) and total biomass (B_{2032}/B_{MSY} = 1.555 vs 1.565 under Alternative 1). However, these changes are negligible, such that the effects do not represent a change in the status of bigeye tuna stocks compared to Alternative 1.

Outcome B: Two specified fishing agreements

Based on the information described in Section 2.2, two specified fishing agreements would allow allocation of up to 2,000 mt of bigeye tuna from two U.S. participating territories. Therefore, under Outcome B, the combined catch of bigeye tuna would be 6,023, which figure includes the longline fisheries of the U.S. territories, American Samoa (521 mt), Guam (0 mt), and the CNMI (0 mt), plus the U.S. longline fisheries based in Hawaii (3,502 mt) and the allocation of (2,000 mt) (521 mt + 0 + 0 + 3,502 + 2,000 = 6,023 mt). In 2016, the bigeye catch would be 6,075 mt, which represents the U.S. territories, American Samoa (521 mt) , Guam (0 mt), and the CNMI (0 mt), plus the U.S. longline fisheries based in Hawaii (3,554) and the allocation of (2,000 mt) (521 + 0 + 0 + 3,554 + 2,000 = 6,075 mt).

Applying the Council/PIFSC stochastic analysis to Alternative 2-Outcome B, the projected median F_{2032}/F_{MSY} = 0.987, median SB_{2032}/SB_{MSY} = 1.556 and median total biomass B_{2032}/B_{MSY} = 1.545. These values are similar to projected values under one specified fishing agreement (F_{2032}/F_{MSY} = 0.983, SB_{2032}/SB_{MSY} = 1.568, and B_{2032}/B_{MSY} = 1.555). As shown in Table 35, bigeye tuna catch under Outcome B is associated with a 43 percent risk of overfishing and a zero risk of becoming overfished, and indicates bigeye tuna would not be subject to overfishing and not overfished in 2032.

Compared to Alternative 1, Alternative 2-Outcome B would result in a slight increase in the fishing mortality rate (F_{2032}/F_{MSY} = 0.987 vs. 0.978 under Alternative 1) and a slight decrease in both spawning biomass (SB_{2032}/SB_{MSY} = 1.556 vs. 1.580 under Alternative 1) and total biomass (B_{2032}/B_{MSY} = 1.545 vs. 1.565 under Alternative 1). However, these changes are negligible, such that the effects do not represent a change in the status of bigeye tuna stocks compared to Alternative 1.

Compared to Alternative 1, Alternative 2-Outcome B would result in a slight increase in the fishing mortality rate (F_{2032}/F_{MSY} = 0.987 vs. 0.978 under Alternative 1) and a slight decrease in both spawning biomass (SB_{2032}/SB_{MSY} = 1.556 vs. 1.580 under Alternative 1) and total biomass (B_{2032}/B_{MSY} = 1.545 vs. 1.565 under Alternative 1). However, these changes are so minute as to have an overall negligible impact to bigeye tuna stock status compared to Alternative 1.

Outcome C: Three specified fishing agreements

Based on the information described in Section 2.2, three specified fishing agreements would allocate up to 3,000 mt of bigeye tuna from three U.S. participating territories. Therefore, under Alternative 2-Outcome C, the combined catch of bigeye tuna in 2015 would be 7,023. This figure represents the longline fisheries of the U.S. territories, American Samoa (521 mt), Guam (0 mt) and the CNMI (0 mt), plus the U.S. longline fisheries in Hawaii (3,502 mt), and the allocation (3,000 mt) (521 + 0 + 0 + 3,502 + 3,000 = 7,023 mt). The 2016 catch would expected to be 7,075 mt, which represents the U.S. territories catch, American Samoa (521 mt), Guam (0 mt) and the CNMI (0 mt), plus the U.S. longline fisheries in Hawaii (3,554 mt), and the allocation (3,000 mt) (521 + 0 + 0 + 3,554 + 3,000 = 7,075 mt).

Applying the Council/PIFSC stochastic analysis Alternative 2-Outcome C, the projected median mortality would be F_{2032}/F_{MSY} = 0.993, the median biomass would be SB_{2032}/SB_{MSY} = 1.545 and the median total biomass would be B_{2032}/B_{MSY} = 1.535. As shown in Table 35, bigeye tuna catch under Outcome C is associated with a 45 percent risk of overfishing and a zero risk of becoming overfished. These values are less favorable for bigeye tuna compared to the recruitment projections under Outcomes A and B. However, the recruitment projections in Outcome C still indicate bigeye tuna would not be subject to overfishing and not overfished in 2032.

Compared to Alternative 1, Alternative 2-Outcome C would result in a slight increase in the fishing mortality rate (F_{2032}/F_{MSY} = 0.993 vs. 0.978 under Alternative 1) and a slight decrease in both spawning biomass (SB_{2032}/SB_{MSY} = 1.545 vs 1.580 under Alternative 1) and total biomass (B_{2032}/B_{MSY} = 1.535 vs 1.565 under Alternative 1). However, these changes are negligible, such

that the effects do not represent a change in the status of bigeye tuna stocks compared to Alternative 1.

<u>Outcome D: Three specified fishing agreements and Full Utilization of Territorial Limits</u>

Based on the information described in Section 2.2, three specified fishing agreements would allocate 3,000 mt of bigeye and each territory is assumed to fully utilize the remaining 1,000 mt of their 2,000 mt limit for a total of an additional 3,000 mt. In Alternative 2-Outcome D, the 2015 expected bigeye catch would be 9,502 mt., which represents an assumed catch of the U.S. territories non-allocated limits, American Samoa (1,000 mt), Guam (1,000 mt), and the CNMI (1,000 mt), added to the catch by U.S. longline fisheries from Hawaii (3,502 mt), plus 3,000 mt allocated under three specified fishing agreement (1,000 + 1,000 + 1,000 + 3,502 + 3,000 = 9,502 mt). The 2016 bigeye catch would be expected to be 9,554 mt, assuming the same non-allocated catch for the territories, the 2016 U.S. limit (3,554 mt), plus the 3,000 mt in allocation (1,000 + 1,000 + 1,000 + 3,554 + 3,000 = 9,554 mt).

Applying the Council/PIFSC's stochastic analysis Alternative 2-Outcome D, the projected median mortality would be F_{2032}/F_{MSY} = 1.007, the median biomass would be SB_{2032}/SB_{MSY} = 1.515 and median total biomass would be B_{2032}/B_{MSY} = 1.510. As shown in Table 35, bigeye tuna catch under Outcome D is associated with a 55 percent risk of overfishing and a zero risk of becoming overfished. These values are less favorable for bigeye tuna when considered with the projections under Outcomes A, B and C of Alternative 2.

While Outcome D would result in a 55 percent probability of overfishing of WCPO bigeye tuna, this outcome is unlikely to occur. This is because it requires longline fisheries in each of the U.S. territories to each catch 1,000 mt of bigeye tuna (i.e., 3,000 mt combined) in 2015 and 2016. However, as previously discussed, no bigeye tuna is expected to be caught by longline vessels in CNMI or Guam in 2015 or 2016 because there are currently no active longline fisheries based in those islands. Although the fishing mortality rate under Outcome D would be F_{2032}/F_{MSY} = 1.007, this value is virtually indistinguishable from the overfishing threshold of F/F_{MSY} >1.0.

With respect to future projections of spawning biomass and total biomass, the projected 2032 values are both above the MSST of 0.5 and above the level necessary to produce MSY on a continuing basis. Based on the above, WCPO bigeye under Outcome D would not be overfished in 2032.

Compared to Alternative 1, Alternative 2-Outcome D would result in a small increase in the fishing mortality rate (F2032/FMSY = 1.007 vs. 0.978 under Alternative 1) and a small decrease in both spawning biomass (SB2032/SBMSY = 1.515 vs 1.580 under Alternative 1) and total biomass (B2032/BMSY = 1.510 vs 1.565 under Alternative 1). Although these values are less favorable for bigeye tuna compared to the values under Alternative 1, the effects of Alternative 2-Outcome D do not represent a change in the status of bigeye tuna stocks and the stock would remain not subject to overfishing and not overfished in 2032; the same as under Alternative 1.

4.1.2.2 Potential Impacts to Other Non-Target Stocks

Catches of non-target species in the Hawaii longline fishery are driven by the fishing effort for bigeye tuna. If fishing effort for bigeye tuna increases, the catches of other target and non-target stocks would be expected to increase commensurate with the increases in fishing effort.

Based on 2015 levels of bigeye tuna catch by vessels to which the limit applies, NMFS forecasted the 2015 U.S. bigeye tuna limit was reached on August 5, 2015. Under Alternative 1, NMFS prohibited retention of longline-caught bigeye tuna in the WCPO starting on August 5, 2015, through the remainder of the year (80 FR 44883, July 28, 2015). If 2015 level of catch is repeated in 2016, the bigeye tuna limit of 3,554 mt may be reached in August 2016.
Under Alternative 2, U.S. participating territories could enter into a specified fishing agreement with Pelagic permitted vessels in Hawaii. Under a specified fishing agreement, pelagic permitted vessels would be able to fish to the allocation limit. Therefore, fishing effort under Alterative 2 would be more than the level of effort that would occur under Alternative 1.

NMFS cannot predict the number of specified fishing agreements that the U.S. participating territories may negotiate and submit to NMFS in 2015 and 2016. Additionally, NMFS cannot predict the amount of each non-target stock that might be caught with each 1,000 mt of bigeye tuna under a specified fishing agreement. For these reasons, the EA analyses evaluates the impact to non-target stocks based on the assumption that three specified fishing agreements would be executed. Operating under three agreements would allow fishing effort in the deep set fishery to continue at the levels that occurred in 2011-2014, when specified fishing agreements were initially negotiated.

Under Alternative 2, the expected annual level of fishing effort by the Hawaii deep-set longline fishery in terms of number of vessels, hooks set, trips and longline sets would be similar to the levels seen in 2011-2014 (see Table 7). While this level of effort is expected to be more than the level of effort that would occur under Alternative 1, the difference in effort level is not expected to result in adverse effects to non-target stocks.

As described in Section 3.1, recent catch levels of non-target stocks by the U.S. longline fleet, including the Hawaii longline fishery, represent a small percent (generally less than 1 percent) of each stock's estimated MSY.

For non-target stocks that NMFS has determined to be subject to overfishing or overfished, the potential for additional catch under Alternative 2 could result in additional impacts compared to Alternative 1. As noted in Section 3.1.7, the EPO stock of North Pacific swordfish is subject to overfishing because $F_{2012}/F_{MSY} = 1.11$, but is not overfished because $B_{2012}/B_{MSY} = 1.87$. Based on federal logbook records, the 2012 catch of swordfish by Hawaii longline vessels operating within the boundary of the EPO stock was 4 mt (NMFS unpublished data). This level of catch is less than 1 percent of the stock's estimated MSY of 5,490 mt.

Under Alternative 2, catch of EPO swordfish is not expected to increase by any appreciable amount compared to 2012 levels when the fishery operated under a specified fishing agreement. This is because Hawaii longline vessels would likely remain in the WCPO (generally west of 150° W. long.) and not fish in the core area of the EPO swordfish stock. Under Alternative 1, Hawaii longline vessels targeting bigeye tuna in the WCPO would move to the EPO which may potentially result in increased catch of EPO swordfish.

As noted in Section 3.1.8, North Pacific striped marlin is also subject to overfishing because the fishing mortality F/F_{MSY} is > 1.0 (1.25) and is overfished because the spawning biomass (938 mt) is lower than the minimum stock size threshold (MSST) of 1,628 mt. In 2014, total striped marlin catch by all U.S. longline fisheries in the North Pacific Ocean was 426 mt (NMFS unpublished data, Preliminary 2014 U.S. Part 1 annual report to the WCPFC). This level of catch is below the WCPFC-agreed upon limit of 457 mt as proscribed in CMM 2010-01.

During 2014, the U.S. longline fishery in Hawaii operated under the same catch and allocation limits proposed under Alternative 2. For this reason, under Alternative 2, catch of North Pacific striped marlin is expected to be similar to the level reported in 2014 and not expected to exceed the WCPFC-agreed upon limit of 457 mt. Additionally, the Council has recommended NMFS implement this limit under the authority of the Magnuson-Stevens Act, and prohibit the retention of striped marlin by U.S. longline fishing vessels when 95 percent of the limit (or 435 mt) is projected to be reach. NMFS is currently reviewing that action for consistency with the Magnuson-Stevens Act and other applicable laws.

The WCPFC has agreed to other CMMs that limit the effort of fisheries that target North Pacific albacore and Pacific bluefin tuna. However, the U.S. longline fishery operating in the WCPO and longline fisheries of the US Territories do not target North Pacific albacore or bluefin tuna. For this reason, the CMMs do not apply to these longline fisheries.

Under Alternative 2, catches of North Pacific albacore by U.S. longline fisheries operating in the North Pacific is expected to be similar to the level reported in 2014, which was 186 mt (Table 10). Since 2011, there have been no reported catch of bluefin by U.S. longline fisheries in the North Pacific Ocean.

As described in Section 3.1.2, the most recent stock assessment of yellowfin in the WCPO by Davies et al. (2014) using data up to 2012 concluded the stock is not subject to overfishing because the $F_{2012}/F_{MSY} = 0.72$ and is not overfished because B_{2012}/B_{MSY} is 1.24. CMM 2014-01 includes an objective to ensure the fishing mortality rate for yellowfin tuna I no greater than F_{MSY}, i.e. $F/F_{MSY} \leq 1$. Paragraph 40 of CMM 2014-01 also includes a statement that WCPFC member countries agree to take measures not to increase catches of yellowfin tuna by their longline vessels. Paragraph 40 also that the WCPFC will formulate and adopt appropriate limits for WCPFC members at its 2015 regular session, which will be held in Bali, Indonesia in December 2015.
As shown in Table 10, total catch of all U.S. longline vessels operating in the WCPFC statistical area has declined each year from 1,437 mt in 2011 down to 1,023 mt in 2014. Under Alternative 2, catches of yellowfin tuna in the WCPO by U.S. longline fisheries is expected to be similar to or lower the level reported in 2014.

4.2 Potential Impacts to Longline Fishery Participants and Fishing Communities

4.2.1 Potential Impacts of Alternative 1 (No Management Action)

American Samoa and Hawaii have home-based pelagic longline fleets, but CNMI and Guam have currently little domestic longline capacity.

Under Alternative 1, no Territory bigeye specifications would be established, and therefore a territory could not allocate any bigeye tuna to FEP-permitted vessels under a specified fishing agreement in 2015 or 2016. This alternative would have minor to moderately negative consequences for fisheries in the territories, the Hawaii longline fishery, and Hawaii seafood consumers depending upon when the bigeye limit is reached. This alternative would eliminate a mechanism to facilitate the infusion of capital into fisheries development projects identified in the MCPs of the Territories for 2015.

When the U.S. longline limit for bigeye tuna is reached in 2015 and 2016, NMFS will prohibit by regulation the retention and landing of bigeye tuna in the WCPO. Thereafter, U.S. longline vessels fishing in the WCPO either must tie up for the remainder of the season, switch to shallow-set longline fishing for swordfish, or fish for bigeye tuna in the EPO. Based on past experience (2009 and 2010), there could be a negative economic impact to certain longline vessels based in Hawaii that would not be able to switch to swordfish or fish in the EPO.

In addition to potential economic impacts described above, potential safety-at-sea issues arise under Alternative 1. Federal regulations prohibit Hawaii longline vessels from being longer than 101 ft and many active vessels range from 60-75 ft long. Longline vessels fishing for bigeye in Hawaii's EEZ or the high seas generally fish throughout the year and often in varied weather conditions. To switch gears to fish for swordfish and/or to fish in the EPO for bigeye tuna generally involve longer trips and greater distances from the home port. Fishing during the winter months, when strong storms are common in the North Pacific, may pose minor to moderate safety-at-sea concerns. Therefore, minor to moderate safety-at-sea issues arise if vessels have to travel greater distances when bigeye tuna in the WCPO is prohibited.

The impact of a prohibition under Alternative 1 may reduce the supply of bigeye tuna caught by Hawaii longline vessels. This occurred in 2009 and 2010 (74 FR 68190, December 23, 2009; and 75 FR 68725, November 9, 2010). Because the restrictions in 2009 and 2010 occurred toward the end of the year (December and November, respectively), and during the holiday season when fresh, high-quality tuna is in high demand in Hawaii, members of the Oahu fishing community were concerned about price spikes or the unavailability of preferred holiday fare.

A PIFSC study of the 2010 restriction found minor to moderately negative consequences, though neither the longline industry nor seafood consumers experienced strictly negative impacts (Richmond et al. 2012). Many small sized vessels were not able to fish because they could not reach the EPO. Also, sub-premium quality tuna (though still good quality fish) was sold at a lower than average price.

As a direct result of the bigeye tuna restriction on longline fishery in the WCPO that went into effect on November 22, 2010, Hawaii small boat non-longline fishermen increased their catch of bigeye tuna and benefitted economically from the sales of those tuna. In fact, December 2010 landings of, and revenue from, bigeye tuna by small boat vessels was $166,430, up 533 percent from $26,291 in December 2009 when the longline restriction on bigeye occurred on December 29, 2009 (WPFMC 2012). However, these small vessel fleets would not be able to replace the Hawaii longline fleet in terms of volume and value of fresh fish, as typically bigeye tuna caught by longline receives a higher price at market than troll- or handline-caught bigeye tuna.

4.2.2 Potential Impacts of Alternative 2 (Status Quo/Council and NMFS Preferred)

Under Alternative 2, the U.S. participating territories would each have an annual 2,000-mt longline limit for bigeye tuna and a limit of 1,000 mt for bigeye tuna that could be allocated each year to FEP-permitted vessels. Longline fisheries in Guam and CNMI have yet to develop much fishing capacity to harvest that quantity of bigeye tuna on an annual basis, so the limit would not affect current FEP-permitted longline vessels located in the Marinas because the fishery is currently inactive.

The American Samoa longline fishery has around 20 active vessels, but the fishery is capped at 60 permits under the limited entry program. The fishery currently targets albacore when fishing in the South Pacific, and vessels with dual Hawaii and American Samoa permits target bigeye tuna when fishing out of Hawaii. The American Samoa longline fishery would need to diversify and likely add vessel capacity to reach a 2,000-mt limit in the near term. However, if American Samoa entered into a specified fishing agreement, which allocated 1,000 mt of bigeye tuna to other vessels, catches by American Samoa longline vessels fishing in the South Pacific and North Pacific, combined with the 1,000 mt of allocated bigeye tuna could get close to a 2,000-mt limit (see Table 10). In 2012, 1,505 mt of bigeye tuna was reported for American Samoa, with 771 mt of that amount caught by Hawaii longline vessels operating under a specified fishing agreement with the Territory.

If the 2,000 mt limit were reached, and if the fishery was prohibited from retaining or landing bigeye tuna, minor to moderately adverse impacts to fishery participants could result. However, any government that makes agreements with FEP-permitted vessels could control the amount of catch allocated, and thus reserve a greater portion of the 2,000 mt limit to local vessels and reduce potential impacts to local fishery participants.

Federal regulations implementing Amendment 7 at 50 CFR 665.819 require that specified fishing agreements direct funds to the Western Pacific Sustainable Fisheries Fund (WP SFF) to support fisheries development projects identified in a U.S. participating territory's MCP, or that vessels operating under such agreements must land in the territory to which the agreement applies. Pursuant to Section 204(e) of the Magnuson-Stevens Act, the Council, in close coordination with a particular U.S. participating territory, would use the WP SFF to implement fishery development projects identified in that territory's MCP.

Under Alternative 2, fishing communities in U.S. participating territories would benefit indirectly through fishery improvement projects funded from specified fishing arrangements,

with the number of territories benefiting depending on the number of agreements. Benefits are expected to vary per fisheries development project from minor to moderate in magnitude of impact, depending on the fishery improvement projects implemented. These projects are likely to involve improvements to or construction of infrastructure and facilities, upgrades to existing vessels, and vessel capacity, and the development of fishermen training programs.

Also under Alternative 2, the U.S. participating territories stand to realize minor to moderately positive benefits from developing catch history within WCPFC managed fisheries. As mentioned, the WCPO supports the world's largest tuna fishery; however, Guam and CNMI, do not currently have the domestic fishing capacity to participate in the WCPO tuna fishery. American Samoa has domestic longline capacity with only a history of albacore fishing. The authorization of specified fishing agreements allow catch to be attributed to the territory to which the agreement applies, and demonstrate the aspirations of the U.S. participating territories to participate in the larger, internationally managed WCPO fisheries.

Under Alternative 2, the Hawaii longline fishery participants also stand to realize minor to moderately positive benefits from the ability to enter into agreements with a U.S. participating territory. In general, benefits from arrangements for fishery participants include a reduction in the need to fish for seasonally-variable bigeye tuna in the EPO (which saves fuel costs), the ability to supply locally caught fresh, high quality tuna, and a stable income. The local community benefits from the continued availability of fresh, high quality tuna and lower consumer prices due to more product being available.

If the proposed action were approved, and if the U.S. bigeye tuna limit were reached, some Hawaii longline vessels would begin to fish under a specified fishing agreement where their catch would be attributed to the U.S. territory to which the agreement applies. In addition, the EPO may be available for most U.S. longline vessels based in Hawaii all year, since the EPO bigeye tuna catch limit applies to U.S. vessels over 24 m long and many longline vessels based in Hawaii are shorter. However, as mentioned, the availability of bigeye tuna in the EPO can be seasonally variable.

Since the Hawaii longline fleet fish predominately in the WCPO, fishermen are able to optimize their fishing schedule by choosing when to fish in certain areas, since they can have a better sense of transit times and costs. As a less desirable option, fishing in the EPO usually means longer transit times, which results in higher fuel costs, fewer numbers of sets, and potentially poorer quality fish at auction. Further, profits could be lower for fishermen who must fish in the EPO because the availability of bigeye tuna in the EPO can vary seasonally and inter-annually.

For all of these reasons, Alternative 2 is likely to have minor to moderately positive benefits for U.S. participating territories, participants in Hawaii longline fisheries and fishing communities of Hawaii.

4.3 Potential Impacts to Protected Species

Longline fisheries have the potential to interact with several protected species identified in Section 3 as this gear type involves baited hooks suspended in depths near the surface to about

300 m. Because there are no active longline fisheries in CNMI and Guam, the analysis will focus on potential impacts of the American Samoa and Hawaii longline fisheries.

The current levels of interactions for the American Samoa and Hawaii longline fisheries are described in section 3.5. These fisheries operate under separate NMFS Biological Opinions and associated Incidental Take Statements, are subject to observer coverage and reporting, and must be conducted using a suite of mitigation measures to reduce the number and severity of protected species interactions (see 50 CFR 665 Subpart F and 50 CFR 229.37). Under the Alternatives considered, longline fisheries in all U.S. participating territories and Hawaii would continue to be managed under applicable Pelagic FEP regulations, and protected species statutes, including the ESA, MMPA, and MBTA.

4.3.1 Potential Impacts of Alternative 1 (No Management Action)

4.3.1.1 American Samoa Longline Fishery

NMFS has evaluated the potential impact of the American Samoa longline fishery on ESA-listed species under its jurisdiction. In a July 27, 2010 informal consultation under the ESA for the continued operation of the American Samoa longline fishery, NMFS determined that the fishery may affect, but is not likely to adversely affect, loggerhead sea turtles, humpback and sperm whales, and would not affect blue, fin, or sei whales. This determination was based on information demonstrating the fishery does not interact with these species.

On September 16, 2010, NMFS issued a no-jeopardy biological opinion (2010 BiOp), which concluded the American Samoa longline fishery may adversely affect, but is not likely to jeopardize, the existence of green, hawksbill, leatherback, and olive ridley sea turtles (NMFS 2010). The 2010 BiOp also authorized an ITS of 45 green sea turtles, and one hawksbill, one leatherback and one olive ridley sea turtle over a three-year period (see Table 19.) The fishery has no ITS for any other ESA-listed species.

Since the completion of the 2010 BiOp, from 2011 through 2014, NMFS estimates[16] 23 leatherback turtle interactions (takes) occurred in the American Samoa longline fishery. NMFS estimates 13 leatherback mortalities as a result of these takes (See Table 21). These take and mortality estimates exceed the 2010 ITS. From 2011 through 2014, NMFS also estimates 25 olive ridley interactions occurred in the American Samoa longline fishery. NMFS estimates eight olive ridley mortalities as a result of these takes (See Table 21). These levels of take and take-associated mortality exceeded the three-year ITS set forth in the 2010 BiOp and triggered the requirement for NMFS to reinitiate consultation under ESA section 7(a)(2) to evaluate the effects of the continuation of the American Samoa longline fishery on these species. The fishery has not exceeded an ITS for any other species. Thus, the 2010 BiOp and associated ITS for species other than leatherback and loggerhead sea turtles remain valid.

[16] For the American Samoa longline fishery, NMFS does not have 100% observer coverage to verify the interactions with protected species. Thus, based on the observer coverage percentage, NMFS uses an expansion calculation to account for the lack of 100% observer coverage. Accordingly, the interaction rates discussed for the American Samoan longline fishery are estimated interactions.

In addition to the consultation triggers described above, on July 3, 2014, NMFS published a final rule that listed four DPS of scalloped hammerhead shark under the ESA (79 FR 38213). The threatened Indo-West Pacific DPS is the only DPS of the scalloped hammerhead shark that occurs in the action area and that may be affected by the American Samoa longline fisheries. On September 10, 2014, NMFS also published a final rule (79 FR 53852) that listed 20 new species of reef-building corals as threatened under the ESA. Of those, NMFS believes seven occur in waters under U.S. jurisdiction, with six in American Samoa. These new listings also triggered the requirement for NMFS to reinitiate consultation under ESA section 7(a)(2).

On May 8, 2015, NMFS reinitiated consultation under section 7 of the ESA to evaluate the effects of the American Samoa longline fishery on ESA-listed species, including the effects of the proposed action and other potential changes to the regulations as recommended by the Council, but not yet implemented by NMFS (NMFS 2015). NMFS specifically evaluated the potential effects of the American Samoa longline fishery on leatherback and olive ridley sea turtles, the Indo-West Pacific DPS and the six ESA listed reef corals during the period of consultation, and determined that the fishery is not likely to jeopardize the continued existence of ESA-listed species under NMFS jurisdiction, and would not result in irreversible or irretrievable commitments of resources that would foreclose the formulation or implementation of any reasonable and prudent alternative measure for the fishery. NMFS documented these determinations in memoranda dated May 8, 2015 and July 21, 2015. NMFS expects to complete the consultation in mid- October 2015. A summary of the analyses for each species is provided below.

Leatherback Sea Turtles

The highest observed level of incidental take in the fishery is three leatherbacks in a three-month period, which occurred in the second quarter of 2015 (Table 20). Prior to 2015, the highest level of observed take was two leatherbacks in a year. In the second quarter of 2015, NMFS placed observers on 17.95 of longline trips (NMFS Observer Program unpublished data). Based on an expansion factor of 5.57 (17.95 x 5.57 =100%), NMFS estimates the fishery has taken 17 leatherback sea turtles thus far in 2015. Based on past levels of interactions, NMFS anticipates that the fishery could take two additional leatherbacks during the remainder of the consultation period.

Observer coverage is expected to increase to 20 percent over the remainder of the year so two additional takes would be expanded to 10 total fleet-wide interactions. Therefore NMFS anticipates that the fishery could take up to 27 leatherback turtles during the six-month consultation period (May 8, 2015 through October 2015). Furthermore, NMFS anticipates that these 27 interactions also represent the total number of interactions for 2015. This is because, of the eight total observed takes of leatherbacks by this fishery (2006-2015), all have occurred between May and October. Finally, the fishery primarily operates during austral summer and there has never been an observed leatherback interaction between November and April.

The Southwest Fisheries Science Center (SWFSC) conducted a genetic analysis of one leatherback sea turtle sample collected by observers from the American Samoa longline fishery. The SWFSC determined that it was from the Western Pacific genetic stock comprised of nesting

populations in Papua-Barat, Indonesia (formerly known as Irian Jaya), Papua New Guinea and Solomon Islands (Peter Dutton, SWFSC, pers. comm., 3/24/15).

Based on observed leatherback sea turtle takes in the American Samoa longline fishery since 2011, and applying the NMFS' post-hooking mortality criteria (Ryder et al. 2006), NMFS revised its take-associated mortality rate from 53 percent to 70.6 percent. Thus, we estimate the fishery would take 27 individuals during the period of formal consultation, 20 of which would result in mortality (27*0.706 = 19.06).

To discount for males, we use a 65/35 female-to-male ratio for Western Pacific leatherback sea turtles (Snover 2008), which drops the 19.06 mortality estimate to 12.39 female mortalities. To discount for natural mortality, the ANE is then calculated to be 0.639 for this population using exact demographic matching, described by Van Houtan (2013). These numbers are analogous to the fishery causing a single adult female mortality every 1.566 years. This level of impact is 0.043% percent of the female breeding population,[17] or 1 in 2,335 nesters. Therefore, the analysis indicates that the American Samoa longline fishery is not likely to pose an appreciable risk to the leatherback sea turtle.

Olive ridley sea turtles

The highest annual number of observed olive ridley sea turtle interactions in the American Samoa longline fishery is two, which occurred in 2014 (Table 20). In that year, NMFS observed 19.4 percent of American Samoa longline trips (NMFS 2015b). It is assumed that two interactions with olive ridley sea turtles could occur again in 2015.

In the first quarter of 2015 (January 1-March 31, 2015), NMFS placed observers on 18.75 percent of longline trips (NMFS Observer Program unpublished data). Assuming NMFS continues to observe the fishery at a rate of 18.75 percent throughout 2015, each interaction would be expanded by a factor of 5.33 to account for 18.75 percent observer coverage (18.75% x 5.33 = 100% observer coverage). This expansion estimate results in a single olive ridley sea turtle interaction equating to 5.33 (rounded up to six) fleet-wide interactions. Therefore, NMFS anticipates the fishery could interact with up to 12 olive ridley sea turtles in 2015. However, during the period of consultation, which may take up to 180 days (6 months) from the date of re-initiation (May 8, 2015), NMFS anticipates the number of olive ridley sea turtles that may interact with the fishery would be approximately one half of the total annual 2015 estimates, or six olive ridley sea turtles.

Olive ridleys in the action area could be from the Eastern and Western Pacific populations. There is limited genetic information on the olive ridleys caught in the fishery. The SWFSC conducted a genetic analysis of one olive ridley sample collected by observers from the American Samoa

[17] Van Houtan (2014) estimated the northern segment of the Western Pacific leatherback nesting population to be 1,949 breeding females. Based on the ratio of boreal and austral summer nesting activity at Jamursba-Medi and Wermon (Tapilatu et al. 2013) and the remaining leatherback nesting activity in the Western Pacific which occur during the austral summer (Dutton et al. 2007), the southern segment of the Western Pacific leatherback population nesting during the austral summer is estimated to be 76.5% of the northern segment (1,491 breeding females).

longline fishery and found it was from the Eastern Pacific nesting stocks (Mexico/Costa Rica/Central America) (Peter Dutton, SWFSC, pers. comm., 3/24/15).

The mortality coefficient for olive ridleys in the American Samoa longline fishery is 0.29%. We estimate a total of six individuals would be taken during the period of formal consultation and two of those would result in mortalities (6*.29=1.74). The Eastern Pacific population has at least one million adult nesting females. If we assume that fifty percent of the adults killed (1 out of 2) during the period of formal consultation are from the Eastern Pacific population then the impact would be 0.0001 percent (1/1,000,000) of the adult female population that would be affected. The Western Pacific population has at least 33,500 adult nesting females. If we assume that fifty percent of the adults killed (1 out of 2) during the six month period of formal consultation are from this Western Pacific population, then the impact would be 0.003 percent (1/33,500) of the adult female population that would be affected. Based on prior analyses, this level of impact is extremely small. Thus, the risk to both olive ridley populations from the American Samoa longline fishery during the consultation period is considered negligible to the two species' population.

Existing regulations for longline fishing in American Samoa include requirements for the fishery to conduct operations in accordance with a suite of management measures designed to reduce the number and severity of interactions with sea turtles. These include requirements for safe handling and mitigation training and gear for protected species, specific requirements for gear configuration to set gear at a minimum depth of 100 m, and accommodation of observers upon request (see 50 CFR 665). Because Alternative 1 is not expected to directly result in immediate changes in the conduct of the American Samoa longline fishery, including gear types used, areas fished, level of catch or effort, the level of interactions with protected species is expected to be similar to those described in Section 3.3, and not expected to result in large adverse effects to those species.

Indo-West Pacific Scalloped Hammerhead Shark DPS

The American Samoa longline fishery operates in the range of the Indo-West Pacific DPS and between 2006-2014, observers in the fishery recorded interactions with nine scalloped hammerhead sharks and three unidentified hammerheads. As mentioned above, on May 8, 2015, NMFS recently reinitiated consultation for this fishery and estimates interaction rates for this DPS at 12 scalloped hammerhead sharks annually (NMFS 2015). Based on observed interaction associated mortality rate of 40% (NMFS 2015), NMFS estimates 12 interactions could result in up to 4.8 (rounded to 5) mortalities of Indo-West Pacific DPS sharks annually. The effective population size of the Indo-West Pacific DPS is estimated to be at least 11,280 adults (Miller et al. 2014), therefore five mortalities represent 0.04 percent (5/11,280*100=0.04432) of the population. Based on this level of take, the risk to the scalloped hammerhead shark DPS from the American Samoa longline fishery would be negligible.

Reef Corals

In American Samoa, coral reef habitat is generally in nearshore waters from 0-3 nm from shore, although some coral reef habitat can be found further offshore. In contrast, pelagic fisheries

generally operate and target pelagic fish species in the water column dozens to a thousand miles offshore, far away from the islands and coral reef habitat areas. Because the American Samoa longline fishery occurs deeper than ESA-listed coral depth and fishermen typically avoid coral reef structures during transit in Territorial and Federal waters to protect their vessels, under the No Action Alternative, the likelihood of damage to corals from pelagic fishing gear or transiting vessels is extremely unlikely to occur.

4.3.1.2 Hawaii Longline Fisheries

On September 19, 2014, NMFS completed a no-jeopardy biological opinion (2014 BiOp) that included an analysis of the potential impacts of the Hawaii deep-set longline fishery on protected species, including sea turtles, humpback whales, sperm whales, the Main Hawaiian Islands (MHI) insular false killer whale DPS, and scalloped hammerhead DPS's. The 2014 BiOp considered the impacts of the continuation of the deep-set longline fishery under the proposed action, and anticipates the deep-set fishery to continue to operate largely unchanged from what has occurred in the last several years under specified fishing agreements, in terms of fishing location, the number of vessels that deep-set, catch rates of target, non-target, and bycatch species, depth of hooks, or deployment techniques in setting longline gear. The 2014 BiOp also authorized over a three-year period, the incidental take of 9 green, 72 leatherback, 9 North Pacific loggerhead, and 99 olive ridley sea turtles as shown in Table 15, and 6 humpback, 9 sperm and 1 MHI insular false killer whale DPS (Table 25). Based on the analysis provided in the 2014 BiOp, NMFS determined that the fishery may affect, but is not likely to adversely affect, any ESA listed species. The fishery has not exceeded any ITS.

Based on 2015 levels of bigeye tuna catch by vessels to which the limit applies, NMFS forecasted the 2015 U.S. bigeye tuna limit was reached on August 5, 2015. Under Alternative 1 (No Management Action) NMFS prohibited the retention of longline caught bigeye tuna in the WCPO through the end of the year (80 FR 44883, July 28, 2015). If 2015 level of catch is repeated in 2016, the bigeye tuna limit of 3,554 mt may be reached in August 2016.

During a fishery restriction, Hawaii longline fishing effort is expected to shift to the EPO, where interactions with protected species may also occur. Due to the distance involved in transiting to the EPO, and potential for less boats to venture to that zone due to safety at sea issues, the ability to fish in the EPO is not predicted to result in the same amount of fishing effort that would have been expended if the WCPO remained open to fishing for bigeye tuna. Thus, NMFS expects that interactions levels with protected species under Alternative 1 would be lower than the levels described in Section 3 and incidental interactions would be reduced compared to the proposed action.

The current and maximum likely levels of fishing effort by longline fisheries managed under the FEP would continue to be subject to the level of take authorized under the ESA and regulations under other applicable laws. For example, under MMPA false killer whale take reduction plan regulations, if the fishery injures two false killer whales from the pelagic stock within the U.S. EEZ around Hawaii, a "Southern Exclusion Zone" near the MHI is closed to longline fishing (see 50 CFR 229). As noted in Section 3.3, NMFS is be required to re-initiate consultation under

ESA section 7 if any ITS applicable to the Hawaii deep-set longline fishery (Table 15 and 25) or the shallow-set fishery (Table 17) is exceeded or another criterion for reinitiation is triggered.

Longline fisheries managed under the Pelagic FEP are among the most responsible fisheries in the world as they are highly monitored, and subject to a suite of effective protected species mitigation requirements. Catch restrictions that reduce the ability of U.S. longline fisheries managed under the Pelagic FEP to obtain optimum yield and supply fresh fish to U.S. seafood consumers, may, as was the case in the shallow-set fishery, result in foreign fisheries targeting the same HMS stocks to fill potential market gaps left open by the U.S. fishery. Although a specific study on interaction rates with protected species by the longline deep-set fishery versus foreign fisheries has not been conducted, foreign fishing operations, which are not subject to ESA and MMPA are expected to have higher protected species interaction levels compared longline fisheries managed under the Magnuson-Stevens Act and Pelagic FEP. Thus, restricting the Hawaii longline fishery may result in more interactions with protected sea turtles by foreign fleets that continue to fish to fill the void left by a restricted Hawaii longline fleet (see Chan and Pan 2012).

For example, in 2012 there was a 350 percent increase in foreign imports of bigeye tuna into Hawaii from the Marshall Islands compared to 2011 (see Figure 7). An analysis by Gilman et al. (2013) evaluating sea turtle interactions from the 55 foreign-flagged longline vessels fishing out of the Marshall Islands that target bigeye tuna estimated the annual level of sea turtle interactions to be 149 leatherbacks, 53 greens, 32 olive ridleys, and 11 hawksbills, totaling 244 turtles per year, of which only 20 were estimated to be alive upon capture.

4.3.2 Potential Impacts of Alternative 2 (Status Quo/Council and NMFS Preferred)

4.3.2.1 American Samoa Longline Fishery

Because the American Samoa longline fishery primarily targets south Pacific albacore tuna, the fishery's impact on protected species identified in Section 3.3 is expected to be the same regardless of whether NMFS specifies a catch limit for bigeye tuna or not. However, as a result of Alternative 2, funding may become available to support fisheries development projects identified in the American Samoa MCP, which may lead to a diversification of the American Samoa longline fishery from primarily an albacore fishery to a fishery that is able to harvest and market other pelagic MUS such as bigeye and yellowfin tunas. However, such potential diversification is not expected to result in higher amounts of fishing effort by American Samoa longline vessels, but rather support the targeting and retention of various pelagic MUS, including bigeye tuna. Therefore, fishing effort levels are expected to be the same as in Alterative 1 and not expected to increase beyond levels at which the fishery has been authorized, and the interactions currently authorized by NMFS are not expected to be exceeded under Alternative 2.

4.3.2.2 Hawaii Longline Fisheries

Hawaii longline vessels operating under specified fishing agreements under the proposed action would likely continue to operate in a manner consistent with historical fishing patterns and in locations within the EEZ around Hawaii and adjacent high seas throughout the calendar year.

The 2014 BiOp has evaluated the effects of the fishery operating under specified fishing agreements and based on this information, NMFS has determined that the fishery would not jeopardize the continued existence of any ESA-listed species. Under Alternative 2, impacts to protected species from Hawaii longline vessels operating under one, two or three fishing agreements are expected to be within authorized baseline levels identified Section 3.5 and are not expected to result in large adverse effects to any protected species.

4.3.2.3 Guam and CNMI Longline Fisheries

For Guam and CNMI, which currently do not have active longline vessels, it is not possible to estimate foreseeable levels of effort that may be used to predict impacts to protected species. Fisheries development in Guam and CNMI is not expected to be rapid, but rather an iterative process; therefore, it is expected that any fisheries development resulting in increased participation in the near term will not result in levels of interactions currently authorized.

4.4 Potential Impacts to Marine Habitats and Essential Fish Habitat

Essential Fish Habitat (EFH) is defined as those waters and substrate necessary for federally managed species to spawn, breed, feed, and/or grow to maturity. It is the legal tool that NMFS uses to manage marine habitat to ensure that the federally managed species identified by the fishery management councils have a healthy future. Habitat Areas of Particular Concern (HAPC) are subsets of EFH that merit special attention because they meet at least one of the following four criteria:

1) provide important ecological function;
2) are sensitive to environmental degradation;
3) include a habitat type that is/will be stressed by development;
4) include a habitat type that is rare.

HAPC are afforded the same regulatory protection as EFH and do not exclude activities from occurring in the area, such as fishing, diving, swimming or surfing.

An “adverse effect” to EFH is anything that reduces the quantity and/or quality of EFH. It may include a wide variety of impacts such as:

1) direct impacts (e.g., contamination or physical disruption);
2) indirect impacts (e.g., loss of prey, reduction in species’ fecundity); or site-specific/habitat wide impacts, including individual, cumulative or synergistic consequences of actions.

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).

Ten years later, in 2009, the Council developed and NMFS approved five new archipelagic-based fishery ecosystem plans (FEP). The FEP 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) for all MUS. In considering the potential impacts of a proposed fishery management action on EFH, all designated EFH must be considered. Table 36 summarizes the designated areas of EFH and HAPC for all FEP MUS by life stage.

Table 36. EFH and HAPC for FEP MUS

MUS	Species Complex	EFH	HAPC
Pelagic MUS	**Tunas:** albacore (*Thunnus alalunga),* bigeye (*T. obesus*), yellowfin (*T. albacare*s), Bluefin (*T. orientalis*), skipjack (*Katsuwonus pelamis*), kawakawa (*Euthynnus affinis*), Other tunas (*Auxis* spp.*, Scomber* spp.*, Allothunnus* spp.); **Billfishes:** striped marlin (*Tetrapturus audax*), shortbill spearfish (*T. angustriostris*), swordfish (*Xiphias gladius*), sailfish (*Istiophorus platypterus*), blue marlin (*Makaira nigricans*), black marline (*Istiompax indica*); **Sharks:** pelagic thresher (*Alopias pelagicus*), bigeye thresher (*A. superciliosus*), common thresher (*A. vulpinus*), silky shark (*Carcharhinus falciformis*), oceanic whitetip (*C. longimanus*); blue shark (*Prionace glauca*), shortfin mako (*Isurus oxyrinchus*), longfin mako (*I. paucus*), salmon shark (*Lamna ditropi*s); **Other pelagic MUS:** mahimahi (*Coryphaena spp.*), wahoo (*Acanthocybium solandri*), moonfish (*Lampris* spp.), oilfish (Gempylidae), pomfret (Bramidae); **Squid:** diamondback squid (*Thysanoteuthis rhombus*), neon flying squid (*Ommastrephes bartramii*), purpleback flying squid (*Sthenoteuthis oualaniensis*).	**Eggs and larvae:** the water column down to 1,000 meters (m) depth from shoreline out to EEZ boundary **Juvenile/adults:** the water column down to 200 meters depth from shoreline out to EEZ boundary	The water column down to 1,000 m that lies above seamounts and banks.

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 (*Epinephelus quernus*), lehi (*Aphareus rutilans*)	**Eggs and larvae:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fathoms) **Juvenile/adults:** the water column and all bottom habitat extending from the shoreline to a depth of 400 meters (200 fm)	All slopes and escarpments between 40–280 m (20 and 140 fm) Three known areas of juvenile opakapaka habitat: two off Oahu and one off Molokai
Seamount Groundfish MUS	**Hawaii Seamount groundfish species (50–200 fm):** armorhead (*Pseudopentaceros wheeleri*), raftfish/butterfish (*Hyperoglyphe japonica*), alfonsin (*Beryx splendens*)	**Eggs and larvae:** the (epipelagic zone) water column down to a depth of 200 m (100 fm) of all EEZ waters bounded by latitude 29°–35° **Juvenile/adults:** all EEZ waters and bottom habitat bounded by latitude 29°–35° N and longitude 171° E–179° W between 200 and 600 m (100 and 300 fm)	No HAPC designated for seamount groundfish

MUS	Species Complex	EFH	HAPC
Crustaceans MUS	**Spiny and slipper lobster complex (all FEP areas):** spiny lobster (*Panulirus marginatus*), spiny lobster (*P. penicillatus, P.* sp.), 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.
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* sp.), gold coral (*Callogorgia gilberti*), gold coral (*Narella* sp.), gold coral (*Calyptrophora* sp.), bamboo coral (*Lepidisis olapa*), bamboo coral (*Acanella* sp.)	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

MUS	Species Complex	EFH	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

Neither Alternative 1 nor Alternative 2 would adversely impact the marine habitat, particularly critical habitat, EFH, HAPC, marine protected areas (MPAs), marine sanctuaries, or marine monuments. None of the western Pacific pelagic fisheries are known to have large adverse impacts to habitats, and so none of the Alternatives are likely to lead to substantial physical, chemical, or biological alterations to the habitat. Fishing activity would not occur in identified critical habitat, so no critical habitat would be impacted by the proposed regulatory changes. Longline fishing does not occur in MPAs, marine sanctuaries or marine monuments, so no marine protected areas would be impacted.

Longline fishing involves suspending baited hooks in the upper surface layers of the water column, which does not materially impact benthic marine habitat under typical operations. Derelict longline gear may impact marine benthic habitats, especially substrate such as corals if carried by currents to shallow depths; however, the loss of longline gear during normal fishing operations is not believed to be at levels that result in significant or adverse impacts to EFH, HAPC, or the marine habitat.

When fishing, all longliners occasionally lose hooks, mainline, floats, float line, and branch lines, which include hooks, lead weights, and usually wire leaders in the deep-set fishery. Fishermen do try to recover gear, and are normally successful – as the floats used in the fishery are marked to be visible from distance, even at night. Lost hooks are unlikely to have a major impact to the physical marine environment. First, hooks are not expected to continue ghost fishing indefinitely since baits would decompose. Second, hooks are made of steel and decompose over time. Most J-shaped and circle hooks are composed of steel and, depending on quality, the hooks will corrode. Hooks lost on the deep-sea bed in water just above freezing, will corrode more slowly, and stainless steel hooks will corrode at a slower rate than non-stainless steel hooks.

In addition, participants in the Hawaii longline fishery have been participating in the Honolulu Harbor Derelict Fishing Gear Port Reception Program since 2006, where fishermen voluntarily dispose of spent longline gear and derelict fishing gear they encounter. The derelict fishing gear is then incinerated on Oahu's H-Power facility to generate electricity. This model private/public partnership is expected to continue under both of the Alternatives.

There are presently no known districts, sites, highways, cultural resources, structures or objects listed in or eligible for listing in the National Register of Historic Places in the U.S. EEZ around

American Samoa, Guam, CNMI and Hawaii and areas of the high seas in international waters where pelagic longline fishing activities are conducted. Additionally, longline fishing activities are not known to result in adverse impacts to scientific, historic, archeological or cultural resources because fishing activities occur generally miles offshore. Additionally, longline fishing is not known to be a potential vector for spreading alien species as most vessels fish in far away from coastal areas far offshore. It is therefore anticipated that Alternatives 1 and 2 would not increase the potential for the spread of alien species into or within nearshore waters in Hawaii or any of the U.S. participating territories.

4.5 Potential Impacts to Administration and Enforcement

4.5.1 Potential Impacts of Alternative 1 (No Management Action)

Using historical data and data collected during the fishing year, PIFSC projects the Hawaii longline fleet's bigeye tuna catches against the U.S. WCPO limit estimates, thereby reducing the potential for exceeding the limit.

This Alternative would have minor positive impacts associated with administration and enforcement, because Territory bigeye specifications would not be established for 2015. As a consequence, specified fishing agreements would not be authorized under this Alternative. Therefore, the administrative costs associated with tracking and assigning catches made under Territory arrangements with FEP-permitted vessels would be unnecessary under this Alternative. NMFS would continue to monitor catch by U.S. vessels operating in the WCPO against the U.S. catch limit through submission of logbooks as described above. If the U.S. longline industry reached the annual limit of bigeye tuna in the WCPO, NMFS would prohibit catch and retention as occurred in 2009 and 2010 through a notice published in the *Federal Register* and by other means.

4.5.2 Potential Impacts of Alternative 2 (Status Quo/Council and NMFS Preferred)

Under Alternative 2, the administrative costs would be similar to Alternative 1, including in-season monitoring of the U.S. WCPO longline catch limits for bigeye tuna by NMFS' PIFSC, and regulatory and management costs associated with announcing a catch prohibition and notifying fishermen. Additional costs would result from monitoring and attributing catches made by vessels identified in a specified fishing agreement to the U.S. participating territory to which the agreement applies.

The administrative burden for the government involves NMFS' fishery scientists monitoring catches by the Hawaii-based longline fishery, forecasting when the U.S. limit may be reached, collecting and correcting catch data, and attributing catch to either the U.S. bigeye tuna catch limit, Territory attributed catch, or American Samoa catch by dual permitted vessels. PIFSC estimates the current administrative burden of this component of the Hawaii longline monitoring program as about half of a full-time employee salary per year and $75,000 in administrative costs.

Regarding enforcement, both Alternatives 1 and 2 require PIFSC tracking the fishery and projecting the date the U.S. bigeye tuna will be reached, and then the NOAA Office of Law Enforcement and U.S. Coast Guard monitoring vessel compliance with applicable regulations and laws through vessel monitoring systems and vessel boarding at sea. Under Alternative 2, PIFSC would also need to forecast the date a territorial catch limit and allocation limit would be reached. This has been ongoing since 2011. Therefore, changes to the level of monitoring or an increase in costs are not expected since this is the status quo.

4.6 Potential Cumulative Effects

Cumulative effects refer to the combined effects on the human environment that result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-federal) or person undertakes such other actions. Further, cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The cumulative impact analysis examines whether the direct and indirect effects of the Alternatives considered on a given resource, interact with the direct and indirect effects of other actions on that same resource to determine the overall, or cumulative effects, on that resource. Section 3 describes the elements of the human environment that could be affected by the Alternatives considered. Section 3 describes the baseline for assessing the direct and indirect impacts of the proposed action, as presented in Section 2.

The following cumulative effects analysis is organized by the following issues: target and non-target species, protected species, and fishery participants and communities. Because pelagic longline fishing activities authorized occur far offshore and in deep oceanic waters away from land, populated areas, and marine protected areas such as marine national monuments, neither of the Alternatives considered would have an effect on air/water quality, coral reefs, benthic marine habitats. As such, these resources will not be considered in this cumulative effects analysis.

4.6.1 Cumulative Effects on Target and Non-Target Stocks

4.6.1.1 Past, Present and Reasonably Foreseeable Management Actions

NMFS Management Actions

The Council has recommended NMFS implement or authorize several actions, which are presently in various stages of development and/or review and have yet to be transmitted to NMFS for Secretarial review under the Magnuson-Stevens Act. These include the following action:

- American Samoa longline limited access permit program modifications to support fishery participation by small vessels (< 50ft) in the fishery and reduce program complexity;
- Temporary exemption to the American Samoa Large Vessel Prohibited Area;
- Establishment of regulations for an American Samoa-based shallow-set longline fishery;
- Large vessel (> 120 ft) prohibited fishing area around CNMI and Guam; and
- Prohibition on FAD sets by U.S. purse seine fishery in U.S. EEZ waters.

- Authorization one longline vessel into the Hawaii longline fishery under the western Pacific community development program (CDP).

In general, the Alternatives considered would not have interactive effects with the proposed actions listed as they vary in management scope and impact, and the public will have an opportunity to review and comment on the actions at a later date.

With respect to the proposed CDP project, the action would allow one vessel to enter into the Hawaii deep-set longline fishery to target pelagic MUS including bigeye tuna in accordance with all requirements applicable to deep-set longline fishing in Hawaii, except the administrative requirement to hold a Hawaii limited entry longline fishing permit. NMFS estimates this vessel could set up to a maximum of 242,000 hooks per year. The location of fishing activities and the amount and type gear used would not be substantially different from other vessels in the Hawaii-based commercial deep-set longline fishery. The species caught would also be similar.

International Management Actions

As noted in Section 4.1, the objective of the CMM 2013-01 is to reduce the fishing mortality rate for WCPO bigeye tuna to a level no greater than F_{MSY}, i.e., $F/F_{MSY} \leq 1$. To achieve this objective, the CMM-2013-01, as continued in CMM 2014-01, includes a number of provisions to be implemented over the period 2014-2017, including longline catch limits for certain member countries, seasonal purse seine Fish Aggregation Device (FAD) closures or FAD closures and annual FAD set limits, and a FAD closure on the high seas, including a 5 month FAD closure by all member countries in 2017.

The analysis in Section 4 includes an evaluation of the Alternatives considered when added to the expected effects of CMM 2013-01, as continued by CMM 2014-01.

External Factors

Five major exogenous factors were identified as having the potential to contribute to cumulative effects on pelagic target and non-target stocks:

- Fluctuations in the pelagic ocean environment focusing on regime shifts
- Ocean noise
- Marine debris
- Ocean productivity related to global climate change

Fluctuations in the Pelagic Ocean Environment

Catch rates of pelagic fish species fluctuate temporally and spatially in relation to environmental factors (e.g., temperature) that influence the horizontal and vertical distribution and movement patterns of fish. Cyclical fluctuations in the pelagic environment affect pelagic habitats and prey availability at high frequency (e.g., seasonal latitudinal extension of warm ocean waters) and low-frequency (e.g., El Niño Southern Oscillation-related longitudinal extension of warm ocean waters). Low or high levels of recruitment of pelagic fish species are also strongly related to fluctuations in the ocean environment.

The effects of such fluctuations on the catch rates of PMUS obscure the effects of the combined fishing effort from Pacific pelagic fisheries. During an El Niño, for example, the purse seine fishery for skipjack tuna shifts over 1,000 km from the western to central equatorial Pacific in response to physical and biological impacts on the pelagic ecosystem (Lehodey et al. 1997). Future ocean shifts are likely to cause changes in the abundance and distribution of pelagic fish resources, which could contribute to cumulative effects. For this reason, accurate and timely fisheries information is needed to produce stock assessments that allow fishery managers the ability to regulate harvests based on observed stock conditions.

Oceanic Noise Pollution

In the last 50 years, there have been significant increases in sound producing ocean activities such as commercial shipping, hydrocarbon exploration and research, military sonar and other defense related-actions (Hildebrand 2005). Ambient noise from shipping in the Pacific Ocean has doubled every decade for the last 40 years (McDonald et al. 2006). Commercially important fish stocks and marine mammals can be affected by noise pollution by making it more difficult to find food and mates, avoid predators, navigate, and communicate (Popper 2003). Studies of bluefin tuna in the Mediterranean suggest that noise pollution from shipping results in changes to schooling behavior, which could impact migration (Sara et al. 2007). The effects of noise pollution on bigeye tuna and other target and non-targets stocks are unknown, but given the above information and depending on exposure duration and at what life stage, increases in oceanic noise levels could potentially have adverse impacts on target and non-target stocks.

Marine Debris

Derelict fishing gear such as drift-nets have the ability to ghost fish, i.e., continue to catch and kill fish and other animals long after they have been lost or discarded. The amount of derelict fishing gear in the Pacific has not been quantified nor has the amount of fish species killed by ghost nets. Longline gear is not readily lost during normal fishing operations because the gear is equipped with radio transponder devices. In addition, Hawaii longline fishermen make efforts to prevent gear loss as well as participate in a voluntary derelict fishing net retrieval program based in Honolulu. Retrieved derelict nets are brought back to Honolulu Harbor and placed in a receptacle which is transported to Schnitzer Steel Corporation, where the nets are cut up for incineration at Honolulu City and County's H-Power plant. Purse seine fisheries often used FADs to aggregate fish. While many of these FADs are equipped with radio transponders or GPS beacons to locate them, the FAD themselves are made of netting or other loosely connected materials that have the potential to contribute to marine debris.

Ocean productivity related to global climate change

Using remotely-sensed chlorophyll concentrations from satellite observations, Polovina et al. (2008) have found that over the past decade primary productivity in the subtropical and transition zone has declined an average of 1.5 percent per year with about a 3 percent per year decline occurring at the southern limit of the North Pacific Transition Zone. The expansion of the low

chlorophyll waters is consistent with global warming scenarios based on increased vertical stratification in the mid-latitudes.

Expanding oligotrophic[18] portions of the subtropical gyres in the world's oceans in time will lead to a reduction in chlorophyll density and carrying capacity in the larger subtropical gyres, thus impacting the abundance of target and non-target species. In general, it has been shown that large scale climate cycles can impact winds, currents, ocean mixing, temperature regimes, nutrient recharge, and affect the productivity of all trophic levels in the North Pacific Ocean (Polovina et al. 1994).

For example, a scientific study using an enhanced version of the spatial ecosystem and population dynamics model (SEAPODYM[19]) suggests that by the end of this century, ocean temperatures in the WCPO will increase to levels that may not support bigeye tuna populations in the WCPO.[20] In order to support the long-term sustainability target and non-target fish stocks, and taking in to account potential impacts from climate change, continued research, improved fishery data collection, and coordination with international organizations, will be important to facilitate adaptive fishery management.

4.6.1.2 Effects Analysis on Target and Non-Target Stocks

As described in section 4.1, the direct and indirect impact of the Alternatives considered are expected to have minor positive and negative impacts on the status of target and non-target stocks, including bigeye tuna, with none expected to be substantial. U.S. fisheries including those of the Territories are sustainably managed and are operating consistent with internationally agreed upon conservation and management measures. Bigeye tuna is experiencing overfishing in the WCPO, but is not overfished according to the Pelagic FEP.

Alternative 2 would provide for NMFS-oversight of limited allocation of bigeye tuna catch limits under three fishing arrangements, while ensuring that the amount allocated does satisfy the objective of CMM 2013-01 as continued in CMM 2014-01 to reduce the fishing mortality rate for WCPO bigeye tuna to a level no greater than F_{MSY}, i.e., $F/F_{MSY} \leq 1$.

In accordance with federal regulations at 50 CFR 665.819, FEP permitted longline vessels cannot be identified in more than one specified fishing agreement at a time. For this reason, vessels can only operate under one specified fishing agreement at a time. Given this controlling measure, combined with the U.S. WCPO bigeye tuna catch limit of 3,502 mt in 2015 and 3,554 mt in 2016, and the current and expected levels of vessel participation, it is likely that the level of effort and associated catches in 2015 and 2016 will be within historical baseline levels. Furthermore, the location of where most U.S. longline fishing effort for bigeye tuna is expected to occur under Alternatives 1 and 2 is an area in the central North Pacific with lower fishing

[18] Meaning waters where relatively little plant life or nutrients occur, but which are rich in dissolved oxygen.
[19] The model based on advection-diffusion-reaction equations explicitly predicts spatial dynamics of large pelagic predators, while taking into account data on several mid-trophic level components, oceanic primary productivity and physical environment.
[20] SEAPODYM working progress and applications to Pacific skipjack tuna population and fisheries WCPFC-SC7-2011/EB-WP 06 rev. 1

mortality, as compared to the equatorial Pacific, which represents approximately 88 percent of fishing mortality on bigeye tuna in the WCPO (See Figure 1; Section 3.1.1).

As discussed in Section 3.1.1, the majority of fishing effort by the Hawaii longline fishery occurs north of above 20° N in Region 2, and further 98% of bigeye tuna caught by the Hawaii longline fishery comes from north of 10° N and outside of the core equatorial zone of heavy purse seine and longline fishing (NMFS unpublished data; NMFS PIFSC 2013).

Bigeye tuna is considered a Pacific-wide stock that is managed and assessed separately by the WCPFC and IATTC. In the WCPO bigeye tuna has been experiencing overfishing since 2004 (69 FR 78397, December 30, 2004), according to stock status determination criteria described in the Pelagic FEP (WPFMC 2009).In the EPO bigeye is not in an overfishing condition. In both the WCPO and EPO, bigeye tuna is not overfished according to stock status determination criteria described in the Pelagic FEP (WPFMC 2009). In the WCPO, bigeye tuna is harvested across a range of fishing gears, with primary impacts from longline and purse seine fisheries. As an internationally managed species, the U.S. cannot end overfishing on bigeye tuna through unilateral actions. International cooperation within the WCPFC is ultimately required to end and prevent overfishing of bigeye tuna in the WCPO. The proposed action imposes limits on otherwise unrestricted catches applicable to the Territories.

Although the WCPFC and IATTC both manage bigeye tuna, it is a single pan-Pacific stock with no evidence of stocks separation between eastern and western segments of the population. Reduction of fishing mortality in the EPO has been achieved largely through the wholesale reduction of longline fishing mortality, where catches have consistently been lower than IATTC recommended maximum. Given that this is a single stock with exchange between the EPO and WCPO, the reduction of fishing mortality in the EPO may have some benefits to the population as a whole through survival of recruits to reproductive age and spillover of recruits from the EPO to the WCPO. This is especially relevant to bigeye tuna fishing mortality in Regions 2 and 4, where the eastern boundaries of these regions adjoin the EPO. The impact of the improved stock condition of bigeye tuna in the EPO and its potentially positive impact to the WCPO stock, especially in the eastern portions of Regions 2 and 4 cannot be discounted and may be quantified in future Pacific-wide bigeye tuna stock assessments. This issue is relevant when evaluating the impact of the Hawaii longline fishery, which fishes predominately in Region 2, as well as in Region 4 and the EPO. Combined catches by the Hawaii longline fishery when fishing under the U.S.WCPO limit and specified fishing agreement may be buffered by the improved status of bigeye tuna in the adjacent EPO. Approximately 80 percent of bigeye catch by the Hawaii longline fishery when operating under specified fishing agreements occurs north of 20 degrees N.

Catches of non-target species in the Hawaii longline fishery are driven by the fishing effort for bigeye tuna. If fishing effort for bigeye tuna increases, the catches of other target and non-target stocks would be expected to increase commensurate with the increases in fishing effort. The predicted level of fishing effort by the U.S. participating territories and the Hawaii longline fishery under Alternatives 1 and 2 are expected to result in catches of non-target species within historical baseline levels, although there could be slightly less effort by Hawaii-based fisheries under Alternative 1 compared to Alterative 2.

As described above, there are several exogenous factors that may be affecting target and non-target species, with the industrial scale purse seine and longline fisheries responsible for the largest impact on the sustainability of the stocks. The impacts analysis of the Alternatives on bigeye tuna stocks was developed in consideration of all other sources of fishing mortality on the stock and the U.S. fisheries would continue to comply with applicable conservation and management measures that are developed by international fishery management organizations.

Concerning bigeye tuna, the U.S. cannot end overfishing unilaterally and international cooperation within the WCPFC is needed to eliminate overfishing. None of the Alternatives would result in large adverse impacts to bigeye tuna or prevent management measures from succeeding in improving the status of bigeye tuna in the Pacific.

As the provisions CMM 2013-01 and CMM 2014-01 provide the SIDS and PTs, including the U.S. participating territories, essentially unlimited annual catches of bigeye tuna, there is potential for increased bigeye tuna catches by these countries either through vessel chartering or similar mechanisms including catch attribution programs. Vessel chartering is a common practice among WCPFC membership, principally between SIDS and distant water fishing nations as mechanism for the SIDS to gain fishing capacity.

There are no existing WCPFC conservation and management measures to restrict vessel chartering or to limit the amount of catch a country may allocate to another under a charter arrangement. The only WCPFC conservation and management measure applicable to vessel chartering (CMM 2012-05) is a notification of chartering to the WCPFC Secretariat; the list of vessels operating under charter is available to the public (see WCPFC 2013 (e)). For this reason, there is a potential for WCPFC members with catch limits to enter into charter arrangement with SIDS and PTs with no limits and catch an unlimited amount of bigeye tuna.

Such actions, if widely emulated, could cumulatively erode conservation of bigeye tuna. Allocation of purse seine fishing effort is occurring within the WCPO among members of the Parties to the Nauru Agreement (PNA) and longline catch allocations have occurred in the WCPFC, and other RFMO areas of competence, such as IATTC in the eastern Pacific, and ICCAT in the Atlantic. Thus, there is international precedence for one country allocation quota to another. However, alternative 2 demonstrates how the U.S. approach to allocations would not erode conservation of bigeye tuna because the proposed action not only sets a limit for its territories, which have no limit under the WCPFC, but also restricts the amount of bigeye tuna each territory may allocate to a level that is consistent with the objective of CMM 2014-01.

With respect to U.S. negotiating positions and the need for further reductions in bigeye fishing mortality, the Alternatives do not negatively impact future U.S. negotiating positions. Alternative 1 would maintain U.S. limits consistent with CMM 2013-01 as continued in CMM 2014-01. Alternative 2, which would establish a 2,000-mt catch limit for bigeye tuna in each Territory, is a more restrictive measure than what is currently in place for the SIDS and PTs. Additionally, a 1,000-mt allocation limit on bigeye tuna catch under specified fishing arrangements could strengthen U.S. negotiating positions and put pressure on other WCPFC members to adopt more restrictive measures on chartering.

With regard to market effects and impacts to bigeye tuna and other pelagic MUS, the Hawaii market for fresh and frozen tuna is substantial and cannot be supplied with the current amount of domestic landings. The adherence to the U.S. bigeye tuna catch limits has left the Hawaii market accessible for foreign imports. If the Hawaii based longline fishery reaches its annual catch limit in any one year and is restricted from landing bigeye tuna caught in the WCPO, as could occur under Alternative 1, it is believed that foreign imports would fill the market demand in Hawaii. The effect of adhering to the U.S. bigeye tuna limit is expected to result in the same amount or more fishing for bigeye tuna by foreign interest to satisfy the Hawaii market. Because foreign longline fisheries are believed to be less monitored in terms of target and non-target catches and landings and protected species interactions as compared to U.S. longline fisheries, the proposed action would maintain the U.S. production of bigeye tuna at optimal levels through the highly monitored, environmentally responsible domestic longline fisheries.

Said differently, a pound of bigeye tuna caught by the Hawaii longline fishery is believed to be more environmentally friendly than a pound of bigeye tuna caught by a foreign longline fleet with regard to protected species interactions and non-target catches (e.g., retained shark bycatch). In addition, supporting the domestic supply of fresh tuna for the Hawaii seafood market is believed to make it less reliant on foreign tuna imports that are likely caught in equatorial regions with higher fishing mortality levels and in areas known for tuna spawning (e.g., Regions 3 and 4 of the 2011 stock assessment for bigeye tuna in the WCPO). As described earlier, 98% of the Hawaii longline bigeye catch comes from north of 10° N, and outside the core equatorial zone where approximately 90% of fishing mortality on bigeye tuna occurs.

4.6.2 Cumulative Effects on Protected Species

4.6.3 Past, Present, and Reasonably Foreseeable Future Management Actions

As noted in Section 4.3.1.1, NMFS recently listed the Indo-West Pacific scalloped hammerhead shark and several species of shallow-reef corals under the ESA triggering the requirement to reinitiate consultation under ESA section 7(a)(2). On May 8, 2015, NMFS reinitiated consultation under section 7 of the ESA to evaluate the effects of the American Samoa longline fishery on ESA-listed species, including the effects of the proposed action and other potential changes to the regulations (NMFS 2015). NMFS specifically evaluated the potential effects of the American Samoa longline fishery on leatherback and loggerhead sea turtles, the Indo-West Pacific DPS and the six ESA listed reef corals during the period of consultation, and determined that the fishery is not likely to jeopardize the continued existence of ESA-listed species under NMFS jurisdiction, and would not result in irreversible or irretrievable commitments of resources that would foreclose the formulation or implementation of any reasonable and prudent alternative measure for the fishery. NMFS documented these determination in memoranda dated May 8, 2015, and July 21, 2015. NMFS expects to complete the consultation in mid- October 2015.

Through data collected from observer programs and other sources, the Council and NMFS will continue to monitor interactions between managed fisheries and marine mammals. NMFS scientists in association with other researchers will continue to collect biological samples to refine stock definitions as well as conduct surveys to monitor populations. The Council and

NMFS will continue to conduct workshops with participation from fishermen to develop mitigation methods as appropriate, and NMFS will continue to conduct mandatory annual protected species workshops for all longline permit holders that teach how to identify marine mammals and how to reduce and mitigate interactions.

4.6.3.1 Effects Analysis on Protected Species

As previously described in Section 4, the Council and NMFS have taken significant steps to reduce sea turtle and seabird interactions in longline fisheries, and ongoing work is being conducted to further reduce interactions. Longline fisheries managed under the Pelagic FEP are held as the benchmark (WCPFC Science Committee 2009 Report) for successful sea turtle, and seabird interaction reductions, and the successes of the Council and NMFS' work are being transferred to other fleets in the region.

Under Alternatives 1 and 2, all U.S. longline vessels will continue to be subject to strict measures to avoid and reduce protected species interactions and to reduce the severity of interactions when they do occur. Therefore, impacts to protected species under the two Alternatives will be similar. The levels of interactions that are authorized in each fishery do consider the estimated impacts on the same species by all fisheries where the domestic fishery operates, as well as cumulative effects. Cumulative impacts of the U.S. fleets have been considered and authorized in the BiOps, and determinations of impacts to MMPA-protected species to a lesser extent, that apply to the domestic longline and other pelagic fisheries in the western Pacific region.

4.6.4 Cumulative Effects to Fishery Participants and Fishing Communities

4.6.4.1 Past, Present, and Reasonably Foreseeable Future Management Actions

As noted in Section 3.2.6, the Council has identified American Samoa, CNMI, Guam, and each of the inhabited Hawaiian Islands as a fishing community. In accordance with the Magnuson-Stevens Act, the Council and NMFS will continue to assess the impact of management actions on fishery participants and fishing communities, and where possible, minimize negative effects while developing appropriate measures for the conservation and management of fishery resources.

External Factors

There are a number of wide-ranging factors (that change over time) that have the potential to affect fishing participants as well as fishing communities. Current factors may include, but are not limited to, high fuel costs, high costs of other equipment and supplies, increased seafood imports, and restricted access to traditional fishing grounds. High fuel and materials/supply costs affect fishing participants by increasing the costs to go fishing. The effect is that fishery participants reduce the number of fishing trips, switch to less fuel-intensive fisheries, or simply do not go fishing at all. Some longline fishing in the western Pacific has shown contraction in recent years, with an example being longline fishing on small vessels in the American Samoa longline fishery.

The amount of imported seafood is also increasing, where the U.S. now imports nearly 85 percent of consumed seafood.[21] Increased seafood imports are significant as the level of imports relates to market competition, where a glut of foreign fish products can flood the market and lower ex-vessel prices for U.S. fishermen. Once U.S. fish products lose market channels to imported seafood products, it may also be hard for U.S. fishermen to regain those channels. As described previously, the Territories face significant barriers to developing responsible longline fisheries, which include lack of infrastructure, transportation, and access to markets.

In addition, a reliance on foreign imports in Hawaii and the U.S. territories is believed to impact local food security. At a broader level, a recent study by the Great Britain's Royal Institute of International Affairs (Ambler-Edwards et al. 2009) has identified seven fundamental issues, which affect food production and food security. These are as follows:

1. Rapidly rising world population (population growth rates in the western Pacific region range from 1-7%)
2. Nutrition transition, i.e., a shift from traditional staples to processed foods high in sugars, oils, and fats
3. The rising costs of energy (oil, gas, electricity)
4. Limited availability of agricultural land (especially critical on small islands)
5. Increasing demands for water for agricultural and food production
6. Climate change
7. Labor and urban drift

All of these seven fundamentals are especially critical to Hawaii and the U.S. participating territories. The development of domestic sustainable fisheries production in the Western Pacific region would help to mitigate the impacts of most of these fundamental issues by providing increased revenues for communities and developing fisheries that meet domestic consumption needs. Alternative 1 would not allow the territories to enter into specified fishing agreements in 2015 or 2016, whereas Alternative 2 would allow for such agreements and could promote potential opportunities to develop fisheries in the U.S. participating territories, which could help offset other factors that are affecting fishing communities in the U.S. territories.

With regard to the Hawaii fishing communities, which also face the issues such as rising operational costs and increasing seafood imports, Alternative 1 may lead to more foreign imports of bigeye tuna and other pelagic species to fill any market gaps in the Hawaii and U.S. seafood market that depend on fish products provided by Hawaii longline fishery throughout the year. Alternative 2 would provide the Hawaii longline fishery the opportunity to supply U.S. markets with bigeye tuna caught in the WCPO through fishing agreements with one or more U.S. participating territory. The Hawaii longline fishery is the largest producer of fresh fish in the State of Hawaii and is an important supplier of quality seafood that supports Hawaii's tourism economy and local seafood market.

[21] http://www.fishwatch.gov/farmed_seafood/index.htm

4.6.5 Effects Analysis on Fishery Participants and Fishing Communities

Regardless of which Alternative is selected, Western Pacific pelagic fisheries will continue to be managed sustainably. The Alternatives are not expected to result in a large change to the fisheries in terms of area fished, effort, harvests, or protected species interactions. Alternative 1 would not allow U.S. participating territories to make fishing agreements with FEP-permitted vessels. As a result, a territory could not allocate any bigeye tuna. Alternative 1 also does not provide long-term stability for fishery participants in the Hawaii longline fishery and vessel owners and captains would need to prepare for restrictions each year. However, this may encourage fishery participants to explore other management options, such as catch shares or individual fishing quotas.

Alternative 2, while allowing fishing arrangements to occur in 2015, would provide minor to moderate benefits to fishery participants and provide some payments to the U.S. territories through the Western Pacific Sustainable Fisheries Fund. This Alternative is expected to result in the greatest short and long-term benefit to fishery participants by providing the most intensive management oversight of fishing arrangements, managing Territorial catches of bigeye tuna, and in terms of providing long-term stability in the commercial pelagic fisheries. Such stability is expected to result in less cumulative impacts of external stressors on fishing participants and communities, as compared to the Alternative 1.

4.6.6 Climate Change

NMFS and the Council evaluated the potential impacts of climate change on the resources that are considered in this draft EA. We also considered the potential impacts of the Alternatives considered in the face of climate change.

A climate change impact analysis is a difficult undertaking given its global nature and interrelationships among sources, causes, mechanisms of actions and impacts. We focus our analysis on whether climate change is expected to impact resources that are the focus of this analysis including: target stocks (bigeye tuna), non-target stocks and bycatch of particular management interest (striped marlin and north pacific swordfish stocks, and silky sharks), and on protected species.

Implications of climate change for the environmental effects of the Alternatives:

We note that the impacts of climate change on these resources may be positive if climate change impacts benefit a species' prey base or otherwise enhance the species' ability to survive and reproduce, or impacts may be negative if the impacts reduce a species' ability to survive and reproduce. Impacts may also be neutral.

For the current proposed specifications, the impacts of climate change on target and non-target species that are caught by the Hawaii deep-set longline fishery have been considered indirectly because the proposed bigeye tuna catch and allocation limits were based on recent fishery catches (including all fishing mortality on the stock), and in consideration of the most recent stock status.

Climate change would have similar impacts to the resources regardless of which Alternative is considered. The No-management action (Alternative 1), would limit bigeye tuna catches by the Hawaii longline fleet to 3,502 mt in 2015 and 3,554 mt in 2016, but any gains to the stock are likely to be offset by increased international fishing in Regions 3 and 4 (e.g., the tropical equatorial zone between 20° N and 10° S) where 88 percent of bigeye tuna fishing mortality occurs (WCPFC 2011a) (see Figure 1).So on the whole, Alternatives 1 and 2 would have similar outcomes, even in light of any climate change impacts that may be occurring in the environment.

In the coming years, the Council and NMFS will continue to monitor domestic catches of all pelagic MUS, and continue to consider information from scientifically-derived stock status reports as future catch and allocation limits are made, and as changes to fishery management are contemplated and implemented. Ongoing and future monitoring and research will allow fishery managers and scientists to consider impacts of climate change, fishing, and other environmental factors that are directly or indirectly affecting the resources.

Potential effects on climate change in terms of greenhouse gas emissions:

The U.S. longline fishery is already authorized to conduct fishing with or without a bigeye tuna specification. The proposed specification would not direct any particular level of fishing effort and, therefore, neither NMFS, nor the Council controls where fishing vessels fish beyond existing restricted fishing areas, how long a fishing trip lasts, or other decisions that are made by individual fishermen. For this reason our comparison of potential greenhouse gas emissions will be qualitative.

As described above in Section 2, the expected fishery outcomes of the alternatives considered are fairly similar. Under Alternative 1, (No Management Action), the Hawaii deep-set longline fishery would be prohibited from retaining bigeye tuna caught in the WCPO a few months before the end of the year. When this happens, there could be more fishing by the Hawaii longline fleet in the EPO (east of 150 degrees W. long.), until the bigeye tuna catch limit is caught in the EPO. Under Alternative 2, vessels in the Hawaii deep-set longline fleet are expected to expend slightly higher level of fishing effort in terms of number of trips and longline sets than they might under Alternative 1; however, much of the deep-set longline fishing toward the latter part of the year may be closer to the Hawaiian archipelago instead of the EPO. For these reasons, neither Alternative is expected to result in a large change to greenhouse gas emissions.

5 Consistency with Other Applicable Laws

5.1 National Environmental Policy Act

In accordance with NEPA, NOAA Administrative Order (NAO) 216-6 - *Environmental Review Procedures for Implementing the National Environmental Policy Act* requires NMFS to consider the effects of proposed agency actions and alternatives on the human environment. As part of this process, NMFS and the Council provide opportunities for the involvement of interested and affected members of the public before a decision is made. This EA was prepared in accordance with NEPA and its implementing regulations, as well as NMFS' NAO 216-6. The NMFS Regional Administrator will use this draft EA to consider the impacts of the proposed action on

the human environment, taking into consideration public comments on the proposed action presented in this document, and to determine whether the proposed action would have a significant environmental impact to require the preparation of an environmental impact statement.

5.2 Document Preparers

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5.3 Agencies and Persons Consulted

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. The agencies that participated in the deliberations and development of the proposed management measures discussed herein include:

- American Samoa Department of Marine and Wildlife Resources
- Coastal Zone Management Program of American Samoa
- Guam Department of Agriculture, Division of Aquatic and Wildlife Resources
- Coastal Zone Management Program of Guam
- Hawaii Department of Land and Natural Resources, Division of Aquatic Resources
- Coastal Zone Management Program of Hawaii
- CNMI Department of Land and Natural
- Coastal Zone Management Program of the CNMI
- Resources, Division of Fish and Wildlife
- U.S. Coast Guard
- U.S. Fish and Wildlife Service
- U.S. Department of State

5.4 Public Coordination

The development of the proposed 2015 bigeye tuna catch and allocation limit specifications for pelagic longline fisheries of American Samoa, Guam, the CNMI, and accountability measures, evolved during public meetings held by the SSC and the Council where participation by the public and interested and/or affected parties was invited. In addition, the Council notified members of the public about the proposed action through media releases, newsletter articles, and the Council's website, http://www.wpcouncil.org. On August 24, 2015, NMFS published the proposed specifications, and request for public comments on the action and the draft EA (80 FR 51193); the comment period ended September 8, 2015. NMFS received comments from individuals, businesses, and non-governmental organizations on the proposed specifications and on the draft EA. NMFS considered public comments in finalizing the EA and in making its decision on the proposed action, and responds to comments in the final specification.

5.5 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 pelagic longline fisheries of Hawaii, American Samoa, Guam and the Northern Mariana Islands for potential impacts on ESA-listed species under the jurisdiction of NMFS. The conclusions of these consultations are briefly summarized below.

Hawaii Deep-Set Longline Fishery

In a biological opinion dated September 19, 2014 (2014 BiOp), NMFS concluded that the continued operation of the Hawaii deep-set longline fishery as authorized under the Pelagic FEP is not likely to jeopardize the continued existence of ESA-listed species under NMFS jurisdiction. The 2014 BiOp also issued an ITS for humpback whales, sperm whales, the main Hawaiian islands (MHI) insular false killer whale distinct population segment (DPS), North Pacific loggerhead DPS, leatherback sea turtles, olive ridley sea turtles, green sea turtles, and the Indo-west Pacific scalloped hammerhead DPS as shown in Table 15. Since the issuance of the 2014 BiOp, the fishery has not exceeded any ITS and, therefore, the 2014 BiOp remains valid.

Hawaii Shallow-Set Longline Fishery

In a biological opinion dated March 31, 2012 (2012 BiOp), NMFS concluded that the continued operation of the Hawaii shallow-set longline fishery as authorized under the Pelagic FEP is not likely to jeopardize the continued existence of ESA-listed species under NMFS jurisdiction. The 2012 BiOp also issued an ITS for North Pacific loggerhead sea turtles, leatherback sea turtles , olive ridley sea turtles and green sea turtles shown in Table 17. Since the issuance of the 2012 BiOp, the fishery has not exceeded any ITS and the 2012 BiOp remains valid.

On February 27, 2015, the gear from a Hawaii shallow-set longline vessel entangled a fin whale slightly more than 200 miles from the coast of California. The crew released the animal with no gear attached. NMFS preliminarily determined that this interaction did not result in a serious injury because the crew and NMFS observer were able to disentangle the whale after they cut the mainline. The observer recorded only superficial wounds on the whale, the crew released the whale with no gear attached, and the observer saw the whale diving after release. NMFS previously determined that the shallow-set fishery was not likely to adversely affect fin whales based on the discountable likelihood that a fin whale would be hooked or entangled by the shallow-set fishery or hit by a vessel, and because of the low densities of these whales. NMFS evaluated the effects of the Hawaii shallow-set longline fishery on fin whales and determined that the fishery is not likely to adversely affect the species. NMFS documented its determination in a letter of concurrence dated September 16, 2015.

On August 21, 2015, NMFS published a final rule (80 FR 50926) designating critical habitat for the Hawaiian monk seal (*Neomonachus schauinslandi*) in MHI and expanding monk seal critical habitat in the NWHI. In response to the critical habitat designation, NMFS reinitiated ESA section 7 consultation to evaluate the potential impacts of Hawaii deep-set and shallow-set longline fisheries on monk seal critical habitat and determined that the Hawaii shallow-set and deep-set longline fisheries may affect, but are not likely to adversely modify monk seal critical habitat. NMFS documented its determinations in a letter of concurrence dated September 16, 2015.

American Samoa Longline Fisheries

In a biological opinion dated September 16, 2010 (2010 BiOp), NMFS concluded that the continued operation of the American Samoa longline fishery as authorized under the Pelagic FEP is not likely to jeopardize the continued existence of ESA-listed species under NMFS jurisdiction. The 2010 BiOp also issued an ITS for green sea turtles, hawksbill sea turtles, leatherback sea turtles, and olive ridley sea turtles shown in Table 19.

Since the 2010 BiOp was completed, fishery interactions for leatherback sea turtles and olive ridely sea turtles have exceeded the incidental take statement (one) sea turtle of each species over a three year period. Additionally, NMFS recently listed Indo-West Pacific DPS of scalloped hammerhead shark (*Sphyrna lewini*) as threatened under the ESA, and the fishery is known to interact with this species. For these reasons, NMFS reinitiated consultation on May 8, 2015 under section 7 of the ESA to evaluate the effects of the American Samoa longline fishery on ESA-listed species, including the effects on these species under the proposed action. NMFS expects to complete the consultation in mid- October 2015.

Pursuant to 7(a)(2) and 7(d) of the ESA,, NMFS determined that the continued operation of the American Samoa longline fishery, including operations under the proposed action, would not jeopardize the continued existence of any ESA-listed species under NMFS jurisdiction or result in the irreversible or irretrievable commitments of resources that would foreclose the formulation or implementation of any reasonable and prudent alternative measures for the fishery. NMFS documented these determinations in memoranda dated May 8, 2015 and July 21, 2015. NMFS expects to complete the consultation in mid- October 2015.

Guam and the Northern Mariana Islands

In a biological opinion dated March 29, 2001 (2001 BiOp) NMFS determined that the longline fisheries of Guam and the Northern Mariana Islands as authorized under the Pelagic FEP were not likely to jeopardize the continued existence of any ESA-listed species under NMFS jurisdiction and issued an incidental take statement (ITS) for up to 3 hardshell and 1 leatherback sea turtle annually as shown in Table 22 of this document. Since the issuance of the 2001 BiOp, the fishery has not exceeded any ITS and are currently inactive.

5.6 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 NMFS as delegated by the Secretary of Commerce, the authority and duties for all cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions, except walruses). With this responsibility, NMFS required to prepare and periodically review stock assessments of marine mammal stocks.

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. These categories are based on the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. Specifically, the MMPA mandates that each fishery be classified according to whether it has frequent, occasional, or a remote likelihood of or no known incidental mortality or serious injury of marine mammals. A Category 1 fishery is one with frequent incidental morality and serious injury of marine mammals. A Category 2 fishery is one with occasional incidental morality and serious injury of marine mammals. A Category 3 fishery is one with a remote likelihood or no known incidental morality and serious injury of marine mammals.

On December 29, 2014, (79 FR 77919), NMFS published the final LOF for 2015 which classifies the Hawaii deep-set longline fishery as a Category 1, while the Hawaii shallow-set longline fishery and the American Samoa longline fishery are both classified as Category 2 fisheries. Because there has been no documented interaction with marine mammals in longline fisheries of Guam and CNMI and because those fisheries have been inactive since 2011, they are not classified in the 2015 list of fisheries.

Because catches of bigeye tuna by longline fisheries of American Samoa have remained well below the proposed 2,000 mt limit, and because there are no active longline fisheries in Guam or the CNMI, the proposed catch limit of 2,000 mt applicable to each of the U.S. participating territories is not expected to directly result in immediate changes in the conduct of territorial longline fisheries, including gear types used, areas fished, level of catch or effort. Under the proposed allocation limits, Hawaii longline vessels operating under specified fishing agreements would likely continue to operate in a manner consistent with historical fishing patterns and in locations within the EEZ around Hawaii and adjacent high seas throughout the calendar year.

Because the proposed action would not modify vessel operations or other aspects of the longline fisheries of American Samoa, Guam, CNMI and Hawaii, longline fisheries as conducted under the proposed action, are not expected to affect marine mammals in any manner not previously considered or authorized the commercial fishing take exemption under section 118 of the MMPA.

5.7 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) requires a determination that a recommended management measure has no effect on the land, water uses, or natural resources of the coastal zone or is consistent to the maximum extent practicable with an affected state's enforceable coastal zone management program. 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 on July 14, 2015, for review by the appropriate agencies under section 307 of the CZMA.

5.8 National Historic Preservation Act

The National Historic Preservation Act (NHPA) requires federal agencies undergo a review process for all federally funded and permitted projects that will impact sites listed on, or eligible for listing on, the National Register of Historic Places. There are presently no known districts, sites, highways, cultural resources structures or objects listed in or eligible for listing in the National Register of Historic Places in the U.S. EEZ around American Samoa, Guam, CNMI, and Hawaii, or in adjacent areas of the high seas in international waters where pelagic longline fishing activities are conducted.

5.9 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act (PRA) 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 that 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 not previously addressed.

5.10 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 a Regulatory Flexibility Analysis and Final Regulatory Flexibility Analysis (FRFA) for each proposed and final rule, respectively. Under the RFA, an agency does not need to conduct an IRFA or FRFA if a certification can be made that the proposed rule, if adopted, will not have a significant adverse economic impact on a substantial number of small entities.

On June 12, 2014, the Small Business Administration (SBA) issued an interim final rule revising small business size standards, effective July 14, 2014 (79 FR 33647). The rule increased the size standard for finfish fishing from 19.0 to $20.5 million, for shellfish fishing from $5.0 million to $5.5 million, and for other marine fishing from $7.0 million to $7.5 million.

Based on the available information presented in this draft EA, NMFS has determined that all vessels federally permitted under Pelagic FEP are small entities under the SBA's definition of a small entity, i.e., they are engaged in the business of fish harvesting (NAICS Code: 114111), are independently owned or operated, are not dominant in their field of operation, and have annual gross receipts not in excess of $20.5 million.

Even though this proposed action would apply to a substantial number of vessels, the implementation of this action would not result in significant adverse economic impact to individual vessels. Furthermore, there would be little, if any, disproportionate adverse economic

impacts from the proposed rule based on gear type, or relative vessel size. The proposed action also will not place a substantial number of small entities, or any segment of small entities, at a significant competitive disadvantage to large entities. The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration during the proposed rule stage that this action would not have a significant economic impact on a substantial number of small entities. NMFS published the factual basis for the certification in the proposed rule (80 FR 51193, August 24, 2015). NMFS received no comments on this certification; as a result, a regulatory flexibility analysis is not required, and none has been prepared.

5.11 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 certain exceptions.

The proposed 2015 territorial catch and allocation limit action complies with the provisions of the APA. In developing the proposed specifications and AM recommendations, the Council and the SSC held public meetings, provided opportunities for the public to comment on the proposed methods, specifications and recommendations, and the Council considered comments from the public and membership in making its recommendation. On August 24, 2015, NMFS published the proposed specifications, and request for public comments on the action and the draft EA (80 FR 51193); the comment period ended September 8, 2015. After considering public comments, NMFS will publish in the *Federal Register* a final specification, which will become effective 30 days after publication, unless an exception to waive the 30-day delay of effectiveness period applies.

5.12 Executive Order 12898 Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898 (E.O. 12898), "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." E.O. 12898 provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." E.O. 12898 also provides for agencies to collect, maintain, and analyze information on patterns of subsistence consumption of fish, vegetation, or wildlife. That agency action may also affect subsistence patterns of consumption and indicate the potential for disproportionately high and adverse human health or environmental effects on low-income populations, and minority populations. A

memorandum by President Clinton, which accompanied E.O. 12898, made it clear that environmental justice should be considered when conducting NEPA analyses.[22]

The longline fisheries of Hawaii, American Samoa, Guam and the Northern Mariana Islands are not known to have a large adverse environmental effects on stocks of fish that may be caught by subsistence fisherman, or on other marine resources that may be targeted for subsistence consumption. The fishery does not pollute marine waters and so does not have adverse impacts to human health or on marine life. The longline fisheries are also managed through federal regulations which are intended to conserve marine resources and habitats to enhance the economic and social well-being of fishing communities, including members of minority populations and low-income populations.

None of the Alternatives is expected to have large impacts to the environment that would result in a disproportionately large and adverse effect on minority or low-income populations. Therefore, there would not be a disproportionately high and adverse impact to minority or low-income populations with respect to the availability of fish because of the proposed action.

5.13 Executive Order 12866 Regulatory Impact Review

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.

Based on the costs and benefits discusses in the Draft RIR (Appendix D) and the above criteria, none of the alternative appears to have the potential to constitute a "significant" action under the E.O. 12866.

5.14 Information Quality Act

The information in this document complies with the Information Quality Act and NOAA standards (NOAA Information Quality Guidelines, September 30, 2002) that recognize information quality is composed of three elements: utility, integrity, and objectivity. National

[22] "Each Federal agency should analyze the environmental effects, including human health, economic, and social effects of Federal actions, including effects on minority populations, low-income populations, and Indian tribes, when such analysis is required by NEPA. Memorandum from the president to the Heads of Departments and Agencies. Comprehensive
Presidential Documents No. 279 (February 11, 1994).

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, the information product (i.e., this EA) incorporates the best biological, social, and economic information available to date, including the most recent biological information on, and assessment of, the pelagic fishery resources and protected resources, and the most recent information available on fishing communities, including their dependence on pelagic longline fisheries, and up-to-date economic information (landings, revenues, etc.). The policy choices, i.e., proposed management measures, contained in the information product are supported by the available scientific information. The management measures are designed to meet the conservation goals and objectives of the Pelagic FEP and the Magnuson-Stevens Act, and other applicable laws.

The data and analyses used to develop and analyze the measures contained in the information product are presented in this amendment. Furthermore, all reference materials utilized in the discussion and analyses are properly referenced within the appropriate sections of the environmental assessment. The information product was prepared by Council and NMFS staff based on information provided by NMFS Pacific Islands Fisheries Science Center (PIFSC) and NMFS PIRO. The information product was reviewed by PIRO and PIFSC staff, and NMFS Headquarters (including the Office of Sustainable Fisheries). Legal review was performed by NOAA General Counsel Pacific Islands and General Counsel for Enforcement and Litigation for consistency with applicable laws, including but not limited to the Magnuson-Stevens Act, National Environmental Policy Act, Administrative Procedure Act, Paperwork Reduction Act, Coastal Zone Management Act, Endangered Species Act, Marine Mammal Protection Act, and Executive Orders 13132 and 12866.

5.15 Executive Order 13132 – Federalism

The objective of Executive Order 13132 is to guarantee the Constitution's division of governmental responsibilities between the federal government and the states. Federalism Implications (FI) is defined as having substantial direct effects on states or local governments (individually or collectively), on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. This action does not contain policies with FI under E.O. 13132, as it does not impact or alter the relationship between the federal government and the governments of the Territory of American Samoa, the Territory of Guam, the CNMI or the State of Hawaii.

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Appendix A Overview of the Western and Central Pacific Fisheries Commission and Conservation and Management Measures Related to Bigeye Tuna

1. Background

The National Marine Fisheries Service (NMFS) and the Western Pacific Fishery Management Council manage fishing for bigeye tuna and other pelagic management unit species (PMUS) in federal waters of the Exclusive Economic Zone (EEZ; generally 3-200 nautical miles or nm from shore) around American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI) and Hawaii, and on the high seas through the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region (Pelagic FEP) as authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. § 1801 *et seq.*). Fishing for bigeye tuna and other Pelagic MUS by fishing vessel of the United States is also subject to the management of two international regional fishery management organizations – the Western and Central Pacific Fisheries Commission (WCPFC) and the Inter-American Tropical Tuna Commission (IATTC). The WCPFC has authority over fisheries in the Western and Central Pacific Ocean (WCPO) generally west of 150° W. long. north of the Equator and west of 140° W. long. south of the Equator (WCPF Convention Area), while the IATTC has authority for fisheries operating in the Eastern Pacific Ocean (EPO) east of the WCPFO Convention area to the coast of the Americas (Figure 1). The proposed action described in this EA pertains to longline fisheries catching bigeye tuna in the WCPO under the jurisdiction of the WCPFC. Therefore, fisheries in the EPO, and management of the IATTC are not discussed in further detail in this document.

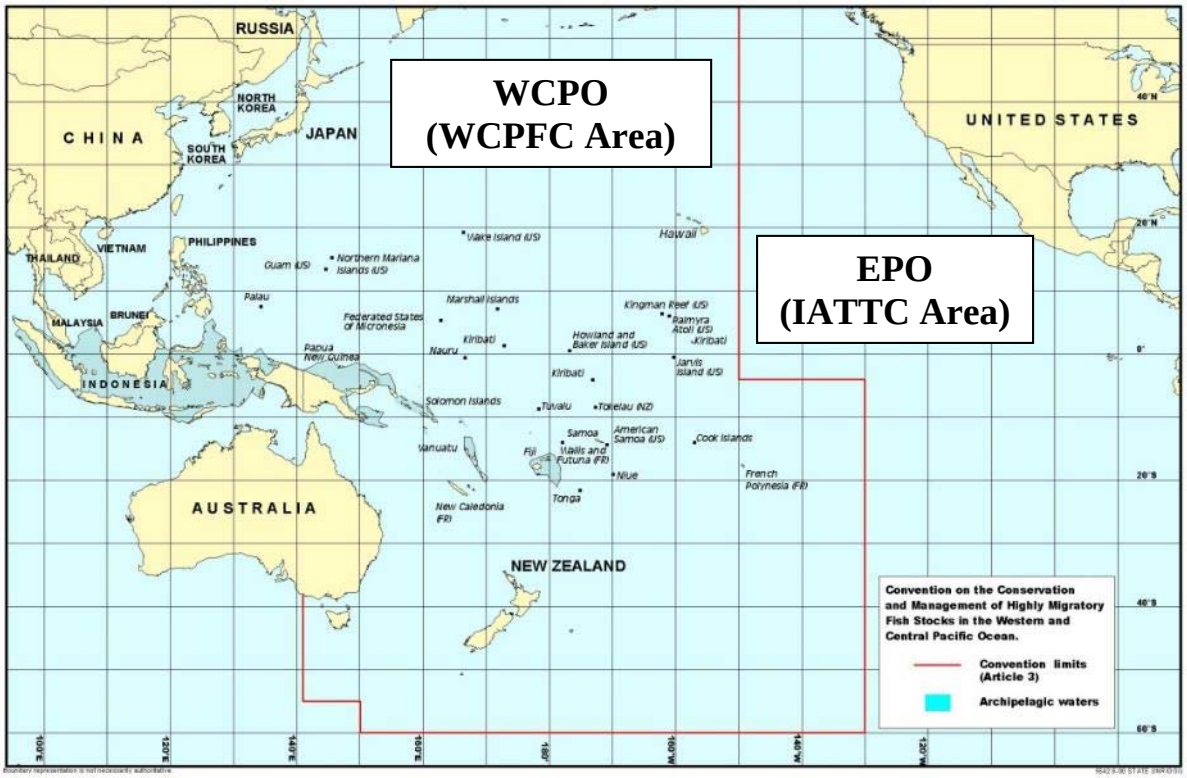

Figure 1. WCPFC and IATTC areas of jurisdiction in the Pacific Ocean

As a signatory to the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention), the United States is a member of WCPFC, along with over 40 other member countries, cooperating non-members, and participating territories. The primary responsibility of the WCPFC is to develop and agree upon conservation and management measures (CMM) for highly migratory species (HMS) caught by fisheries in the WCPO, including bigeye tuna. For the purpose of WCPFC membership, the United States, is a full member, while the U.S. territories of American Samoa, Guam and the CNMI are each a Participating Territory to the WCPFC (hereafter, U.S. participating territory). The U.S. Participating Territories have limited participation rights at WCPFC, as described by Article 43 of the *Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean* (WCPF Convention) and the WCPFC's Rules of Procedure.

Article 1 of the WCPF Convention defines terms used in the WCPF Convention text, including HMS, which includes all fish stocks listed in Annex I of the 1982 United Nations Law of the Sea Convention (UNCLOS) as well as other such species the WCPFC may determine are in need conservation and management. Article 3 of the WCPF Convention states that the WCPF Convention applies to all HMS within the WCPFC Convention Area, and further, that CMMs shall be applied throughout the range of the stocks; in other words, applied to both the high seas and the exclusive economic zones (EEZs) of cooperating members and cooperating non-members.

Article 30 of the WCPF Convention recognizes the special needs of SIDS and PTs. Among other provisions, Article 30 provides that CMMs should take into account that SIDS and PTs are economically vulnerable and heavily dependent on their fisheries, and should not be placed at a disadvantage in developing their fisheries as a result of measures intended to reduce the impact on tuna and other fish stocks by more developed nations. In recognition of these circumstances, CMMs adopted by the WCPFC recognize that SIDS and PTs have unique challenges in participating in some fisheries, and are often provided exceptions or special consideration with regards to allocations of fishing privileges. In addition, the WCPFC recently agreed to CMM 2013-07, which identifies several issues associated with the special requirements of SIDS and PTs, including supporting domestic fisheries, tuna related businesses, and market access. As U.S. participating territories to the WCPFC, American Samoa, Guam and the CNMI participate in all WCPFC meetings and subsidiary bodies; however, are unable to vote on procedural and substantive matters before the WCPFC.

The WCPFC has developed and agreed on several CMMs for WCPO HMS stocks since its 1st Regular Meeting in 2004. These CMMs include a mix of catch and effort limits, requirements for vessel monitoring systems, observer coverage, high seas boarding and inspection, and at-sea transshipment. To date, the WCPFC has only agreed on catch limits for bigeye and yellowfin tunas and striped marlin, although there are no currently agreed upon limits for yellowfin tuna.[23]

Generally, when WCPFC members endorse a fishery management measure, the individual members are responsible for implementing the requirements under domestic regulations for their fisheries and vessels flying their flag. Therefore, NMFS implements CMMs agreed to by the

[23] The WCPFC plans to formulate and adopt appropriate yellowfin tuna limits at the 2015 WCPFC meeting.

WCPFC as may be necessary to carry out the U.S. obligations under the authority of the Western and Central Pacific Fisheries Convention Implementation Act (WCPFCIA; 16 U.S.C. § 6901, *et seq*.). Table 1 lists recent CMMs developed and agreed to by the WCPFC for HMS in the WCPO.

Table 1. Recent WCPFC Conservation and Management Measures for HMS in the WCPO

Fish stock and WCPFC CMM number	**Measure**	**Exemption for SIDS/PTs**
S. Pac. Albacore (2010-05)	Limit vessels fishing for S. Pac. albacore S. of 20° S at 2005 levels	Yes
S. Pac. Swordfish (2009-03)	Limit vessels fishing for swordfish S. of 20° S between 2000-2005 and limit catch any amount between 2000-2006	Yes
SW Pac. Striped Marlin (2006-04)	Limit vessels fishing for SW Pacific striped marlin S. of 15° S to 2000-2004 levels.	Yes
N. Pac. Striped Marlin (2010-01)	Limit catch for NP striped marlin from highest years between 2000-2003 and reductions of 10% in 2011, 15% in 2012, and 20% in 2013	Yes
N. Pac. Albacore (2005-03)	Limit fishing effort for N. Pac. albacore to 2005 levels	Yes
Pacific Bluefin Tuna (2010-04)	Limit fishing effort for Pac. bluefin tuna N. of 20° N to 2002-2004 levels for 2011 and 2012	Yes
Bigeye Tuna (2008-01) (2011-01) (2012-01) (2013-01) (2014-01)	Limits on purse seine fishing effort in EEZ and high seas; Purse seasonal FAD closures; Longline bigeye catch limits.	Yes (exempt for longline limits)

Source: WCPFC website at http://www.wcpfc.int., accessed on May 1, 2015.
For more information on these measures, see www.wcpfc.int. For U.S. implementation of WCPFC measures see: http://www.fpir.noaa.gov/IFD/ifd_index.html.

2. Conservation and Management Measures for Bigeye Tuna in the WCPO

CMM 2008-01

In the WCPO, bigeye tuna has been experiencing overfishing since 2004 (69 FR 78397, December 30, 2004), but is not considered overfished according to stock status determination criteria described in the Pelagic FEP (WPFMC 2009). The area in the WCPO with the highest fishing mortality is along the tropical zone between 20 degrees North and 10 degrees South

latitudes. The WCPO purse seine fisheries and surface fisheries of Indonesia and the Philippines have an equal to or greater impact on the stock status of bigeye tuna compared the other longline fisheries in the same region. The 2011 stock assessment for bigeye tuna in the WCPO concluded that the level of maximum sustainable yield (MSY) for bigeye tuna would rise if the mortality of small fish were reduced, allowing for greater overall yields to be sustainably attained (Davies et al. 2011).

At its 5th Regular Session held December 8-12, 2008, in Busan, Korea, the WCPFC, adopted CMM 2008-01, with the objective of reducing bigeye tuna fishing mortality by 30 percent from 2001-2004 levels. CMM 2008-01 required WCPFC members to implement the following measures for their purse seine fisheries:

- fishing effort limits for the high seas and EEZ at 2001-2004 levels;
- seasonal FAD closure period (2 months in 2009 and 3 months in 2010 and 2011);
- closure of Western Pacific high seas pockets in 2010 and 2011;
- full catch retention in 2010 and 2011; and
- 100 percent observer coverage if fishing during the FAD closure period in 2009, as well as 100 percent observer coverage for the entire years in 2010 and 2011.

CMM 2008-01 also established annual longline catch limits that would reduce bigeye tuna catches over a three-year period (2009-2011) by 30 percent of the 2001-2004 baseline catch levels identified in Attachment F of that measure. CMM 2008-01 also required that fresh fish longline fisheries (those that did not freeze fish at sea), which caught less than 5,000 mt per year reduce longline landings of bigeye tuna by 10 percent of 2004 catch levels. As the only fresh fish longline fishery in the WCPO, this provision effectively applied only to the United States Hawaii-based longline fishery. For the U.S., the 10 percent reduction of its 2004 level of catch resulted in a limit of 3,763 mt. CMM 2008-01 also established a 2,000 mt longline bigeye tuna catch limit for SIDS and PTs; however, the 2,000-mt limit did not apply to SIDS or PTs conducting responsible fisheries development.[24] Thus, SIDS and PTs conducting responsible fisheries development had no bigeye tuna catch limit.

CMM 2011-01 and CMM 2012-01

At its 8th Regular Session held March 26-30, 2012, in Guam, the WCPFC adopted CMM 2011-01, which extended the provisions of CMM 2008-01 as interim measures for 2012. Then, at its 9th Regular Session held December 2-6, 2012 in Manila, Philippines, the WCPFC adopted CMM 2012-01, which again extended the provisions of CMM 2008-01 for 2013. CMM 2012-01 also maintained longline bigeye tuna catch limits for distant water fleets.For the U.S., the 2013 limit remained at 3,763 mt, but CMM 2012-01 did not provide annual longline bigeye tuna catch limits for any of the PTs or SIDS. Thus, the U.S. territories of American Samoa, Guam and the CNMI were not subject to a bigeye tuna limit in 2013. CMM 2012-01 also increased the FAD closure by a month, requiring a four-month purse seine FAD closure or equivalent reduction in

[24] WCPFC CMM 2008-01, paragraph 34. The term "responsible fisheries development" is undefined in CMM 2008-01.

purse seine FAD sets. CMM 2012-01 also established a new goal of reducing bigeye tuna mortality to a level $F/F_{MSY} \leq 1$[25], through a step-by-step approach through 2017.

Also at this meeting, the WCPFC agreed to a charter notification measure that applies to WCPFC members and PTs that charter, lease or enter into other mechanisms with eligible vessels[26] flagged to a another State or Fishing Entity for the purpose of conducting fishing operations in the Convention Area as an integral part of the domestic fleet of that chartering Member or Participating Territory (CMM 2012-05).[27] This measure directs WCPFC members and cooperating non-members to cooperate further on issues of attribution of catch and effort by chartered vessels.

CMM 2013-01

At its 10th Regular Session held December 2-6, 2013, in Cairns, Australia, the WCPFC reviewed the effectiveness of CMM 2008-01 in meeting the objective of reducing bigeye tuna fishing mortality by 30 percent from 2001-2004 levels. In a report to the WCPFC, Williams and Terawasi (2013) found that WCPO longline fisheries reduced landings of bigeye tuna by approximately 20 percent from baseline levels (2001-2004 average, or 2004 catch levels). However, catch of bigeye tuna by WCPO purse seine fisheries increased to record levels in 2011 (Williams and Terawasi 2013). The WCPFC then agreed on CMM 2013-01, which builds off of CMM 2012-01.

To address impacts to bigeye by purse seine fisheries, CMM 2013-01 required WCPFC members with purse seine fisheries to implement in 2014, a 4 month fish aggregation device (FAD) closure, or 3 month FAD closure, plus a flag-based FAD set limits shown in Attachment A of the measure. For years 2015 and 2016, WCPFC members with purse seine fisheries could either choose to restrict their vessels to a 5 month FAD closure, plus limiting their vessels to their 2010-2012 FAD set average, or restrict their vessels to a 3 month FAD closure, plus restrict their vessels to FAD set limits shown in Attachment A of the measure. For 2017, WCPFC members shall follow the purse seine options available for 2015 and 2016, in addition to prohibiting their vessels from FAD sets on the high seas for the entire calendar year. Under CMM 2013-01, implementing the fifth month of FAD closure was conditional upon the WCPFC determining that the extra month FAD closure did not place a disproportionate conservation burden on SIDS.

To address impacts to bigeye by longline fisheries, CMM 2013-01 established flag-based bigeye catch limits through 2017 representing a 15% reduction from the limits established in CMM

[25] F/F_{MSY} is defined as the ratio of the fishing mortality rate (F; catch relative to the size of the stock) to the fishing mortality when the stock is being fished at maximum sustainable yield (F_{MSY}; the largest catch that can be taken from a specific fish stock over an indefinite period under constant environmental conditions). If the ratio is less than 1, fishing mortality (F) on the stock is sustainable.

[26] Only vessels listed on the WCPFC Record of Fishing Vessels or the WCPFC Interim Register of Non-CCM Carriers and Bunkers, and not on the WCPFC IUU vessel list, or IUU List of another RFMO, are eligible for charter (CMM 2012-05 para. 4).

[27] Vessel chartering arrangements are a common tool for fisheries development in the WCPO where one party has vessels to offer and the other party has available resources or an allocation of such resources that it needs assistance in harvesting. Vessel chartering often involves foreign vessels being chartered by a chartering entity (government or business) where the vessel can fish on behalf of the chartering entity without having to reflag.

2012-01, and approximately a 40% reduction from limits established under CMM 2008-01. The measure also requires any overage of a catch limit by a WCPFC member country to be deducted from the catch limit for the following year. As previously mentioned, the U.S. territories for the purposes of WCPFC membership and decisions are considered a Participating Territory to the WCPFC, and are, accordingly, not subject to the U.S. bigeye tuna limit.

Under CMM 2013-01, the US WCPO longline bigeye limit for 2014 was maintained at 3,763 mt, but is reduced 5.5 percent to 3,554 mt in 2015 and 2016. For 2017, CMM 2013-01 reduces the US longline limit to 3,345 mt, which represent an 11% reduction from the 3,763 mt level. If the reductions to the U.S. limit from CMM 2008-01 to CMM 2013-01 are taken collectively, the US longline bigeye limit of 3,345 mt represents a 20 percent reduction from the 2004 baseline level used in CMM 2008-01.

CMM 2013-01 also clarified that the flag-based catch limits do not apply to members that caught less than 2,000 mt in 2004. However, CMM 2013-01directed each WCPFC member country that caught less than 2,000 mt of bigeye in 2004 to ensure that their catch does not exceed 2,000 mt in 2014, 2015, 2016 and 2017. Paragraph 7 of CMM 2013-01 also makes clear, however, clarified that nothing in CMM 2013-01 shall prejudice the rights and obligations of SIDS and PTs seeking to develop their domestic fisheries. Pursuant to paragraph 7, the 2,000 mt bigeye tuna catch limit also does not apply to SIDS and PTs, including the U.S. territories.

Because the U.S. territories did not land more than 2,000 mt of bigeye tuna, the U.S. WCPO longline bigeye tuna catch limit did not apply to them. CMM 2013-01 also continues the goal of reducing bigeye tuna mortality to a level no greater than F_{MSY} (i.e., $F/F_{MSY} \leq 1.0$) through a step-by-step approach through 2017, as previously established in CMM 2012-01.

CMM 2014-01

At its 11th Regular Session held December 1-5, 2014 in Apia, Samoa, the WCPFC adopted CMM 2014-01, which essentially re-iterates the provisions of CMM 2013-01 described above. CMM 2014-01 also maintains the goal of reducing bigeye tuna mortality to a level no greater than F_{MSY}

3. U.S. Implementation of Conservation and Management Measures for Bigeye Tuna

Implementation of CMM 2008-01

In accordance with CMM 2008-01, NMFS in 2009, implemented the U.S. longline bigeye tuna catch limit of 3,763 mt (74 FR 63999, December 7, 2009) under the authority of the WCPFCIA. That limit, applicable in 2009, 2010 and 2011, represented a 10% reduction of the 2004 baseline U.S. longline bigeye tuna catch of 4,181 mt, and applied to U.S. longline vessels based in Hawaii and west Coast (i.e., California, Washington and Oregon) that fished in the WCPO. Although CMM 2008-01 established a separate catch limit of 2,000 mt for SIDs and PTs, given the fact that the historical bigeye tuna catches in American Samoa, Guam and the CNMI were below the 2,000 mt limit, NMFS determined there was no need to establish a limit for longline fisheries of the U.S. participating territories for 2009, 2010 and 2011. Furthermore, bigeye tuna landed by

longline fisheries in American Samoa, Guam or the CNMI were not counted against the U.S. limit, and were reported separately to the WCPFC.

In implementing the U.S. bigeye tuna limit, WCPFCIA regulations at 50 CFR 300.224 requires that when NMFS projects the limit would be reached, NMFS prohibits the retention, transshipment and landing of bigeye tuna by federally permitted vessels of the Hawaii longline fishery in the WCPO through the remainder of the year, with certain exceptions. Specifically, NMFS determined that bigeye tuna caught by a vessel registered for use with an American Samoa longline fishing permit, and landed in Hawaii would not count against the U.S. limit provided that the bigeye tuna were not caught in the U.S. EEZ around Hawaii, and were landed in compliance U.S. West Coast fishing regulations at 50 CFR 660.707 and Western Pacific fishing regulations at 50 CFR 665.801. This provision recognized that vessels operating with a valid American Samoa longline permit have established a sufficiently close connection with American Samoa such that catch on the high seas may be attributed to American Samoa, regardless of where they are landed. For example, fish caught outside of the EEZ around Hawaii may be landed in Hawaii and attributed to American Samoa so long as the vessel landing the fish possesses a valid Hawaii limited access permit and an American Samoa limited access permit. Since 2004, the annual bigeye tuna catches made by these dual-permitted vessels have been less than 400 mt.

Fishery Performance in 2009 and 2010 under CMM 2008-01

In 2009 and 2010, NMFS projected the U.S. bigeye tuna limit would be reached, in December and November, respectively, and NMFS issued a notice in the *Federal Register* restricting vessels from retaining bigeye tuna in the WCPO for the remainder of each year (74 FR 68190, December 23, 2009; and 75 FR 68725, November 9, 2010). Under the restriction, only bigeye tuna caught in the EPO, or by vessels fishing under dual Hawaii and American Samoa longline permits fishing on the high seas could land bigeye tuna in Hawaii. Due to the proximity of the EPO to the main Hawaiian Islands (approximately 120 east of Hilo, Hawaii), Hawaii longline vessels do fish in the EPO on a regular basis throughout the year, but the majority of their EPO effort is in the summer months.

In November 2011, the U.S. Congress passed the Consolidated and Further Continuing Appropriations Act of 2012 or CFCAA (Pub. Law 112-55, 125 Stat. 552 *et seq*.). Section 113 of the CFCAA (hereafter Section 113) authorized U.S. participating territories to use, assign, allocate and manage their catch and effort for highly migratory fish stocks (HMS), including PMUS, through fishing arrangement with U.S. vessels permitted under the Pelagic FEP to support fisheries development in the U.S. participating territories. Section 113 also determined that vessels under such arrangements are integral to the domestic fisheries of the U.S. participating territories, provided that arrangements do not impose requirements regarding where the vessels must fish or land their catch, and that arrangements be funded by deposits to the Western Pacific Sustainable Fisheries Fund in support of fisheries development projects identified in a U.S. participating territory's MCP. Section 113 also required the Secretary (through NMFS) to attribute catches made by vessels operating under fishing arrangements to the U.S. participating territories for the purposes of annual reporting to the WCPFC, and directed the Council to recommend an amendment to the Pelagic FEP and associated regulations to

implement Section 113 under the authority of the Magnuson-Stevens Act. Section 113 was later extended through the end of 2013 by the Commerce, Justice, Science and Related Agencies Appropriations Act of 2013 (Pub. Law 113-6, 125 Stat. 603, Section 110, the Department of Commerce Appropriations Act, 2013).

In 2011, the U.S. bigeye tuna limit was not reached because Hawaii-based longline vessels operated under provisions of Section 113.

Implementation of CMM 2011-01, CMM 2012-01 and CMM 2013-01

In accordance with CMMs 2011-01 and 2012-01, NMFS implemented the U.S. longline bigeye tuna catch limit of 3,763 mt for 2012 (August 27, 2012, 77 FR 51709). As CMM 2011-01 and 2012-01 did not provide annual longline bigeye tuna catch limits for any of the PTs or SIDS, NMFS did not implement a catch limit for the U.S. participating territories in 2012. Consistent with CMM 2013-01, NMFS again implemented the U.S. longline bigeye tuna catch limit of 3,763 mt for 2013 and 2014 (September 23, 2013, 78 FR 58240).

In 2012 and 2013, the U.S. bigeye tuna limit was not reached because Hawaii-based longline vessels operated under provisions of Section 113.

The Council in 2014, developed and NMFS approved Amendment 7 to the Pelagic FEP implementing provisions of Section 113 under the Magnuson-Stevens Act (WPFMC and NMFS 2014). In that year, the U.S. bigeye tuna limit again was not reached because Hawaii-based longline vessels operated under provisions of Amendment 7 to the Pelagic FEP,

Implementation of CMM 2014-01

On July 23, 2015, NMFS published an interim final rule to implement U.S. bigeye tuna catch limit specifications applicable to the U.S. longline fleet for 2015, 2016 and 2017. For 2015, the U.S. longline bigeye tuna catch limits is 3,502 mt. While the WCPFC adopted limit for the United States in 2015 and 2016 is 3,554 mt, NMFS, in accordance with CMM 2013-01 and CMM 2014-01, reduced the 2015 WCPFC-adopted limit of 3,554 mt to 3,502 mt because NMFS determined the 2014 bigeye tuna catches were 3,815 mt and exceed the 2014 catch limit of 3,763 mt by 52 mt. For 2016 and 2017, the limit will be 3,554 mt and 3,345 mt, respectively, unless reduced by NMFS due to an overage in a preceding year.

Based on 2015 levels of bigeye tuna catch by longline vessels to which the limit applies, NMFS forecasted the U.S. bigeye tuna limit was reached on August 5, 2015, and prohibited the retention of longline caught bigeye tuna in the WCPO through the end of the year (80 FR 44883, July 28, 2015).

4. Territory Interest in Responsibly Developing Their Fisheries

Pelagic fishing fleets of American Samoa, CNMI, and Guam currently do not target bigeye tuna and do not locally harvest more than 1,000 mt of bigeye tuna collectively on an annual basis. For example, the longline fleet based in American Samoa, which targets albacore, catches

approximately 250-400 mt of bigeye tuna each year, and its small-vessel troll fleet catches very few, if any bigeye tuna (WPFMC in prep). From 2009 to 2012 up to four longline vessels fished around Guam and CNMI; however, fishing effort was low and sporadic and, therefore, catches of bigeye tuna were less than 100 mt per year. These vessels are no longer operating in Guam and CNMI (WPFMC 2012). High operating costs associated with vessel-docking in Saipan along with poor market access are believed to be contributing factors to the recent halt of longline fishing in the Marianas.

While longline fisheries in the U.S. participating territories do not currently harvest substantial amounts of bigeye tuna, responsibly developing their fisheries, as aspired to by other SIDS and PTs, would promote economic growth and food security. For example, the ex-vessel value of all longline caught bigeye tuna from the WCPO in 2012 was over $800 million, yet bigeye tuna catches from all of the SIDS and PTs represent less than 10 percent of the total WCPO bigeye tuna longline catches (Williams and Terawasi 2013). This suggests that the revenues derived by longline fishing for bigeye tuna in the WCPO are skewed towards distant water fishing nations. Longline catches of bigeye tuna in the WCPO are dominated by Japan, Korea, China, and Chinese Taipei (see Tables 5, 6, and 7). For example, under CMM 2013-01 the 2014 U.S. longline limit for WCPO bigeye tuna was 3,763 mt per year, whereas Japan's 2014 longline limit for bigeye tuna is 19,670 mt, even though Japan harvested approximately 12,000 mt of bigeye in 2012.

For fisheries development in the U.S. participating territories, the Council acknowledges that one of the Findings of the Magnuson-Stevens Act is that:

> *"Pacific Insular Areas (American Samoa, Guam and the CNMI) contain unique historical, cultural, legal, political, and geographical circumstances which make fisheries resources important in sustaining their economic growth (Section 2 "Findings" para. 10)."*

The Council further acknowledges that one of the policies of the Magnuson-Stevens Act is:

> *"to ensure that the fishery resources adjacent to a Pacific Insular Area, including resident or migratory stocks within the exclusive economic zone adjacent to such areas, be explored, developed, conserved, and managed for the benefit of the people of such area and of the United States (Section 2 "Policy" para. 7)."*

In demonstrating interest in responsibly developing their fisheries, each U.S. participating territory has developed a marine conservation plan (MCP)[28], which include several fishery development projects (77 FR 58813, September 24, 2012; 79 FR 43399, July 25, 2014; 79 FR 47095, August 12, 2014)

[28] Pursuant to Section 204(e)(4) of the Magnuson-Stevens Act, Marine Conservation Plans are developed by the Governors of each U.S. territory and approved by the Council and Secretary of Commerce.

Appendix B Evaluation of CMM 2013-01

COMMISSION
ELEVENTH REGULAR SESSION
Faleata Sports Complex, Apia, SAMOA
1-5 December 2014

EVALUATION OF CMM 2013-01

WCPFC11-2014-15
4 November 2014

Paper by SPC Ocdeanic Fisheries Programme

Evaluation of CMM 2013-01

Overview

CMM 2013-01 has the stated objective that "bigeye, yellowfin and skipjack tuna stocks are, at a minimum, maintained at levels capable of producing their maximum sustainable yield as qualified by relevant environmental and economic factors including the special requirements of developing States …". In addition, the CMM states that the level of fishing mortality on these stocks "will be maintained at a level no greater than F_{MSY}, i.e. $F/F_{MSY} \leq 1$."

To achieve these objectives, the CMM comprises a number of individual measures to be implemented over the period 2014-2017. The measures of substance for the purpose of this evaluation comprise:

- Seasonal FAD closures, or annual FAD set limits;
- A FAD closure on the high seas (or verifiable reductions in purse seine bigeye catch) (from 2017);
- Purse seine effort restrictions in EEZs to historical levels – 2010 for PNA countries; 2010 or 2001-2004 average for non-PNA countries with purse seine effort exceeding 1,500 days annually over the period 2006-2010; and self-declared EEZ purse seine limits for all other countries;
- Specified purse seine effort limits for non-SIDS for the high seas; and
- Flag-based longline bigeye catch limits – for flag states that caught >2,000 mt of bigeye in 2004, the limits are specified (China, Indonesia, Japan, Korea, Chinese Taipei and United States). Non-SIDS that caught <2,000 mt of bigeye in 2004, are limited to 2,000 mt (Australia, EU, New Zealand, Philippines. The domestic fleets of SIDS are exempted from this measure.

This paper aims to:

1. Estimate in simple terms the levels of associated (ASS) and unassociated (UNA) set purse seine effort and longline bigeye catch that would result from adherence to the CMM. This estimation requires a number of simplifying assumptions that are detailed in the paper. Since our evaluation uses long-term indicators, we estimate the levels of catch and effort resulting from the full (as at 2017) implementation of the CMM and assume that these would be in place thereafter.
2. Express these levels of purse seine effort and longline bigeye catch as scalars relative to observed (or reported) levels of these quantities for 2012.
3. Use the estimated purse seine effort and longline catch scalars in bigeye tuna stock projections to evaluate the outcomes in relation to the stated objectives of the CMM regarding bigeye tuna. The main indicators used are the spawning biomass at the end of the 20 year projection in relation to the average unfished level in 2002-2011 ($SB_{2032}/SB_{F=0}$, and specifically in relation to the agreed limit reference point of 0.2) and the fishing mortality at the end of the projection period in relation to the fishing mortality at maximum sustainable yield (F_{2032}/F_{MSY}). The outcomes of the CMM for skipjack and yellowfin tuna are not covered explicitly in this paper, but are dealt with elsewhere.

The key findings are that

- If future recruitment remains on average consistent with recent (2002-2011) levels, the CMM will reduce the risk of the spawning biomass falling below the limit reference point (LRP) to 4%,

relative to the status quo (2012) risk of 32%, and will reduce the median level of fishing mortality to approximately the MSY level.

- If future recruitment occurs at a lower level consistent with the long-term estimates, the CMM will reduce the risk of breaching the LRP, but the reduced risk (74%) is still high. Also, the CMM will reduce the level of fishing mortality, but it would remain above the MSY level.
- It is suggested that, for the purpose of evaluating the CMM and any proposed alternatives, the Commission focus on the recent recruitment projection scenarios, as recommended by SC6.

Evaluation approach

Estimating purse seine effort and longline catch levels consistent with CMM 2013-01

Undertaking a quantitative evaluation of the outcomes of CMM 2013-01 requires some interpretation of the text of the CMM in order to estimate the most likely resulting purse seine effort and longline catch levels that would result. The following table outlines the approach that has been taken in relation to the relevant paragraphs of the CMM. Since we are evaluating the long-term impact of maintaining the measures of the CMM using equilibrium indicators, it is appropriate just to consider the final form of the measures (i.e., 2017) and assume that this is maintained into the future.

Relevant paragraphs of CMM 2013-01	Evaluation Approach
Objectives	
1	We use the spawning biomass depletion ratio, SB/SBF0, since this is the metric of the limit reference point (LRP) formally adopted by WCPFC (0.2SBF0). Projections are run to equilibrium over 20 years. The indicators are for the end of this period.
3	FMSY is also a performance indicator.
Area of application	
11	The area of application does not include archipelagic waters (AW). The evaluation will necessarily be for the WCPO rather than the WCPFC Convention Area because of the structure of the assessment models.
12	No guidance is given regarding level of AW reductions; we assume 2012 levels of effort will continue.
Overlap area	
13	The catch and effort data used in tropical tuna assessments do NOT include activities in the overlap area. Therefore, the evaluation of the measure is for the WCPO not the WCPFC Convention Area. This will not significantly impact the results of the evaluation.
FAD set management	
14-17	A FAD closure of 4 months in 2014 (Jul-Oct). FAD set restriction in lieu of 4th month has been chosen only by Japan, FSM and Kiribati. There is an additional 2 month closure from 2015 (Jan-Feb) and October drops off as a closure month, however implementation of this measure is conditional upon WCPFC11 agreeing to arrangements to ensure that a disproportionate burden on conservation action is not transferred onto SIDS. Since we are interested in long-term performance, we do not evaluate the effect of transitional measures, just the final (2017) total measure. Also, the alternative year-round FAD-set limit that can be chosen in lieu of the Jan-Feb closure for simplicity is assumed to be equivalent in effect (if any CCM choses this) to the closure. We assume therefore that the long-term measure is equivalent to a 5 month (Jan-Feb, Jul-Sep) FAD closure.
18	The high seas FAD closure scheduled for introduction in 2017 could result in some reduction in purse seine FAD effort; however it is difficult to say to what extent this will occur.
19	As noted above, we do not attempt to explicitly model FAD set limits. We assume recent average ASS/UNA mix, and that FAD closures adopted by everyone will be equivalent in effect to a small number of CCMs opting for FAD set measures.
Purse seine effort control	
20-27	For simplicity, we assume that purse seine total effort in EEZs and high seas will be as per 2010, which represents a substantial decrease on 2013 (and likely 2014). This assumption means that we

	do not expect EEZs where purse seine effort has been less than 1500 days annually over 2006-2010 to suddenly attract a lot of effort. Effort in AW is assumed to be as per 2012.
Longline fishery – bigeye catch limits	
40-42	Longline catch limits are not completely specified. We have assumed that those fleets with specified limits in excess of 2,000 mt will take those limits and all other fleets will continue to operate at 2012 levels.
Other commercial fisheries	
46-48	There are neither estimates of capacity nor effort for the majority of fisheries in this category; therefore, we assume continuation of 2012 catch levels.
Capacity management	
49-55	Not relevant to the evaluation, assuming that total effort and catch measures are adhered to.

Estimation of scalars for purse seine associated effort and longline catch

For **purse seine effort**, it is estimated that the extension of the FAD closure to 5 months would reduce 2012 ASS purse seine effort by a factor of **0.78**. In other words, it is estimated that the amount of purse seine ASS effort allowed by the CMM is 78% of the 2012 level of purse seine ASS effort. It is further assumed that UNA purse seine effort would rise by an amount equivalent to the ASS decrease, thus maintaining the total amount of purse seine effort at the 2012 level (which is very close to the 2010 level). Embedded in this calculation is the assumption that purse seine ASS effort in archipelagic waters would remain at the 2012 level since it is beyond the scope of the measure. We note that the adoption of the Jan-Feb FAD closure in addition of the Jul-Sep closure in conditional on a decision by WCPFC11, and so it is not certain to be implemented. If it is not, then the 2014 arrangements of a Jul-Sep closure, plus an Oct closure or flag-based annual FAD set limits, will continue. If this occurs, then the extent of reduction in purse seine ASS effort will have been over-estimated by the 0.78 scalar. On the other hand, we have not attempted in this evaluation to model the high-seas FAD closure scheduled for introduction in 2017. This could result in some reduction in purse seine FAD fishing if such activity is not simply transferred into EEZs. If such a reduction does result from this measure, then the extent of reduction in purse seine ASS effort may be somewhat under-estimated by the 0.78 scalar.

For **longline catch**, we assume that the catches of those fleets having 2,000 mt limits and the fleets of SIDS for which no limits are defined by the CMM, are continued at their 2012 levels. Catches by Vietnam are included in the 2014 bigeye tuna stock assessment, but are not limited by the CMM due to the uncertain status of the South China Sea in the WCPFC Convention. The reported 2012 catch by Vietnam of 3,761 mt is assumed to continue. Under these assumptions, the longline catch would be reduced to 87% of the 2012 catch, therefore the scalar is **0.87**. It is noted that flag States with longline catches of bigeye of less than 2,000 mt could increase to this level and remain compliant with the CMM. Also, SIDS longline fleets are currently unrestricted and could increase to any level under the CMM. If either of these things should occur, then the extent of reduction of longline catch will be over-estimated by the 1.87 scalar.

For all other fisheries, it is assumed that 2012 catches are continued into the future.

Projections

The analysis of the impact of the potential reductions of purse seine ASS effort and longline catch is conducted using the full uncertainty framework approach endorsed by SC10, i.e.

- Projections are conducted using 9 separate model runs, and weighted as per the decision of SC10:

Run name	Model Description	Relative weight
037_L0W0T0M0H0	Reference case	1.0
038_L0W0T0M0H1	Low steepness	0.8
039_L0W0T0M0H2	High steepness	0.8
043_L0W0T1M0H0	Fast mixing	0.8
044_L0W0T1M0H1	Fast mixing | low steepness	0.64
045_L0W0T1M0H2	Fast mixing | high steepness	0.64
049_L0W0T2M0H0	Exclude Coral Sea	1.0
050_L0W0T2M0H1	Exclude Coral Sea | low steepness	0.8
051_L0W0T2M0H2	Exclude Coral Sea | high steepness	0.8

- For each model run, 200 projections are run for the estimated purse seine ASS effort and longline catch provisions of CMM 2013-01. The outputs of the projections – $SB_{2032}/SB_{F=0}$ and F_{2032}/F_{MSY} – are combined across the 9 model runs, weighted as shown in the table above.

- Future recruitment in the projections is determined by randomly sampling from either (i) the 2002-2011 recruitment deviations from the stock-recruitment relationship estimated in the 2014 assessment model runs shown in the table above; or (ii) the 1962-2011 recruitment deviations from the stock recruitment relationship estimated in the 2014 assessment model runs. These alternatives have previously been shown to have quite different projection outcomes (Pilling et al. 2014), with alternative (i) effectively assuming that the above-average recruitment conditions of the past 10 years will continue into the future, and alternatively (ii) assuming that the long-term average recruitment conditions, which are lower than in the past 10 years, will determine future recruitment. The outcomes from both of these future recruitment hypotheses are presented.

Results

Figure 1 shows the aggregate distributions of the reference point variables in 2032 for both the status quo (2012) and the purse seine ASS effort and longline catch assumed to occur under CMM 2013-01, under the hypothesis that future recruitment remains on average consistent with 2002-2011 conditions. The impact of the CMM conditions is apparent by shifting of the $SB_{2032}/SB_{F=0}$ distribution to the right towards higher relative biomass levels and shifting of the F_{2032}/F_{MSY} distribution to the left, towards lower fishing mortality. Under this future recruitment hypothesis, the risk of breaching the LRP is reduced from 32% to 4% (Table 1) and the median value of $SB_{2032}/SB_{F=0}$ increased from 0.24 to 0.31 (Table 2). The probability of fishing mortality exceeding F_{MSY} is reduced from 72% under the status quo to 48% under CMM 2013-01 (Table 1) while the median F_{2032}/F_{MSY} is reduced from 1.21 to 0.99 (Table 2).

Figure 2 shows the same set of distributions, but under the alternative hypothesis that future recruitment remains on average consistent with long-term (1962-2011) conditions. In this case, the impact of the CMM is also evident, with the biomass and fishing mortality distributions shifted to higher and lower levels of biomass and fishing mortality, respectively. However, while the risk of breaching the

LRP is reduced (from 94% to 74% - Table 1) it still remains high, with the median value of $SB_{2032}/SB_{F=0}$ increased from 0.08 to 0.15 (Table 2). Also, the CMM would reduce the median F_{2032}/F_{MSY} from 1.91 to 1.44 (Table 2), i.e., it would remain above the MSY level.

Discussion

CMM 2013-01 has been evaluated using stochastic projections (incorporating random variation of future recruitment from assumed distributions) across a range of weighted models as agreed by SC10. This approach is superior to the previous approach of evaluating management measures using deterministic projections for just a base-case model because it incorporates the essential elements of uncertainty and can thus express the results in the form of a risk assessment (consistent with the Kobe 2 Strategy Matrix approach).

Two main difficulties were encountered in evaluating the CMM. First, it is not possible to define precisely what levels of purse seine effort and longline catch will result from the CMM. There are a numbers of "either/or" choices, exemptions or exclusions and decisions yet to be made with respect to some measures that make it impossible to predict the outcomes in terms of actual future catch and effort levels. We have made hopefully sensible assumptions, but there is obviously no certainty that they are correct.

The second difficulty encountered is the very different outcomes that are obtained for the different underlying assumptions of how future recruitment might occur. The assumption that future recruitment will generally be consistent with recent (2002-2011) levels indicates that the CMM will reduce the risk of spawning biomass falling below the agreed LRP of 0.2 $SB_{F=0}$ to an acceptable level of 4%. However, if future recruitment would be more consistent with the lower long-term conditions, the risk of the spawning biomass remaining below the LRP would remain high (74%). When these alternatives were discussed previously at SC6 in the context of undertaking deterministic projections, it was agreed that the recent recruitment scenario was more appropriate because of the possibility of some bias in the estimates of early recruitment in the bigeye tuna stock assessment. While this issue has been alleviated to an extent in the 2014 assessment, the preference for using the recent recruitment conditions may still be valid.

References

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Table 1. Risk of breaching reference points in 2032 under two future harvest scenarios (2012 status quo and CMM 2013-01) and future recruitment hypotheses (long-term [1962-2011] recruitment and short-term [2002-2011] recruitment).

	Recruitment Deviations	LRP ($0.2SB_{F=0}$)	F_{MSY}
Status quo	Long term	94%	93%
CMM 2013-01	Long term	74%	81%
Status quo	Short term	32%	72%
CMM 2013-01	Short term	4%	48%

Table 2. Median values of reference point variables in 2032 under two future harvest scenarios (2012 status quo and CMM 2013-01) and future recruitment hypotheses (long-term [1962-2011] recruitment and short-term [2002-2011] recruitment).

	Recruitment Deviations	$SB_{2032}/SB_{F=0}$	F_{2032}/F_{MSY}
Status quo	Long term	0.08	1.91
CMM 2013-01	Long term	0.15	1.44
Status quo	Short term	0.24	1.21
CMM 2013-01	Short term	0.31	0.99

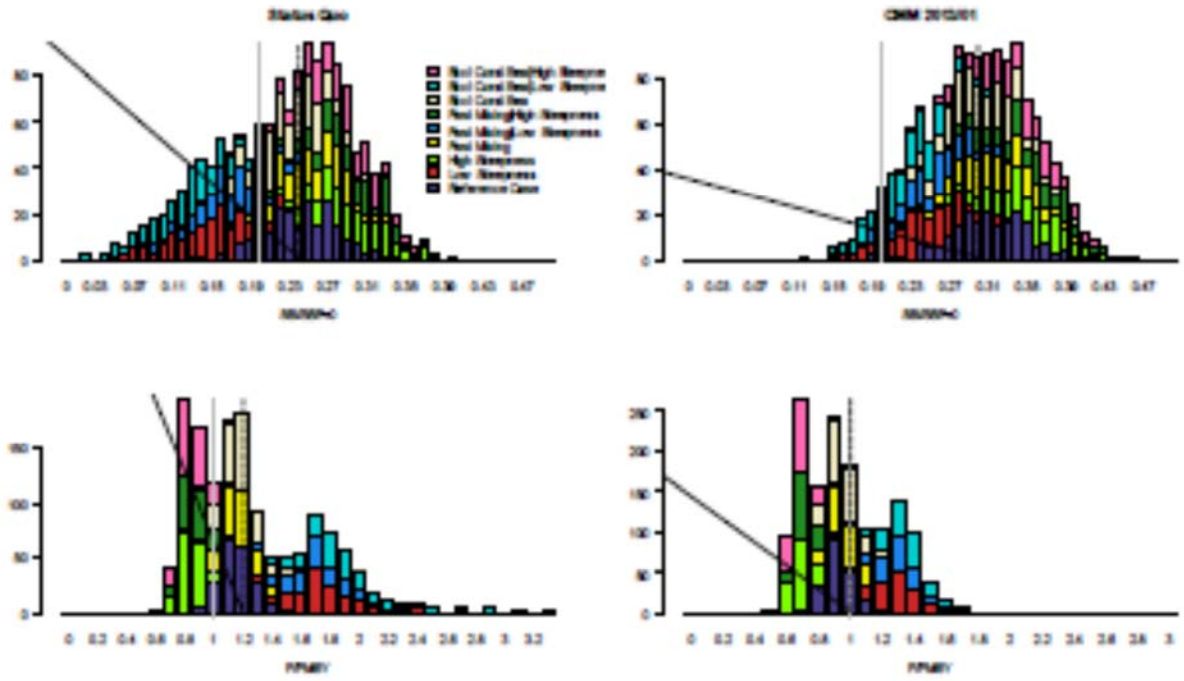

Figure 1. 2002-2011 recruitment deviations: Histograms of the predicted distribution of $SB_{2032}/SB_{F=0}$ and F_{2032}/F_{MSY} for bigeye tuna for 2 effort scenarios; the first representing the 2012 status quo (left column) and the second representing conditions consistent with CMM 2013-01 (right column). Different colours indicate the results from different stock assessment model runs. The vertical dotted line indicates the overall median value across all model runs. Vertical grey lines indicate 0.2 $SB_{F=0}$ and F_{MSY}, respectively.

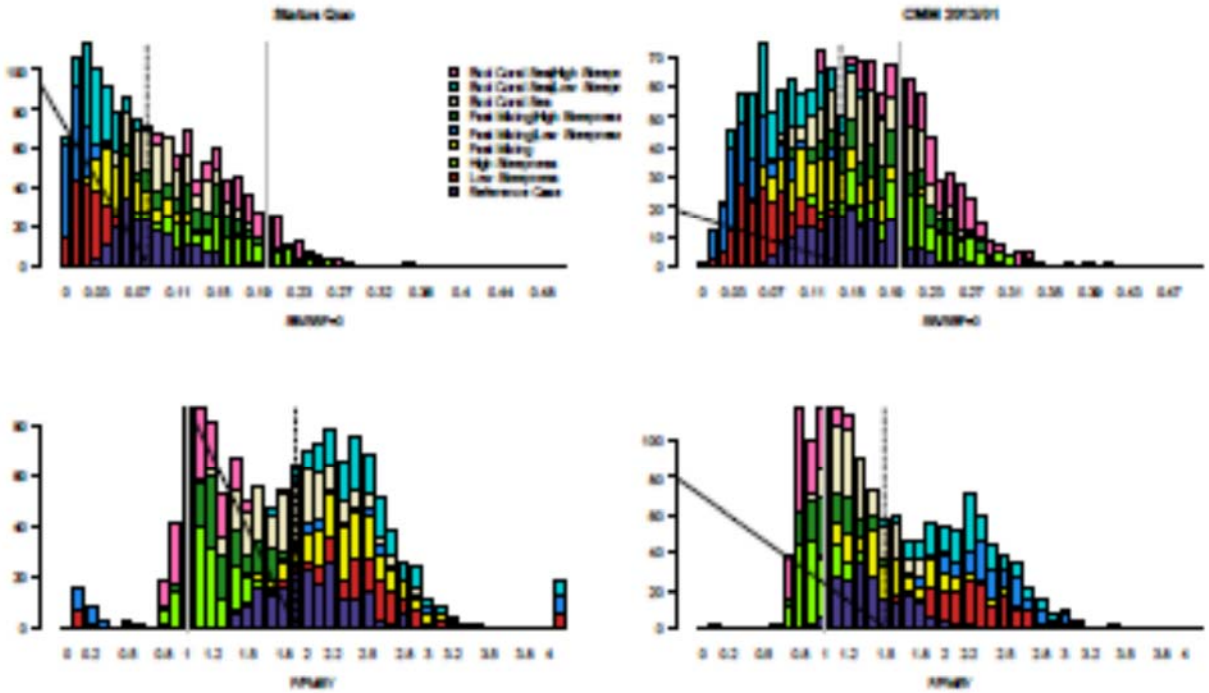

Figure 2. 1962-2011 recruitment deviations: Histograms of the predicted distribution of $SB_{2032}/SB_{F=0}$ and F_{2032}/F_{MSY} for bigeye tuna for 2 effort scenarios; the first representing the 2012 status quo (left column) and the second representing conditions consistent with CMM 2013-01 (right column). Different colours indicate the results from different stock assessment model runs. The vertical dotted line indicates the overall median value across all model runs. Vertical grey lines indicate 0.2 $SB_{F=0}$ and F_{MSY}, respectively.

Appendix C Evaluation of Proposed 2015 Territorial Bigeye Tuna Catch and Allocation Limits

Evaluation of Proposed 2015 Territorial Bigeye Tuna Catch and Allocation Limits*

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Background

This report evaluates impacts on bigeye tuna stock status of a proposed US management action (RIN0648 XD998) that would establish catch limits for US Territories and allow a portion of these limits to be transferred for use by Hawaii longline vessels. The Hawaii longline catch is otherwise limited under Conservation and Management Measure (CMM 2013-01) of the Western and Central Pacific Fisheries Commission (WCPFC).[1] This current report addresses how increases in catch allowed under the proposed US action would influence the effectiveness of the management measure with respect to WCPFC conservation objectives.

At the WCPFC's 11th Regular Session held December 1-5, 2014, in Apia, Samoa, the Secretariat of the Pacific Community (SPC) presented an evaluation of the outcomes of CMM 2013-01 on bigeye tuna stock status in year 2032 should WCPFC member countries adhere to the conservation and management measures proscribed in the measures (SPC 2014).[2] This evaluation was based on the 2014 bigeye tuna stock assessment (Harley et al., 2014) and utilized stochastic projections across a range of weighted models as agreed to by the Western and Central Pacific Commission Science Committee at its 10th meeting held August 6-14, 2014 (SC10), in Majuro, Republic of the Marshall Islands (SPC 2014).

The bigeye tuna stock assessment (Harley et al., 2014) indicated that recent levels of fishing mortality exceeded the level that will support MSY, and that recent spawning biomass was near or below the spawning biomass at MSY. The objective of CMM 2013-01 is to reduce the fishing mortality rate for bigeye tuna to a level no greater than F_{MSY}, i.e. $F/F_{MSY} \leq 1$. To achieve this objective, the CMM includes a number of provisions to be implemented over the period 2014- 2017, including longline catch limits for certain member countries, seasonal purse seine Fish Aggregation Device (FAD) closures or a combination of FAD closures and annual FAD set limits, and a FAD closure on the high seas. The SPC analysis assumed full implementation of the CMM, including the conditional 5-month purse seine FAD closure by member countries in 2017. For purse seine effort, it was estimated that a FAD closure of 5 months would reduce 2012 FAD- associated purse seine effort by 22%, or by a scalar factor of 0.78. The analysis further assumed

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[1] In December 2014, the WCPFC adopted CMM 2014-01, which maintains the applicable purse seine and longline management measures found in CMM 2013-01.

[2] The SPC conducted a twenty-year projection from 2012, rather than a 10-year projection due to the stock not reaching equilibrium in the 10 year horizon with the assumed purse seine effort and longline catch, and under the recruitment assumptions used. (G. Piling. SPC, pers. comm. February 2015).

* PIFSC Internal Report IR-15-026. Issued 23 July 2015

that unassociated (non-FAD) purse seine effort would rise by an amount equivalent to the associated decrease, thus maintaining the total amount of purse seine effort at the 2012 level.

For longline catches, the SPC analysis assumed that countries with specified annual longline bigeye limits in excess of 2,000 mt would each catch their full annual limit, even if actual catches have been less. We note, for example, that in recent years total WCPO bigeye catches of Japan longline fisheries have been several thousand metric tons below their annual WCPO bigeye catch limit (Japan 2015); however, the SPC analysis assumed Japan will catch its full limits under CMM 2013-01. For member countries that have bigeye longline catches less than 2,000 mt, and for Small Island Developing States (SIDS) and Participating Territories (PTs) without limits specified in CMM 2013-01, it was assumed that the catches of these fleets would be continued at their 2012 levels. SPC (2014) indicates that catches by Vietnam were included in the 2014 bigeye tuna stock assessment, but are not limited by the CMM due to the uncertain status of the South China Sea in the WCPFC Convention. Therefore, in the SPC analysis the reported 2012 catch by Vietnam of 3,761 mt was assumed to continue. Under all these assumptions, SPC (2014) estimates that the total WCPO longline bigeye catch would be reduced to 87% of the 2012 catch; therefore the scalar is 0.87.

The SPC (2014) analysis noted that if the adoption of the 5-month purse seine FAD closure is not implemented, then the extent of reduction in purse seine associated FAD effort will have been over-estimated by the 0.78 scalar. On the other hand, CMM 2013-01 includes a required 2017 high seas purse seine FAD prohibition, which was not included in the SPC's analysis. The SPC (2014) analysis indicates that the 2017 high seas FAD closure could result in some reduction in purse seine FAD fishing if such activity is not simply transferred into Exclusive Economic Zones, and thus if such a reduction does result from this provision of CMM 2013-01, then the extent of reduction in purse seine FAD associated effort may be somewhat under-estimated by the 0.78 scalar.

The SPC (2014) analysis also noted that member flag States with longline catches of bigeye of less than 2,000 mt could increase their catch to this level and remain compliant with the CMM 2013-01, and further that longline fleets of SIDS and PTs are currently unrestricted and could increase their catches of bigeye to any level under CMM 2013-01. The SPC (2014) indicates that if either of these events should occur, then the extent of reduction of longline catch will be over-estimated by the 0.87 scalar.

SPC (2014) also considered two possible future bigeye tuna recruitment hypotheses – short-term and long-term. Under the short-term recruitment hypothesis, future recruitment would remain on average consistent with 2002-2011 conditions. Under the long-term hypothesis, future recruitment would remain on average consistent with long term conditions (1962-2011). The WCPFC Science Committee has agreed that for the purpose of evaluating the CMM, and any proposed alternatives, that the recent (2002-2011) recruitment scenario is more appropriate because of the possibility of some bias in the estimates of early recruitment in the bigeye stock assessment (SPC 2014).

Under the short-term (2002-2011) recruitment scenario, the median F_{2032}/F_{MSY} is reduced from 1.21 (assuming 2012 catch or effort levels continue from 2013 to 2032) to 0.99 (assuming full

implementation of CMM 2013-01). In other words, if CMM 2013-01 is fully implemented, bigeye tuna would not be subject to overfishing in 2032. Under the long-term (1962-2011) scenario, the median F_{2032}/F_{MSY} is reduced from 1.99 (assuming 2012 catch or effort levels continue from 2013 to 2032) to 1.44 (assuming full implementation of CMM 2013-01); therefore, the stock would continue to be subject to overfishing.

With respect to spawning biomass and total biomass in 2032 versus their levels at MSY, SPC (2014) did not calculate those values, focusing instead on the ratio of spawning biomass in 2032 to that in the absence of fishing ($SB_{2032}/SB_{F=0}$). SPC (2014) projected that this ratio would recover substantially due to decreased fishing mortality through 2032.

Evaluation of 2015 Proposed Territorial Bigeye Tuna Catch and Allocation Limits

The proposed action would set limits of 2,000 metric tons of bigeye tuna caught in the WCPFC Area for each of the three US Pacific Island Territories, and would allow up to 1,000 metric tons of each Territorial limit to be transferred to other permitted US (i.e. Hawaii-based) longline vessels. The SPC (2014) projections evaluating WCPFC management assumed that the US Territorial longline catch in 2012 would continue, which included catch from Hawaii longline vessels operating under an agreement with American Samoa. In the analysis conducted for the current report, a projection for the 2012 baseline conditions as used in SPC (2014) was included as reference. Other projections included one with no attribution of catch to Territories and projections with Territorial catch limit transfers to Hawaii longliners, and full utilization of the proposed Territorial catch limits up to a total combined maximum of 6,000 metric tons of catch. No other increase in catch (e.g. additional catch by SIDS) was modeled for the analysis in this report.

Staff of the Western Pacific Fishery Management Council and National Marine Fisheries Service (NMFS) Pacific Islands Fisheries Science Center (PIFSC), with assistance from the SPC conducted and evaluated the projections to illustrate potential outcomes of the proposed action in relation to the implementation of CMM 2013-01. The analysis utilized stochastic projections of recent (2002-2011) bigeye recruitment distributions, which the SPC (2014) determined is superior to using deterministic projections. The analyses are only presented using recent recruitment distributions, which is consistent with recommendations made at SC10 (WCPFC 2014). See SPC (2014) and the background paragraph on recruitment hypotheses (above) for projections using the long-term average recruitment.

The Council/PIFSC projections reported here used purse seine effort and longline catch scalars to project and evaluate the outcomes in relation to the implementation of CMM 2013-01 with respect to future (2032) bigeye stock status. The main indicators presented are the respective ratios of projected 2032 fishing mortality, spawning biomass, and total biomass in relation to their levels under maximum sustainable yield harvesting (i.e., F_{2032}/F_{MSY}, SB_{2032}/SB_{MSY}, and B_{2032}/B_{MSY}) and the spawning biomass at the end of the 20 year projection in relation to the average unfished level in 2002-2011 ($SB_{2032}/SB_{F=0}$). The latter is the overfished limit reference point adopted by the WCPFC.

Six model scenario runs were conducted. The baseline scenario is a re-run of the SPC 2014 projection with slight differences from the SPC results due to stochasticity. The other scenarios include the same assumptions except scalars on the US longline bigeye catch component. The Alternative 1 scenario represents no action in relation to the US proposal to set territorial catch and allocation limits. Thus, with no transfers of Territorial allocation to Hawaii longline vessels, the Alternative 1 projection includes less catch than the baseline (SPC 2014). The 4 potential outcomes for Alternative 2 include Territorial transfers of 1,000, 2,000, and 3,000 metric tons of bigeye to Hawaii longline vessels from 1, 2, and 3 Territories (A-C, respectively) and then also adding full utilization of Territorial catch limits up to a maximum of 6,000 metric tons (D).

The U.S. longline catch assumptions, which included potential transfer of allocations from U.S. Territories to eligible U.S. vessels under the various scenarios were scaled in WCPO bigeye stock assessment regions 2 and 4, and projections were calculated using 6 scalars as illustrated in Tables 1 and 2. Bigeye tuna catch outside the Hawaii EEZ by longline vessels that are permitted to fish and land fish in both American Samoa and Hawaii (AS/HI Dual Permitted) is assigned to American Samoa even if the vessel does not initiate fishing from, or return to land fish in American Samoa. Such catches are shown separately. For each model run, 200 projections were run for the estimated purse seine associated and unassociated effort and longline catch provisions of CMM 2013-01 and U.S. longline catch. Model runs used the reference base-case model in the bigeye tuna stock assessment (Harley et al. 2014). Future recruitment in the projections was based on using recent average bigeye tuna recruitment by randomly sampling from the 2002- 2011 recruitment deviations from the stock-recruitment relationship estimated in the 2014 assessment model.

Results

Results of the projections are presented in Table 3.

If CMM 2013-01 was fully implemented, and the total catch of bigeye by US longline fisheries were held at 2012 baseline catch levels, then the median F_{2032}/F_{MSY} is projected to be 0.983, indicating the bigeye tuna would not be subject to overfishing, and both spawning biomass (median SB_{2032}/SB_{MSY} = 1.568) and total biomass (median B_{2032}/B_{MSY} = 1.554) would be above the level necessary to produce MSY on a continuing basis. Note that the 2012 baseline scenario accounts for one specified fishing agreement which resulted in the transfer of 771 mt of the American Samoa bigeye tuna catch allocation to Hawaii longline vessels in 2012 (Table 1).

Under Alternative 1, if CMM 2013-01 was fully implemented, but no specified fishing agreements were allowed, the projected median F_{2032}/F_{MSY} would decrease 0.61 % (from 0.983 to 0.978) compared to the 2012 baseline, while median spawning biomass and total biomass ratios are projected to increase by 0.8 % (from 1.568 to 1.580) and 0.7 % (from 1.554 to 1.565), respectively. This minor improvement in stock status over the baseline is due to removal of the American Samoa transfer included the baseline scenario.

Under Alternative 2, if CMM 2013-01 was fully implemented, there are four distinct possible fishery outcomes depending on the number of specified fishing agreements authorized. Under Potential Outcome A, having one specified fishing agreement with 1,000 mt of bigeye catch

allocation transferred to Hawaii longline vessels from a U.S. territory, the projected median F_{2032}/F_{MSY} = 0.983, median SB_{2032}/SB_{MSY} = 1.568 and median total biomass B_{2032}/B_{MSY} = 1.555. These values are virtually identical to the projections under the 2012 baseline conditions, and indicate bigeye tuna would not be subject to overfishing and not overfished in 2032.

Under Potential Outcome B, having two specified fishing agreements with 2,000 mt of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected median F_{2032}/F_{MSY} would increase 0.4 % (from 0.983 to 0.987) compared to the 2012 baseline, while median SB_{2032}/SB_{MSY} would decrease 0.7 % from 1.568 to 1.556 and median total biomass B_{2032}/B_{MSY} = would decrease 0.6 % (from 1.554 to 1.545). This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2032 as a result of Potential Outcome B.

Under Potential Outcome C, having three specified fishing agreements with 3,000 mt of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories , the projected median F_{2032}/FMSY would increase 1.0 % from 0.983 to 0.993) compared to the 2012 baseline, while median SB_{2032}/SB_{MSY} would decrease 1.5 % (from 1.568 to 1.545 and median B_{2032}/B_{MSY} would decrease 1.3 % (from 1.554 to 1.535 This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2032 as a result of Potential Outcome C.

Under Potential Outcome D, having three fishing agreements, with 3,000 mt of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories and full utilization of specified catch limits by longline fisheries of American Samoa, Guam and the Northern Mariana Islands, the projected median F_{2032}/F_{MSY} would increase 2.5 % (from 0.983 to 1.007) compared to the 2012 baseline, while median SB_{2032}/SB_{MSY} would decrease 3.3 % (from 1.568 to 1.515) and median B_{2032}/B_{MSY} would decrease 2.8 % (from 1.554 to 1.510). This indicates that bigeye tuna would technically meet the definition of overfishing (although F_{2032}/F_{MSY} would be statistically indistinguishable from the overfishing threshold of 1.0). The stock would not be overfished in 2032 as a result of Potential Outcome D.

Table 1. Bigeye Tuna Catch (mt) by U.S. and Territorial Longline Fisheries in the Western and Central Pacific Ocean 2011-2014.

Longline Fishery	2014	2013	2012	2011	Ave. 2011-2014
U.S. Hawaii longline permitted vessels	3,815	3,654	3,660	3,565	3,674
Catch allocated to Hawaii longline-permitted vessels from a U.S. territory	*1,000*[1]	*492*[1]	*771*[2]	*628*[2]	*723*
Dual permitted U.S. Hawaii/American Samoa longline vessels	245	305	567	458	394
American Samoa longline permitted vessel	82	84	164	178	127
Guam longline vessels	0	0	0	0	0
CNMI longline vessels	0	0	0	0	0
Total Catch	**5,142**	**4,535**	**5,162**	**4,829**	**4,917**

[1] Catch allocated to Hawaii longline vessels through a specified fishing agreement with the CNMI.
[2] Catch allocated to Hawaii longline vessels through a specified fishing agreement with American Samoa.
Source: 79 FR 1354, January 8, 2014.

Table 2: Methodology to determine scalars on US longline bigeye catches to evaluate potential outcomes of the proposed action.

Projection Runs	U.S. HI Longline Permitted Vessel BET Catch	AS/HI Dual Longline Permitted Vessel BET Catch	AS/GU/CNMI Longline BET Catch*	BET Transfers to HI Longline Vessels	Projected U.S. Longline BET Catch (Regions 2 and 4)*	% Difference in SPC data[3]	Projected U.S. Longline BET Catch in SPC data value (Regions 2 & 4)	2012 U.S. Longline BET Catch Totals in SPC data (Regions 2 & 4)	Scalar on 2012 US Longline BET catch in SPC data (Regions 2 & 4)
2012 Baseline	3,660	567	0	771	4,998	Add 11.8%	5,587	5,587	1
Alt. 1: No action	3,554	394[1]	0	0	3,948	Add 11.8%	4,414	5,587	0.79
Alt. 2: 2,000 mt catch limit /1,000 mt allocation limit	See below	See below	See below	See below	See below	See below	See below	See below	See below
Potential Outcome A	3,554	394[1]	0	1,000	4,948	Add 11.8%	5,532	5,587	0.99
Potential Outcome B	3,554	394[1]	0	2,000	5,948	Add 11.8%	6,650	5,587	1.19
Potential Outcome C	3,554	394[1]	0	3,000	6,948	Add 11.8%	7,768	5,587	1.39
Potential Outcome D	3,554	0 (see next column)	3,000[2]	3,000	9,554	Add 11.8%	10,681	5,587	1.91

Notes:

* The model accounts for BET catch by U.S longline vessels landing in AS in Region 6, which was 164 in 2012 and averaged 127 mt for the period 2011-2014. Thus, these catches are not included in this table but are accounted for in stochastic projections of BET stock status in 2032. There were no reported longline BET landings in Guam or CNMI in 2012, and currently, there are no U.S. longline vessels active in Guam or CNMI.

[1] AS/HI LL dual permit catch (394 mt) = average catch from dual American Samoa/Hawaii longline permitted vessels from 2011-2014.

[2] Potential Outcome D assumes each U.S. territory allocates 1,000 mt to Hawaii longline permitted vessel and the remainder (1,000 mt) of its specified catch limit is caught by longline vessels operating in the respective territory. These totals include AS/HI dual permitted catch.

[3] The catch in metric tons in the bigeye tuna assessment model and in the SPC (2014) projections is 11.8 % greater than what is reported by US in its Annual Part 1 report to WCPFC. This is likely due to the assessment being based on numbers of catch, not weight, and different length-weight conversions used in the assessment.

Table 3: Stochastic projections related to Alternatives 1 and 2, and % increase in median F/F_{MSY}, SB/SB_{MSY} and B/B_{MSY} levels, $SB_{2032}/SB_{F=0}$, at various scalars, and using stochastic projections of recent average bigeye tuna recruitment (2002-2011) distributions.

	Baseline Catch	Alternative 1: No Action		Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory							
				Potential Outcome A		*Potential Outcome B*		*Potential Outcome C*		*Potential Outcome D*	
No. of Specified Fishing Agreements	**2012**	**No Fishing Agreements and No BET Transfers**		**1 Fishing Agreement and 1,000 mt of BET Transfers**		**2 Fishing Agreements and 2,000 mt of BET Transfers**		**3 Fishing Agreements and 3,000 mt of BET Transfers**		**3 Fishing Agreement and 3,000 mt of BET transfers and Full Utilization of BET in Territories**	
U.S. Longline BET Catch (Regions 2 and 4)	**4,998 mt*** HI: 3,660 HI/AS Dual: 567 Transfers: 771	**3,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 0		**4,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 1,000		**5,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 2,000		**6,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 3,000		**9,554 mt** HI: 3,554 HI/AS Dual: 394 AS: 1,000 - 394[1] GU: 1,000 CNMI: 1,000 Transfers: 3,000	
			Percent Change		**Percent Change**		**Percent Change**		**Percent Change**		**Percent Change**
2032 F/F_{MSY}	**0.983**	**0.978**	**-0.5%**	**0.983**	**0.0%**	**0.987**	**0.4%**	**0.993**	**1.0%**	**1.007**	**2.5%**
2032 SB/SB_{MSY}	**1.568**	**1.580**	**0.8%**	**1.568**	**0.0%**	**1.556**	**-0.7%**	**1.545**	**-1.5%**	**1.515**	**-3.3%**
2032 B/B_{MSY}	**1.554**	**1.565**	**0.7%**	**1.555**	**0.0%**	**1.545**	**-0.6%**	**1.535**	**-1.3%**	**1.510**	**-2.8%**
SB_{2032}/SBF=0	**0.330**	**0.332**	**0.7%**	**0.330**	**0.0%**	**0.328**	**-0.6%**	**0.326**	**-1.3%**	**0.320**	**-3.1%**

Notes:

* The model accounts for BET catch by U.S longline vessels landing in AS in Region 6, which was 164 in 2012 and averaged 127 mt for the period 2011-2014. Thus, these catches are not included in this table but are accounted for in stochastic projections of BET stock status. There were no reported longline BET landings in Guam or CNMI in 2012, and currently, there are no U.S. longline vessels active in Guam or CNMI.

[1] The HI/AS dual permitted catch would be included in full utilization of the A. Samoa limit.

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Appendix D TUMAS Analysis on Impacts to Stock Status of WCPO Bigeye Tuna

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Introduction

The following analysis uses TUMAS (Tuna Management Simulator) to evaluate impacts to bigeye tuna from international fisheries occurring within the WCPFC Convention Area. TUMAS is an online web tool designed to allow users to control fisheries data under various scenarios and project the status of a particular stock in the future.[29] This application was developed by the SPC-OFP and relies on stock assessments of tropical tunas in the WCPO.

With respect to bigeye tuna, the most recent version of TUMAS incorporates the 2014 stock assessment of bigeye tuna in the WCPO (see Harley et al. 2014). This stock assessment is a spatially disaggregated MULTIFAN-CL model that separates the WCPO into 9 regions. As designed, TUMAS incorporates bigeye tuna catch information from the early 1950s up to 2012 and allows users to scale catch data by fisheries overall or in one or more of the six stock assessment regions to make predictions about likely stock responses to catch or effort changes. New stock assessments are incorporated into TUMAS as they become available. The TUMAS model available at the time of writing incorporates 2012 catch information of bigeye tuna and does not include 2013 or 2014 catches.[30]

TUMAS also offers the ability to conduct projections under two stock-recruitment scenarios for bigeye tuna:

1) Long-term recruitment average (1952-2011), which is termed "spawner recruitment relationship" in the model; and

2) Recent average recruitment (1989-2011).

The two recruitment scenarios offer different stock status trajectories, with long-term average recruitment being more pessimistic and recent average recruitment being more optimistic. The long-term recruitment average includes several decades (1950s-1970s) of older recruitment estimates that were derived from periods when fishing mortality on bigeye tuna was much lower and confined primarily to longline fishing. Higher levels of bigeye tuna recruitment occurred after the 1980s with the expansion of FAD-based purse seine fishing in the WCPO, and thus the recent average recruitment scenario (1989-2011) better reflects current conditions and conditions

[29] http://www.tumas-project.org/about-tumas
[30] The 2013 WCPO bigeye catch was less than in 2012. The 2014 WCPO bigeye catch is unavailable at the time of writing.

that are likely to prevail into the near future, where bigeye tuna catches will be from a mixture of purse seine and longline fisheries.

With regards to deterministic projections, such as those produced using TUMAS, the WCPFC Science Committee has recommended that the WCPFC science provider (SPC-OFP) conduct projections using recent average recruitment and the long-term recruitment average; however, since the higher level of recent bigeye tuna recruitment is considered to be a better indicator of future recruitment levels, greater emphasis is provided to recent average recruitment when presenting catch projections (WCPFC 2010; WCPFC 2011(d); J. Hampton, SPC-OFP, pers. comm., 2013).[31] The SPC-OFP will likely incorporate data after 2012 in the TUMAS tool after the next WCPO bigeye stock assessment.

For comparative purposes, the analysis below provides projection results using both recruitment scenarios and scaled 2012 US longline catches combined with catch and effort of other fisheries in 2012. When comparing projection results between years under the same catch levels, there is a noticeable trend in stock status, with the stock improving under the recent average recruitment scenario and declining under the long-term average recruitment scenario

Although using both recruitment scenarios in the TUMAS projections results in overfishing under all Alternatives, less emphasis is placed on these results derived using the long-term recruitment average because recruitment levels associated with the long-term recruitment average are not believed to be representative future levels of recruitment. Beginning in the late 1980s, higher levels of recruitment have been observed and incorporated in the bigeye tuna stock assessment. The long-term recruitment average includes several decades (1950s-1970s) of recruitment estimates that were derived from periods when fishing mortality on bigeye tuna was much lower and confined primarily to longline fishing. Moreover, the older recruitment estimates, especially in the 1950s were based on longline data from the Japanese longline fishery when it was more spatially constrained and had not spread out across the WCPO.

Higher levels of bigeye tuna stock recruitment occurred after the 1980s with the expansion of FAD-based purse seine fishing in the WCPO. This high level of juvenile catch is explained in the stock assessment as elevated levels of bigeye recruitment. Moreover, the dynamics of the ecosystem may also have responded to the increasing levels of fishing mortality, which have reduced the upper trophic level predator biomass including adult bigeye tuna, likely resulting in more favorable survival rates for juvenile bigeye tunas (Myers and Worm 2003; Sibert et al. 2006; Polovina et al. 2009; Woodworth-Jefcoats et al. 2012). Furthermore, the 2011 stock assessment for WCPO bigeye tuna indicates that most of the high levels of recruitment observed in the model occur at low estimated spawning biomass (Davies et. al 2011). As such, recent average recruitment of bigeye tuna is likely to be a better reflection of future levels of recruitment, given that favorable conditions will likely persist including the mix of longline and purse seine fishing gears harvesting bigeye in the WCPO.

[31] In 2011, the SPC-OFP ran projections using both recent average recruitment and long-term average recruitment; however, the SPC-OFP only presented projections using recent average recruitment at the Eighth Regular Session of the WCPFC in March 2012. This exemplifies the greater emphasis being placed on recent average recruitment versus long-term average recruitment when conducting projections on the stock status of bigeye tuna. See WCPFC 2011(d).

Because recent average recruitment is believed to be a better representation of current and future recruitment trends, greater emphasis is placed on recent average recruitment associated projections to evaluate impacts from the Alternatives to future bigeye stock status. This is consistent with the advice provided by WCPFC Science Committee (WCPFC 2010; 2011(d)) and subsequent projections conducted by the SPC-OFP (WCPFC 2011(d)). See Appendix D for further information.

Under the Pelagics FEP, $F/F_{MSY}>1$ indicates overfishing is occurring, and $B/B_{MSY}<0.6$ indicates the stock is in an overfished condition. The tables below also include the SB/SB_{MSY} ratio which represents adult fish biomass levels.

Methods

The following provides the methods used in the TUMAS analysis. TUMAS allows users to apply various scalars on the reported US WCPO (e.g., Hawaii) longline catches while not modifying other catches reported for various fisheries included in the model. Hawaii longline data catch data in the model are separated in to Region 2 and Region 4, respectively, of the WCPO MULTIFAN-CL bigeye stock assessment.

Results

Table 1: Projections Related to Alternatives 1 and 2, and Percent Increase in F/F_{MSY}, SB/SB_{MSY} and B/B_{MSY} levels, at various scalars, and using recent average bigeye tuna (BET) recruitment (1989-2011). Catch in metric tons (mt)

TUMAS Runs	U.S. HI Longline Permitted Vessel BET Catch	AS/HI Dual Longline Permitted Vessel BET Catch	AS/GU/CNMI Longline BET Catch*	BET Transfers to HI Longline Vessels	Projected U.S. Longline BET Catch (Regions 2 and 4)*	% Difference in TUMAS[3]	Projected U.S. Longline BET Catch in TUMAS value (Regions 2 & 4)	2012 U.S. Longline BET Catch Totals in TUMAS (Regions 2 & 4)	Scalar on 2012 US Longline BET catch in TUMAS (Regions 2 & 4)
2012 Baseline	3,660	567	0	771	4,998	Add 10.5%	5,587	5,587	1
Alt. 1: No action	3,554	394[1]	0	0	3,948	Add 10.5%	4,363	5,587	0.78
Alt. 2: 2,000 mt catch limit /1,000 mt allocation limit	See below	See below	See below	See below	See below	See below	See below	See below	See below
Potential Outcome A	*3,554*	*394[1]*	*0*	*1,000*	*4,948*	Add 10.5%	*5,468*	5,587	*0.98*
Potential Outcome B	*3,554*	*394[1]*	*0*	*2,000*	*5,948*	Add 10.5%	*6,573*	5,587	*1.18*
Potential Outcome C	*3,554*	*394[1]*	*0*	*3,000*	*6,948*	Add 10.5%	*7,678*	5,587	*1.37*
Potential Outcome D	*3,554*	*0 (see next column)*	*3,000[2]*	*3,000*	*9,554*	Add 10.5%	*10,557*	5,587	*1.89*

Notes:

* The TUMAS model accounts for BET catch by U.S. longline vessels landing in AS in Region 6, which was 164 in 2012 and averaged 127 mt for the period 2011-2014. Thus, these catches are not included in this table but are accounted for in TUMAS when projecting BET stock status in 2022. There were no reported longline BET landings in Guam or CNMI in 2012, and currently, there are no U.S. longline vessels active in Guam or CNMI.

[1] AS/HI LL dual permit catch (394 mt) = average catch from dual American Samoa/Hawaii longline permitted vessels from 2011-2014.

[2] Potential Outcome D assumes each U.S. territory allocates 1,000 mt to Hawaii longline permitted vessel and the remainder (1,000 mt) of its specified catch limit is caught by longline vessels operating in the respective territory.

[3] The catch in metric tons in TUMAS is 10.5 % greater than what is reported by US in its Annual Part 1 report to WCPFC. This likely due to different length-weight conversion factors.

Table 2: Projections Related to Alternatives 1 and 2, and Percent Increase in F/F_{MSY}, SB/SB_{MSY} and B/B_{MSY} levels, at various scalars, and using recent average bigeye tuna (BET) recruitment (1989-2011).

	Baseline Catch	Alternative 1: No Action		Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory							
				Potential Outcome A		*Potential Outcome B*		*Potential Outcome C*		*Potential Outcome D*	
No. of Specified Fishing Agreements	**1 Fishing Agreement and 771 mt of BET Transfers**	**No Fishing Agreements and No BET Transfers**		**1 Fishing Agreement and 1,000 mt of BET Transfers**		**2 Fishing Agreements and 2,000 mt of BET Transfers**		**3 Fishing Agreements and 3,000 mt of BET Transfers**		**3 Fishing Agreement and 3,000 mt of BET transfers and Full Utilization of BET in Territories**	
U.S. Longline BET Catch (Regions 2 and 4)	**4,998 mt*** HI: 3,660 HI/AS Dual: 567 Transfers: 771	**3,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 0		**4,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 1,000		**5,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 2,000		**6,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 3,000		**9,554 mt** HI: 3,554 HI/AS Dual: 394 AS: 1,000 GU: 1,000 CNMI: 1,000 Transfers: 3,000	
			Percent Change		**Percent Change**		**Percent Change**		**Percent Change**		**Percent Change**
2017 F/F_{MSY}	**1.740**	**1.729**	**-0.63%**	**1.739**	**0.045%**	**1.749**	**0.52%**	**1.759**	**1.09%**	**1.784**	**2.54%**
2017 SB/SB_{MSY}	**0.685**	**0.693**	**1.06%**	**0.686**	**0.10%**	**0.680**	**-0.86%**	**0.673**	**-1.77%**	**0.666**	**-2.86%**
2017 B/B_{MSY}	**0.816**	**0.822**	**0.70%**	**0.817**	**0.07%**	**0.812**	**-0.57%**	**0.807**	**-1.18%**	**0.794**	**-2.75%**
2022 F/F_{MSY}	**1.695**	**1.683**	**-0.74%**	**1.694**	**-0.06%**	**1.71**	**1.34%**	**1.72**	**1.99%**	**1.746**	**2.96%**
2022 SB/SB_{MSY}	**0.743**	**0.752**	**1.18%**	**0.744**	**0.11%**	**0.736**	**-2.11%**	**0.734**	**-3.11%**	**0.710**	**-4.68%**
2022 B/B_{MSY}	**0.839**	**0.846**	**0.81%**	**0.840**	**0.07%**	**0.833**	**-1.46%**	**0.828**	**-2.14%**	**0.812**	**-3.20%**

* The TUMAS model accounts for BET catch by U.S. longline vessels landing in AS in Region 6, which was 164 in 2012 and averaged 127 mt for the period 2011-2014. Thus, these catches are not included in this table but are accounted for in TUMAS when projecting BET stock status. There were no reported longline BET landings in Guam or CNMI in 2012, and currently, there are no U.S. longline vessels active in Guam or CNMI.

Table 3: Projections Related to Alternatives 1 and 2, and Percent Increase in F/F_{MSY}, SB/SB_{MSY} and B/B_{MSY} levels, at various scalars, and using long-term average bigeye tuna (BET) recruitment (1952-2011).

	Baseline Catch	Alternative 1: No Action		Alternative 2: 2,000 mt Catch Limit and 1,000 mt Allocation Limit for each U.S. Territory							
				Potential Outcome A		*Potential Outcome B*		*Potential Outcome C*		*Potential Outcome D*	
No. of Specified Fishing Agreements	**1 Fishing Agreement and 1,000 mt of BET Transfers**	**No Fishing Agreements and No BET Transfers**		**1 Fishing Agreement and 1,000 mt of BET Transfers**		**2 Fishing Agreements and 2,000 mt of BET Transfers**		**3 Fishing Agreements and 3,000 mt of BET Transfers**		**3 Fishing Agreement and 3,000 mt of BET transfers and Full Utilization of BET in Territories**	
Projected U.S. Longline BET Catch (Regions 2 and 4)	**4,998 mt*** HI: 3,660 HI/AS Dual: 567 Transfers: 771	**3,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 0		**4,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 1,000		**5,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 2,000		**6,948 mt*** HI: 3,554 HI/AS Dual: 394 Transfers: 3,000		**9,554 mt** HI: 3,554 HI/AS Dual: 394 AS: 1,000 GU: 1,000 CNMI: 1,000 Transfers: 3,000	
			percent change		**percent change**		**percent change**		**percent change**		**percent change**
2017 F/F_{MSY}	**1.689**	**1.678**	**-0.64%**	**1.688**	**-0.07%**	**1.697**	**0.50%**	**1.706**	**1.04%**	**1.731**	**2.50%**
2017 SB/SB_{MSY}	**0.578**	**0.585**	**1.25%**	**0.579**	**0.12%**	**0.572**	**-1.01%**	**0.566**	**-2.08%**	**0.550**	**-4.93%**
2017 B/B_{MSY}	**0.613**	**0.619**	**1.00%**	**0.613**	**0.09%**	**0.608**	**-0.80%**	**0.603**	**-1.65%**	**0.589**	**-3.93%**
2022 F/F_{MSY}	**1.988**	**1.963**	**1.23%**	**1.985**	**-0.11%**	**2.008**	**2.28%**	**2.030**	**3.40%**	**2.091**	**5.22%**
2022 SB/SB_{MSY}	**0/382**	**0.392**	**2.67%**	**0.383**	**0.24%**	**0.373**	**-4.72%**	**0.365**	**-6.93%**	**0.341**	**-10.59%**
2022 B/B_{MSY}	**0.457**	**0.466**	**1.97%**	**0.458**	**0.19%**	**0.449**	**-3.51%**	**0.442**	**-5.16%**	**0.421**	**-7.88%**

* The TUMAS model accounts for BET catch by U.S. longline vessels landing in AS in Region 6, which was 164 in 2012 and averaged 127 mt for the period 2011-2014. Thus, these catches are not included in this table but are accounted for in TUMAS when projecting BET stock status. There were no reported longline BET landings in Guam or CNMI in 2012, and currently, there are no U.S. longline vessels active in Guam or CNMI

Appendix E Draft Regulatory Impact Review

1. Introduction

This document is a regulatory impact review (RIR) prepared under Executive Order (E.O.) 12866, "Regulatory Planning and Review." The regulatory philosophy of E.O.12866 stresses that, in deciding whether and how to regulate, agencies should assess all costs and benefits of all regulatory alternatives and choose those approaches that maximize the net benefits to the society. To comply with E.O. 12866, NMFS prepares an RIR for regulatory actions that are of public interest. The RIR provides an overview of the problems, policy objectives, and anticipated impacts of regulatory actions. The regulatory philosophy of E.O. 12866 is reflected in the following statement:

> *In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory Alternatives, including the Alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among Alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages, distributive impacts; and equity), unless a statue requires another regulatory approach.*

This RIR is for a proposed measure to specify a catch limit of 2,000 metric tons (mt) of longline-caught bigeye tuna for each of the pelagic longline fisheries of American Samoa, Guam and the Northern Mariana Islands in 2015. Along with the proposed specification, NMFS also proposes to authorize each U.S. territory to allocate and transfer, up to 1,000 mt of its 2,000 mt bigeye tuna limit to a U.S. longline fishing vessel or vessels identified in a specified fishing agreement.

2. Problem Statement and Management Objective

The purpose of this action is to establish a bigeye tuna catch limit for longline fisheries of each U.S. participating territory (American Samoa, Guam and the CNMI), and support the development of fisheries in those territories consistent with Amendment 7 to the Pelagic FEP and fishery development provisions of the Magnuson-Stevens Act. The proposed catch limits for 2015 are needed because bigeye tuna is currently subject to overfishing and the Council has determined that a catch limit of 2,000 mt should apply to American Samoa, Guam, and the CNMI as a proactive management measure, because the WCPFC has not implemented bigeye tuna limits for SIDS or PTs, if engaged in responsible fishery development.

The proposed allocation limits for 2015 would help U.S. participating territories to responsibly develop their fisheries under specified fishing agreements. Enabling each U.S. participating territory to allocate a portion of its bigeye tuna catch limit provides economic support for NMFS-

approved fisheries development projects identified in the participating territory's Marine Conservation Plan. The proposed allocation limits would also potentially allow the Hawaii longline fishery to harvest a portion of a U.S. territory's bigeye tuna limit, which would help ensure a plentiful supply of fresh bigeye tuna to Hawaii markets, even after the U.S. bigeye tuna limit has been reached.

A detailed description of the problem and the management objective are presented in Sections 1.3 and 1.4 of the Environmental Assessment (EA).

3. Description of the Fisheries

Section 3.2 of the EA provides an overview of the pelagic fisheries of the Territories and Hawaii. These include the American Samoa longline fishery (Section 3.2.2), Mariana Archipelago longline fishery (Section 3.2.1); Hawaii longline, (Section 3.2.3); and the WCPO Purse Seine Fisheries (Section 3.2.5). Section 3.2.4 presents specific information on U.S. longline catches of bigeye tuna in the Pacific.

4. Description of the Alternatives

This section describes the alternative longline bigeye tuna catch and allocation limits for American Samoa, Guam, and the CNMI for 2015. Please see Section 2 of the EA for more details on each of the alternatives that were analyzed.

Alternative 1: No Specification of Territorial Catch or Allocation Limits (No Action)

Under Alternative 1, NMFS would not specify a bigeye tuna catch or allocation limit for any U.S. participating territory in 2015.

Alternative 2: Specify for each U.S. participating territory, a 2,000-mt catch limit and 1,000-mt allocation limit in 2015 (Status Quo/Council Preferred)

Under Alternative 2, NMFS would specify the Council's recommended catch limit of 2,000 mt (4,409,240 lb) of longline caught bigeye tuna for each U.S. participating territory in 2015. NMFS would also authorize each of the three U.S. territories to allocate or transfer up to 1,000 mt (2,204,620 lb) of its 2,000 mt limit to a FEP-permitted longline vessels identified in a specified fishing agreement with a U.S. territory. NMFS implemented the same bigeye tuna catch and allocation limits in 2014.

5. Analysis of Alternatives

This section describes potential economic effects of alternatives that were considered and evaluates the impacts of the action alternative relative to the no-action alternative. The analysis considers four types of effects in particular: changes in net benefits to the nation; distributional changes in net benefits; changes in income and employment; and cumulative impacts.

Alternative 1: No Specification of Territorial Catch or Allocation Limits (No Action)

Under Alternative 1, NMFS would not specify a bigeye tuna catch or allocation limit for any U.S. participating territory in 2015. Longline fisheries of American Samoa, Guam, and the CNMI would not be subject to a bigeye tuna catch limit in either year. Furthermore, none of the U.S. participating territories could allocate or transfer bigeye tuna catch to eligible U.S. longline vessels permitted under the Fisheries Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region (Pelagics FEP).

The U.S. longline fishery based in Hawaii would be subject to a 2015 catch limit of 3,502 mt (WCPFC limit of 3,554 mt less the 2014 catch overage of 52 mt). Without the option of receiving an allocation of catch through an agreement with any participating territory, vessels in this fishery can no longer retain bigeye tuna caught in the WCPFC upon reaching the catch limit.

Based on 2015 levels of bigeye tuna catch by vessels to which the limit applies, NMFS forecasted the 2015 U.S. bigeye tuna limit was reached on August 5, 2015 and prohibited the retention of longline caught bigeye tuna in the WCPO through the end of the year (80 FR 44883, July 28, 2015). If 2015 level of catch is repeated in 2016, the bigeye tuna limit of 3,554 mt may be reached in August 2016.

Owners and operators of vessels in the Hawaii fleet that also have an American Samoa longline limited access permit, however, would be able to catch and retain bigeye tuna as long as it is caught outside the U.S. EEZ surrounding the Hawaiian Archipelago.

The 3,502 mt limit is approximately 6.5 percent of the stock's estimated maximum sustainable yield of 108,520 mt. Assuming other foreign fishing nations also abide by catch and effort limits set forth in CMM 2014-01, the analysis indicates this would result in a positive impact to bigeye tuna stock status and, by 2032, the stock would no longer be subject to overfishing.

American Samoa, Guam, and the CNMI longline fisheries:

Bigeye catch by longline vessels based in American Samoa, Guam, and the CNMI, as U.S. participating territories, would not be subject to a bigeye tuna catch limit in 2015. Recent fishery performance and the current lack of active longline vessels in the CNMI and Guam, suggest that longline vessels based in CNMI and Guam are unlikely to fish for bigeye tuna in 2015. The American Samoa longline fishery sees more activity by comparison. Bigeye tuna catches by longline vessels possessing an American Samoa limited entry permit averaged 521 mt from 2011 through 2014. These landings included those that possessed limited entry permits for both American Samoa and Hawaii (dual AS/HI longline permitted vessels). Possessing both permits enabled these dual AS/HI longline permitted vessels to attribute fish landed in Hawaii, but caught outside of the Hawaii EEZ, to American Samoa. Of the average 521 mt caught by American Samoa longline vessels, dual AS/HI longline permitted vessels fishing on the high seas accounted for an average 394 mt, while vessels possessing a single American Samoa permit accounted for 127 mt. landings Once the Hawaii longline vessels are no longer able to retain bigeye tuna caught in the WCPO, dual AS/HI longline permit holders might expect to earn a higher price per pound of bigeye tuna as compared to what they might earn for that same fish

prior to the limit being reached. They might also increase fishing effort and/or number of trips to land more bigeye tuna in Hawaii with the potential to earn additional revenue.

Hawaii longline fisheries:

Under Alternative 1, once the U.S. reaches the bigeye catch limit of 3,502 mt in U.S. longline vessels based in Hawaii may no longer retain bigeye tuna caught in the WCPO, although they would still be able to land other species or fish for bigeye tuna outside of the WCPO. Under current predictions, the closure is expected to occur in early August and continue through the remainder of the calendar year, for a time period of almost five months. If a Hawaii longline vessel also possesses an American Samoa longline permit, it may continue to land bigeye tuna in Hawaii, as long as it was caught outside of the U.S. EEZ surrounding Hawaii. Hawaii-based longline vessels may also fish for bigeye tuna in the Eastern Pacific Ocean (EPO), although larger boats, specifically those that exceed 24 meters in length are also subject to a 500 mt bigeye tuna catch limit in the EPO (17 out of 140 vessels in the Hawaii longline fishery exceed 24 meters in length). NMFS estimates that the catch of bigeye tuna in the EPO by these boats to be 208 mt (http://www.fpir.noaa.gov/SFD/SFD_regs_3.html, accessed July 21, 2015). Some longline vessels would switch to shallow-set longline fishing, targeting swordfish, especially among those vessels already outfitted to make this switch. Shallow-set longline fishing would remain an option unless the fishery reaches either limit on sea turtle takes before the end of the year (26 for leatherbacks and 34 for loggerheads). Based on 2014 logbook data, about 20 vessels actively participated in the shallow-set swordfish fishery. Some vessels might stop fishing altogether until January 1, 2016.

Markets, consumers, and wholesalers:

Alternative 1 will result in a drop in the supply of fresh bigeye tuna in Hawaii. Consumers and wholesalers may be expected to pay higher price per pound for fresh (and possibly frozen) bigeye tuna provided by other sources. The drop in this supply can be offset by dual AS/HI longline permit holders' bigeye tuna landings, and landings from longline vessels fishing in the EPO. The offset will not be enough to completely meet demand for fresh tuna, especially at the end of the year, when demand for fresh bigeye tuna peaks. Because of this, bigeye tuna imports into Hawaii will likely increase to help offset U.S. demand.

Fisheries fund:

As any agreement leading to the allocation or transfer of catch would in return provide contribution into the Western Pacific Sustainable Fisheries Fund to fund fisheries development projects as identified through an approved MCP for each territory, no funds would be deposited into this fund in either 2015. As a result, there would be fewer opportunities for fisheries development in the U.S. participating territories, including improvements to fishery infrastructure.

Administration and Enforcement:

Under Alternative 1, with the lack of Territory bigeye specifications and specified fishing agreements for 2015, actions associated with tracking and assigning catches made under Territory arrangements would not be required.

Alternative 2: **Specify for each U.S. participating territory, a 2,000-mt catch limit and 1,000-mt allocation limit in 2015 and 2016 (Status Quo/Council Preferred)**

Under Alternative 2, longline fisheries in the U.S. participating territories would each be subject to a 2,000 mt catch limit for bigeye tuna. Each territory would also be able to allocate up to 1,000 mt of its 2,000 mt catch limit to FEP-permitted longline vessels under specified fishing agreements. Specified fishing agreements under this Alternative would support responsible fisheries development in the U.S. participating territories by providing funds for approved MCPs.

Under Alternative 2, several potential scenarios may occur, depending on the number of specified fishing agreements developed and submitted to and approved by NMFS in 2015. U.S. participating territories could enter into specified fishing agreements with U.S. pelagic permitted vessels, up to three total, one for each territory. The possible outcomes under the varying number of agreements are discussed more fully in the EA. With the timing of reaching the catch limit projected to be in early August, a single fishing agreement allocating 1,000 mt of catch is not likely to allow the U.S. longline vessels to fish and supply locally caught bigeye tuna through the end of the year, whereas three (and possibly two) specified fishing agreements may.

The proposed allocation would provide up to 3,000 mt of bigeye tuna to the U.S. longline fleet based in Hawaii through specified fishing agreements, in addition to the 3,502 mt provided under the U.S. bigeye tuna limit. Assuming other foreign fishing nations also abide by catch and effort limits set forth in CMM 2014-01, the environmental impact analysis indicates that this level of increase would have a negligible effect on bigeye tuna stock status, and like under Alternative 1, the stock would no longer be subject to overfishing in 2032.

Section 4.2.2 contains greater detail on the impacts to the U.S. participating territories and Hawaii longline fisheries.

American Samoa, Guam, and the CNMI longline fisheries:

Impacts to the Guam and CNMI longline fisheries should be the same as under the no action alternative, because of the lack of recent longline activity and no currently active longline vessels based in those islands. As mentioned under Alternative 1, dual AS/HI longline permit holders might earn higher price per pound for bigeye tuna, with any potential gap in demand for bigeye tuna. They might also increase fishing effort to partially offset the reduced supply of fresh bigeye tuna in Hawaii. As the number of fishing agreements increase, it becomes less likely that this increase in fishing effort by dual AS/HI longline vessels will occur. If only one agreement is implemented, one might expect overall fishing effort by dual AS/HI longline permit holders to be higher in that year, compared to the case where two or three agreements are implemented.

American Samoa limited entry permit holders that are not dual permit holders, are expected to fish about the same as in recent years; these longliners target albacore to sell to canneries.

With the potential increase in fishing effort by American Samoa longline vessels, if U.S. vessels enter into a specified fishing agreement with American Samoa, and with an early enough closure of the U.S. fishery, American Samoa longline fishery may possibly reach the limit of 1,000 mt.

Hawaii longline fisheries:

Under Alternative 2, participants in the Hawaii deep-set longline fishery listed on any specified fishing agreement would expect to see positive benefits, while those that are not listed, would see the impacts similar to the no action. Since most participants in this fishery primarily fishes for bigeye tuna in the WCPO, rather than the EPO, or fishing for swordfish, enabling many of these participants to fish in this area throughout the year would allow them to continue to earn higher revenues than if they were no longer able to do so (as under the no action alternative). The net gain to this fishery would depend on the number of approved specified fishing agreements.

Markets, consumers, and wholesalers:

Compared with Alternative 1, Alternative 2 would yield a higher supply of fresh bigeye tuna to consumers in Hawaii. If the number of specified fishing agreements enables the Hawaii deep-set longline fishery to fish for and supply bigeye tuna throughout the year, then markets would not be disrupted. Consumers, wholesalers, retailers and restaurants would not have to rely on imports, dual AS/HI longline permit holders' bigeye tuna landings, landings from longline vessels fishing in the EPO and landings by troll and handline boats to help meet market demand for bigeye tuna, and/or pay a higher price per pound for the same quality of bigeye tuna.

Fisheries fund:

Specified fishing agreements under this alternative would help provide financial support for responsible fisheries development projects identified in the MCPs for U.S. participating territories by providing funds for these projects. If more agreements are executed, more monies may be available through the Western Pacific Sustainable Fisheries Fund to support fishery development projects.

Administration and Enforcement:

Administrative costs under Alternative 2 would be slightly higher than under Alternative 1. Administrative costs may be generated from activities such as in-season monitoring of the WCPO longline catch limits for bigeye tuna by NMFS, regulatory and management costs associated with announcements and notifications of catch prohibition, as well as additional costs from monitoring and attributing catches made by vessels identified in a specified fishing agreement with the U.S. participating territory to which the agreement applies. Enforcement costs should be about the same as under Alternative 1.

Comparing Net Benefits between alternatives:

Implementing the proposed action may generate a positive net benefit relative to the no action. The proposed action would result in a very small potential negative impact to bigeye tuna stocks and possibly to some domestic fishing entities such as dual permitted vessels and troll and handline boats that might receive higher prices for bigeye tuna. But these may be offset by the incremental benefits to the U.S. longline fishery based in Hawaii as a whole, consumers, and to fisheries development in territories that are party to the specified fishing agreement through the end of the calendar year.