WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

Draft Environmental Assessment

Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in U.S. Pacific Island Territories
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Abstract

The Western Pacific Fishery Management Council (Council) and National Marine Fisheries Service (NMFS) propose to establish bigeye tuna territorial catch and/or allocation limits for each U.S. participating territory in the western and central Pacific Ocean, as recommended annually by the Council, for years 2019-2023. NMFS would authorize each U.S. territory to allocate and transfer bigeye tuna limits to a U.S. longline fishing vessel(s) permitted under the Fishery Ecosystem Plan for the Pacific Pelagic Fisheries of the Western Pacific Region and identified in a specified fishing agreement applicable to the territory. Criteria for a specified fishing agreement 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 are codified in 50 CFR 665.819. If approved, the catch and/or allocation limits would be in effect until the end of the relevant fishing year.

This environmental assessment (EA) considers the following alternatives for catch and allocation limit specifications in detail:

- Alternative 1: NMFS would not specify territorial bigeye tuna catch or allocation limits (No Action).
- Alternative 2: NMFS would specify, for each territory, a 2,000 metric ton (t) catch limit and 1,000 t allocation limit (Preferred/Status Quo).
- Alternative 3: NMFS would specify, for each territory, a 2,000 t catch limit and up to a 2,000 t allocation limit.

The alternatives are identical to those analyzed in the environmental assessment supporting the 2018 Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in the U.S. Pacific Island Territories (NMFS 2018g). The analysis indicates that the alternative catch and allocation limits and accountability measures are not expected to result in adverse effects on the long-term sustainability of bigeye tuna, other non-target species, bycatch species, protected species, or adversely affect marine habitats, or result in large changes to any western Pacific longline fishery.

At its 176th meeting, from March 19-21, 2019, in Honolulu, Hawaii, the Council recommended a 2,000 t bigeye tuna catch limit and 1,000 t allocation limit for fishing year 2019, which is NMFS' preferred alternative in this EA.

ABBREVIATIONS

ANE	Adult nesting equivalency
APA	Administrative Procedure Act
B	Biomass
BE	biological evaluation
BET	bigeye tuna
BiOp	Biological Opinion
CMM	Conservation and management measure
CNMI	Commonwealth of the Northern Mariana Islands
CNP	Central North Pacific
CPUE	Catch per unit of effort
Convention	Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean
Council	Western Pacific Fishery Management Council
DSLL	deep-set longline
DPS	Distinct population segment
EA	Environmental assessment
EEZ	Exclusive economic zone
EFH	Essential fish habitat
EPO	Eastern Pacific Ocean
ESA	Endangered Species Act
F	Fishing mortality
FAD	Fish aggregation device
FEP	Fishery ecosystem plan
FMP	Fishery management plan
FR	*Federal Register*
HAPC	Habitat areas of particular concern
HI	Hawaii
HMS	highly migratory species
IATTC	Inter-American Tropical Tuna Commission
IFKW	insular false killer whale
ISC	International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean
ITS	Incidental take statement
lb	Pound(s)
LRP	Limit reference point
LVPA	large vessel prohibited area
M	Natural mortality rate
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MCP	Marine Conservation Plan
MHI	Main Hawaiian Islands
MFMT	Maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MSST	Minimum stock size threshold
MSY	Maximum sustainable yield

MUS	Management unit species
M&SI	Mortalities or serious injuries
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NEPO	northeast Pacific Ocean
nm	Nautical mile(s)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPO	North Pacific Ocean
NS	National Standard
NWHI	Northwestern Hawaiian Islands
OLE	Office of Law Enforcement
Pelagics FEP	Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region
PBR	Potential biological removal
PIFSC	Pacific Islands Fisheries Science Center
PIRO	Pacific Islands Regional Office
PRIA	Pacific Remote Island Areas
PT	Participating Territory
RA	Regional Administrator
SAR	stock assessment report
SB	spawning biomass
SC	Scientific Committee of the WCPFC
SDC	status determination criteria
SEZ	southern exclusion zone
SIDS	Small Island Developing States
SPC	Secretariat of the Pacific Community
SPO	South Pacific Ocean
SPTT	South Pacific Tuna Treaty
t	Metric ton(s)
USCG	U.S. Coast Guard
U.S. FWS	U.S. Fish and Wildlife Service
WCNPO	Western and central North Pacific Ocean
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and central Pacific Ocean
WP SFF	Western Pacific Sustainable Fisheries Fund
WPFMC	Western Pacific Fishery Management Council

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1 INTRODUCTION

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

The Western Pacific Fishery Management Council (Council or WPFMC) and the National Marine Fisheries Service (NMFS) manage fishing for pelagic management unit species (MUS) in the U.S. 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 (Pelagics 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, harvested predominantly by purse seine and longline fleets of several nations. In the western and central Pacific Ocean or WCPO (generally west of 150° W. long.) bigeye tuna was previously assessed as experiencing overfishing (69 FR 78397, December 30, 2004), but currently is not experiencing overfishing based on the latest stock assessment (McKechnie et al. 2017) as updated (Vincent et al. 2018). Bigeye has not been in an overfished condition according to stock status determination criteria (SDC) described in the Pelagics FEP (WPFMC 2009).

Since 2006, the Western and Central Pacific Fisheries Commission (WCPFC) has adopted conservation and management measures (CMMs) aimed at reducing fishing mortality of bigeye tuna in the WCPO, including catch and effort limits that are applicable to longline and purse seine fisheries of WCPFC member countries. For the purpose of WCPFC membership, the United States is a 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 Rules of Procedure.

The most recent WCPFC CMM that applies to WCPO bigeye tuna is CMM 2018-01. The CMM provides a U.S. longline bigeye limit for 2019-2020 of 3,554 metric tons (t), which was the same limit in place for 2016 and 2018 (Table 1). The 3,554 t limit for the United States is only applicable to U.S. 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 the WCPFC treats each as separate from the U.S. for the purpose of tropical tuna catch or effort limits. Furthermore, the WCPFC attributes catch and effort of U.S.-flagged vessels operating under agreements with its PTs to the U.S. participating territories, and not to the United States (see Paragraph 9 of CMM 2018-01). WCPFC has not placed limits on the amount of bigeye transferrable from U.S. participating territories and other Small Island Developing States (SIDS) [1] under agreements.

[1] CMM 2018-01 defines "SIDS" as inclusive of Participating Territories. See Paragraph 6.

Table 1. Longline bigeye catch limits for WCPFC CCMs

WCPFC CMM	2016 Catch Limit (t)	2017 Catch Limit (t)	2018 Catch Limit (t)	2019 -2020 Catch Limit (t)
Japan	18,265	16,680	17,765	17, 765
Korea	13,942	12,869	13,942	13,942
Chinese Taipei	10,481	9,675	10,481	10,481
China	8,224	7,049	8,724	8,724
Indonesia	5,889	5,889	5,889	5,889
USA	3,554	3,345	3,554	3,554
NZ, AU, EU, PI,	2,000	2,000	2,000	2,000
SIDS/PTs	No limit	No limit	No limit	No limit

Source: WCPFC (2018a)

CMM 2018-01 also provides that each WCPFC member country that is not a SIDS that caught less than 2,000 t of tuna in 2004 to ensure that its catch does not exceed 2,000 t in 2019 and 2020. Paragraph 5 of CMM 2018-01 makes clear, however, that nothing shall prejudice the rights and obligations of SIDS and PTs seeking to develop their domestic fisheries. This provision of CMM 2018-01 addresses Article 30 of the WCPF Convention. Specifically, Article 30 of the WCPF Convention recognizes the special needs of SIDS and PTs. CMMs must 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, WCPFC does not apply the 2,000 t bigeye limit 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.

1.2 Overview of Catch and Allocation Limit Specification Process

In 2014, the Council developed and NMFS approved Amendment 7 to the Pelagics FEP (WPFMC 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 the U.S. participating territories, as recommended by the Council.[2] 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 MUS to a U.S. fishing vessel permitted under the Pelagics FEP through specified fishing agreements to support fisheries development in the U.S. participating territories.

[2] At its 173rd meeting held June 11-13, 2018, in Wailea, Maui, the Council recommended amending the Pelagic FEP and implementing regulations to remove the requirement for establishing a separate total catch or effort limit for the U.S. participating territories prior to establishing allocation limits, and the requirement that the Council must annually specify catch and allocation limits by permitting the Council to recommend that NMFS promulgate multi-year catch and/or allocation limits in regulations.

Regulations implementing Amendment 7 became effective on October 24, 2014 (see 50 CFR 665.819).

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].

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 NMFS projects the U.S. longline bigeye limit will be reached, or upon the effective date of the agreement, whichever is later. NMFS attributes catches of bigeye tuna made by Hawaii-permitted longline vessels identified in a specified fishing agreement to the territory to which the agreement applies in reports to the WCPFC.

By entering into a specified fishing agreement with Hawaii-permitted longline vessels, funds are deposited into the WP SFF and made available to support fisheries development projects identified in the Guam MCP (82 FR 38876, August 16, 2017), the CNMI MCP (82 FR 37198, August 8, 2017), and the American Samoa MCP (83 FR 42490, August 22, 2018). If funds remain after all projects in the MCPs for the U.S. participating territories have been completed, funds may be used to support projects identified in the Pacific Remote Island Areas (PRIA) MCP (82 FR 37575, August 11, 2017). For more information on the territorial catch and allocation limit process, see Amendment 7 to the Pelagics FEP (WPFMC 2014), and implementing federal regulations at 50 CFR 665.819.

From 2014 through 2018, the Council has used the territorial catch, effort and allocation limit measure to recommend annual longline bigeye catch limits of 2,000 t for each U.S. participating territory and recommended that each territory could allocate up to 1,000 t of that limit pursuant to specified fishing agreements. NMFS has authorized either one or two specified fishing agreements between U.S. participating territory governments and Hawaii-based longline vessels each year.

1.3 Proposed Action

Pursuant to Amendment 7 of the Pelagics FEP, the Council reviews bigeye tuna catch and allocation limits at least annually to ensure consistency with the Pelagics FEP, Magnuson-Stevens Act, WCPFC decisions, and other applicable laws. Based on this review, the Council recommends to NMFS whether the catch and allocation limits should be approved for the fishing year. The proposed action is NMFS' implementation of the Council's recommendations for

[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.

territorial bigeye tuna catch and allocation limits, for fishing years 2019-2023. The Council would recommend and NMFS would authorize each U.S. territory to allocate and transfer bigeye tuna limits to a U.S. longline fishing vessel(s) permitted under the Pelagics FEP and identified in a specified fishing agreement applicable to the territory. Criteria for a specified fishing agreement 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 are codified in 50 CFR 665.819. Under existing regulations, the specified catch and allocation limits would be in effect until they expire at the end of the relevant fishing year.

NMFS would monitor catches of bigeye tuna in the WCPO by the longline fisheries of each U.S. participating territory, including catches made by U.S. longline vessels operating under specified fishing agreements. As an accountability measure, NMFS would prohibit the retention of longline-caught bigeye tuna by vessels in the applicable U.S. territory (if NMFS projects the fishery will reach the territorial catch limit), and/or by vessels operating under specified fishing agreements (if NMFS projects the fishery will reach the allocation limit). 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 would attribute any overage of the limit back to the U.S. or U.S. participating territory to which the vessel(s) is(are) registered and permitted.

While the Council expects a new bigeye tuna stock assessment and a new WCPFC tropical tuna measure will be available in late 2020, NMFS believes that the WCPFC and the Council have established a general pattern of management for bigeye tuna. Based on the WCPFC's CMMs on tropical tunas from 2008 through 2018[4], NMFS expects that provisions similar or identical to the provisions in CMM 2018-01 will likely be adopted by the WCPFC for the reasonably foreseeable future. Similarly, NMFS expects the Council would recommend territorial bigeye tuna catch and allocation limits in the reasonably foreseeable future similar or identical to those analyzed in this environmental assessment (EA), as the Council has recommended 2,000 t catch

[4] See CMM 2008-01, CMM 2011-01, CMM 2012-01, CMM 2013-01, CMM 2014-01, CMM 2015-01, CMM 2016-01, CMM 2017-01, and CMM 2018-01, available on the WCPFC Web site at https://www.wcpfc.int/.

and 1,000 t allocation limits for all fishing years from 2014 through 2018.[5] For the purposes of this document, the reasonably foreseeable future is 2019 through 2023.[6]

1.4 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. participating territory (American Samoa, Guam, and the CNMI) that: 1) prevents bigeye overfishing, 2) supports fisheries development in U.S. territories, and 3) promotes the availability of sustainably caught bigeye from U.S. vessels supplying the Hawaiian seafood market during the culturally important end of year season of peak demand. The need for this action is to ensure that NMFS and the Council manage allocations of longline caught bigeye tuna under specified fishing agreements consistent with the conservation needs of the stock.

1.5 Action Area

The action area where U.S. longline vessels operate is the EEZ around Hawaii, American Samoa, Guam, the CNMI, the PRIA, and the adjacent high seas. However, under the proposed action, the catch and allocation limits apply only to bigeye tuna caught by longline gear in the WCPO (generally west of 150° W) and does not apply to bigeye tuna caught by longline gear in the eastern Pacific Ocean (EPO; generally east of 150° W).

1.6 Decision(s) to be Made

The Council will use this EA to support recommendations for bigeye tuna catch and allocation limits for U.S. participating territories in 2019 through 2023. NMFS may also use this document to support a decision whether to approve, disapprove, or partially approve subsequent Council recommendations regarding bigeye tuna catch and/or allocation limits applicable in 2019 through 2023. NMFS notes that specific Council and agency actions may be subject to change, as the WCPFC may adopt new or different measures not within the scope of the EA or the Council may recommend limits not within the scope of this EA.

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[5] See WPFMC. 2014. Amendment 7 to the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region. Regarding the Use and Assignment of Catch and Effort Limits of Pelagic Management Unit Species by the U.S. Pacific Island Territories and Specification of Annual Bigeye Tuna Catch Limits for the U.S. Pacific Island Territories, including an Environmental Assessment and Regulatory Impact Review. Honolulu, HI. p. 279., NMFS. 2015c. 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. Honolulu, HI. p. 181., NMFS. 2016. Final Supplemental Environmental Assessment and Finding of No Significant Impact: Specification of Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in U.S. Pacific Island Territories in 2016. p. 66.. NMFS. 2017b. Supplemental Information Report: Specification of Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in U.S. Pacific Island Territories p. 14., and NMFS. 2018g. Environmental Assessment on 2018 Bigeye Tuna Catch and Allocation Limits in U.S. Pacific Island Territories including a Regulatory Impact Review Honolulu, HI. p. 203.

[6] The Council and NMFS have identified 2019 through the end of 2023 as the timeframe for analysis in this EA, because generally analyses more than five years old need to be reexamined to determine whether supplemental information is needed.

1.7 Scope of this Analysis

The purpose of this draft EA is to provide decision-makers and the public with an evaluation of the environmental and economic effects of territorial bigeye tuna catch and allocation limits in 2019-2023. The analytical portion of this draft EA – Chapters 3 and 4 – examines the direct, indirect, and cumulative effects of the proposed action on the physical, biological, and human environment. Because the Council has only recommended 2,000 t catch and 1,000 t allocation limits per territory in every year since 2014 but considered allocation limits up to 2,000 t in 2018, in this draft EA we analyze alternatives including allocations up to 2,000 t.

At the time that NMFS receives a Council recommendation for territorial bigeye tuna limits, NMFS would consider whether the recommendation is substantially different from the alternatives for bigeye tuna catch and allocation limits analyzed in this document. If the effects that would result from implementation of the recommendation are similar to those analyzed in this draft EA, and if the analysis remains valid in light of any new information or circumstances, NMFS would consider the analysis to be adequate in support of the Council's recommendation. NMFS would supplement this draft EA if it is found that there are substantial changes to the territorial bigeye tuna limits that are relevant to environmental concerns, or there are significant new circumstances or information relevant to environmental issues bearing on the territorial bigeye tuna limits or its impacts.

1.8 List of Preparers

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1.9 Public Involvement

Council meetings and meetings of the Council's advisory bodies are open to the public and are noticed in the Federal Register and local newspapers and publications and on the Council's website (www.wpcouncil.org). Meeting agendas provide opportunities for public comment.

The Council generally considers annual bigeye tuna catch and allocation limits at its first meeting following the December regular session of the WCPFC. In making its recommendation, the Council considers advice, if offered, from its Scientific and Statistical Committee (SSC) and Advisory Panels, which meet and consider Council actions prior to Council meetings.

At its 176th meeting held March 19-21, 2019, the Council considered and discussed issues relevant to bigeye tuna catch and allocation limits for the U.S. participating territories, including the most recent (2018) bigeye stock assessment, the recommendations of the Council's Scientific

and Statistical Committee (SSC) made at the 131st SSC meeting to held March 12-14, 2019, and other relevant information. For fishing year 2019, the Council recommended 2,000 t catch and 1,000 t allocation limits for each U.S. participating territory, which NMFS has identified as its preferred alternative in this EA.

NMFS is seeking public comment on the proposed rule for 2019 territorial bigeye tuna catch and allocation limits and draft EA for the proposed action. The reader may find instructions on how to comment on the proposed rule and the EA by searching on RIN 0648-XG925 at www.regulations.gov, or by contacting the responsible official or Council at the above addresses. NMFS will consider comments received by the deadline specified in the proposed rule. NMFS will similarly seek public comment on proposed rules for territorial bigeye tuna catch and allocation limits, upon receipt of Council recommendations, for future fishing years through www.regulations.gov and supplement this environmental assessment if necessary.

2 DESCRIPTION OF THE ALTERNATIVES

This section describes alternatives for longline bigeye tuna catch and allocation limits for American Samoa, Guam, and the CNMI and the expected fishery outcomes that would occur under each alternative. Table 2 provides a comparison of the features of the alternatives considered and possible fishery outcomes.

2.1 Development of the Alternatives

From 2014 to 2018, the Council has recommended annual longline bigeye catch limits of 2,000 t for each U.S. participating territory and recommended that each territory could allocate up to 1,000 t of that limit. The Council made these recommendations taking into account WCPFC measures, Magnuson-Stevens Act requirements, other applicable law, and bigeye stock status. Prior to 2017, the Secretariat of the Pacific Community (SPC), the science provider to the WCPFC, assessed bigeye tuna as experiencing overfishing. As previously mentioned, the best scientific information available indicates that bigeye is no longer experiencing overfishing. In light of the updated and improved stock status of WCPO bigeye tuna (Vincent et al. 2018), the Council will consider the projected impact of various catch and attribution scenarios on the stock (Appendix A) and outcomes from WCPFC's December 2018 meeting in making its recommendation for the 2019 fishing year. For future bigeye tuna catch limits, the Council will consider the best available scientific information and catch and effort limits from the WCPFC's most recent meeting in order to recommend whether bigeye tuna catch and/or effort limits should be approved for the fishing year.

2.2 Description of the Alternatives

Features Common to all Alternatives

In accordance with CMM 2018-01 adopted by the WCPFC, the U.S. longline bigeye limit for the WCPO remains at 3,554 t for 2019 and 2020. For the purposes of estimating impacts to WCPO bigeye tuna, NMFS assumes that this catch limit would remain in place each year for 2019 - 2023. NMFS implemented this limit in 2018, which remains in place unless modified or rescinded (83 FR 33851, July 18, 2018). If NMFS projects vessels will reach the catch limit, NMFS would prohibit the retention of longline-caught bigeye tuna in the WCPO for the

remainder of the calendar year. Once the prohibition on bigeye tuna retention is in effect, Hawaii longline vessels that target bigeye tuna in the WCPO may shift fishing effort for bigeye tuna into the EPO. Vessels may also switch to targeting swordfish if the shallow-set fishery is open and bigeye tuna caught by these vessels in the WCPO would count toward the U.S. longline bigeye limit.

In the EPO, the Inter-American Tropical Tuna Commission (IATTC) has adopted and NMFS has implemented an annual bigeye tuna limit applicable to U.S. longline vessels of 750 t for vessels greater than 24 m (78.7 ft) in length for the years 2018-2020 (83 FR 15503, April 11, 2018). The limit does not apply to vessels shorter than 24 m in length. As of April 2018, 36 out of 145 vessels in the Hawaii longline fishery are greater than 24 m. If NMFS projects vessels greater than 24 m will reach the catch limit, NMFS would prohibit the retention of longline-caught bigeye tuna by vessels longer than 24 m in the EPO for the remainder of the calendar year. However, the remaining 109 vessels shorter than 24 m may retain longline-caught bigeye tuna in the EPO.

Consistent with WCPFC decisions and articles of the WCPF Convention applicable to SIDS and PTs, U.S. longline vessels that are not subject to the U.S. longline bigeye limit for the WCPO 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 catch and attribution limits for bigeye tuna are recommended and 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 toward the U.S. longline bigeye tuna limit. Rather, in accordance with 50 CFR 300.224, NMFS attributes catches of bigeye tuna by these vessels to the applicable U.S. participating territory because the vessels are fishing under the territory's established limit. 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.

2.2.1 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. We provide this alternative for comparison with the other alternatives, but it does not meet the purpose and need for action.

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; they would also not be able to allocate any catch under a specified fishing agreement.

Based on recent fishery performance data, NMFS anticipates that vessels operating in the longline fisheries of American Samoa would catch approximately 541 t of bigeye tuna each year on average. This amount represents the combined average annual bigeye tuna caught in 2012-2017 by American Samoa longline permitted vessels fishing in the South Pacific Ocean (SPO)

within or nearby the EEZ around American Samoa (97 t), and in the North Pacific Ocean (NPO) outside the EEZ near Hawaii by vessels holding both American Samoa and Hawaii limited access longline permits (444 t) (see Appendix A, Kingma and Bigelow (2018)). NMFS does not expect longline vessels in CNMI or Guam to catch bigeye tuna in the near future because there are no active longline vessels based in those islands and fisheries development would be incremental. High docking costs along with poor market access contribute to the lack of longline fishing in the Marianas (WPFMC 2014). Based on recent historical fishery performance, NMFS anticipates that vessels operating in the Hawaii longline fishery would catch the entire U.S. bigeye tuna limit of 3,554 t, by November or earlier.

Under Alternative 1, the expected total bigeye tuna catch in the WCPO for longline fisheries managed under the Pelagics FEP would be 4,095 t. This represents the combined anticipated catch of bigeye tuna by the U.S. longline fisheries from Hawaii (3,554 t), American Samoa (541 t), Guam (0 t) and the CNMI (0 t) (3,554 + 541 + 0 + 0 = 4,095).

Without any Council-recommended specifications for catch and allocation limits for the U.S. participating territories, NMFS would not authorize any 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 (WP SFF). Consequently, there would be no funding from specified fishing agreements 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.

The Hawaii longline fishery would likely catch the U.S. WCPO bigeye tuna limit prior to the end of each fishing year, resulting in a WCPO closure under this alternative. In the event of a closure in the WCPO, the Hawaii-based longline fleet may see increased trip lengths, increased exposure to rougher seas in the EPO, race to fish conditions associated with uncertainty over applicable limits, and differential economic impacts on different segments of the fleet (Ayers et al. 2018). Imported fish caught in less regulated foreign fisheries may fill the demand for bigeye tuna, and reduced availability may affect the supply of fresh bigeye tuna in the culturally important holiday season. Hawaii troll and handline vessels may change targeting behavior to bigeye tuna during a closure and experience increased revenue (Richmond et al. 2015). Finally, Hawaii-based longline vessels may switch to targeting swordfish to continue fishing in the WCPO during a closure, if the shallow-set fishery is open.

2.2.2 Alternative 2: Specify for each U.S. participating territory a 2,000 t bigeye catch limit and 1,000 t bigeye allocation limit (Preferred/Status Quo)

Under Alternative 2, the Council would recommend and NMFS would implement a catch limit of 2,000 t of bigeye tuna for each U.S. participating territory. This catch limit is more restrictive than CMM 2018-01, which places no limits on SIDS and PTs (see Section 1.1). NMFS would also authorize the three U.S. participating territories to each allocate up to 1,000 t of their 2,000 t bigeye limit to FEP-permitted longline vessels identified in a specified fishing agreement with a U.S. territory. Specified fishing agreements under this alternative would support responsible fisheries development in the U.S. participating territories by providing funds for territorial MCPs.

As an AM, NMFS would prohibit the retention of longline-caught bigeye tuna by vessels in the applicable U.S. territory (if NMFS projects the territorial limit will be reached), and/or by vessels operating under the applicable specified fishing agreement (if NMFS projects the allocation limit will 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(are) registered and permitted.

This alternative is identical to the bigeye tuna catch and allocation limit specifications NMFS implemented in 2014 (79 FR 64097, October 28, 2014), 2015 (80 FR 61767, October 14, 2015; 80 FR 68778, November 6, 2015), 2016 (81 FR 63145, September 14, 2016), 2017 (82 FR 47644, October 13, 2017), and 2018 (83 FR 53399).

Expected Fishery Outcomes

Under this alternative, NMFS evaluates the range of effects to the WCPO bigeye tuna stock and other fishery resources assuming that NMFS could authorize one, two, or three specified fishing agreements based on a potential Council recommendation for a 2,000 t catch limit and 1,000 t allocation limit for each U.S. participating territory. Thus, under Alternative 2 the four distinct possible fishery outcomes for catch of bigeye tuna include authorization of one specified fishing agreement (A), two specified fishing agreements (B), three specified fishing agreements (C), and three specified fishing agreements with maximum use of the territorial catch limits (D).

NMFS does not expect longline vessels based in CNMI or Guam to catch bigeye tuna in the near future because there are currently no active longline fisheries based in those territories and fisheries development would be incremental. For American Samoa, NMFS expects annual bigeye tuna catches by longline vessels possessing an American Samoa limited access permit to be similar to the average annual catch from 2012-2017, which is approximately 541 t. Therefore, limiting the amount of bigeye tuna a U.S. participating territory could allocate to 1,000 t ensures that some quota (1,000 t) would remain available for American Samoa longline fishery participants.

Based on recent levels of bigeye tuna catch by longline vessels to which the U.S bigeye tuna limit applies, the U.S. longline fleet could reach the U.S. bigeye tuna limit of 3,554 t by November or earlier. Once the prohibition occurs, NMFS anticipates that 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 t limit. Because federal regulations prohibit a vessel from participating in more than one specified fishing agreement at a time, U.S. longline permitted vessels from Hawaii would enter into specified fishing agreements sequentially, with one or more U.S. territories, as has occurred annually from 2014 to 2018.

Potential Outcome A: One Specified Fishing Agreement

Under Outcome A, NMFS would authorize a single specified fishing agreement. Like Alternative 1, NMFS expects vessels operating under an American Samoa longline permit to catch about 541 t of bigeye tuna annually. This is the average level of catch for the period 2012-2017. As previously discussed, NMFS does not expect longline vessels in CNMI or Guam to

catch bigeye tuna in the near future. We expect vessels operating in the Hawaii longline fishery to catch 3,554 t of bigeye tuna every year. With one specified fishing agreement, the expected bigeye tuna catch under Outcome A is 5,095 t. This amount represents the combined assumed catch of bigeye tuna by the longline fisheries of the U.S. participating territories of American Samoa (541 t), Guam (0 t), CMMI (0 t) and by the U.S. longline fisheries from Hawaii (3,554), plus an allocation of the maximum of 1,000 t under one specified fishing agreement.

Potential Outcome B: Two Specified Fishing Agreements

Under Outcome B, NMFS would authorize two specified fishing agreements, and would maintain the same assumptions for catch by American Samoa, Guam, CNMI, and Hawaii longline vessels as Outcome A. With two agreements, the expected annual bigeye tuna catch under Outcome B is 6,095 t. This amount represents the combined assumed catch of bigeye tuna by the longline fisheries of the U.S. participating territories of American Samoa (541 t), Guam (0 t), CMMI (0 t) and by the U.S. longline fisheries from Hawaii (3,554), plus an allocation of 2,000 t under two specified fishing agreements.

Potential Outcome C: Three Specified Fishing Agreements and Partial Utilization of Territorial Limits

Under Outcome C, NMFS would authorize three specified fishing agreements and would maintain the same catch assumptions for American Samoa, Guam, CNMI, and Hawaii longline vessels as Outcome A. With three agreements, the expected annual longline bigeye tuna catch under Outcome C is 7,095 t. This amount represents the combined assumed catch of bigeye tuna by the longline fisheries of the U.S. participating territories of American Samoa (541 t), Guam (0 t), CMMI (0 t) and by the U.S. longline fisheries from Hawaii (3,554), plus an allocation of 3,000 t under three specified fishing agreements.

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

Under Outcome D, NMFS would authorize three specified fishing agreements and assumes that each territory would fully utilize its catch limit of 2,000 t. Specifically, Outcome D assumes that all three U.S. territories - American Samoa, Guam and the CNMI - would each catch 1,000 t of bigeye tuna (3,000 t), and each territory would also allocate their 1,000 t of bigeye tuna under three specified fishing agreements (3,000 t), for a total of 6,000 t. Outcome D also assumes the Hawaii longline fishery would catch 3,554 t every year, for a total of 9,554 t under this scenario. NMFS does not anticipate this scenario would occur in the foreseeable future due to lack of longline vessels operating out of Guam and the CNMI in recent years, but we analyze the scenario as the maximum authorized effect on the environment, including the WCPO bigeye tuna stock.

Discussion

Under Outcomes A through D, we do not expect 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, effort, species targeted, area fished, seasons fished, or intensity of fishing. Additionally, NMFS does not expect the effort of these fisheries to deviate from the recent

increasing trend (NMFS 2018d) due to existing regulatory constraints, including allocation limits and limited entry programs. NMFS expects that the available amount of bigeye tuna would continue to drive catch of all fish species.

2.2.3 Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 t of the catch limit

Under Alternative 3, NMFS would specify a catch limit of 2,000 t of bigeye tuna for each U.S. participating territory and authorize the three U.S. territories to each allocate up to their entire 2,000 t bigeye limit to FEP-permitted longline vessels identified in a specified fishing agreement with a U.S. territory. As an AM, NMFS would prohibit the retention of longline-caught bigeye tuna by vessels in the applicable U.S. territory (if NMFS projects the territorial limit will be reached), and/or by vessels operating under the applicable specified fishing agreement (if NMFS projects the allocation limit will 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(are) registered and permitted.

Expected Fishery Outcomes

Under Alternative 3, each U.S. participating territory would be subject to a total longline bigeye limit (2,000 t), and would be able to each allocate their entire catch limit of 2,000 t to FEP-permitted longline vessels identified in a specified fishing agreement. Like Alternative 1, NMFS does not expect bigeye tuna to be caught by longline vessels based in CNMI or Guam in the near future because there are currently no active longline fisheries based in those islands. Therefore, under this alternative, it is possible for the CNMI and Guam to allocate all 2,000 t of its limit to vessels identified in a specified fishing agreement.

For American Samoa, the territory would have the ability allocate away all 2,000 t of its limit to vessels identified in a specified fishing agreement, or allocate only a portion of its bigeye tuna limit while retaining a portion for its local fleet. Based on average annual catch in 2012-2017, the American Samoa longline fleet landed an average of approximately 541 t annually, with 97 t from vessels operating inside the EEZ around American Samoa and 444 t from dual American Samoa and Hawaii permitted vessels operating in the NPO.

Based on recent levels of bigeye tuna catch by longline vessels to which the U.S. bigeye tuna limit applies, the U.S. longline fleet could reach the assumed U.S. bigeye tuna limit of 3,554 t by November or earlier. Once the prohibition occurs, NMFS expects that 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 allocation limit. Because federal regulations prohibit a vessel from participating in more than one specified fishing agreement at a time, U.S. longline permitted vessels from Hawaii would enter into specified fishing agreements sequentially, with one or more U.S. territories.

Potential Outcome E: Three Specified Fishing Agreements and Maximum Allocation of Territorial Limits

Under Alternative 3, there are several distinct possible fishery outcomes for total catch of bigeye tuna, ranging from one specified fishing agreement (3,554 t from the U.S. limit, plus 2,000 t catch and allocation limit = 5,554 t) to all three specified fishing agreements (3,554 t from the U.S. limit, plus 6,000 t catch and allocation limit = 9,554 t). Under three specified fishing agreements, the maximum allowable catch, however, would be 3,554 t plus 6,000 t in allocations, or 9,554 t. This draft EA analyzes 9,554 t as the expected fishery Outcome E under Alternative 3. Under Outcome E, all three territories would each allocate all 2,000 t of their catch limit, and American Samoa would not retain any bigeye tuna for its local fleet.

Potential Outcome F: Three Specified Fishing Agreements and Maximum Allocation of Territorial Limit for Guam and the CNMI and 1,500 t Allocation for American Samoa

Because NMFS does not expect American Samoa to allocate its entire 2,000 t catch limit to U.S. longline vessels, we also analyze a more plausible outcome (Outcome F), where NMFS would authorize all three specified fishing agreements, with Guam and the CNMI each allocating the maximum of 2,000 t, while American Samoa allocates 1,500 t of its 2,000 t limit for a total of 5,500 t in allocations. Under this scenario (Outcome F), American Samoa would retain 500 t for its local fleet. Thus, the maximum allowable catch of bigeye tuna under Outcome F would be 9,554 t, with 3,554 t from the U.S. limit, 2,000 t of allocation each from the Guam and the CNMI, plus 1,500 t from the American Samoa allocation, and 500 t from American Samoa catch. While total bigeye mortality would be the same as in Outcome E (i.e., 9,554 t) under this outcome, there are slightly different socioeconomic effects for American Samoa.

Discussion

Under Outcomes E and F, we do not expect 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. Under higher allocation limits, catch of target and non-target stocks and interactions with protected species could increase in the Hawaii deep-set longline fleet if effort increases, as the catch of bigeye tuna drives fleet dynamics in the longline fishery as a whole. However, fishing effort alone is not a good predictor of protected species interactions.

2.3 Comparison of Features of the Alternatives

Table 2 summarizes and compares the features of the alternatives.

Table 2. Comparison of Features of the Alternatives.

Topic	**Alternative 1: No Action** ***No catch and allocation limits for U.S. territories, and no fishing agreements***	**Alternative 2: 2,000 t Catch Limit and 1,000 t Allocation Limit for each U.S. Territory**				**Alternative 3: 2,000 t Catch Limit and up to 2,000 t Allocation Limit for each U.S. Territory**	
		Outcome A 1 fishing agreement and 1,000 t allocation	***Outcome B 2 fishing agreements and 2,000 t allocation***	***Outcome C 3 fishing agreements and 3,000 t allocation and partial utilization of BET limit in U.S. territories***	***Outcome D 3 fishing agreements and 3,000 t allocation and full utilization of BET limit in U.S. territories***	***Outcome E 3 fishing agreements and 6,000 t allocation***	***Outcome F 3 fishing agreements and 5,500 t allocation and full utilization of American Samoa BET limit***
Proposed longline-caught bigeye tuna (BET) catch limit for each U.S. participating territory	None	2,000 t	2,000 t	2,000 t	2,000 t	2,000 t	2,000 t
Proposed BET limit each U.S. participating territory may allocate to Pelagic FEP permitted longline vessels	None	1,000 t	1,000 t	1,000 t	1,000 t	2,000 t	2,000 t

Topic	**Alternative 1: No Action** ***No catch and allocation limits for U.S. territories, and no fishing agreements***	**Alternative 2: 2,000 t Catch Limit and 1,000 t Allocation Limit for each U.S. Territory**				**Alternative 3: 2,000 t Catch Limit and up to 2,000 t Allocation Limit for each U.S. Territory**	
		Outcome A 1 fishing agreement and 1,000 t allocation	***Outcome B 2 fishing agreements and 2,000 t allocation***	***Outcome C 3 fishing agreements and 3,000 t allocation and partial utilization of BET limit in U.S. territories***	***Outcome D 3 fishing agreements and 3,000 t allocation and full utilization of BET limit in U.S. territories***	***Outcome E 3 fishing agreements and 6,000 t allocation***	***Outcome F 3 fishing agreements and 5,500 t allocation and full utilization of American Samoa BET limit***
AMs to ensure the proposed longline BET catch and allocation limits are not exceeded	None	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 prohibit the retention of longline-caught BET by vessels operating under specified fishing agreements.					
Expected annual amount of longline caught BET that would be attributed to the U.S. (Hawaii) longline vessels	3,554 t	3,554 t	3,554 t	3,554 t	3,554 t	3,554 t	3,554 t

Topic	**Alternative 1: No Action** ***No catch and allocation limits for U.S. territories, and no fishing agreements***	**Alternative 2: 2,000 t Catch Limit and 1,000 t Allocation Limit for each U.S. Territory**				**Alternative 3: 2,000 t Catch Limit and up to 2,000 t Allocation Limit for each U.S. Territory**	
		Outcome A 1 fishing agreement and 1,000 t allocation	***Outcome B 2 fishing agreements and 2,000 t allocation***	***Outcome C 3 fishing agreements and 3,000 t allocation and partial utilization of BET limit in U.S. territories***	***Outcome D 3 fishing agreements and 3,000 t allocation and full utilization of BET limit in U.S. territories***	***Outcome E 3 fishing agreements and 6,000 t allocation***	***Outcome F 3 fishing agreements and 5,500 t allocation and full utilization of American Samoa BET limit***
Expected annual number of specified fishing agreements	None	1	2	3	3	3	3
Expected annual amount of BET that would be allocated to the Hawaii longline fishery under specified fishing agreements	None	1,000 t	2,000 t	3,000 t	3,000 t	6,000 t	5,500 t

Topic	**Alternative 1: No Action** ***No catch and allocation limits for U.S. territories, and no fishing agreements***	**Alternative 2: 2,000 t Catch Limit and 1,000 t Allocation Limit for each U.S. Territory**				**Alternative 3: 2,000 t Catch Limit and up to 2,000 t Allocation Limit for each U.S. Territory**	
		Outcome A 1 fishing agreement and 1,000 t allocation	***Outcome B 2 fishing agreements and 2,000 t allocation***	***Outcome C 3 fishing agreements and 3,000 t allocation and partial utilization of BET limit in U.S. territories***	***Outcome D 3 fishing agreements and 3,000 t allocation and full utilization of BET limit in U.S. territories***	***Outcome E 3 fishing agreements and 6,000 t allocation***	***Outcome F 3 fishing agreements and 5,500 t allocation and full utilization of American Samoa BET limit***
Expected annual amount of BET caught by longline vessels in the three U.S. participating territories	541 t	541 t	541 t	541 t	3,000 t	0 t	500 t
Expected annual amount of BET caught by Hawaii and U.S. territory longline vessels combined	4,095 t	5,095 t	6,095 t	7,095 t	9,554 t	9,554 t	9,554 t
Fishery Activity (based on	WCPO likely to close by November or	WCPO likely to close in third or fourth	WCPO could close in fourth quarter. Less	WCPO unlikely to close; less	WCPO unlikely to close; less	WCPO unlikely to close; less	WCPO unlikely to close; less

Topic	**Alternative 1: No Action** ***No catch and allocation limits for U.S. territories, and no fishing agreements***	**Alternative 2: 2,000 t Catch Limit and 1,000 t Allocation Limit for each U.S. Territory**				**Alternative 3: 2,000 t Catch Limit and up to 2,000 t Allocation Limit for each U.S. Territory**	
		Outcome A 1 fishing agreement and 1,000 t allocation	***Outcome B 2 fishing agreements and 2,000 t allocation***	***Outcome C 3 fishing agreements and 3,000 t allocation and partial utilization of BET limit in U.S. territories***	***Outcome D 3 fishing agreements and 3,000 t allocation and full utilization of BET limit in U.S. territories***	***Outcome E 3 fishing agreements and 6,000 t allocation***	***Outcome F 3 fishing agreements and 5,500 t allocation and full utilization of American Samoa BET limit***
most recent 5 year period)	earlier; EPO likely to close to large vessels, shortly after WCPO closure.	quarter of the year. Less effort in EPO compared to Alternative 1. However, EPO could close to large vessels, if one fishing agreement allocation is exhausted.	effort in EPO compared to Alt. 1 and Alt. 2 Outcome A. However, EPO could close to large vessels, if two fishing agreement allocation is exhausted. Less activity in EPO than Alt 1 or Alt 2 Outcome A.	activity in EPO.	activity in EPO.	activity in EPO. American Samoa vessels unable to retain bigeye tuna.	activity in EPO. American Samoa likely able to retain bigeye throughout the year.

2.4 Alternatives Considered, but Rejected from Further Analysis

The Council and NMFS did not consider additional alternatives for bigeye tuna catch and allocation limits for U.S. participating territories that met the purpose and need for the proposed action and have been rejected from further analysis. If the Council considers additional alternatives for territorial bigeye tuna catch limits in later years, NMFS will evaluate whether the alternatives are substantially different from those presented in this document and whether the analysis in this document can support a decision on whether to approve resulting recommendations.

3 AFFECTED ENVIRONMENT

This chapter describes the baseline condition of resources in the action area under recent fishery conditions. The environmental resources that are potentially affected include target and non-target species (including bycatch), protected resources, and marine habitat. This chapter also describes fishery participants, fishing communities, and the management setting. NMFS derives the data in this chapter from longline and observer reports, required under the Pelagics FEP, and other available information from regional fishery management organizations such as the WCPFC or IATTC.

3.1 Target and Non-Target Stocks

This section identifies the pelagic MUS managed under the Pelagics FEP that the longline fisheries of American Samoa, Guam, the CNMI and Hawaii harvest. They include several species of tuna, billfish and sharks shown in Table 3. This section also briefly summarizes the overfishing and overfished status of pelagic MUS where known. For a comprehensive discussion of the biology and life history of pelagic MUS, see the Pelagics FEP (WPFMC 2009).

The Pelagics FEP (WPFMC 2009) includes SDC, also known as limit reference points (LRPs) for overfishing and overfished conditions. Specifically, 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 maximum sustainable yield (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), or the level that jeopardizes the capacity of the stock to produce MSY on a continuing basis (B_{MSY}). Specifically, 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 for the stock falls below 0.65, the stock is overfished. If a stock has a natural mortality rate greater than 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. It is important to note that NMFS National Standard 1 guidelines at 50 CFR 665.310(e)(1)(i)(C) defines B_{MSY} as the long-term average size of the stock measured in terms of spawning biomass (SB) or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at B_{MSY}. Thus, whenever available, NMFS will use estimates of SB in determining the status of a stock. When

estimates of SB are not available, NMFS may use estimates of total biomass (B), or other reasonable proxies for determining stock status.

Table 3 shows the stock status of pelagic MUS measured against the SDCs of the Pelagics FEP, based on the most recent stock assessment for the stock. For some pelagic MUS, the SDC specified in the Pelagics FEP differs from the SDC or LRPs adopted by the WCPFC and IATTC. Additionally, in some cases, the LRPs adopted by the WCPFC for a particular stock of fish differs from the LRPs adopted by the IATTC. Finally, in other cases, no stock assessments are available and fishery management organizations must infer stock status from other indicators or not at all. For the purposes of stock status determinations, NMFS uses the SDCs specified in the Pelagics FEP.

Table 3. Estimates of stock status in relation to Pelagics FEP overfishing and overfished SDCs for pelagic MUS.

Stock	Overfishing reference point	Is overfishing occurring?	Approaching Overfishing (2 yr)	Overfished reference point	Is the stock overfished?	Approaching Overfished (2 yr)	Assessment results	Natural mortality[1]	MSST
Skipjack Tuna (WCPO)	F/F_{MSY}=0.45	No	No	SB_{2015}/SB_{MSY}=2.56, $SB_{2015}/SB_{F=0}$=0.58	No	No	McKechnie et al. (2016) WCPFC (2017b)	>0.5 yr^{-1}	0.5 B_{MSY}
Skipjack Tuna (EPO)	Unknown	Unknown	Unknown	Unknown	No	Unknown	Maunder (2018)	Unknown	Unknown
Yellowfin Tuna (WCPO)	F/F_{MSY}=0.74	No	No	$SB_{2012-2015}/SB_{MSY}$=1.41, $SB_{2012-2015}/SB_{F=0}$=0.33	No	No	Tremblay-Boyer et al. (2017) WCPFC (2017b)	0.8-1.6 yr^{-1}	0.5 B_{MSY}
Yellowfin Tuna (EPO)	F/F_{MSY}=1.01	Yes, because F>MFMT	Not applicable	$SB_{2015-2017}/SB_{MSY}$=1.08, $B_{2015-2017}/B_{MSY}$=1.35	No	No	Minte-Vera et al. (2018)	0.2-0.7 yr^{-1}	0.5 B_{MSY}
Albacore (S. Pacific)	F/F_{MSY}=0.20	No	No	$SB_{2013-2016}/SB_{MSY}$=3.3, $SB_{2013-2016}/SB_{F=0}$=0.52,	No	No	Tremblay-Boyer et al. (2018) WCPFC (2018b)	0.3 yr^{-1} 0.4 yr^{-1}	~0.6 SB_{MSY}
Albacore (N. Pacific)	F/F_{MSY}=0.61	No	No	$SB_{2015}/SB_{F=0}$=0.40	No	No	ISC (2017b)	0.4 yr^{-1}	0.6 B_{MSY}
Bigeye Tuna (WCPO)	F/F_{MSY}=0.77	No	No	$SB_{2012-2015}/SB_{MSY}$=1.38, $SB_{2012-2015}/SB_{F=0}$=0.36	No, because SSB>MSST	No	Vincent et al. (2018) WCPFC (2018b)	0.4 yr^{-1}	0.6 B_{MSY}
Bigeye Tuna (EPO)	NA	NA	NA	NA	NA	NA	Maunder et al. (2018a)	NA	NA
Pacific Bluefin Tuna	F/F_{MSY} =1.17	Yes, because F>MFMT	Not applicable	SB_{2016}/MSST=0.21	Yes, because SSB<MSST	Not applicable	ISC (2018a)	0.25-1.6 yr^{-1}	~0.75 B_{MSY}
Blue Marlin (Pacific)	F/F_{MSY}=0.81	No	Unknown	$SB_{2012-2014}/SB_{MSY}$=1.23	No	Unknown	ISC (2016)	0.22-0.42 yr^{-1}	~0.7 B_{MSY}

Stock	Overfishing reference point	Is overfishing occurring?	Approaching Overfishing (2 yr)	Overfished reference point	Is the stock overfished?	Approaching Overfished (2 yr)	Assessment results	Natural mortality[1]	MSST
Swordfish (WCNPO)	$F_{2013\text{-}2015}/F_{MSY}$=0.45	No	Unknown	SB_{2016}/SB_{MSY}=1.87	No	Unknown	ISC (2018b)	0.22-0.42 yr^{-1}	~0.7 B_{MSY}
Swordfish (EPO)	F_{2012}/F_{MSY} = 1.11	Yes, because F > MFMT	Not applicable	SB_{2012}/SB_{MSY} =1.87	No	Unknown	ISC (2014)	0.35 yr^{-1}	0.65 B_{MSY}
Striped Marlin WC (N. Pacific)	F/F_{MSY}=1.49	Yes, because F>MFMT	Not applicable	SB_{2013}/SB_{MSY}=0.39	Yes, because SSB_{2013}<MSST	Not applicable	ISC (2015b)	0.4 yr^{-1}	0.6 SB_{MSY}
Striped Marlin (NEPO)	Not provided in assessment	No	No	$SB_{(2009)}/SB_{MSY}$=1.5	No	Unknown	Hinton and Maunder (2011)	0.5 yr^{-1}	0.5 B_{MSY}
Blue Shark (N. Pacific)	F/F_{MSY}=0.38	No	Unknown	$SB_{2012\text{-}2014}/SB_{MSY}$=1.69	No	Unknown	ISC (2017a)	0.145-0.785 yr^{-1}	~0.8 B_{MSY}
Oceanic white-tip shark (WCPO)	F/F_{MSY}=6.69	Yes	Not applicable	SB/SB_{MSY}=0.15	Yes	Not applicable	Rice and Harley (2012b)	0.18 yr^{-1}	0.82 B_{MSY}
Silky shark (WCPO)	F/F_{MSY}=1.61	Yes	Not applicable	SB_{2016}/SB_{MSY}=1.18 $SB_{2018}/SB_{F=0}$=0.47	No	Unknown	Clarke et al. (2018)	0.18 yr^{-1}	0.82 B_{MSY}
Silky Shark (EPO)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Lennert-Cody et al. (2018)	Unknown	Unknown
Longfin mako shark (N. Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Shortfin mako shark (N. Pacific)	F/F_{MSY}=0.62	No	Unknown	SA_{2016}/SA_{MSY}=1.36	No	Unknown	ISC (2018c)	0.128 yr^{-1}	0.872 B_{MSY}
Common thresher shark (N. Pacific)	F/F_{MSY}=0.21	No	Unknown	SB/SB_{MSY}=1.4	No	Unknown	Teo et al. (2018)	0.04 yr^{-1}	0.96 B_{MSY}
Bigeye thresher	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Stock	Overfishing reference point	Is overfishing occurring?	Approaching Overfishing (2 yr)	Overfished reference point	Is the stock overfished?	Approaching Overfished (2 yr)	Assessment results	Natural mortality[1]	MSST
shark (N. Pacific)									
Pelagic thresher shark (N. Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Salmon shark (N. Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Mahimahi (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Wahoo (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Opah (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Pomfret (family Bramidae, W. Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Black marlin (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Shortbill spearfish (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Sailfish (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Kawakawa (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Oilfish (family	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Stock	Overfishing reference point	Is overfishing occurring?	Approaching Overfishing (2 yr)	Overfished reference point	Is the stock overfished?	Approaching Overfished (2 yr)	Assessment results	Natural mortality[1]	MSST
Gempylidae, Pacific)									
Other tuna relatives (*Auxis* spp., *Allothunnus* spp., and *Scomber* spp, Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Squids (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Source: WPFMC (2018a) and those assessments listed in the "Assessment results" column.
[1] Estimates based on Boggs et al. (2000) or assumed in the assessments.

3.1.1 Bigeye Tuna

WCPO

The Secretariat of the Pacific Community (SPC) prepared the most recent stock assessment for WCPO bigeye tuna in July 2017, updated August 2018, which covers bigeye tuna from Indonesia in the far western Pacific, to the 150° W. meridian in the central Pacific Ocean (McKechnie et al. 2017; Vincent et al. 2018). The 2017 and 2018 assessment reports update the 2014 stock assessment by incorporating additional bigeye catch data from 2013-2015, and investigating alternative regional bigeye tuna stock structure in combination with a new bigeye tuna growth curve. The new growth curve is based on directly observed age at length from otoliths, rather than estimated internally in the assessment model. The new growth model suggests bigeye tuna is more productive than previously assumed. The newly introduced alternative regional structure is based on composition of fisheries in equatorial waters south of 10ºN and homogeneity of fisheries operating north of 10ºN (notably Region 2, inclusion of Hawaii in a single continuous region). Unlike the 2014 stock assessment, which identified four model variants that most plausibly reflected the condition of the stock, the 2017 stock assessment identifies 72 plausible model variants. The models make up a grid to explore the interactions among axes of uncertainty, known as a structural uncertainty grid. 2018 assessment update revisited the uncertainty grid with respect to the exclusive use of new growth information and alternative regional structure scenarios.

The WCPFC Scientific Committee (SC) reviewed and endorsed the 2017 bigeye stock assessment at its Thirteenth Regular Session (SC13) as the most advanced and comprehensive assessment yet conducted for this species. At the Fourteenth Regular Session of the Science Committee (SC14), the SC also endorsed the use of the assessment model uncertainty grid as best available scientific information to characterize stock status and management advice. SC14 recommended to retain only model runs with newest growth information, comprising 36 model configurations and noted variance in the assessment results with respect to regional stock structure.The consensus weighting considered all options within the four axes of uncertainty for steepness, tagging dispersion, size frequency and regional structure to be equally likely. The resulting uncertainty grid was used to characterize stock status, to summarize reference points and to calculate the probability of breaching the Commission-adopted spawning biomass limit reference point ($0.2*SB_{F=0}$) and the probability of F_{recent} being greater than F_{MSY} (WCPFC 2018b).

Based on the uncertainty grid adopted by SC14, the WCPO bigeye tuna spawning biomass is likely above the MSST of the Pelagics FEP and the WCPFC's biomass LRP. Additionally, recent F is likely below F_{MSY} (MFMT). Therefore noting the level of uncertainties in the current assessment it appears that the stock is not experiencing overfishing (94% probability, 34 of 36 models) and it appears that the stock is not in an overfished condition (100% probability) with respect to Commission-adopted LRP in 2015 (SB_{latest}/SB_{MSY}). The central tendency of relative recent SB under the selected new and old growth curve model weightings in the absence of fishing was median ($SB_{recent}/SB_{F=0}$) = 0.42 with a range of 0.251 to 0.452 and (SB_{latest}/SB_{MSY} = 1.624) with a range of 1.146 and 2.187 (Table 4). There was a roughly 6% probability (2 out of 36 models) that the recent spawning biomass (SB_{recent},2012-2015) had breached the adopted LRP (WCPFC 2018b).

The central tendency of relative recent fishing mortality under the SC14's selected new growth model configurations was median (F_{recent}/F_{MSY}) = 0.768 with a range of 0.592 to 1.058 (Table 4). There was a roughly 6% probability (2 out of 36 models) that the recent fishing mortality was above F_{MSY} (WCPFC 2018b).

Table 4: Summary of reference points using WCPFC SC structural uncertainty grid

	Mean	Median	Min	10%	90%	Max
C_{latest}	152,148	151,846	148,888	148,936	154,971	155,577
YF_{recent}	154,180	153,220	133,120	141,140	170,720	172,280
f_{mult}	1.291	1.301	0.946	1.075	1.499	1.690
F_{MSY}	0.050	0.049	0.044	0.045	0.054	0.056
MSY	158,551	159,020	133,520	143,040	173,880	180,120
F_{recent}/F_{MSY}	0.789	0.768	0.592	0.667	0.931	1.058
SB_0	1,674,833	1,675,500	1,261,000	1,415,500	1,941,000	2,085,000
$SB_{F=0}$	1,841,609	1,858,775	1,509,007	1,632,014	2,043,108	2,139,644
SB_{MSY}	471,956	476,050	340,700	386,600	577,400	614,200
SB_{MSY}/SB_0	0.281	0.280	0.260	0.262	0.300	0.302
$SB_{MSY}/SB_{F=0}$	0.255	0.255	0.226	0.235	0.280	0.287
SB_{latest}/SB_0	0.456	0.456	0.346	0.392	0.523	0.568
$SB_{latest}/SB_{F=0}$	0.414	0.420	0.298	0.351	0.480	0.526
SB_{latest}/SB_{MSY}	1.633	1.624	1.146	1.306	1.933	2.187
$SB_{recent}/SB_{F=0}$	0.353	0.358	0.251	0.295	0.412	0.452
SB_{recent}/SB_{MSY}	1.394	1.377	0.963	1.117	1.659	1.879

Source: Vincent et al. (2018)

The SC determined that although the new assessment is a significant improvement in relation to the 2014 assessment, the SC advised that the amount of uncertainty in the stock status results for the 2017 and 2018 assessment reports is higher than for the previous assessment due to the inclusion of new information on bigeye tuna growth and regional structures. The SC also noted continued higher levels of depletion in the equatorial and western Pacific (specifically Regions 3, 4, 7 and 8 of the stock assessment) and the associated higher levels of impact, especially with respect to disproportionally higher juvenile bigeye tuna fishing mortality in these regions due to the associated purse-seine fisheries and the "other" fisheries within the western Pacific which tend to select smaller individuals (WCPFC 2018b). In recent years, the reviewers of the fishery management performance of the WCPFC recognized the disparity in effects to the stock between evaluated regions in the stock assessment and recommended that the WCPFC consider adopting spatial management measures to end overfishing of bigeye tuna (Hazin et al. 2012). Bigeye tuna is no longer considered subject to overfishing.

The majority of fishing effort by the U.S. longline fishery operating out of Hawaii occurs north of 20° N in Region 2 (Figure 1). Moreover, 98% of bigeye tuna caught by this fishery occurs north of 10° N, which is above the core equatorial zone of the heaviest purse seine and longline fishing (NMFS unpublished data). According to the Pelagics FEP SDCs, the WCPO bigeye tuna stock is not overfished or experiencing overfishing.

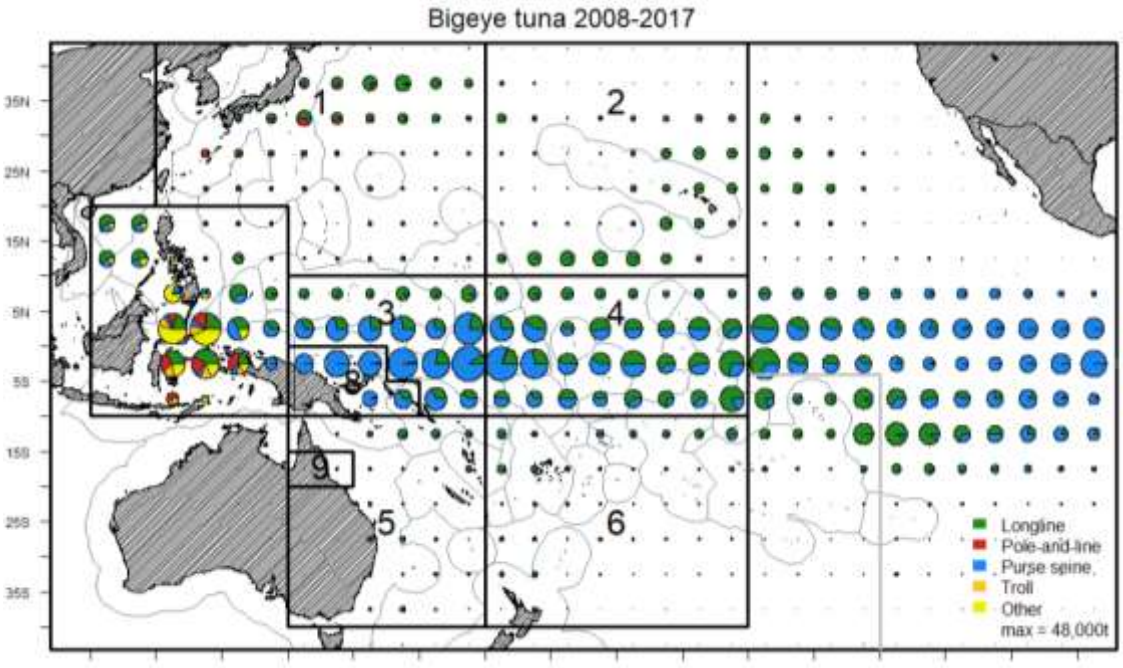

Figure 1. Distribution of cumulative bigeye tuna catch from 2008-2017 by 5-degree squares of latitude and longitude and by fishing gear in the nine sub-regions of the WCPO bigeye tuna assessment.
Figure 1 shows the sub-regional spatial stratification used in stock assessment for the WCPF Convention area. The Hawaii deep-set longline fishery fishes predominately in Region 2.
Source: Stephen Brouwer (2018).

In 2017, total WCPO bigeye tuna landings by the longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 5,358 t (Table 15) or less than 4 percent of the estimated median MSY of 159,020 t (Vincent et al. 2018). U.S. and U.S. participating territory longline catches make up 3 percent of the estimated total catch of WCPO bigeye tuna (Table 17).

EPO

The IATTC assessed bigeye tuna in the EPO in 2018 and the assessment results indicate F/F_{MSY} = 1.15 and $SB_{2014\text{-}2016}/SB_{MSY}$ = 1.02 (Xu et al. 2018). This substantial change in the reference points from the previous year's assessment, which were F/F_{MSY} = 0.87 and $SB_{2014\text{-}2016}/SB_{MSY}$ = 1.23 (Aires-da-Silva et al. 2017), triggered IATTC to investigate the cause of the change. The authors attribute the change in status to new data for the indices of relative abundance, based on longline catch-per-unit-effort (CPUE), which resulted in lower estimates of recent biomass. Such changes caused by the addition of new data indicate that the model is mis-specified (Maunder et al. 2018b).There is substantial uncertainty in the estimate of current fishing mortality and in the model assumptions used (Xu et al. 2018) and the relative contribution of assessment uncertainty and variability in the relationship between fleet capacity and fishing mortality to the overfishing reference point are also unknown (Maunder et al. 2018b).

The EPO bigeye tuna stock assessment (Xu et al. 2018) assumes a single stock that is randomly mixed within the EPO. Tagging data do not support this assumption. The pattern of recruitment

evident in the EPO bigeye assessment in which recruitment suddenly increases in the mid-1990s, corresponding to a substantial increase in purse-seine catches in the equatorial region, could also indicate that this assumption contributes to assessment uncertainty (Valero et al. 2018).

IATTC scientists (Valero et al. 2018) explored the spatial structure of the EPO BET stock using a systematic division of the EPO and an integrated model. The integrated model divided the EPO based on a central area (between 5°N and 5°S from 110°W to 85°W) and re-defined the fisheries used in the most current assessment by their spatial overlap with this central area. Where enough data were available for the systematic division, larger biomass declines were modeled in the equatorial areas while other areas showed either flat biomass trajectories or smaller declines. In the integrated model, the spawning biomass ratio showed a steeper declining trend and a more depleted stock status in the central area than the current assessment estimates for the entire EPO (Valero et al. 2018).

Because the longline CPUE is the main driver of the stock's abundance estimate, increased purse-seine catch in the equatorial regions in the mid-1990s appears to force the model to increase recruitment to explain the increase in catch without a reduction in the abundance index. Models that reflect the localized dynamics of the longline and purse seine catches and the associated local longline CPUE indices do not show the increased recruitment in the mid-90s, and show greater depletion of the stocks in the equatorial regions (Valero et al. 2018). These results suggest that alternative spatial management measures should be evaluated (Valero et al. 2018).

Purse seiners rarely catch bigeye tuna north of 10°N in the EPO (Xu et al. 2018), and the majority of the U.S. longline fleet's fishing pressure occurs north of 20° N (Figure 1). The impact of the purse-seine fishery on the bigeye stock is far greater than that of the longline fishery (Xu et al. 2018). Because the usefulness of the current bigeye assessment (Xu et al. 2018) has been questioned, IATTC staff developed a suite of stock indicators for bigeye based on purse seine data (Maunder et al. 2018a). These indicators show increasing fishing mortality and reduced abundance over time, and are at or above their reference levels. The results indicate that additional purse seine measures are required (Maunder et al. 2018a).

NMFS has noted that the EPO bigeye tuna stock is under increasing fishing pressure, especially from the purse seine fish aggregating device (FAD) fishery. The report on indicators for bigeye stock status, however, does not provide the information required by the Pelagic FEP for making a status determination (NMFS 2018h). In 2017, total bigeye tuna landings in the EPO by the longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 2,690 t (WPFMC 2018a) or 2.8 percent of the estimated MSY of 95,491 t (Xu et al. 2018) and 2.8 percent of the total 2017 catch (IATTC 2018).

3.1.2 Yellowfin Tuna

WCPO

Tremblay-Boyer et al. (2017) conducted the most recent stock assessment for yellowfin tuna in the WCPO. Yellowfin is not subject to overfishing or overfished. Similar to the bigeye assessment, the SC endorsed a weighted assessment model uncertainty grid to characterize stock

status. SC13 noted that the central tendency of relative recent spawning biomass was median ($SB_{recent}t/SB_{F=0}$) = 0.33 with a probable range of 0.20 to 0.41 (80% probable range), and that there was a roughly 8% probability (4 out of 48 models) that the recent spawning biomass had breached the WCPFC limit reference point. The central tendency of relative recent fishing mortality was median (F_{recent}/F_{MSY}) = 0.74 with an 80% probability interval of 0.62 to 0.97, and there was a roughly 4% probability (2 out of 48 models) that the recent fishing mortality was above F_{MSY} (WCPFC 2017b). In 2017, total yellowfin tuna landings by the longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 2,587 t (Table 15) or less than 1 percent of the estimated MSY. Of the 2,587 t, the longline fleet based in Hawaii accounted for 1,761 t with the remainder landed by the American Samoa longline fishery.

EPO

The IATTC assessed yellowfin tuna in the EPO in 2018 and found that the stock is subject to overfishing (F/F_{MSY} = 1.01) and is not overfished ($SB_{2015-2017}/SB_{MSY}$=1.08) (Minte-Vera et al. 2018). In 2017, U.S. longline fisheries landed 530 t of yellowfin tuna in the EPO (WPFMC 2018), or less than one percent of the estimated MSY of 264,283 t (Minte-Vera et al. 2018). The 2017 U.S. longline total is 0.25 percent of the 2017 total catch of yellowfin in the EPO (IATTC 2018).

3.1.3 Skipjack Tuna

WCPO

McKechnie et al. (2016) conducted the most recent assessment of skipjack tuna in the WCPO using data up to 2015. The median estimates of the ratio of current fishing mortality to fishing mortality at MSY ($F_{2011}/F_{MSY)}$ =0.48 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}) = 2.15. Fishing pressure and recruitment variability (influenced by environmental conditions) will continue to be the primary influences on stock size and fishery performance (McKechnie et al. 2016). McKechnie et al. (2016) estimate MSY at 1,875,600 t. In 2017, total skipjack tuna landings by the longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 254 t (Table 15), or less than 1 percent of the estimated MSY. Of the 254 t, the Hawaii longline fishery accounted for 157 t with the remainder landed by the American Samoa longline fishery.

EPO

A reliable index of abundance does not exist for EPO skipjack tuna, and nor do tagging studies for this stock comparable to studies that have occurred in the WCPO. In the absence of a stock assessment, IATTC infers the status of skipjack tuna in the EPO from bigeye tuna in the EPO, most recently based on the work of Maunder (2018). Biomass and recruitment of skipjack tuna have increased over the last 20 years; however, the exploitation rate has fluctuated around its average since the mid-1990s. The data- and model-based indicators have yet to detect any adverse impacts of the fishery on the stock (Maunder 2018).

3.1.4 North Pacific Albacore

The International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) in 2017 completed the most recent stock assessment of North Pacific albacore, which uses data through 2015 (ISC 2017b). The assessment indicates that: a) the stock is likely not overfished relative to the limit reference point adopted by the WCPFC ($20\%SSB_{current}$, F=0), and b) no F-based reference points have been adopted to evaluate overfishing, but stock status was evaluated against seven potential LMRs and current fishing intensity ($F_{2012\text{-}2014}$) is below six of the seven reference points except for $F_{50\%}$. In 2017, total albacore tuna landings in the North Pacific by the longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 90 t (Table 15), or less than 1 percent of the estimated MSY. The Hawaii longline fishery made nearly all of the landings.

3.1.5 South Pacific Albacore

Tremblay-Boyer et al. (2018) completed the most recent stock assessment of South Pacific albacore using data through 2016. The new assessment used previously unavailable operational-level longline data, a simplified regional structure, a geostatistical model to standardize the CPUE, and reported results using a structural uncertainty grid in the same approach used for the most recent WCPO bigeye tuna assessment (Tremblay-Boyer et al. 2018).

The central tendency of relative recent (2013-2016) spawning biomass to spawning biomass in the absence of fishing, over all 72 models in the structural uncertainty grid, was median ($SB_{recent}/SB_{F=0}$) = 0.52 with a range of 0.32 to 0.72 and at MSY was median (SB_{recent}/SB_{MSY}) = 3.3 with a range of 1.58 to 9.67. The central tendency of relative recent fishing mortality was median (F_{recent}/F_{MSY}) = 0.2 with a range of 0.06 to 0.53 (Tremblay-Boyer et al. 2018). Results indicate the stock is not subject to overfishing and the stock is not overfished under the Pelagics FEP and WCPFC LRPs.

The 2018 assessment estimated MSY at an average of 100,074 t across all models in the structural uncertainty grid (Tremblay-Boyer et al. 2018). In 2017, total South Pacific albacore tuna landings by the longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 1,381 t (Table 15), or 1.4 percent of the estimated MSY. The American Samoa longline fishery accounted for all of the landings.

3.1.6 North Pacific Bluefin Tuna

Scientists consider Pacific bluefin tuna as a single North Pacific-wide stock. The most recent assessment of the status of Pacific bluefin tuna used data through 2016, and concluded that the stock is still experiencing overfishing and is overfished (ISC 2018a). The ISC assessment estimated the F/F_{MSY} = 1.17 and SB/MSST= 0.21. Current spawning biomass is estimated at 21,000 t in 2016, up from near a near historical low in 2010 (ISC 2018a).

The U.S. longline fleet rarely catches Pacific bluefin tuna (NMFS 2018b). In 2017, total North Pacific bluefin tuna landings by all U.S. longline fisheries was 1 t (Table 15), or much less than one percent of current spawning biomass. At such a low percentage of fishing mortality, the relative impact of the U.S. longline fisheries on the stock is negligible and therefore overfishing of the stock is due to excessive international fishing pressure. NMFS continues to work with the

Pacific and Western Pacific Councils and the State Department to ensure that WCPFC and IATTC adopt effective management measures to end overfishing and rebuild the stock.

3.1.7 North Pacific Swordfish

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.

Hawaii-permitted deep-set fishing operations north of the equator may land no more than 25 swordfish per trip, if only circle hooks are used; and 10 swordfish per trip, if any other type of hook is used. These limits do not apply if an observer is on board.

WCNPO

The results of the most recent assessment (ISC 2018b) support the conclusion that the WCNPO stock is not subject to overfishing because $F_{2013\text{-}2015}/F_{MSY} = 0.45$, and is not overfished because $SB_{2016}/SB_{MSY} = 1.87$. The 2018 stock assessment estimated MSY for the WCNPO stock at 14,941 t (ISC 2018b). In 2017, total landings of swordfish by all U.S. longline fisheries in the NPO, which may include a small percentage of EPO swordfish, was 1,617 t (WPFMC 2018a) or approximately 11 percent of the estimated MSY. The Hawaii longline fishery made nearly all of the landings.

EPO

The results of the most recent assessment (ISC 2014), using data through 2012, 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 t (ISC 2014). Based on federal logbook records, catch of swordfish by the U.S. longline vessels operating within the boundary of the EPO stock is less than 5 t annually in years 2004-2018 (NMFS unpublished data). This amount (<5 t) is less than 1 percent of the estimated MSY; therefore, the relative impact of the U.S. longline fisheries on the stock is negligible.

In March of 2016, the Council responded to the requirement under the Magnuson-Stevens Act that the Council develop recommendations for domestic regulations to address the relative impact of the domestic fishing fleet on the stock, and develop recommendations to the Secretary of State and Congress for international actions to end overfishing of the EPO swordfish stock. The Council recommended continued logbook and observer program monitoring by NMFS of the incidental catch of swordfish in the EPO in the HI deep-set longline fishery, and noted that any non-retention of EPO swordfish is not warranted for the Hawaii deep-set longline fishery because (1) fishing mortality is primarily the result of overfishing pressure at the international level; (2) Hawaii fishermen harvest an insignificant fraction of EPO swordfish and (3) non-retention would disadvantage Hawaii fishermen while providing negligible conservation benefits. The WPFMC further recommended the US delegation to the IATTC put forward a proposal that the IATTC take action to eliminate overfishing on this stock by reducing the fishing mortality on North Pacific EPO swordfish by at least 10 percent. NMFS continues to

work with the Pacific and Western Pacific Councils and the State Department to ensure that the IATTC adopt effective management measures to end overfishing and rebuild the stock.

3.1.8 Striped Marlin

Genetic and tagging studies suggest that striped marlin in the Pacific is comprised of three stocks: southwest Pacific Ocean, WCNPO, and north east Pacific Ocean (NEPO). Stock assessments are available for the WCNPO stock (ISC 2015b) and the NEPO stock (Hinton and Maunder 2011).

WCNPO

The results of a 2015 stock assessment (ISC 2015b) indicate the WCNPO stock of striped marlin continues to be subject to overfishing (F/F_{MSY} is =1.49) and overfished (SB/SB_{MSY} = 0.39). The 2015 stock assessment estimated MSY at 5,657 t. CMM 2010-01 for North Pacific striped marlin adopted by the WCPFC requires members and cooperating non-members to limit striped marlin landings 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 measure. The highest striped marlin catch by U.S. fisheries between 2000 and 2003 was 571 t. Thus, a 20 percent reduction from 571 t is 457 t. The Hawaii longline fishery accounts for more than 90 percent of the total U.S. catch of this stock, with the remainder made by Hawaii small-scale troll fisheries. Since 2013, total landings of WCNPO striped marlin by all U.S. fisheries combined have never exceeded 425 t (NMFS 2018b).

In 2017, total WCNPO striped marlin (or striped marlin caught in the WCPO) landings by all U.S. fisheries was 336 t, with the Hawaii longline fisheries accounting for 286 t, the American Samoa longline fishery accounting for 48 t, and the Hawaii troll fisheries accounting for 8 t (NMFS 2018b) or about 6 percent of MSY for all U.S. fisheries. Thus, overfishing of the stock is due to excessive international fishing pressure and the IATTC and WCPFC have inadequate measures in place to address the issue. Nonetheless, NMFS continues to work with the Pacific and Western Pacific Fishery Management Councils, and the State Department to ensure that the WCPFC and IATTC adopt effective management measures to end overfishing.

NEPO

The results of the 2011 stock assessment (Hinton and Maunder 2011) indicate that the NEPO striped marlin stock is not overfished or experiencing overfishing. The stock biomass has increased from a low of about 2,600 t in 2003, and was estimated to be about 5,100 t in 2009. There has been an increasing trend in the estimated ratio of the observed annual spawning biomasses to the spawning biomass (SB) in the unexploited stock, which has doubled from about 0.19 in 2003 to about 0.38 in 2009. The estimated ratio of spawning biomass in 2009 to that expected to provide catch at the level of MSY, SB_{2009}/SB_{MSY}, was about 1.5, which indicates that the spawning biomass was above the level expected to support MSY. The estimated recent levels of fishing effort (average 2007-2009) were below those expected at MSY (Hinton and Maunder 2011). Between 2013 and 2017, Hawaii longline catches of NEPO striped marlin (or striped marlin caught in the EPO) ranged between 63 and 77 t annually, which is no greater than 3 percent of the stock's biomass (WPFMC 2018a).

3.1.9 Pacific Blue Marlin

The 2016 stock assessment by the ISC Billfish Working Group (ISC 2016) which uses data through 2014 indicates Pacific blue marlin is not experiencing overfishing (F_{2014}/F_{MSY} = 0.88).

Applying the 2014 spawning biomass estimates of 24,809 t, and the spawning biomass at MSY of 19,858 t, the ratio of SB/SB_{MSY} is 1.25 indicating the stock is not overfished. In 2017, total blue marlin landings by all longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 606 t (Table 15), or approximately 3 percent of the estimated MSY. Of the 606 t, the Hawaii longline fishery accounted for 485 t with the remainder caught by the American Samoa longline fishery.

3.1.10 North Pacific Blue Shark

The results of the 2017 assessment (ISC 2017a) indicate the North Pacific blue shark is not subject to overfishing ($F_{2012\text{-}2014}/F_{MSY}$ = 0.37), and is not overfished ($SB_{2012\text{-}2014}/SB_{MSY}$ =1.71). The 2017 stock assessment estimated SB_{MSY} at 179,539 t. In 2017, total blue shark landings by all U.S. longline fisheries was 0 t (Table 15). Nearly all blue sharks caught in US longline fisheries are returned to the sea alive, with some discarded dead as well.

3.1.11 North Pacific Shortfin Mako Shark

In 2018, ISC concluded the first full stock assessment of shortfin mako shark in the North Pacific Ocean (ISC 2018c). Previous abundance indices showed conflicting trends from which stock status could not be determined (ISC 2015a). The new assessment used data through 2016, and assumed a single stock in the NPO (ISC 2018c). The results indicate that the stock is not subject to overfishing because $F_{2013\text{-}2015}/F_{MSY}$ = 0.62, and is not overfished because SA_{2016}/SA_{MSY} =1.36. Spawning abundance (SA) was used instead of spawning biomass because the size of mature female sharks does not appear to affect the number of pups produced (ISC 2018c).

ISC estimated the MSY at 3,127 t (ISC 2018c). In 2017, total mako shark landings by all U.S. longline fisheries in the North Pacific Ocean was 71 t (Table 15), or 2.3 percent of the MSY.

3.1.12 Silky shark

Silky sharks have a restricted habitat range compared to the other HMS but within this range, they dominate both longline and purse seine catches (Rice and Harley 2013). Research conflicts on stock boundaries of silky sharks, which complicates development of a pan-Pacific assessment model (Clarke et al. 2018). Additionally, CPUE indices from WCPO and EPO fisheries show correlations with oceanographic conditions, so may not represent reliable indices of abundance and may bias indicators of stock status (Clarke et al. 2018; Lennert-Cody et al. 2018). Based on apparent declines and in the absence of better scientific information, both the WCPFC and the IATTC implemented precautionary measures to prohibit vessels from retaining any part or carcass of a silky shark, except to assist WCPFC observers in collection of samples. A pan-Pacific assessment was completed in 2018, but the authors cautioned that estimates of stock status reference points for determining whether the stock is experiencing overfishing or is overfished are unreliable and should not be used as the basis for management advice (Clarke et al. 2018).

WCPO

The assessment by Rice and Harley (2013) for the WCPO concluded that catches at the time were higher than the MSY (5,331 t versus 1,994 t), and further catch at current levels of fishing mortality would continue to deplete the stock below MSY. Overfishing is occurring because $F/F_{MSY} = 4.32$ and stock is overfished because $SB/SB_{MSY} = 0.72$. Bycatch from the longline fishery accounts for the greatest impact to the stock, but there are also impacts from the associated purse seine fishery, which catches predominantly juvenile individuals. Given the bycatch nature of fishery impacts, mitigation measures provide the best opportunity to improve the status of the silky shark population (Rice and Harley 2013) and SC9 recommended that the WCPFC also consider measures directed at targeted catch, such as from shark lines (WCPFC 2012). In 2017, total silky shark landings by all U.S. longline fisheries in the WCPO was 0 t (Table 15), demonstrating full compliance with requirements to discard silky sharks.

Clarke et al. (2018) assessed silky sharks in the WCPO in 2018, given the difficulty of assessing a pan-Pacific stock. The assessment results were that $F_{2016}/F_{MSY} = 1.607$ and $SB_{2016}/SB_0 = 0.469$, with a 72 percent probability that current biomass is above biomass at MSY (Clarke et al. 2018).

EPO

Uncertainties in fishery data prevent the use of conventional stock assessment models to assess the EPO stock (Lennert-Cody et al. 2018). Bycatch rates of silky shark north of the Equator in the EPO of all three size classes analyzed by Aires-da-Silva et al. (2015) indicate a declining trend, which begins in the mid-2000s for the large size class. The standardized CPUE index shows a possible increase in recent years, preceded by a period of stability following a sharp decline in the mid-1990s. The recent increase could be a result of adults migrating into the area from the west or an effect of fishing closer to the coast. For the southern stock, a similar declining trend appears in bycatch rates. CPUE sharply declined during 1994-2004, and has remained stable since then (Aires-da-Silva et al. 2015).

3.2 Socioeconomic Setting

The socioeconomic setting includes U.S. fisheries in the WCPO as well as their associated fishing communities, which are described in this section.

U.S. and territorial longline fisheries comprise the Hawaii deep-set tuna longline fleet (including several vessels based on the U.S. West Coast), the Hawaii shallow-set swordfish longline fleet, and the American Samoa deep-set albacore longline fleet. In the past, several deep-set tuna longline vessels were based in Guam and the CNMI, but there has been no longline fishing in these locations since 2011. Longline is a type of fishing gear consisting of a mainline that exceeds 1 nm (6,076 ft) in length that is suspended horizontally in the water column, from which branchlines with hooks are attached. Longline deployment is referred to as "setting," and the gear, once deployed, is referred to as a "set." Sets are normally left drifting for several hours before they are retrieved, along with any catch. In shallow-set longline fishing, the gear is configured so that the hooks remain above 100 meters (m) in depth to target swordfish near the surface. In deep-set longline fishing, the gear is configured so that all of the hooks fall below 100 m to target deeper-dwelling tunas.

Troll and handline fishing also occurs on a commercial and non-commercial basis in Hawaii, American Samoa, Guam, and CNMI, representing relatively small annual catches of pelagic MUS compared to catches by domestic and foreign longline and purse seine fleets operating in the WCPO. Therefore, troll and handline catch are analyzed in this draft EA as part of the baseline condition affecting this stock. The proposed action is not expected to adversely affect the troll and handline vessels in terms of revenue, catch, effort, or area fished because the proposed catch and allocations would only apply to longline vessels. However, Hawaii troll and handline vessels may increase bigeye tuna targeting activity in the event of a longline closure. Therefore, catch and revenue from this fleet are discussed in this section. About 80 percent of troll and handline landings in the management area are made by Hawaii vessels (WPFMC 2018a).

3.2.1 Hawaii Longline Fisheries

Domestic longline fishing around Hawaii consists of two separately managed fisheries. The deep-set fishery targets bigeye tuna in the EEZ around Hawaii and on the high seas at an average target depth of 167 m (WPFMC 2009). 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 permit program. Some Hawaii-permitted vessels also hold American Samoa longline permits. The number of dual-permitted vessels has ranged between 13 and 25 over the last five years (NMFS unpublished data). Dual-permitted vessels land their catch in Hawaii or American Samoa.

3.2.1.1 Longline Fishing Area

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 main Hawaiian Islands (MHI). However, federal regulations and other applicable laws prohibit longline fishing inside the 200 nm U.S. EEZ around the Northwestern Hawaiian Islands, to minimize interactions with protected species shoreward from 50 nm. Longline fishing within 50 to 75 nm from the shoreline in the MHI is prohibited to minimize the potential for gear conflicts with small boat fisheries and interactions with protected species.

Federal regulations temporarily prohibit longline fishing in the Southern Exclusion Zone (SEZ), an area in the EEZ south of Hawaii (84 FR 5356, February 21, 2019). An SEZ closure is triggered under regulations implementing the False Killer Whale Take Reduction Plan if there are two or more observed serious injuries or mortalities of false killer whales in the EEZ around Hawaii in a given year. One observed mortality and one observed serious injury occurred in January of 2019 (84 FR 5356). The SEZ was closed to deep-set longline fishing between July 18 – December 31, 2018 (83 FR 33484, July 18, 2018) following four false killer whale serious injuries in the Hawaii deep-set longline fishery that occurred inside the EEZ around Hawaii during that calendar year. Because the 2019 observed false killer whale mortality and serious injury occurred in the calendar year following an SEZ closure, the SEZ will be closed until one or more of the criteria found at 50 CFR 229.37(e)(5) are met (please see the False Killer Whale Take Reduction Plan for more information).

Some longline fishing also occurs in the U.S. EEZ around U.S. Pacific Remote Island Areas (PRIA) of Kingman Reef and Palmyra Atoll (5° N). Figure 2 shows the distribution of fishing effort by the Hawaii deep-set longline fleet as the annual average number of hooks per 5 degree square in millions of hooks over the years 2008 to 2017.

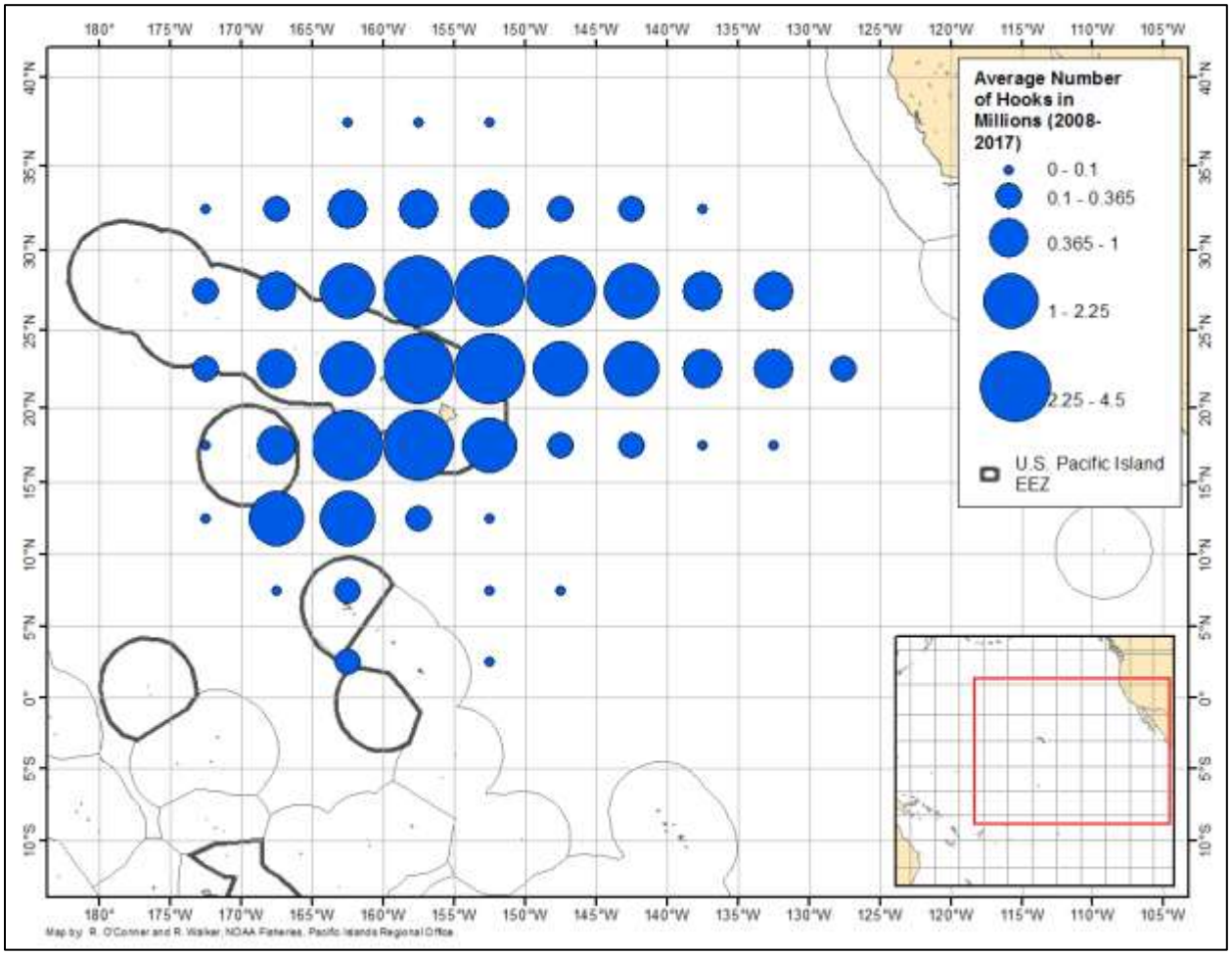

Figure 2. Operating area of the Hawaii deep-set longline fleet, shown in average number of hooks (millions) per five degree square for years 2008-2017.

In general, deep-set longline vessels operate out of Hawaii ports, with the vast majority based in Honolulu. 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 the 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.

The shallow-set (swordfish-targeting) longline fishery operates in the U.S. EEZ around Hawaii and on the high seas to the north and northeast of the MHI seasonally (Figure 3). Effort typically increases in October and peaks in March, after which effort declines through the summer months.

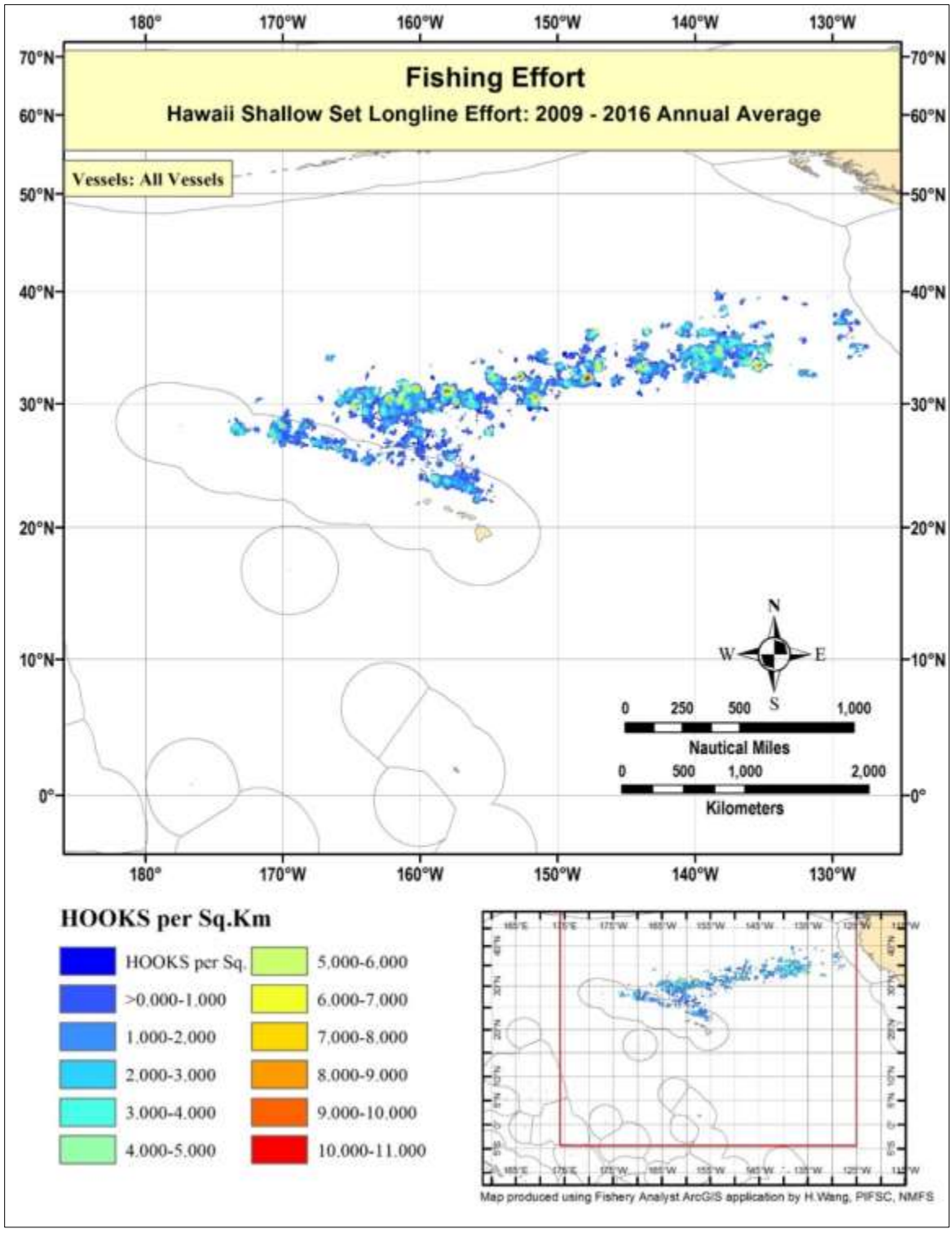

Figure 3. Location of shallow sets made by the Hawaii longline fishery from 2009– 2016. Some sets do not appear on the map due to confidentiality.
Source: PIFSC Fisheries Research and Monitoring Division, 5/9/2017.

For both the deep- and shallow-set fisheries, federal regulations 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.

3.2.1.2 Fishing Participation

NMFS manages Hawaii's deep-set and shallow-set longline fishery under a single limited access fishery with a maximum of 164 vessel permits. Based on logbook data, 145 permitted vessels conducted longline fishing activities in 2017. Of these vessels, 29 were greater than 24 m in length, and 18 vessels participated in the Hawaii-based swordfish fishery. In the event the fishery reaches both of the U.S. bigeye tuna catch limits and NMFS restricts fishing in the WCPO and the EPO, larger vessels would not be able to fish for bigeye tuna in either zone. However, Hawaii-based longline vessels less than 24 m (102 in 2017) may fish in the EPO for the remainder of the year, as the current catch limits in the EPO would not apply to vessels less than 24 m.

3.2.1.3 Fishing Effort

From 2004-2012, the annual number of vessels that participated in the deep-set fishery remained relatively stable, ranging from 124 to 129. The number of active vessels has increased since 2012, with 145 vessels operating in 2017. In 2017, 145 deep-set longline vessels made 1,539 trips with 19,674 sets and deployed 53.5 million hooks (Table 5).

Table 5. Number of active longline vessels and fishing effort in the Hawaii deep-set fishery, 2008-2017 (includes effort in both WCPO and EPO).

Year	Vessels making deep-sets	Deep-set fishing effort (millions of hooks)	Deep-set fishing effort (trips)	Deep-set fishing effort (sets)
2008	127	40.1	1,384	17,923
2009	127	37.9	1,257	16,860
2010	122	37.4	1,211	16,152
2011	129	40.9	1,312	17,260
2012	128	44.3	1,365	18,180
2013	135	46.9	1,386	18,803
2014	139	45.8	1,355	17,831
2015	143	47.6	1,452	18,519
2016	142	51.2	1,480	19,391
2017	145	53.5	1539	19,674

Source: WPFMC (2018a).

The number of vessels participating in the shallow-set fishery has declined over time from a high of 35 vessels in 2006 to a low of 15 vessels in 2016, and the numbers of trips and hooks have been more variable (Table 6).

Table 6. Number of active longline vessels and fishing effort in the Hawaii shallow-set fishery, 2008-2017 (includes effort in both WCPO and EPO).

Year	Active Vessels	Number of Trips	Number of Sets	Number of Hooks (millions)
2008	27	92	1,595	1.5
2009	28	112	1,762	1.7
2010	28	114	1,871	1.8
2011	20	82	1,447	1.5
2012	18	83	1,352	1.4
2013	15	58	961	1.1
2014	20	81	1,329	1.5
2015	22	69	1,130	1.3
2016	13	46	727	0.8
2017	18	61	949	1.0

Source: WPFMC (2018a).

3.2.1.4 Catch Information

Table 7 shows the released catch, retained catch, and total catch of pelagic MUS caught in Hawaii deep-set longline fishery in 2017. Bigeye tuna are the primary targeted species, while yellowfin tuna makes up a large component of the catch. Skipjack tuna, pomfret, mahimahi, ono, oilfish, and spearfish are also important components of the catch. Nearly all sharks are released.

Table 7. Released catch, retained catch, and total catch of pelagic MUS (number of fish) and other fish caught in Hawaii deep-set longline fishery, 2017.

	Deep-set longline fishery			
	Released catch	Percent released	Retained catch	Total Catch
Tuna				
Albacore	21	0.5	4,087	4,108
Bigeye tuna	4,016	1.8	220,375	224,391
Bluefin tuna	2	15.4	11	13
Skipjack tuna	595	2.2	25,990	26,585
Yellowfin tuna	1,613	2.0	78,007	79,620
Other tuna	0	0.0	0	0
Total tunas	**6,247**	**1.9**	**328,470**	**334,717**
Billfish				
Swordfish	315	5.6	5,261	5,576
Blue marlin	32	0.4	7,986	8,018
Striped marlin	134	1.0	12,885	13,019
Spearfish	162	0.8	20,506	20,668
Other marlin	4	0.7	544	548
Total billfish	**647**	**1.4**	**47,182**	**47,829**
Other PMUS				
Mahimahi	344	0.7	45,802	46,146
Wahoo	128	0.5	25,298	25,426
Moonfish	121	0.5	24,673	24,794
Oilfish	2,099	11.5	16,153	18,252
Pomfret	346	0.5	67,390	67,736
Total other PMUS	**3,038**	**1.7**	**179,316**	**182,354**
Non-PMUS fish	3,634	89.2	442	4,076
Total non-shark	**13,566**	**2.4**	**555,410**	**568,976**
PMUS Sharks				
Blue shark	86,650	100.0	0	86,650
Mako shark	3,829	86.5	596	4,425
Thresher shark	7,092	99.5	39	7,131
Oceanic Whitetip shark	537	100.0	0	537
Silky shark	242	99.6	1	243
Total PMUS sharks	**98,350**	**99.4**	**636**	**98,986**
Non-PMUS sharks	721	99.7	2	723
Grand Total	**112,637**	**16.8**	**556,048**	**668,685**

Source: WPFMC (2018a).

Bigeye tuna CPUE has ranged between 3.0 and 4.8 fish per 1,000 hooks over the years 2008-2017 (Figure 4).

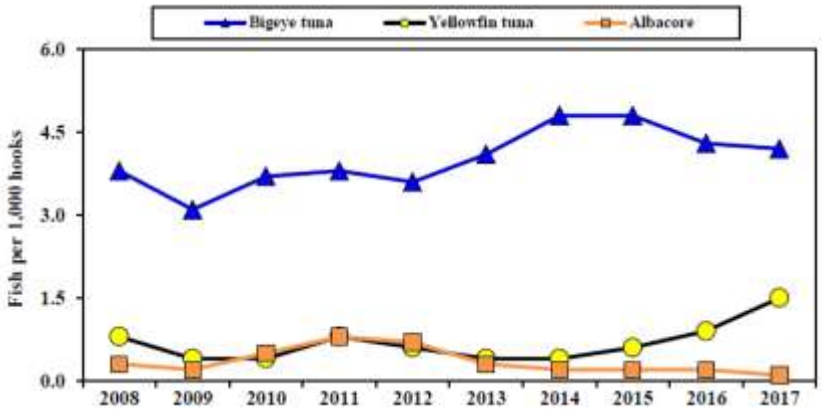

Figure 4: Tuna CPUE for the Hawai`i-permitted deep-set longline fishery, 2008-2017
Source: WPFMC (2018a).

Table 8 shows the released catch, retained catch, and total catch of pelagic MUS caught in the Hawaii shallow-set longline fishery. Swordfish is the targeted species and largest component of the catch, and bigeye tuna, yellowfin tuna, and mahimahi also make up important components of the catch. Most sharks are released.

Table 8. Released catch, retained catch, and total catch of pelagic MUS (number of fish) caught in the Hawaii shallow-set longline fishery, 2017.

	Shallow-set longline fishery			
	Released catch	Percent released	Retained catch	Total Catch
Tuna				
Albacore	32	11.1	255	287
Bigeye tuna	215	14.1	1,315	1,530
Bluefin tuna	0	0.0	1	1
Skipjack tuna	0	0.0	79	79
Yellowfin tuna	98	6.3	1,455	1,553
Other tuna	0	0.0	0	0
Total tunas	**345**	**10.0**	**3,105**	**3,450**
Billfish				
Swordfish	1,109	8.0	12,819	13,928
Blue marlin	4	6.9	54	58
Striped marlin	73	17.8	338	411
Spearfish	11	6.9	149	160
Other marlin	2	10.5	17	19
Total billfish	**1,199**	**8.2**	**13,377**	**14,576**
Other PMUS				
Mahimahi	41	3.2	1,260	1,301
Wahoo	0	0.0	74	74
Moonfish	47	10.9	384	431
Oilfish	344	45.1	418	762
Pomfret	9	23.1	30	39
Total other PMUS	**441**	**16.9**	**2,166**	**2,607**
Non-PMUS fish	**7**	**46.7**	**8**	**15**
Total non-shark	**1,992**	**9.6**	**18,656**	**20,648**
PMUS Sharks				
Blue shark	9,638	100.0	0	9,638
Mako shark	843	75.8	269	1,112
Thresher shark	71	97.3	2	73
Oceanic Whitetip shark	22	100.0	0	22
Silky shark	7	100.0	0	7
Total PMUS sharks	**10,581**	**97.5**	**271**	**10,852**
Non-PMUS sharks	**5**	**100.0**	**0**	**5**
Grand Total	**12,578**	**39.9**	**18,927**	**31,505**

Source: WPFMC (2018a).

3.2.1.5 Revenue

In 2017, Hawaii-based longline vessels landed approximately 32.73 million pounds of pelagic fish valued at $96.1 million (Figure 5). The average catch over years 2008-2017 was 25.43 million pounds valued at $84.3 million (WPFMC 2018a).

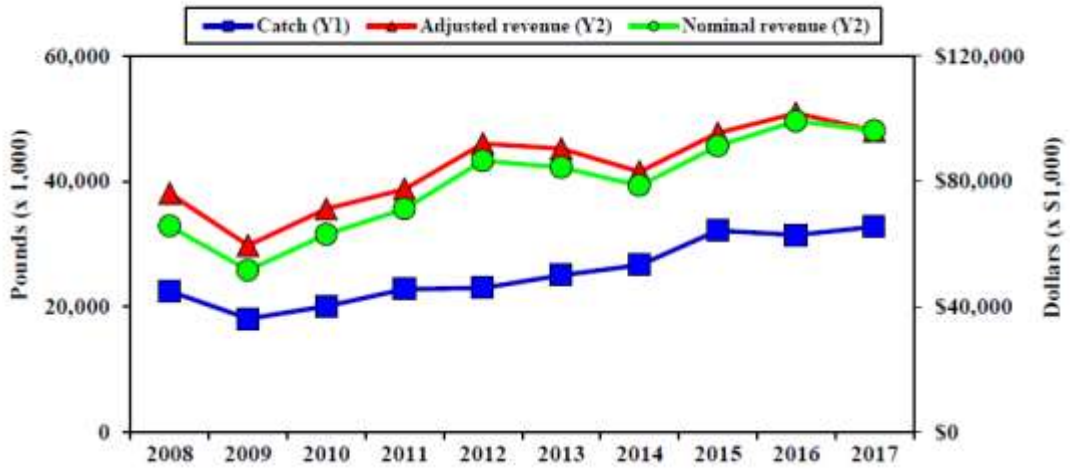

Figure 5. Catch and revenue for the Hawai`i-permitted deep-set longline fishery, 2008-2017
Source: WPFMC (2018a).

In 2017, the Hawaii shallow-set longline fishery landed approximately 2.99 million pounds of pelagic MUS valued at approximately $4.23 million (Figure 6). The average catch over years 2008-2017 was 3.13 million pounds valued at about $5.35 million (WPFMC 2018a).

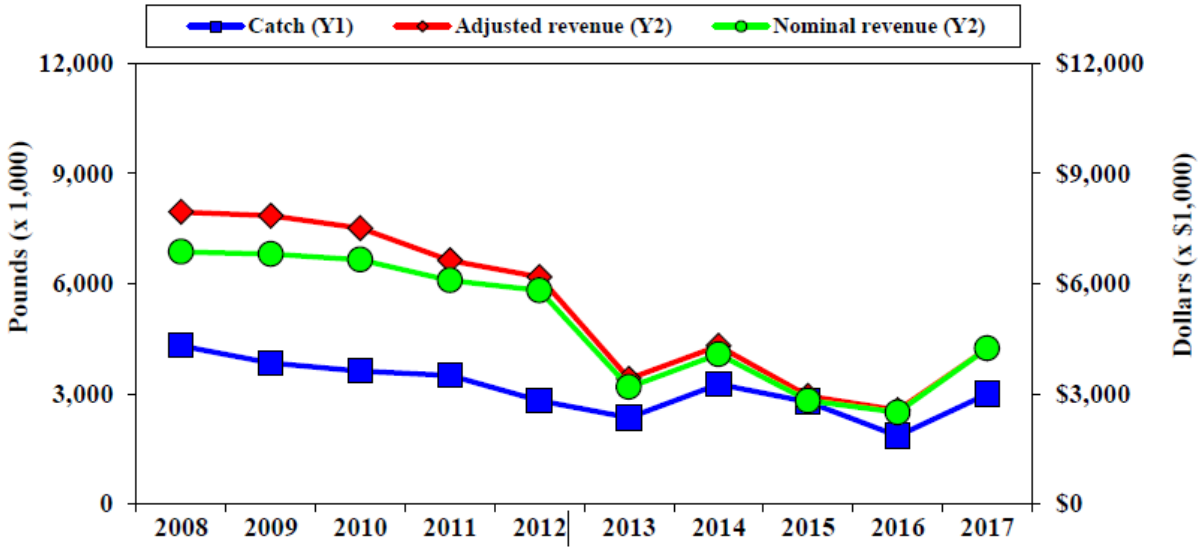

Figure 6. Catch and revenue for the Hawaii-permitted shallow-set longline fishery, 2008-2017.
Source: WPFMC (2018a).

3.2.1.6 Non-Target Species and Bycatch

Table 7 in section 3.2.1.4 provides an estimate of bycatch species in the Hawaii deep-set longline fishery. The deep-set longline fishery released some 111,702 fish in 2017. Sharks accounted for 85 percent of the deep-set longline bycatch. With the exception for mako shark, there is almost no demand for sharks in Hawaii. Of all shark species combined, 99 percent of the deep-set longline shark catch was released, most alive. Conversely, bycatch rate for the deep-set longline fishery was only 2 percent for targeted and incidentally caught non-shark pelagic MUS in 2017. Generally, most marketable species such as tuna and billfish have low discard rates. Although the fishery does not target striped marlin and other miscellaneous pelagic catch such as mahimahi, bluefin tuna, and wahoo, these species are highly marketable and have low rates of discard at less than 5 percent.

Table 8 in section 3.2.1.4 provides an estimate of bycatch species in the Hawaii shallow-set fishery. The shallow-set longline fishery released 12,008 fish in 2017. Sharks accounted for 91% of the shallow-set longline bycatch. Of all shark species combined, 99% of the shallow-set longline shark catch was released. Conversely, the bycatch rate for the shallow-set longline fishery was 9% for targeted and incidentally caught pelagic species in 2017. Since shallow-set longline trips are often longer than deep-set trips, the higher release rate by the shallow-set sector is to conserve space for swordfish and forego keeping other pelagic species due to their short shelf life.

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 MUS (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). 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 do not catch bigeye tuna.

3.2.2.1 Longline Fishing Area

American Samoa longline fishing vessels operate in the EEZ around American Samoa, on the high seas in international waters, and occasionally in the EEZs of countries adjacent to American Samoa. Additionally, around 25 American Samoa longline limited access permit holders also hold Hawaii longline limited access permits.As previously noted, vessels possessing both an American Samoa and a Hawaii longline limited access permit 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 prohibits catch and retention of bigeye tuna in the WCPO when the fishery reaches the U.S. WCPO limit. Federal regulations prohibit fishing within the Large Vessel Prohibited Area (LVPA) for vessels greater than 50 feet in length (generally within 50 nm of emergent lands), and commercial fishing within marine national monuments. Figure 7 shows the distribution of fishing effort by the American Samoa deep-set longline fleet in millions of hooks per five degree square of latitude and longitude in years 2008-2017.

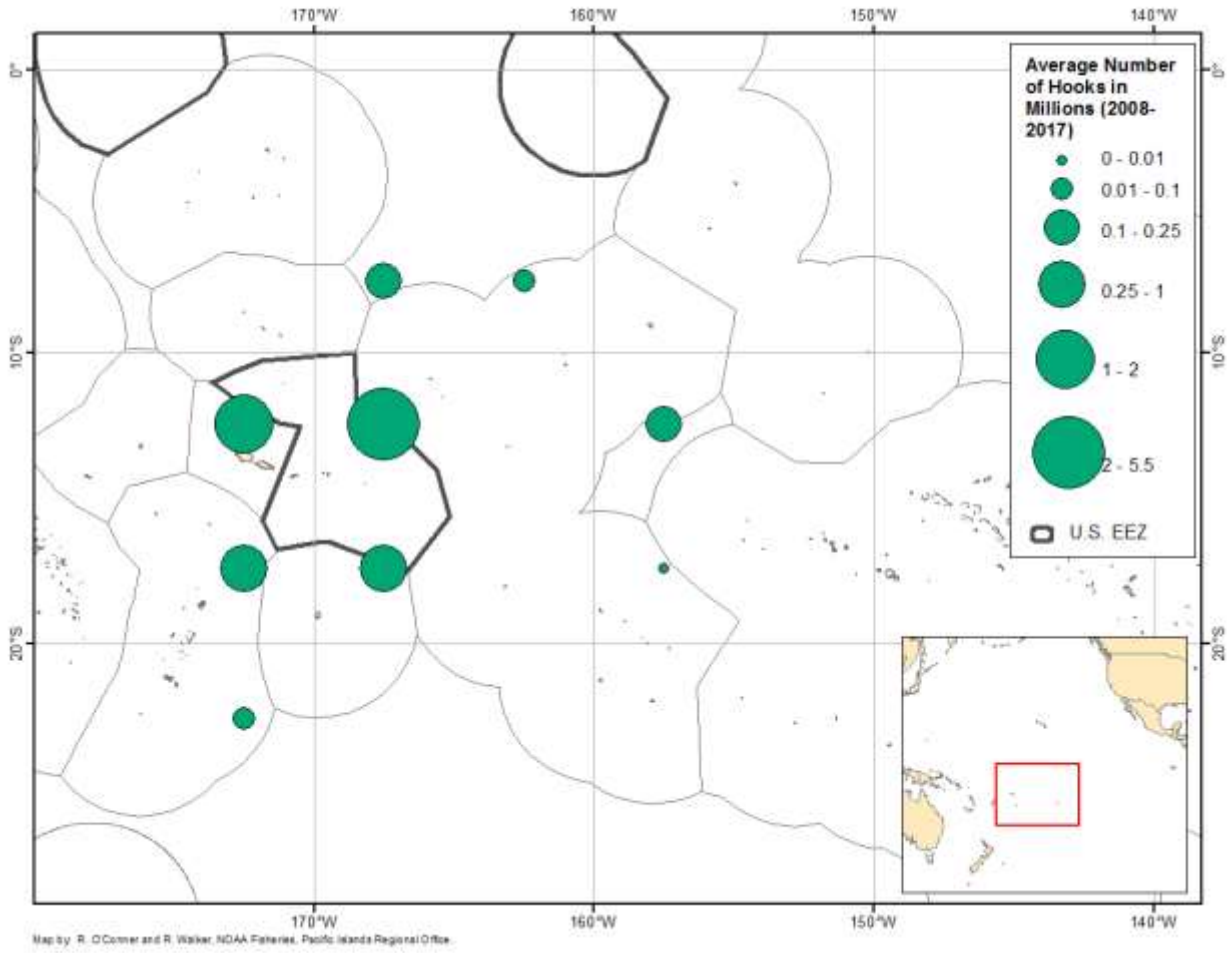

Figure 7. Operating area of the American Samoa longline fleet, shown in average number of hooks (millions) per five degree square for years 2008-2017.

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. 15 permitted vessels conducted longline fishing activities in American Samoa in 2017 (WPFMC 2018a). Table 9 shows the number of permits of each class in the time period 2008-2017.

Table 9. Number of American Samoa permitted and active longline fishing vessels by size class from 2008-2017.

Year	Class A Permits	Class A Active	Class B Permits	Class B Active	Class C Permits	Class C Active	Class D Permits	Class D Active
2008	17	1	6	0	9	8	26	20
2009	16	1	5	0	8	8	26	17
2010	12	1	5	0	12	7	26	18
2011	12	1	5	0	12	8	27	15
2012	5	3	5	0	11	8	27	14
2013	5	1	5	0	11	7	26	14
2014	14	2	5	0	12	7	26	14
2015	7	3	3	0	12	6	27	12
2016	7	2	4	0	12	5	27	13
2017	7	1	3	0	11	5	27	9

Source: WPFMC (2018a).

3.2.2.3 Fishing Effort

Effort in the American Samoa deep-set longline fishery peaked in 2007, when 29 vessels participated and deployed 5,920 sets with approximately 17,554,000 hooks (NMFS 2015b). Since that time, fishery statistics across all categories have generally declined (Table 10). In 2017, 15 of 48 permitted vessels made 135 trips and deployed 2,333 sets with 6.62 million hooks (WPFMC 2018a).

Table 10. Fishing effort in the American Samoa longline fishery, 2008-2017.

Year	Vessels making deep-sets	Deep-set fishing effort (thousand hooks)	Deep-set fishing effort (trips)*	Deep-set fishing effort (sets)
2008	29	14,444	280	4,754
2009	26	15,076	195	4,910
2010	26	13,184	265	4,537
2011	24	11,074	276	3,891
2012	25	12,112	211	4,210
2013	22	10,184	104	3,411
2014	23	7,667	196	2,748
2015	21	7,806	169	2,786
2016	20	6,909	213	2,451
2017	15	6,623	135	2,333

*Note: Trip and set numbers in years 2008-2014 are from NMFS (2015c), year 2015 trip and set numbers are from WPFMC (2017a), and year 2016 trip and set numbers are from WPFMC (2017b).
Source: WPFMC (2018a) unless otherwise noted.

3.2.2.4 Catch Information

The American Samoa longline fleet targets south Pacific albacore tuna, which makes up the majority of the landings in all years (Table 11). Table 11 provides catch statistics associated with the American Samoa-based longline fishery.

Table 11: American Samoa-based Longline Fishery Landings (t), 2013-2017.

	2017	2016	2015	2014	2013
Total Pelagic Landings (t)	2,155	2,167	2,405	2,192	2,828
South Pacific Albacore (t)	1,381	1,517	1,855	1,430	2,128
Yellowfin Tuna (t)	533	386	255	424	390
Bigeye Tuna (t)	64	72	116	82	84
Skipjack Tuna (t)	63	94	67	116	66
Wahoo (t)	48	47	58	75	87
Blue marlin (t)	38	30	25	28	31

Note: all other species (e.g., mahimahi, swordfish, etc.) landed are less than one percent of total landings.
Source: NMFS (2018b)

3.2.2.5 Revenue

In 2017, the American Samoa longline fleet landed approximately 4.8 million pounds of pelagic species with an estimated revenue of $4.7 million. Landings and revenue have generally declined over the last five years (Figure 8).

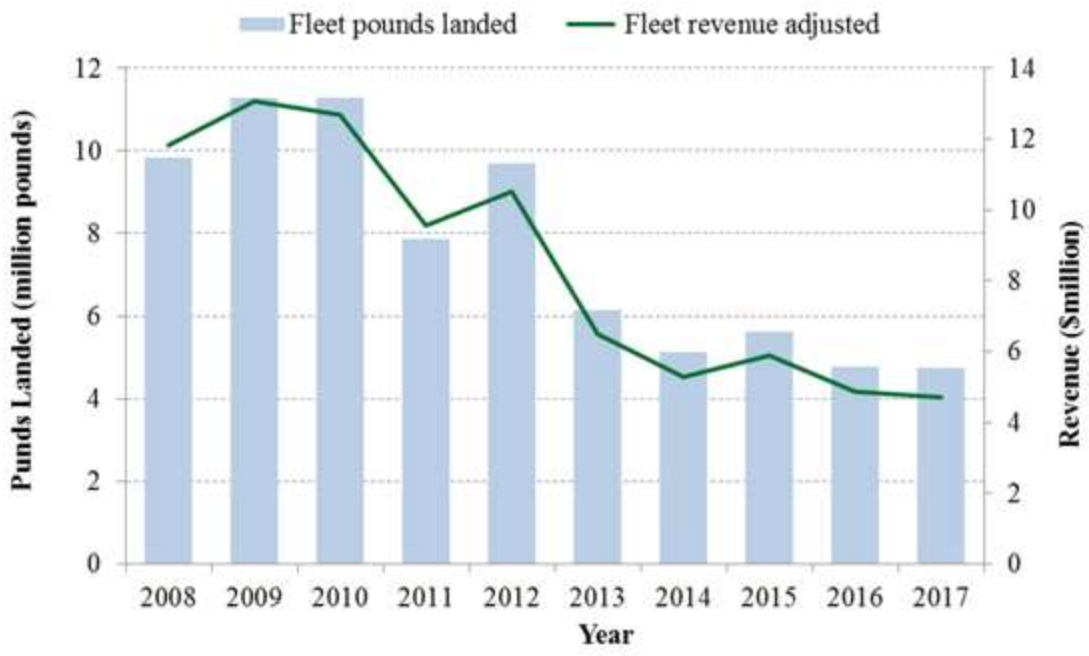

Figure 8. Landings, revenue, and price for American Samoa longline fishery from 2008-2017 adjusted to 2017 dollars.
Source: WPFMC (2018a).

3.2.2.6 Non-Target Species and Bycatch

Table 12 shows the number of fish kept and released in the American Samoa longline fishery during 2016. Fish are released for various reasons including quality, size, handling and storage difficulties, and as well as marketing issues. Fishermen released nearly all sharks and oilfish and a high percentage of certain billfish, which are important to the non-commercial fishery. Overall, fishermen released 10 percent of the total number of fish caught.

Table 12: Number of fish kept, released and percent released for all American Samoa longline vessels during 2017

Species	Number Kept	Number Released	Total Caught	Percent Released
Skipjack tuna	10,228	52	10,280	0.5
Albacore tuna	76,857	490	77,347	0.6
Yellowfin tuna	24,855	216	25,071	0.9
Kawakawa	0	0	0	0.0
Bigeye tuna	2,483	9	2,492	0.4
Tunas (unknown)	8	0	8	0.0
Tuna PMUS Total	**114,431**	**767**	**115,198**	**0.7**
Mahimahi	1,399	17	1,416	1.2
Black marlin	1	1	2	50.0
Blue marlin	648	45	693	6.5
Striped marlin	58	16	74	21.6
Wahoo	4,718	35	4,753	0.7
Sharks (unknown coastal)	12	4,177	4,189	99.7
Swordfish	122	44	166	26.5
Sailfish	46	53	99	53.5
Spearfish	72	126	198	63.6
Moonfish	57	41	98	41.8
Oilfish	30	1,974	2,004	98.5
Pomfret	92	500	592	84.5
Non-Tuna PMUS Total	**7,255**	**7,029**	**14,284**	**49.2**
Barracudas	83	38	121	31.4
Rainbow runner	0	0	0	0.0
Dogtooth tuna	0	0	0	0.0
Non-PMUS Pelagics Total	**83**	**38**	**121**	**31.4**
Total Pelagics	**121,769**	**7,834**	**129,603**	**6.0**

Source: WPFMC (2018a).

3.2.3 Mariana Archipelago Longline Fisheries

The area where longline fishing vessels based in the CNMI and Guam historically have operated is the EEZ around the CNMI and Guam. Historically, fewer than three longline companies have actively fished in the EEZ around Guam and the CNMI. For this reason catch and effort information is confidential. Since 2011, there has been no longline fishing activities around the CNMI or Guam, and NMFS does not expect longline fishing activities to occur in 2019. 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 2014).

3.2.4 Hawaii Troll and Handline Fisheries

Trolling and, to lesser extent, handline fishing is the largest pelagic fishery in Hawaii in terms of participation, although it catches annually a relatively modest volume of fish compared to longline gear. Troll and handline catches are dominated by yellowfin tuna in Hawaii. Other

commonly caught troll catches include mahimahi, wahoo, and blue marlin. The number of days fished by MHI troll fishers has been dropping since a peak in 2012, with 1,394 fishers logging 20,742 days fished around the MHI in 2017. There were 484 MHI handline fishers that fished 4,526 days in 2017, both below their respective long-term averages (WPFMC 2018a).

3.2.4.1 Catch and Revenue

In the years 2013-2017, U.S. tropical troll and handline fisheries caught between 139 and 541 t of bigeye tuna, compared to between 804 and 973 t of yellowfin tuna (NMFS 2018b). Total catch and revenue information for these fisheries are found in Table 13 and Table 14.

Table 13. Catch and revenue for the MHI troll fishery, 2008-2017.

Year	Catch (1,000 lbs)	Adjusted revenue ($1,000)	Nominal revenue ($1,000)	Honolulu CPI
2008	2,971	$6,324	$5,456	228.9
2009	2,958	$5,802	$5,030	230.0
2010	2,855	$6,110	$5,410	234.9
2011	2,966	$6,280	$5,766	243.6
2012	3,690	$9,138	$8,594	249.5
2013	3,117	$7,874	$7,350	253.9
2014	3,486	$8,837	$8,368	257.6
2015	3,094	$8,117	$7,763	260.2
2016	2,582	$7,750	$7,558	265.3
2017	2,146	$6,419	$6,419	272.0
Average	**2,986.5**	**$7,265.0**	**$6,771.4**	
SD	**429.8**	**$1,218.3**	**$1,314.9**	

Source: WPFMC (2018a).

Table 14. Catch and revenue information for the MHI handline fishery, 2008-2017.

Year	Catch (1,000 lbs)	Adjusted revenue ($1,000)	Nominal revenue ($1,000)	Honolulu CPI
2008	701	$1,640	$1,415	228.9
2009	1,067	$2,019	$1,750	230.0
2010	933	$2,153	$1,906	234.9
2011	1,129	$2,322	$2,132	243.6
2012	1,602	$3,574	$3,361	249.5
2013	1,282	$3,606	$3,366	253.9
2014	1,161	$3,105	$2,940	257.6
2015	1,200	$3,028	$2,896	260.2
2016	785	$2,424	$2,364	265.3
2017	933	$2,835	$2,835	272.0
Average	**1,079.4**	**$2,670.5**	**$2,496.5**	
SD	**260.5**	**$664.3**	**$683.2**	

Source: WPFMC (2018a).

3.2.5 Catches by U.S. Longline Vessels in the Pacific

The Hawaii deep-set longline fishery, and secondarily the American Samoa longline fishery, catch the majority of longline catches of FEP-permitted vessels in the Pacific. As described earlier, the CNMI and Guam longline fisheries are not active, but catches under specified fishing agreements by vessels permitted under the FEP are attributed to the territory to which the agreement applies.

Table 15 shows the total U.S. catches of pelagic MUS in the WCPO by Hawaii and U.S. territorial longline fisheries from 2015-2017. Table 16 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 15.

Table 15. Longline landings (t) by species and species group for U.S. and U.S. participating territory longline vessels operating in the WCPFC statistical area, 2015-2017. Source: NMFS (2018b).

	U.S. in North Pacific Ocean			CNMI in North Pacific Ocean			Guam in North Pacific Ocean			American Samoa in North Pacific Ocean			American Samoa in South Pacific Ocean			Total		
	2017	**2016**	**2015**	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**	**2017**	**2016**	**2015**
Vessels	136	133	135	119	117	117		118	112	118	23	22	15	20	21	150	151	156
Species																		
Albacore, North Pacific	74	208	197							16	34	19				90	243	217
Albacore, South Pacific			0										1,381	1,517	1,855	1,381	1,517	1,855
Bigeye tuna	2,968	3,747	3,427	997	879	999		932	856	1,330	586	441	64	72	116	5,358	6,216	5,840
Pacific bluefin tuna	0	0	0							0			1	0	6	2	1	6
Skipjack tuna	157	186	176							35	26	11	63	94	67	254	306	254
Yellowfin tuna	1,761	1,093	681							293	175	105	533	386	255	2,587	1,654	1,041
Other tuna		0	0								0						0	0
TOTAL TUNA	**4,960**	**5,234**	**4,482**	**997**	**879**	**999**		**932**	**856**	**1,674**	**821**	**577**	**2,042**	**2,069**	**2,299**	**9,673**	**9,936**	**9,214**
Black marlin	0	1	0							0		0	0			1	1	0
Blue marlin	485	419	445							84	57	55	38	30	25	606	506	525
Sailfish	9	15	11							2	2	2	1	2	2	12	19	15
Spearfish	206	251	188							26	28	15	2	2	1	234	281	204
Striped marlin, North Pacific	286	280	378							48	48	36				334	327	414
Striped marlin, South Pacific			0										2	2	3	2	2	3
Other marlins	1	1	1							0		0				1	1	1
Swordfish, North Pacific	924	596	665							49	43	24				973	639	690
Swordfish, South Pacific			0										6	6	8	6	6	8
TOTAL BILLFISH	**1,910**	**1,562**	**1,688**							**209**	**179**	**133**	**48**	**41**	**40**	**2,168**	**1,782**	**1,861**
Blue shark											0			1	1		1	1
Mako shark	30	37	35							5	9	4	0	0		35	46	39
Thresher	2	3	5							0	0	1	1	0		3	4	6
Other sharks	0	0											0	0		0	0	
Oceanic whitetip shark														0				
Silky shark	0															0		
Hammerhead shark		0															0	
Tiger shark																		
Porbeagle																		
TOTAL SHARKS	**32**	**40**	**40**							**6**	**10**	**5**	**1**	**1**	**1**	**39**	**51**	**45**
Mahimahi	147	202	199							22	28	21	14	4	6	183	234	226
Moonfish	258	304	279							61	74	55	1	2	2	321	380	336
Oilfish	93	160	165							21	29	20	0	2	0	115	191	185
Pomfret	261	339	380							38	46	39	0	0	0	299	386	419
Wahoo	218	309	256							35	47	27	48	47	58	301	403	340
Other fish	2	7	7							0	1	1	0	1	1	3	9	9
TOTAL OTHER	**980**	**1,322**	**1,285**							**178**	**224**	**164**	**64**	**55**	**66**	**1,222**	**1,602**	**1,515**
GEAR TOTAL	**7,883**	**8,158**	**7,495**	**997**	**879**	**999**		**932**	**856**	**2,067**	**1,235**	**878**	**2,155**	**2,167**	**2,405**	**13,101**	**13,371**	**12,634**

Table 16. Bigeye tuna catch (t) by U.S. Hawaii and U.S. participating territory longline fisheries in the WCPO (2015-2017).

Longline Fishery		**2017**	**2016**	**2015**	**Ave. 2017-2015**	**Ave. 2013-2016**
U.S. Hawaii longline permitted vessels	Catch Hawaii longline-permitted vessels applicable to the U.S. bigeye tuna catch limit	2,968	3,747	3,427	3,381	3,670
	Catch allocated to Hawaii longline-permitted vessels from a U.S. territory	1,755 (997 from the CNMI and 758 from American Samoa)	1,811 (879 from CNMI and 932 from Guam)	1,855 (999 from CNMI and 856 from Guam)	1,807	1,559
American Samoa longline permitted vessels	Catch by dual permitted U.S. Hawaii/American Samoa longline vessels on the high seas	572	586	441	452	422
	Catch by American Samoa longline permitted vessel in the EEZ around American Samoa	64	72	116	84	99
Total Catch in WCPO		5,358	6,216	5,840	5,805	5,750

Source: Table 15 above and Kingma and Bigelow (2019)

Table 17 and Table 18 show 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 (10.35 percent in 2017), the total EPO longline bigeye tuna catch (8.64 percent in 2017), the total WCPO bigeye tuna catch (4.37 percent in 2017), total EPO bigeye tuna catch (2.76 percent in 2017), and the total Pacific-wide bigeye tuna catch (3.66 percent in 2017), respectively.

Table 17: Bigeye tuna catch (t) by longline (LL), purse seine (PS), and other fisheries (OF) in the WCPO, EPO, and total combined contribution by U.S. longline (LL) vessels (Hawaii and U.S. territories including fishing agreements).

Year	WCPO							EPO						
	LL	PS	OF	Total	U.S. LL[1]	% LL	% Total	LL	PS	OF	Total	U.S. LL[2]	%LL	% Total
2007	76,661	50,124	11,871	138,656	5,599	7.30	4.04	29,876	63,450	44	94,260	417	1.40	0.44
2008	77,151	58,414	13,494	149,059	4,781	6.20	3.21	26,208	75,028	28	103,350	1,277	4.87	1.24
2009	76,107	58,543	13,016	147,666	3,990	5.24	2.70	31,422	76,799	15	109,255	730	2.32	0.67
2010	64,135	57,025	11,133	132,293	4,064	6.34	3.07	37,090	57,752	2	95,408	1,356	3.66	1.42
2011	69,820	73,644	10,927	154,391	4,828	6.91	3.13	32,317	56,512	0	89,460	1,050	3.25	1.17
2012	75,150	64,183	16,369	155,702	5,162	6.87	3.32	36,167	66,020	27	102,687	875	2.42	0.85
2013	55,574	70,767	16,815	143,156	4,534	8.16	3.17	36,204	49,487	99	86,063	2,043	5.64	2.37
2014	68,164	66,192	19,520	153,876	5,141	7.54	3.34	35,340	60,445	177	96,045	2,073	5.87	2.16
2015	65,765	49,418	20,274	135,457	5,840	8.88	4.31	41,644	62,913	21	104,755	3,050	7.32	2.91
2016	58,034	61,239	25,134	144,407	6,216	10.71	4.30	35,525	56,713	22	92,801	2,084	5.87	2.25
2017	51,765	58,945	11,920	122,630	5,358	10.35	4.37	31,138	66,192	NA[4]	97,519	2,690	8.64	2.76

Sources: Table 89 from WCPFC (2018c) for WCPO gear totals and Table A-2a from IATTC (2018) for EPO gear totals, unless otherwise noted.
[1]U.S. longline catches in the WCPO are from Tables 28-30 in WCPFC (2018c)in years 2007-2012 and NMFS (2018b) in years 2013-2017.
[2]U.S. longline catches in the EPO are from Table A-3e in IATTC (2018) in years 2007-2011, and WPFMC (2018a) in 2012-2017.
[4]Not available.
Calculations: NMFS
Note: There is no attribution of bigeye tuna caught in the EPO to U.S. territory longline vessels.

Table 18. Bigeye tuna catch (t) in the WCPO, EPO, and total combined contribution by U.S. longline (LL) vessels (Hawaii and US Territory including fishing agreements).

Year	WCPO	EPO	Total	U.S. LL Total[1]	% Total
2007	138,656	94,260	232,916	6,016	2.58
2008	149,059	103,350	252,409	6,058	2.40
2009	147,666	109,255	256,921	4,720	1.84
2010	132,293	95,408	227,701	5,420	2.38
2011	154,391	89,460	243,851	5,878	2.41
2012	155,702	102,687	258,389	6,037	2.34
2013	143,156	86,063	229,219	6,577	2.87
2014	153,876	96,045	249,921	7,214	2.89
2015	135,457	104,755	240,212	8,890	3.70
2016	144,407	92,801	237,208	8,300	3.50
2017	122,630	97,519	220,149	8,048	3.66

Sources: Table 89 fromWCPFC (2018c), Table A-2a from IATTC (2018) for EPO total, others noted.
[1]Total U.S. longline catch is the sum of U.S. longline catches in the WCPO and EPO. U.S. longline catches in the WCPO are from Tables 28-30 in WCPFC (2018c)years 2007-2012, and NMFS (2018b) in years 2013-2017. U.S. longline catches in the EPO are from Table A-3e in IATTC (2018) in years 2007-2011, and WPFMC (2018a) in 2012-2017.
Calculations: NMFS
Note: There is no catch of bigeye tuna in the EPO by U.S. territory longline vessels.

3.2.6 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 reaching a low of 13 vessels in 2006. From 2011 - 2017, participation 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 numbered at 34 vessels in 2017 (NMFS 2018b).

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 19).

Table 19. Number of vessels and tuna catch (t) by the U.S. purse seine fleet, 2013-2017.

Year	Vessels *	Skipjack		Yellowfin		Bigeye		Total tuna Catch (t)
		US reported Catch	SPC estimated catch	US reported Catch	SPC estimated catch	US reported Catch	SPC estimated catch	
2013	40	226,609	207,182	23,277	34,383	8,157	12,706	258,044* (254,271) +
2014	40	269,243	262,138	40,959	40,655	2,802	10,212	313,004* (313,005) +
2015	39	219,550	207,527	17,019	25,074	1,595	5,476	238,164* (238,077) +
2016	37	178,284	168,994	18,162	24,529	4,711	7,629	201,472* (201,152) +
2017	34	138,744	129,999	23,144	28,302	3,247	7,013	165,601* (165,313) +

Sources: SPC (2018a) and NMFS (2018b).
Note: Estimates are based on aggregate data and raised logbook data with species composition adjusted using observer sampling with grab sample bias correction, which accounts for differences in the annual catch estimates provided by the U.S. (SPC 2018a).
*US reported vessel numbers or purse seine catch.
+SPC estimated total US purse seine tuna catch.

3.2.7 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 the 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 effects to such communities.

In 1999, the Council identified American Samoa, Guam, and the CNMI each as a fishing community. The Secretary of Commerce approved this definition on April 19, 1999 (64 FR 19067). In 2002, the Council identified each island -- 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).

3.2.7.1 American Samoa Cultural Fishing Practices

A federal judge recently set aside a NMFS rulemaking that provided an exemption for longliners to fish within certain areas of the LVPA. In her decision, the Court found that NMFS failed to consider its obligations under the Deeds of Cession of Chiefs of Tutuila to the United States Government (1900) and the Deeds of Cession of Manua'a Islands (1904) (collectively, the Instruments) codified at 48 U.S.C. § 1661.[7] In so holding, the Court determined that the Instruments of Cession constitute binding "other applicable law" for purposes of the Magnuson-Stevens Act, and that NMFS improperly failed to consider whether the LVPA rule protected and preserved American Samoan cultural fishing practices.

NMFS, however, disagrees that the Instruments - which make no mention of cultural fishing or cultural fishing practices in marine areas that were at the time part of the high seas - are binding applicable law. NMFS has appealed this decision to the Ninth Circuit Court of Appeals.

"Cultural fishing" is a relatively new term and is not readily defined (Kleiber and Leong 2018). It is widely held that cultures and societies change and evolve but also maintain central core values. As with other studies of culture, "cultural fishing" is context dependent – definitions from other areas may not be suitable for American Samoa. American Samoa culture is often framed in terms of *Fa'a Samoa,* or the "Samoan Way" which govern local social norms and practices. This includes core values and practices such as *Tautua* or "service" which involves the broad collective sharing of labor, resources, income, and social and political support to strengthen the *Aiga* (family groups), the village, and the role of chiefs in perpetuating *Fa'a Samoa*. In a fisheries context this may mean the distribution of catch within the *Aiga*, or the use of fish at specific ceremonial events. Cultural fishing also encompasses the day-to-day practices of subsistence. These values and practices endure in the face of significant technological change.

The Council has solicited comments from the American Samoan government and from the American Samoan public on the meaning of cultural fishing during development of a revised LVPA action. The NMFS Pacific Islands Fisheries Science Center (PIFSC) also conducted social science research and interviews in American Samoa on the meaning of cultural fishing. Some general themes that emerged from these public comments and research include: a) importance of the catch being shared with the community in the form of *Tautua* in perpetuation of *Fa'a Samoa*,

[7] Order Granting in Part and Denying in Part Plaintiff's Motion for Summary Judgment and Denying Defendants' Counter-Motion for Summary Judgment at 39, *Territory of American Samoa v. National Marine Fisheries Service, et al.*, No. 1:16-cv-00095-LEK-KJM, (D. Haw. Mar. 20, 2017), ECF No. 45 [hereinafter, "Order"].

b) motivation for cultural fishing being linked to community service rather than profits, c) cultural fishing includes commercial fishing in order to pay for expenses associated with fishing, d), the offshore banks are important for alia vessels and other small vessels trolling and bottomfishing, e) fishing gear does not have to be limited to traditional methods and can be modern gear including longline fishing, and f) not just indigenous Samoans engage in cultural fishing.

3.3 Protected Species

Longline and other pelagic fishing vessels operating in the western Pacific and targeting pelagic species have the potential to interact with a range of protected species (such as marine mammals, sea turtles, and seabirds). Table 20 lists the species listed as endangered or threatened under the Endangered Species Act (ESA) that have the potential to interact with longline fisheries managed under the Pelagics FEP. This section provides the recent annual estimated or observed interactions of the longline fisheries with protected species, and a summary of the effects of the standard operation of the longline fisheries permitted under the Pelagics FEP with a comparison to incidental take statements (ITS) where relevant. We consider recent interaction levels to be the baseline condition for comparison of environmental effects of the alternatives in Section 4.

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 (U.S. FWS) for terrestrial and freshwater species or their designated critical habitat. The product of formal consultation is the Service's biological opinion (BiOp). Federal agencies need not engage in formal consultation 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 U.S. FWS concur with that conclusion (see ESA section 7 Formal Consultation; 50 CFR 402.14(b)).

The ESA also prohibits the taking[8] of listed species except under limited circumstances. Western Pacific fisheries authorized under the Pelagics FEP operate in accordance with ITS set by ESA consultations, including applicable terms and conditions. The consultations consider the potential interactions of fisheries with listed species, the effects of interactions on the survival and recovery of listed species, and the protection of designated critical habitat.

[8] The definition of "take" includes to harass, harm, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. 50 CFR 402.02.

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 20. ESA-listed species with the potential to interact with longline vessels permitted under the Pelagics FEP

Species	ESA status
Sea Turtles	
Central North Pacific green turtle distinct population segment (DPS) (*Chelonia mydas*)	Threatened
East Pacific green turtle DPS (*Chelonia mydas*)	Threatened
Central South Pacific green turtle DPS (*Chelonia mydas*)	Endangered
Central West Pacific green turtle DPS (*Chelonia mydas*)	Endangered
East Indian-West Pacific green turtle DPS (*Chelonia mydas*)	Threatened
Southwest Pacific green turtle DPS (*Chelonia mydas*)	Threatened
Hawksbill turtle (*Eretmochelys imbricata*)	Endangered
Leatherback turtle (*Dermochelys coriacea*)	Endangered
North Pacific loggerhead turtle 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
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
Guadalupe fur seal (*Arctocephalus townsendi*)	Threatened
Seabirds	
Hawaiian dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*)	Endangered
Newell's shearwater (*Puffinus auricularis newelli*)	Threatened

Species	ESA status
Short-tailed albatross (*Phoebastria albatrus*)	Endangered
Sharks and Rays	
Scalloped hammerhead Indo-West Pacific DPS	Threatened
Scalloped hammerhead Eastern Pacific DPS	Endangered
Oceanic white tip (*Carcharhinus longimanus*)	Threatened
Giant manta ray (*Manta birostris*)	Threatened
Corals and Marine Invertebrates	
Acropora globiceps	Threatened
Acropora jacquelineae	Threatened
Acropora retusa	Threatened
Acropora speciose	Threatened
Euphyllia paradivisa	Threatened
Isopora crateriformis	Threatened
Seriatopora aculeate	Threatened
Chambered nautilus (*Nautilus pompilius*)	Threatened

Source: https://www.fisheries.noaa.gov/species-directory/threatened-endangered?species_title=&field_species_categories_vocab_target_id=All&field_species_status_value=All&field_region_vocab_target_id=1000001116, accessed October 2, 2018.

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

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.[9]

[9] On May 4, 2018, the portion of the 2012 BiOp pertaining to loggerhead turtles was vacated and remanded to NMFS under a stipulated settlement agreement and court order. *See Turtle Island Restoration Network et al. v. U.S. Dep't of Commerce*, et al., No. 1:12-cv-00594-SOM-RLP (D. Haw., May 4, 2018), Dkt. No. 80.

U.S. FWS. 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.

NMFS. 2015. Biological Opinion and Conference Opinion on Continued Operation of the American Samoa Longline Fishery.

NMFS. 2017. Supplement to the 2014 Biological Opinion on Continued Operation of the Hawaii-based Deep-set Pelagic Longline Fishery.

Analyses in the BiOps are comprised of several steps, designed to determine the effects of the fisheries on protected species. First, NMFS or U.S. FWS identifies the probable risks the action poses to listed individuals that are likely exposed to an action's direct and indirect effects. The total annual number of interactions expected in the fishery, or an interaction rate, represents the probable risks. For some species, collisions with fishing vessels represent another potential stressor associated with the proposed action. NMFS or U.S.FWS then integrates the individual risks to identify consequences to the populations those individuals represent, using methods appropriate to the populations under study. Finally, NMFS or U.S. FWS determines the consequences of those population-level risks to the species those populations comprise.

Consultation for the Hawaii deep-set fishery was reinitiated on October 4, 2018, due to reaching several reinitiation triggers. The fishery exceeded the ITS for east Pacific green sea turtle DPS in mid-2018. Listing of the oceanic whitetip shark (83 FR 4153) and giant manta ray (83 FR 2916) as threatened species, and designation of MHI insular false killer whale (IFKW) critical habitat (83 FR 35062) also triggered the requirement for reinitiated consultation.

Consultation for the Hawaii shallow-set longline fishery was reinitiated on April 20, 2018, due to reaching several reinitiation triggers. The fishery interacted with ESA-listed Guadalupe fur seals in 2016 and 2017, a species previously unknown to interact with the fishery, and exceeded the olive ridley sea turtle ITS in early 2018. NMFS's revision of the green turtle listing under distinct population segments (DPSs; 81 FR 20058), listing of the oceanic whitetip shark (83 FR 4153) and giant manta ray (83 FR 2916) as threatened species, and designation of main Hawaiian Islands insular false killer whale critical habitat (83 FR 35062) after the request for re-initiation also triggered the requirement for reinitiated consultation. Finally, on May 4, 2018, the portion of the 2012 BiOp pertaining to loggerhead turtles was vacated and remanded to NMFS under a stipulated settlement agreement and court order.

NMFS intends to promptly reinitiate consultation on the American Samoa longline fishery, due to the listing of the oceanic whitetip shark (83 FR 4153) and giant manta ray (83 FR 2916) as threatened species.

Species Protected under the Marine Mammal Protection Act

The Marine Mammal Protection Act (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 of Commerce to protect and conserve 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).

According to the 2018 List of Fisheries (83 FR 5349, February 7, 2018), the Hawaii deep-set longline fishery is a Category I fishery, and the Hawaii shallow-set longline fishery and American Samoa longline fishery are Category II fisheries. 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 has been developed or is being developed for such species or stock.

On October 16, 2014, NMFS authorized a permit under the MMPA section 101(a)(5)(E), addressing the shallow-set and deep-set fisheries' interactions with ESA-listed species or depleted stocks of marine mammals (79 FR 62106). The permit authorizes the incidental, but not intentional, taking of ESA-listed humpback whales (central North Pacific or CNP stock), sperm whales (Hawaii stock), and MHI insular false killer whales to vessels registered in the Hawaii deep-set and shallow-set fisheries. In issuing this permit, NMFS determined that incidental taking by the Hawaii longline fisheries will have a negligible impact on the affected stocks of marine mammals. Since the issuance of this permit, the CNP humpback whale was designated a DPS and is not a listed species under the ESA (81 FR 62259, September 8, 2016).

Monitoring

NMFS monitors fishery interactions with protected species using at-sea observers, among other means. The NMFS Observer Program monitors interactions on 100 percent of shallow-set fishing trips and on approximately 20 percent of all Hawaii and American Samoa deep-set longline trips, although past coverage in the American Samoa was lower due to federal funding constraints. PIFSC generates fleet-wide estimates of interactions for the deep-set longline fisheries using methods described in McCracken (2009; 2010; 2011a; 2011b; 2012; 2013; 2014a; 2014b; 2014c; 2015; 2016; 2017a; 2017b; 2017c; 2017d), when available. When these data are not available, NMFS estimates fleet-wide interactions by expanding observed takes using an expansion factor based on the observer coverage rate. For example, because the Hawaii deep-set longline fishery was observed at a 20.4 percent coverage rate in 2017, NMFS multiplied each observed interaction by 4.9 to estimate interactions at a 100 percent coverage rate.

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 is not addressed in this document. The species which occur in the area of operation of the Pelagics FEP longline fleets can be found in Table 20. 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 status reviews, 5-year reviews, and recovery plans for each species on the NMFS species pages found at the following website: http://www.fpir.noaa.gov/PRD/prd_esa_section_4.html.

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 and American Samoa longline fisheries through hooking and entanglement. Other pelagic fisheries impacts are primarily limited to the potential for collisions with sea turtles.

The Council and NMFS manage the longline fisheries permitted under the Pelagics FEP through several measures that mitigate the potential for turtle interactions and injury if interactions occur. These measures include training and handling requirements for reducing the severity of interactions, the requirement to carry an observer on a fishing trip if requested, and a requirement for owners and operators of longline vessels to attend a protected species education workshop annually. Additionally, federal regulations require closure of the Hawaii shallow-set fishery once the fishery reaches loggerhead or leatherback hard cap limits and require the use of large circle hooks and mackerel-type fish bait when shallow-setting north of the Equator. Vessels in the American Samoa longline fleet that are longer than 40 m also have specific requirements for gear configuration which result in setting gear at a minimum depth of about 100 m.

After considering a range of potential effects to sea turtles, NMFS, in the 2001, 2010, 2012[10], 2014 as supplemented (2017), and 2015 BiOps listed above, determined that the pelagic fisheries of the western Pacific operating in accordance with the Pelagics 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) of species which the fishery may adversely affect through ITS for these fisheries.

3.3.1.1 Hawaii Deep-set Longline Fishery

Table 21 summarizes the fleet-wide sea turtle interaction estimates for the Hawaii deep-set longline fishery from 2008 through 2018.

Table 21. Annual sea turtles interactions expanded from observed data to fleet-wide estimates for the Hawaii deep-set longline fishery, 2008-2018.

Year	Sea Turtle Species				
	Green	Leatherback	N. Pacific Loggerhead	Olive Ridley	Unidentified hardshell
2008	0	11	0	18	0
2009	0	4	0	18	0
2010	1	6	6	10	0
2011	5	14	0	36	0
2012	0	6	0	34	0
2013	5	15	11	42	0
2014	16	38	0	50	0
2015	4	18	9	69	0
2016	5	15	7	162	5
2017*	15	0	15	127	0
2018*	15	10	0	88	0

*2017 and 2018 estimates expanded by multiplying observed interactions by 4.9 as there was 20.4% observer coverage in 2017 and 2018. Fractional estimates are rounded up to nearest whole number. Because preliminary

[10] On May 4, 2018, the portion of the 2012 BiOp on the operation of the shallow-set longline fishery pertaining to loggerhead turtles was vacated and remanded to NMFS under a stipulated settlement agreement and court order.

observed interactions are reported by date of trip arrival and observer coverage rates are reported by date of trip departure, interaction data may vary from other sources.
Source: WPFMC (2018a), NMFS (2019b)

On September 19, 2014, NMFS issued a no-jeopardy BiOp (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). ITS for green, loggerhead and olive ridley turtles were subsequently exceeded, and NMFS issued a no-jeopardy supplemental BiOp (2017 BiOp) on March 24, 2017, authorizing the incidental take of these species or DPS over a three-year period. NMFS in its 2014 BiOp as supplemented (2017) concluded that the Hawaii deep-set longline fishery as managed under the Pelagics FEP is not likely to jeopardize the continued existence or recovery of any sea turtle species.

The ITS from the 2014 BiOps as supplemented (2017) are shown in Table 22. 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 2008 through June 30, 2014 (end of 2nd quarter 2014). The ITS calculated in the supplement (2017) were based on observed interaction data from 2008 through June 30, 2016 (end of 2nd quarter 2016).

Table 22. 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 BiOp as supplemented (2017) for each DPS where applicable.

Sea turtle species	**3-year ITS in 2014 BiOp**		**3-year ITS in supplement**	
	Interactions	**Mortalities**	**Interactions**	**Mortalities**
Green	9	9	NA	NA
East Pacific DPS	NA	NA	12	12
Central North Pacific DPS	NA	NA	6	6
East Indian-West Pacific DPS	NA	NA	6	6
Southwest Pacific DPS	NA	NA	6	6
Central West Pacific DPS	NA	NA	3	3
Central South Pacific DPS	NA	NA	3	3
Leatherback	72	27	NA	NA
Loggerhead, North Pacific DPS	9	9	18	18
Olive Ridley	99	96	NA	NA
Mexico and eastern Pacific populations	NA	NA	141	134
Western Pacific population	NA	NA	42	40

Sources: NMFS (2014) and NMFS (2017a).

Based on NMFS observer data for the Hawaii deep-set longline fishery for the most recent quarters since the 2014 BiOp data cutoff of June 30, 2014, the fishery has not exceeded the ITS for leatherback turtles.

The new ITS for green turtle DPS's, olive ridley turtle populations and North Pacific DPS of loggerhead turtles in the supplement (2017) to the 2014 BiOp has a monitoring period starting in

July 1, 2016. From July 2017 through July 2018, the NMFS Observer Program reported seven fishery interactions with green sea turtles. These interactions, when expanded to the unobserved fishery and applying a genetic proration of 0.70 percent for the East Pacific DPS, exceeds the ITS of 12 interactions for the East Pacific DPS. NMFS reinitiated ESA Section 7 consultation for the Hawaii deep-set longline fishery on October 4, 2018 (NMFS 2018d).

In the October 4, 2018, request for reinitiation of ESA Section 7 consultation on the operation of the Hawaii deep-set longline fishery, NMFS found that the continued operation of the deep-set longline fleet is likely to adversely affect the east Pacific, central North Pacific, east Indian-west Pacific, southwest Pacific, central west Pacific, and central South Pacific DPS of the green turtle, western Pacific population of the leatherback, North Pacific loggerhead DPS, and eastern and western Pacific populations of olive ridley sea turtles in the biological evaluation (BE) supporting reinitiation.

NMFS estimated the Hawaii deep-set longline fishery could interact with up to 40 green, 43 leatherback, 28 loggerhead, and 179 olive ridley sea turtles annually (NMFS 2018d). These predictions, generated by PIFSC using Bayesian data analysis methods appropriate for count data (McCracken 2018), used observed interactions in the fishery from 2002-2017. The unidentified hardshell interactions in 2016 (Table 21) are accounted for proportionately amongst the green, loggerhead, and olive ridley 2016 interaction estimates. We considered the number of green sea turtles likely to die from boat collisions and found the number of mortalities to be effectively zero (0.09) and therefore discountable (NMFS 2018d).

Using post-hooking mortality criteria described in Ryder et al. (2004), NMFS estimated that 91.6 percent of all green turtle, 40.7 percent of leatherback, 62.4 percent of loggerhead, and 93.9 percent of olive ridley interactions would result in mortality (NMFS 2018d). NMFS applied these post-hooking mortality rates to the interaction estimates to yield the annual number of mortalities expected to occur for each affected sea turtle population from the continued operation of the deep-set longline fleet (Table 23).

NMFS used methodologies appropriate for the available data to estimate interactions or mortalities for relevant populations of the sea turtle species. In order to estimate the interactions for each of the six green sea turtle DPS, NMFS allocated a portion of the expected take to each DPS in the same proportion present in historical observer samples attributed to each DPS. NMFS used the upper 95% confidence interval for each proportion to account for a small sample size of 14 turtles (NMFS 2018d). The proportion attributed to each DPS was rounded up to the nearest whole number to calculate the anticipated interactions for each green sea turtle DPS. The expected take is 32 in the east Pacific, 18 in the central North Pacific, 12 in the east Indian-west Pacific, 10 each in the southwest Pacific and central South Pacific, and 8 in the central west Pacific DPS (NMFS 2018d).

NMFS expects almost all (95 percent) leatherback turtles directly affected by this action to belong to the western Pacific population with the remaining 5 percent attributed to the eastern Pacific population, based on genetic samples from 21 leatherbacks (NMFS 2018d). The North Pacific DPS is the only loggerhead DPS which has the potential to interact with the deep-set longline fishery (NMFS 2018d), so NMFS attributes all interactions and mortalities to this DPS.

For olive ridley sea turtles, NMFS estimated from genetic samples that 73 percent of the take occurs from the eastern Pacific DPS and 27 percent from the Western Pacific. NMFS used these proportions to attribute mortalities to the eastern and western Pacific DPSs. NMFS used the ratio from a sample size of 153 olive ridley turtles, which was substantially larger than the green turtle sample size. NMFS did not adjust the olive ridley DPS mortality estimates based on the upper 95% confidence interval. Table 23 shows interaction and mortality estimates for sea turtles.

In order to analyze the effect of sea turtle interactions at the population level, the BE compared the number of turtles that are predicted to die from the operation of the deep-set longline fleet that would have otherwise be expected to reach breeding age (adult nesting equivalency or ANE) to the total number of breeding females in each population. Counts of adult females on nesting beaches are the only abundance data available for sea turtles. In order to calculate the ANE, three adjustment factors are required: 1) adult equivalence of juveniles (probability of juveniles naturally surviving to become adults), 2) ratio of females in the population (female to male sex ratio), and 3) probability that a turtle will die if it interacts with the fishery. Risk to the population is also expressed in the number of years it takes to kill the equivalent of one adult female in each DPS. Where breeding female abundance is not available for a population, DPS or nesting population, NMFS determines the population effects based on the frequency of expected adult nester mortality.

Table 23 also shows the ANE, number of breeding females, proportion of nesting population where available, and years to kill the equivalent of one female in each turtle species, population, breeding population, or DPS. For more details on the process and rationale used to develop population level impacts, please see the 2014 BiOp as supplemented (2017) (NMFS 2014; 2017a) and biological evaluation prepared for the reinitiation (NMFS 2018d).

NMFS estimates that the fishery may kill between 0.001 percent (east Indian-west Pacific, southwest Pacific, and central west Pacific green turtle DPS) to 0.1 percent (western Pacific leatherback) of the population every year, with population impacts for the remaining nine sea turtle DPS falling in between. For context, a change in the population of 0.1% represents a change in the population growth rate (r) equivalent to 0.001; $r = 0.03$ is a typical growth rate for an increasing population. NMFS does not expect the fishery to cause more than a single adult female mortality ranging between every half year (for the north Pacific loggerhead DPS) to every 11 years (for the central west Pacific DPS) for green and loggerhead species. When considered at the population level for leatherbacks, NMFS does not expect adult female mortalities to occur greater than between once every four months and 4.5 years. No more than 13 (western Pacific DPS) and 35.7 (eastern Pacific DPS) olive ridley adult females are expected to die as a result of the fishery every year, and the proportion of nester abundance remains low. The information indicates that for each sea turtle species, adult female mortalities associated with the estimated annual level of interactions do not substantially affect the population growth rate.

Under the 2014 BiOp as supplemented (2017), the overall population for each sea turtle species was expected to remain large enough to maintain genetic heterogeneity, broad demographic representation, and successful reproduction, and to retain the potential for recovery. This conclusion remains valid for the impacts of the Hawaii deep-set longline fleet on all species and DPS of sea turtles. On October 4, 2018, NMFS determined that the conduct of the fishery during the period of consultation will not violate ESA Sections 7(a)(2) and 7(d); that is, the operation of

the fishery is not likely to jeopardize the continued existence of species listed as threatened or endangered, result in the destruction or adverse modification of designated critical habitat, nor will it result in the making irreversible or irretrievable commitments of resources. Based on the information in the updated BE analysis, NMFS expects the effect of the action on all sea turtle species to be insubstantial.

Table 23. Sea turtle interactions, mortalities, and population level impacts in the Hawaii deep-set longline fleet.

DPS	Annual Interactions	Annual Mortalities	ANE	Nester abundance	Proportion of nesting population	Years to adult female mortality
Green	40	37				
East Pacific DPS	32	NA	0.4	20,112	0.00002	2.5
Central North Pacific DPS	18	NA	0.2	3,846	0.00005	5
East Indian-West Pacific DPS	12	NA	0.14	77,009	0.00001	7.14
Southwest Pacific DPS	10	NA	0.11	83,058	0.00001	9.09
Central West Pacific DPS	8	NA	0.09	6,518	0.00001	11.11
Central South Pacific DPS	10	NA	0.11	2,677	0.00004	9.09
Leatherback						
Western Pacific	41	17	3.04	2,750	0.00111	0.33
Eastern Pacific	3	1	0.22	1,000	NA	4.55
North Pacific Loggerhead DPS	28	18	1.77	8,632	0.00019	0.56
Olive Ridley						
Eastern Pacific DPS	132	124	35.7	1,000,000	0.00004	0.03
Western Pacific DPS	48	45	13.0	205,000	0.00006	0.08

Source: NMFS (2018d)

3.3.1.2 Hawaii Shallow-set Longline Fishery

Table 24 summarizes the fleet-wide estimates for the Hawaii shallow-set longline fishery from 2004 to 2018.

Table 24. Annual number of observed sets (based on begin set date) and observed interactions (based on interaction date) of loggerhead, leatherback, green and olive ridley turtles in the Hawaii shallow-set longline fishery, 2004-2018.

Year	Annual number of observed sets	Observed Interactions (100% Coverage)			
		Loggerhead	Leatherback	Green	Olive ridley

2004	135	1	1	0	0
2005	1645	12	8	0	0
2006	850	17[a]	2	0	0
2007	1570	15	5	0	1
2008	1605	0	2	1	2
2009	1761	3	9	1	0
2010	1875	7	8	0	0
2011	1463	12	16[b]	4	0
2012	1369	5	7	0	0
2013	961	5	11	0	0
2014	1337	15	16	1	1
2015	1156	13	5	0	1
2016	727	15	5	0	0
2017	973	21	4	2	4
2018[c]	476	38	6	1	1
Average (2005-2018)[d]	1,330	12.4	7.5	0.7	0.7

[a] Fishery closed on March 20, 2006, as a result of reaching the loggerhead hard cap of 17.
[b] Fishery closed on November 18, 2011 as a result of reaching the leatherback hard cap of 16.
[c] Fishery closed on May 8, 2018, pursuant to the stipulated settlement agreement and court order.
[d] 2004 and 2018 data omitted from calculation of the long-term average due the fishery closures during peak season.
Source: NMFS (2018e; 2019c)

On March 31, 2012, NMFS issued a BiOp concluding that the Hawaii shallow-set longline fishery as managed under the Pelagics FEP is not likely to jeopardize the continued existence or recovery of any sea turtle species (NMFS 2012). Table 25 shows the ITS from the 2012 BiOp. The 1-year ITS for loggerhead and leatherback turtles are used as a hard cap for interactions in any given year, and NMFS closes the fishery when reached. The 2-year ITS are used for purposes of reinitiating ESA Section 7 consultation if fishery interactions reach these numbers in any given two-year time period.

Table 25. 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 [a]	34	7	68	14
Leatherback	26	6	52	12
Olive ridley	2	1	4	2
Green	3	1	6	2

[a] The portion of the 2012 BiOp pertaining to loggerhead turtles was vacated and remanded to NMFS under a stipulated settlement agreement and court order on May 4, 2018.
Source: NMFS (2012)

Based on observer data over the monitoring period beginning in Quarter 1 of 2012, take of leatherback and green sea turtles has remained below the ITS for the shallow-set longline fishery.

On December 27, 2017, a Ninth Circuit panel issued a split 2-1 opinion finding that NMFS's 2012 BiOp's no-jeopardy determination and associated incidental take statement for the loggerhead turtle to be arbitrary and capricious. *Turtle Island Restoration Network, et al. v. U.S. Dep't of Commerce, et al.*, 878 F.3d 725, 740 (9th Cir. 2017). On May 4, 2018, the District Court approved a settlement vacating and remanding those portions of the 2012 biological opinion and ITS relating to North Pacific loggerheads, and the shallow-set fishery was closed through December 31, 2018 (see *Turtle Island Restoration Network et al. v. U.S. Dep't of Commerce*, et al., No. 1:12-cv-00594-SOM-RLP [D. Haw., May 4, 2018], Dkt. No. 80). The shallow-set fishery reopened on January 1, 2019, under an annual hard cap limit of 17 loggerheads (83 FR 49495), consistent with the ITS from the 2004 BiOp. On March 19, 2019, the shallow-set longline fishery closed (XX FR XXXXX) for the remainder of 2019 due to reaching an annual hard cap limit of 17 loggerheads. The shallow-set fishery will reopen on January 1, 2020, under an annual hard cap limit of 17 loggerheads, unless or until superseded by a new BiOp and hard cap limit issued by NMFS. All remaining provisions of the 2012 BiOp remain in full force and effect.

The fishery exceeded the olive ridley ITS in early 2018. Additionally, described above, the loggerhead portion of the 2012 BiOp was vacated on May 4, 2018. ESA Section 7 consultation for the Hawaii shallow-set longline fishery was reinitiated on April 20, 2018.

In our request for reinitiation of ESA Section 7 consultation on the operation of the shallow-set longline fishery, NMFS found that the continued operation of the Hawaii shallow-set longline fleet is likely to adversely affect the central north Pacific DPS and east Pacific DPS of the green, western Pacific population of the leatherback, North Pacific loggerhead DPS, and eastern and western Pacific populations of olive ridley sea turtles. NMFS estimated the shallow-set fishery could interact with up to five green, 21 leatherback, 37 loggerhead, and five olive ridley sea turtles annually (NMFS 2018e). These predictions, generated by PIFSC using Bayesian data analysis methods appropriate for count data (McCracken 2018), used observed interactions in the fishery from January 1, 2005 through December 31, 2017. For North Pacific loggerhead sea turtles, the predictions are based on observed interactions from January 1, 2005 through January 31, 2018, to account for loggerhead interactions observed in the first month of 2018.

The population-level effects of the anticipated level of sea turtle interactions in the Hawaii shallow-set longline fishery is quantified in the BE as the number of adult females removed from the populations (ANE), using the same methods as NMFS used for the deep-set fishery. The resulting ANEs and proportion of nesting population are summarized in Table 26.

Table 26. Population level effect metrics for ESA-listed sea turtle populations over a 1-year period.

Species	Total Anticipated Annual Interactions	Annual Mortalities	ANE	Estimated Total Nesters	Proportion of Nesting Population	Years to adult female mortality*
Loggerhead turtle (North Pacific DPS)	37	6	0.676	8,632	0.000049	1.48
Leatherback turtle	21	5	1.502	2,750	0.00052	0.67
Olive ridley turtle (eastern Pacific population)	4	1	0.118	>1 million (annual)	< 0.000001	8.47
Olive ridley turtle (western Pacific population)	2	1	0.06	205,000	< 0.000001	16.67
Green turtle (eastern Pacific DPS)	3	1	0.006	20,062	< 0.000001	166.67
Green turtle (central North Pacific DPS)	3	1	0.006	3,846	0.000002	166.67

Source: NMFS (2018e).
*Calculated by the authors.

NMFS estimates that the fishery would kill between less than 0.0001 percent (for the eastern Pacific green DPS and eastern and western Pacific populations of the olive ridley) to 0.0052 percent (leatherback) of the population every year, with population impacts for North Pacific loggerhead and central North Pacific green DPS falling in between. For context, a change in the population of 0.1% represents a change in the population growth rate (r) equivalent to 0.001; r = 0.03 is a typical growth rate for an increasing population.

NMFS expects the fishery to cause a single adult female mortality ranging between every 0.67 (for leatherback) to every 166.67 years (for the eastern Pacific and central North Pacific green DPS) for green, leatherback and loggerhead species. The information indicates that for each sea turtle species, adult female mortalities associated with the estimated annual level of interactions do not substantially affect the population growth rate.

3.3.1.3 American Samoa Longline Fishery

Table 27 summarizes the fleet-wide sea turtle interaction estimates for the American Samoa longline fishery from 2006 through 2018.

Table 27. Annual sea turtle interactions expanded from observer data to fleet-wide estimates for the American Samoa Longline Fishery, from 2006-2018.

	Sea Turtle Species			
Year	**Green**	**Leatherback**	**Olive Ridley**	**Hawksbill**
2006	37	0	0	0
2007	14	0	0	0
2008	16	0	0	0
2009	39	0	0	0
2010	50	0	0	0
2011	32	4	4	0
2012	0	6	6	0
2013	19	13	4	0
2014	17	4	5	0
2015	0	22	6	0
2016	21	5	15	5
2017[1]	20	5	10	0
2018[2]	23	6	11	11

[1]2017 estimates expanded by multiplying observed interactions by 5 as there was 20% observer coverage in 2017. Fractional estimates rounded up to nearest whole number.
[2]2018 estimates expanded by multiplying observed interactions by 5.7 as there was 17.5% observer coverage in 2018. Fractional estimates rounded up to the nearest whole number. Because preliminary observed interactions are reported by date of trip arrival and observer coverage rates are reported by date of trip departure, interaction data may vary from other sources.
Source: WPFMC (2018a) and NMFS (2019a)

On October 30, 2015, NMFS issued a no-jeopardy biological opinion (2015 BiOp) for the American Samoa longline fishery, which authorizes over a three-year period, the incidental take of green, hawksbill, leatherback, loggerhead and olive ridley sea turtles (NMFS 2015b). These ITSs are shown in Table 28. NMFS began monitoring the American Samoa longline fishery ITS in the third quarter of 2015 and uses a rolling three-year period to track incidental take.

Table 28. 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 2015 biological opinion.

	3-year Incidental Take Statement in 2015 BiOp	
Sea turtle species	**Interactions**	**Mortalities**
Loggerhead turtle (South Pacific DPS)	6	3
Leatherback turtle	69	49
Olive Ridley turtle	33	10
Green turtle[a]	60	54
Green turtle (Central South Pacific DPS)[a]	30	27
Green turtle (Southwest Pacific DPS)[a]	20	17.82
Green turtle (East Pacific DPS)[a]	7	6.48
Green turtle (Central West Pacific DPS)[a]	2	1.62
Green turtle (East Indian-West Pacific DPS)[a]	1	1.08
Hawksbill turtle	6	3

[a] The green turtle DPS-specific ITSs became effective in May 2016 when the DPS listings were finalized.
Source: NMFS (2015b).

The 2015 BiOp used the same methods to estimate population effects to sea turtles as those used in the 2014 BiOp, as supplemented (2017) for the Hawaii deep-set longline fishery. NMFS concluded that the American Samoa longline fishery as managed under the Pelagic FEP is not likely to jeopardize the continued existence or recovery of any sea turtle species.

3.3.1.4 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 29 for the number of sea turtle authorized to be taken in the Guam and CNMI longline fisheries.

Table 29: The number of sea turtles estimated to be annually 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 or CNMI; therefore, there have been no observed or reported interactions with a sea turtle. There were no observed or reported interactions with sea turtles in the CNMI longline fishery from the vessels that were active from 2008 to 2011.

3.3.2 Marine Mammals

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

- Blue whale (*Balaenoptera musculus*)
- Fin whale (*Balaenoptera physalus*)
- Guadalupe fur seal (*Arctocephalus townsendi*)

- Hawaiian monk seal (*Neomonachus schauinslandi*)
- Humpback whale (*Megaptera novaeangliae*)
    - Mexico DPS (threatened)
    - Central America DPS (endangered)
    - Western North Pacific DPS (endangered)
- Main Hawaiian Islands insular false killer whale (MHI IFKW) DPS (*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: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region. Additional, recent information may be found on the NMFS species pages found at the following website: http://www.fpir.noaa.gov/PRD/prd_esa_section_4.html.

On September 8, 2016 (81 FR 62259), NMFS published a final rule to reclassify the humpback whale into 14 DPS under the ESA, of which four DPSs were listed as threatened or endangered. The remaining ten DPSs were not listed under the ESA, including the Hawaii DPS and the Oceania DPS, which occur in areas where the Hawaii and American Samoa longline fisheries operate, respectively. 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 Pelagics 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 SARs, available online at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region.

Marine mammals are primarily vulnerable to Hawaii and American Samoa longline fisheries through hooking and entanglement. Although blue whales, North Pacific right whales, and sei whales occur within the action area and could potentially interact with the Pelagics FEP fisheries, fishermen and observers have not reported any incidental hooking or entanglements of these species in these fisheries. Other potential impacts to marine mammals from the operation of fisheries include collisions with vessels, exposure to waste and discharge, and disturbance from human activity and equipment.

The Council and NMFS manage the longline fisheries permitted under the Pelagics FEP through several measures that mitigate the potential for marine mammal interactions and injury if interactions occur. These measures include the requirement to carry an observer on a fishing trip if requested, and a requirement for owners and operators of longline vessels to attend a protected species education workshop annually. Additionally, longline closed areas generally within 30 to 75 nm of each U.S. island archipelago serve as de facto protection for island-associated stocks of marine mammals.

After considering a range of potential effects to marine mammals, NMFS, in the 2012, 2014, and 2015 BiOps, determined that the pelagic fisheries of the western Pacific operating in accordance with the Pelagics FEP and implementing regulations would not jeopardize the survival or recovery of any listed marine mammals. Within each BiOp, NMFS has authorized a certain level of interactions (ITS) of species which the fishery may adversely affect through ITS for these fisheries. NMFS determined that incidental taking by the Hawaii longline fisheries will have a negligible impact on the affected stocks of marine mammals through issuance of its MMPA section 101(a)(5)(E) permit.

3.3.2.1 Hawaii Deep-set Longline Fishery

Table 30 shows the fleet-wide marine mammal interaction estimates for the Hawaii deep-set longline fishery from 2008 through 2018.

Table 30. Estimated annual marine mammal interactions (including mortalities, and serious and non-serious injuries) with the Hawaii deep-set longline fishery from 2008-2018.

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017[1]	2018[1]
Risso's dolphin	2	0	3	0	0	0	0	10	0	5	0
Short-finned pilot whale	5	0	0	0	0	4	0	4	0	0	0
False killer whale	11	55	19	10	15	22	55	21	35	39	59

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017[1]	2018[1]
Pantropical spotted dolphin	3	0	0	0	0	0	0	0	0	0	0
Striped dolphin	0	0	0	4	0	0	0	4	0	0	0
Bottlenose dolphin	0	5	4	0	0	11	0	0	5	5	5
Pigmy killer whale	0	0	0	0	0	5	0	0	0	0	0
Kogia species	0	0	0	0	0	0	10	0	0	0	0
Humpback whale	0	0	0	0	0	0	5	0	0	0	0
Sperm whale	0	0	0	6	0	0	0	0	0	0	0
Rough-toothed dolphin	0	0	0	0	0	5	0	0	5	0	0
Unidentified cetacean[2]	9	0	0	10	10	10	10	5	10	20	20
Unidentified whale[2]	9	15	14	0	0	0	0	0	0	0	0
Unidentified dolphin[2]	0	0	0	0	0	0	0	5	0	0	0

[1]2017 and 2018 estimates expanded by multiplying observed interactions by 4.9 as there was 20.4% observer coverage in 2017 and 2018. Fractional estimates are rounded up to nearest whole number. Because preliminary observed interactions are reported by date of trip arrival and observer coverage rates are reported by date of trip departure, interaction data may vary from other sources.
[2]Unidentified species identification based on PIRO Observer Program classifications. Unidentified cetacean species refers to a marine mammal not including pinnipeds (seal or sea lion); unidentified whale refers to a large whale; and unidentified dolphin refers to a small cetacean with a visible beak. Further classifications based on observer description, sketches, photos and videos may be available from PIFSC.
Source: WPFMC (2018a), NMFS (2019b)

NMFS estimates the effect of the fishery on ESA-listed marine mammals by comparing the expected mortalities, derived from observed interactions, to the stock's PBR and relative proportion of the affected population, where data are available (NMFS 2018d). NMFS reinitiated consultation on the deep-set fishery on October 4, 2018.

In our request for reinitiation, NMFS estimated the deep-set fishery could interact with up to 3 sperm whales and 0.130 MHI IFKW. These predictions, generated by PIFSC using Bayesian data analysis methods appropriate for count data (McCracken 2018), used observed interactions in the fishery from 2002 through 2017. NMFS has assigned prorated interactions to the population of MHI IFKW based on interactions with pelagic false killer whales, and on interactions with false killer whales from unknown populations and unidentified blackfish.

NMFS estimated the number of mortalities and serious injuries (M&SI) for each marine mammal stock based on previous injury determinations for each stock of ESA-listed marine mammal. NMFS expects up to 2 sperm whale mortalities and 0.102 MHI IFKW mortalities, or one MHI IFKW mortality approximately every 10 years.

The PBR for sperm whales is 14 animals and for MHI IFKWs is 0.3 animals annually (Carretta et al. 2018). M&SI estimates for both stocks of ESA-listed marine mammals are below PBR. The

proportion of the sperm whale stock expected to be removed annually is 0.00086 or 0.086 percent of the stock, which can be considered negligible. The M&SI estimate for MHI false killer whales is just under PBR, but NMFS does not expect the mortality of one individual approximately every 10 years to increase the risk of extinction for this population. Table 31 shows the observed interactions since 2004, future level of annual interactions, expected M&SI, stock abundance, and PBR for the marine mammals analyzed in the request for reinitiation.

Table 31. ESA-listed marine mammal interactions and population impact metrics.

Species	Sperm whale	Main Hawaiian Islands Insular False Killer Whale
Observed Interactions (since 2004)	1	19 (includes blackfish)
Future level of annual interactions	3	0.130
Expected Mortalities and Serious Injuries	2	0.102
Stock Abundance	3,478	NA
Potential Biological Removal	14	0.3

[1] No longer listed under ESA ((81 FR 62260, September 8, 2016)
Source: NMFS (2014).

For all species of endangered marine mammals expected to interact with the Hawaii deep-set longline fleet, the 2014 BiOp found that the continued operation of the Hawaii longline fleet would not result in an appreciable reduction in the numbers, distribution, or reproduction of the marine mammals. Based on the information, NMFS concluded that the Hawaii deep-set longline fishery as managed under the Pelagics FEP is not likely to jeopardize the continued existence or recovery of these ESA-listed marine mammals. Based on the information in the updated BE analysis, NMFS expects the effect of the action on these ESA-listed marine mammal species to be insubstantial.

NMFS monitors the effects of the fishery on non-ESA listed marine mammals through comparison of the average level of interactions which result in M&SI to a stock's PBR. For most marine mammal stocks where the PBR is available, the number of observed takes of marine mammal species in the deep-set longline fishery inside the U.S. EEZ around Hawaii is well below the PBR in the time period covered by the most current stock assessment report (Table 32).

Table 32. Mean estimated annual mortality and serious injury (M&SI) and PBR by marine mammal stocks with observed interactions in the Hawaii deep-set longline fishery.

Stock	**Years Included in draft 2017 SAR**	**Outside EEZ[a]**	**Inside EEZ[b]**	
		Mean Estimated Annual M&SI	**Mean Estimated Annual M&SI**	**PBR (Inside EEZ only)**
Bottlenose dolphin, HI Pelagic	2011-2015	2.2	0	140

Pantropical spotted dolphin, HI Pelagic	2011-2015	0[c]	0[c]	403
Rough-toothed dolphin, HI	2011-2015	0	0	46
Risso's dolphin, HI	2011-2015	0.9	0.6	42
Striped dolphin, HI	2011-2015	0.8	0	154
Blainville's beaked whale, HI	2011-2015	0	0	11
Kogia spp. whale (Pygmy or dwarf sperm whale), HI	2007-2011	Pygmy = 0 Dwarf = 0	Pygmy = 0 Dwarf = 0	undetermined
Short-finned pilot whale, HI	2011-2015	1.0	0.1	70
Humpback whale, Central North Pacific	2009-2013	0		83[d]

[a] PBR estimates are not available for portions of the stock outside of the U.S. EEZ around Hawai`i, except for the Central North Pacific stock of humpback whales for which PBR applies to the entire stock.
[b] PBR estimates are only available for portions of the stock within the U.S. EEZ around Hawai`i.
[c] M&SI estimates were not included in the draft 2017 SARs because there were no known takes in 2011-2015 by the deep-set or shallow-set Hawai`i longline fisheries.
[d] PBR for the Central North Pacific stock for humpback whales apply to the entire stock.
Source: WPFMC (2018a).

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 of circle hooks, a permanently closed area, and an EEZ interaction limit, which, when reached, triggers a southern longline fishing exclusion zone (see 50 CFR 229.37). This interaction limit (two observed false killer whale serious injuries or mortalities within the U.S EEZ around Hawaii in a calendar year) was reached in 2018, triggering temporary closure of the SEZ to deep-set longline fishing for the remainder of 2018 (83 FR 33484, July 18, 2018). The deep-set longline fishery also reached this trigger in January of 2019 (84 FR 5356, February 21, 2019). Because an observed false killer whale mortality or serious injury in the EEZ around Hawaii met the established trigger in the subsequent calendar year following an SEZ closure, the SEZ will be closed until one or more of the four criteria described in the False Killer Whale Take Reduction Plan regulations at 50 CFR 229.37(e)(5) (please see the plan for more information).

3.3.2.2 Hawaii Shallow-set Longline Fishery

Table 33 provides total marine mammal interactions observed in the shallow-set fishery from 2008 through 2018.

Table 33. Observed annual marine mammal interactions (including mortalities, serious injuries, and non-serious injuries) with the Hawaii shallow-set longline fishery from 2008-2018.

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Blackfish*	1	0	0	1	0	0	0	0	0	0	0

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Short-beaked Common dolphin	0	0	0	1	0	0	1	0	0	0	0
Risso's dolphin	4	3	7	4	0	3	6	3	2	2	2
Blainville's beaked whale	0	0	0	1	0	0	0	0	0	0	0
Humpback whale	1	0	0	1	0	0	0	1	0	0	0
False killer whale	1	1	0	1	1	0	1	0	0	0	0
Striped dolphin	1	0	2	0	1	0	2	0	1	1	0
Bottlenose dolphin	0	0	2	2	1	2	4	2	1	0	1
Rough-toothed dolphin	0	0	0	0	0	1	0	0	0	0	0
Fin whale	0	0	0	0	0	0	0	1	0	0	0
Unidentified cetacean	0	1	1	0	1	0	0	1	0	0	0
Pygmy or dwarf sperm whale	1	0	0	0	0	0	0	0	0	0	0
Beaked whale, Mesoplodont	0	0	0	1	0	0	0	0	0	0	0
Ginkgo-toothed beaked whale	0	0	0	0	0	0	0	1	0	0	0
Unidentified beaked whale	0	0	0	1	0	2	0	1	0	0	0
Northern elephant seal	0	0	0	0	0	1	1	0	0	0	0
Guadalupe fur seal	0	0	0	0	0	0	0	0	1	3	0
Unidentified pinniped	0	0	0	0	0	0	0	3	0	0	0
Unidentified sea lion	0	0	0	0	0	0	1	2	0	0	0

Note: "Blackfish" include unidentified whales considered to be either false killer whales or short-finned pilot whales.
Source: WPFMC (2018a), NMFS (2019c)

There has not been an interaction with a sperm whale in the shallow-set longline fishery since the deep-set and shallow-set longline fisheries were split in 2004 for management purposes (NMFS 2012). Prior to the separation of the fisheries, there was an interaction in 1999 with a vessel that was targeting swordfish, and one in 2002 with an experimental fishery that was testing sea turtle

mitigation gear similar to what is used in the shallow-set longline fishery now. The interaction occurred on a control set and the sperm whale was entangled in the mainline; the mainline was cut and the animal escaped with no line attached (Boggs 2002). There have been no observed interactions between the MHI IFKW stock and the shallow-set longline fishery.

On March 31, 2012, NMFS issued a no-jeopardy biological opinion (2012 BiOp) for the shallow-set longline fishery, and authorized incidental take of humpback whales (NMFS 2012). On September 8, 2016 (81 FR 62260), NMFS published a final rule dividing humpback whales into 14 DPS and delisted nine DPS from ESA. Hawaii humpback whale DPS is one of the nine stocks no longer warranted for listing under ESA, and therefore NMFS does not monitor take against the ITS.

On February 27, 2015, 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 (Carretta et al. 2018) 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 September 16, 2015.

The Hawaii shallow-set longline fishery interacted with ESA-listed Guadalupe fur seals in 2016 and 2017, outside of the U.S. EEZ off the coast of California. This species was previously not known to interact with the shallow-set fishery and was not included in the 2012 BiOp. Consultation for this species was included in the ongoing consultation reinitiated on April 20, 2018 (NMFS 2018e).

In our request for reinitiation of ESA Section 7 consultation on the operation of the shallow-set longline fishery, NMFS estimated the shallow-set fishery could interact with up to 14 Guadalupe fur seals, including prorated unidentified pinniped and unidentified sea lions. These predictions, generated by PIFSC using Bayesian data analysis methods appropriate for count data (McCracken 2018), used observed interactions in the fishery from January 1, 2013 through December 31, 2017.

The abundance of Guadalupe fur seals is estimated at approximately 20,000 animals, and NMFS estimates the PBR to be 542 animals per year (Carretta et al. 2017). The fishery's anticipated

level of mortality amounts to 13 Guadalupe fur seal mortalities in a given year or 2.39% of the current PBR of Guadalupe fur seals per year, and therefore has insubstantial impacts.

NMFS monitors the effects of the fishery on non-ESA listed marine mammals through comparison of the average level of interactions which result in (M&SI) to a stock's PBR. For marine mammal stocks where the PBR is available, the mean annual M&SI for the shallow-set longline fishery inside the EEZ around Hawaii is well below the corresponding PBR in the time period covered by the current stock assessment report (Table 34).

Table 34. Summary of mean annual mortality and serious injury (M&SI) and potential biological removal (PBR) by marine mammal stocks with observed interactions in the Hawaii shallow-set longline fishery.

Stock	Years Included in draft 2017 SARs	Outside EEZ[a]	Inside EEZ	
		Mean Annual M&SI	Mean Annual M&SI	PBR (Inside EEZ only)[c]
Bottlenose dolphin, HI Pelagic	2011-2015	2	0	140
Risso's dolphin, HI	2011-2015	3.2	0	82
Rough-toothed dolphin, HI	2011-2015	0	1	423
Striped dolphin, HI	2011-2015	0.6	0	449
Blainville's beaked whale, HI	2011-2015	0	0	10
False killer whale, HI Pelagic	2011-2015	0.1	0.1	9.3
Short-finned pilot whale, HI	2011-2015	0.1	0	106
Kogia spp. whale (Pygmy or dwarf sperm whale), HI	2007-2011	Pygmy = 0 Dwarf = 0	Pygmy = 0 Dwarf = 0	undetermined
Humpback whale, Central North Pacific	2009-2013	0.2[b]		83[b]
Fin whale, HI	2011-2015	0	0	0.1
Guadalupe fur seal, CA	2010-2014	0[d]		542[d]

[a] PBR estimates are not available for portions of the stock outside of the U.S EEZ around Hawai`i, except for the Central North Pacific stock of humpback whales for which PBR applies to the entire stock.
[b] PBR and M&SI for the Central North Pacific stock for humpback whales apply to the entire stock.
[c] PBR estimates for Hawai`i stocks are only available for portions of the stock within the U.S. EEZ around Hawai`i.
[d] PBR and M&SI estimates for the Guadalupe fur seal use data from 2010-2014, which only include data from the U.S. West Coast and therefore do not include the seals taken in 2016 and 2017 in the Hawai`i shallow-set longline fishery. The M&SI estimate is only for the Hawai`i shallow-set longline fishery, and the PBR estimate applies to the entire population.
Source: WPFMC (2018a).

3.3.2.3 American Samoa Longline Fishery

Table 35 summarizes the fleet-wide marine mammal interactions in the American Samoa longline fishery from 2006-2018.

Table 35. Number of marine mammal interactions (including mortalities, and serious and non-serious injuries) observed in the American Samoa longline fishery, 2006-2018.

Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Rough-toothed dolphin	0	0	16	0	0	15	0	5	0	0	10	5	6
Cuvier's beaked whale	0	0	0	0	0	3	0	0	0	0	0	0	0
False killer whale	0	0	31	0	0	9	0	5	0	9	10	5	6
Short-finned pilot whale	0	0	0	0	0	0	0	0	5	0	0	0	0
Unidentified cetacean	0	0	0	0	0	6	0	0	0	0	0	0	0

[1]2017 estimates expanded by multiplying observed interactions by 5 as there was 20% observer coverage in 2017. Fractional estimates rounded up to nearest whole number.
[2]2018 estimates expanded by multiplying observed interactions by 5.7 as there was 17.5% observer coverage in 2018. Fractional estimates rounded up to the nearest whole number. Because preliminary observed interactions are reported by date of trip arrival and observer coverage rates are reported by date of trip departure, interaction data may vary from other sources.
Source: WPFMC (2018a) and NMFS (2019a)

To date, fishermen and observers have not reported any humpback, sperm, blue, fin, or sei whale interactions in the American Samoa longline fishery, and as such, this fishery is not likely to adversely affect ESA-listed marine mammals.

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 (coefficient of variation=0.6) and 7.8 false killer whales (coefficient of variation=1.7) (Carretta et al. 2017). No abundance estimates are available and PBR cannot be calculated for either of these stocks (Carretta et al. 2017) and, therefore, potential population impacts are unknown.

3.3.2.4 Guam and CNMI Longline Fisheries

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

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.[11]

On October 7, 2011, in response to a petition to list the black-footed albatross under the ESA, the U.S. FWS 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 U.S. FWS also found that neither DPS of the black-footed albatross warranted listing under the ESA. The U.S. FWS observed that fisheries should continue to minimize black-footed albatross bycatch through implementing effective bycatch minimization measures, and concluded that Hawaii-based longline fishing is not a significant threat to the black-footed albatross.

All seabirds are protected under the Migratory Bird Treaty Act (MBTA). In addition to the ESA-listed seabirds, the Hawaii longline fisheries occasionally interact with other seabirds such as albatrosses, Northern fulmar, sooty shearwaters, and gulls.

Seabirds are vulnerable to fisheries through hooking and entanglement, which may result in injury or mortality. 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. Twenty of the world's 21 albatross species are now at least near threatened with extinction according to the IUCN (IUCN 2017), and incidental catch in fisheries, especially longline fisheries, is considered one of the principal threats to many of these species (Veran et al. 2007).

The Council and NMFS manage the longline fisheries permitted under the Pelagics FEP through several measures that mitigate the potential for seabird interactions and injury to seabirds if interactions occur. These measures include the requirement to carry an observer on a fishing trip if requested, and a requirement for owners and operators of longline vessels to attend a protected species education workshop annually.

Deep-set fishing operations north of 23º N latitude and all shallow-set vessels are required to comply with seabird mitigation regulations that the Council and NMFS intended to reduce

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

interactions between seabirds and Hawaii longline fishing vessels (50 CFR 665.815), implemented in 2002 with regulatory adjustments effective in 2006. Longline fishermen must employ 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. The WCPFC agreed to similar mitigation measures for longline vessels greater than 24 meters or more in overall length north of 23°N, effective June 30, 2008 (WCPFC 2007) and for one mitigation method required for vessels shorter than 24 m in 2017 (WCPFC 2017a).

Shallow-set vessels must begin setting one hour after local sunset and 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. These measures resulted in a reduction of over 90% in total seabird interactions by 2006 in the deep-set and shallow-set fisheries combined (Fossen 2007).

Since NMFS initiated the observer programs in Hawaii in 1994 and American Samoa in 2006, there have been no observed interactions between ESA-listed seabird species and the fisheries under the Pelagics FEP. After considering a range of potential effects to seabirds, U.S. FWS, in its 2012 BiOp, determined that the Hawaii deep-set and shallow-set fisheries of the western Pacific operating in accordance with the Pelagics FEP and implementing regulations, would not jeopardize the survival or recovery of any listed seabirds. U.S. FWS has authorized a certain level of interactions (incidental take) of short-tailed albatross which the fishery may adversely affect through ITS for these fisheries.

3.3.3.1 Hawaii Deep-set Longline Fishery

Table 36 contains the numbers of albatross that have interacted with the Hawaii deep-set longline fisheries from 2005 through 2018 based on observed interactions by the NMFS Observer Program. In addition, from 2005 through 2018, based on expansions from observed sets, the deep-set fishery interacted with 27 red-footed boobies, nine brown boobies, 249 unidentified shearwaters, seven unidentified albatrosses, one unidentified gull, and 65 sooty shearwaters (NMFS 2019b; WPFMC 2018a).

Table 36. Estimated total interactions with albatrosses in the Hawaii deep-set longline fisheries, 2005-2018.

Year	Laysan	Black-footed
2005	43	82
2006	7	70
2007	44	77
2008	55	118
2009	60	110
2010	155	65
2011	187	73
2012	136	167

Year	Laysan	Black-footed
2013	236	257
2014	77	175
2015	119	541
2016	166	485
2017*	186	475
2018*	162	951

*2017 and 2018 estimates expanded by multiplying observed interactions by 4.9 as there was 20.4% observer coverage levels in 2017 and 2018. Fractional estimates are rounded up to nearest whole number. Because preliminary observed interactions are reported by date of trip arrival and observer coverage rates are reported by date of trip departure, interaction data may vary from other sources.
Source: WPFMC (2018a), NMFS (2019b)

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.

Gilman et al. (2016) have linked gradual increases in albatross interactions observed in the Hawaii deep-set longline fishery from 2004 to 2014 with reduced ocean productivity. Results from an analysis of seabird interaction rates in the Hawai`i deep-set longline fishery indicate that seabird interaction rates significantly increased as annual mean multivariate El Nino southern oscillation index values increased, meaning that decreasing ocean productivity may have contributed to the increasing trend in seabird catch rates. The analysis also showed a significant increasing trend in the number of albatrosses attending vessels, which may also be contributing to the increasing seabird catch rates (Gilman et al. 2016).

PIFSC estimated that between 1994 and 1999, an average of 1,175 Laysan albatrosses and 1,388 black-footed albatrosses were incidentally captured and presumed killed in the Hawaii longline fishery each year(WPFMC 2005). These average annual incidental catches represented about 0.46% and 0.05% of the estimated 1998 worldwide black-footed and Laysan albatross populations, respectively. (WPFMC 2005)After the implementation of seabird mitigation measures the fleet incidentally caught 113 albatrosses (65 black-footed and 51 Laysan) in 2002 and 257 albatrosses (111 black-footed and 146 Laysan) in 2003 (WPFMC 2005). Between the years 2005 and 2014 (Table 36), interactions with black-footed and Laysan albatross remained relatively stable in both the deep-set and shallow-set longline fisheries. In recent years, incidental catch of black-footed albatross has shown an increasing trend in the Hawaii deep-set longline fishery, with an average of 500 interactions annually for years 2015-2017 and 119 annual interactions in the years 2005-2014. When combined with shallow-set interactions (Table 37) for purpose of comparison with historical highs, the Hawaii longline fleet has interacted with an average of 544 black-footed albatross annually in the years 2014-2017, which is below the historical high.

The black-footed albatross population exhibits an increasing trend from 1996 to 2016, with a breeding population of approximately 69,969 pairs in 2017 (ACAP 2017). The Laysan albatross population was stable over the time period 1996 to 2016, with a breeding pair population of 666,658 pairs in 2017 (ACAP 2017). Both Hawaii longline fisheries have a low level of interactions with the black-footed and Laysan albatross species. Based on the population estimates, the fisheries likely have very little effect on these populations (NMFS 2018a).

The Council has explored the observed increase in interactions with seabirds in the Hawaii deep-set longline fishery. In November 2017, the Council convened a workshop to review recent increased albatross interactions in the Hawaii fishery; explore possible factors responsible for this increase; evaluate albatross population impacts; and provide input for future data collection, analysis, and models (WPFMC 2018a). A black-footed albatross population model indicated that the recent increase in albatross interactions is unlikely to significantly affect population growth as long as the increase is limited to the Hawaii longline fishery or is episodic (WPFMC 2018a). While reliable North Pacific-wide bycatch estimates are not available, available information on Alaska fisheries bycatch suggest that the 2015-2016 increase is unlikely to be basin-wide (WPFMC 2018b). The full workshop report is not yet available.

The Council convened a second seabird workshop in September 2018 to review seabird mitigation requirements and the best scientific information available for Hawaii's pelagic longline fisheries, considering operational aspects of the fisheries, seasonal and spatial distributions of seabird interactions, alternative bycatch mitigation measures and findings from cost-benefit analyses. Participants discussed potential modifications to seabird regulations for the Hawaii deep-set longline fishery (WPFMC 2018c). The Council at its 174th Meeting in October 2018 received a report of the September 2018 Workshop and recommended: 1) enhancing outreach and training efforts to ensure proper application of existing seabird mitigation measure requirements; 2) NMFS provide support for research and development for alternative measures with potential to replace blue-dyed bait, with high priority placed on identifying suitable designs for tori lines; and 3) encourage submission of Experimental Fishing Permit applications for testing alternative measures without the use of blue-dyed bait to allow comparison of measure effectiveness with and without blue-dyed bait. The Council additionally directed staff to prepare a discussion paper for the March 2019 Council Meeting to evaluate the effect of potential removal of blue-dyed bait without additional replacement measures on seabird interaction rates.

The Council at its 176th meeting held March 19-21, 2019 endorsed the strategies for identifying alternative mitigation measures and improving seabird measure effectiveness for the Hawaii longline fishery as outlined in the discussion paper, including addressing captain effects through strategic outreach, identifying tori line designs suitable for the Hawaii fishery, encouraging trials for making minor modifications to existing required measures, and progressing international bycatch assessments for North Pacific albatross species. The Council further directed staff to work with industry, NMFS, Pelagic Plan Team and other expertise as appropriate to identify draft minimum standards for tori lines, taking into consideration existing standards established for other fisheries, designs currently used voluntarily by Hawaii longline vessel operators, and diversity of vessel size and configuration in the Hawaii longline fishery.

NMFS consulted with the U.S. FWS on effects to endangered species from the Hawaii longline fisheries in a 2012 BiOp (U.S.FWS 2012). U.S. FWS considered that the deep-set fishery might affect short-tailed albatross and authorized the take of two short-tailed albatrosses, even though there were no documented interactions with this species. For purposes of analysis, U.S. FWS used the black-footed albatross as a proxy species, modeling annual take based on the average 2004-2010 rate of black-footed albatross interactions. U.S. FWS estimated 76.9 annual injuries and mortalities of black-footed albatrosses.

Accounting for a fall-off rate (seabirds present observed hooked during gear setting but not upon retrieval) of 31% (Gilman et al. 2003; Gilman et al. 2008), U.S. FWS converted the average interactions to a proportion of the overall black-footed albatross population. U.S. FWS adjusted this proportion for the short-tailed albatross population using the fraction of the short-tailed albatross range that overlaps with the Hawaii-based longline fishery and the most recent population assessment comparable to black-footed albatross data. The estimated take of short-tailed albatrosses based on historical data, scaled to the area of overlap between the species' range and the fishery, is 0.21 albatross per year or more than one (1.07) albatross over five years (U.S.FWS 2012). This is 0.0066 percent of the population (proportion of the population = 0.21/3181 = .000066).

U.S. FWS conducted a population viability analysis in 1999, which found that an annual loss of about 82 subadults and 12 adults would lead to eventual extinction of the species based on a population size at that time of 1,362 birds. The population had increased to 3,181 birds at the time of the 2012 BiOp, and the current total annual estimated loss of reproductive contribution due to adverse effects by US fisheries fell short of 94 birds (three birds over five years in Hawaii fisheries and three per year in Alaska). Based on this information, U.S. FWS concluded that the deep-set longline fishery in Hawaii may slow population growth of short-tailed albatross, but is not anticipated to jeopardize the continued existence of the species (U.S.FWS 2012).

Overall, levels of seabird interactions remain low and NMFS, the Council and international management organizations are monitoring seabird bycatch and developing management measures in response to impacts. At this time, it is not expected that the Hawaii deep-set longline fleet has substantial impacts on seabird populations including black-footed or Laysan albatross populations.

3.3.3.2 Hawaii Shallow-Set Longline Fishery

Table 37 contains the numbers of albatross that have interacted with the Hawaii shallow-set longline fisheries from 2005 through 2018 based on observed interactions by the NMFS Observer Program. In addition, from 2004 through 2018, based on observed sets, the shallow-set fishery interacted with one northern fulmar, four sooty shearwaters, and one unidentified gull (WPFMC 2018a).

Table 37. Number of albatross interactions observed in the Hawaii shallow-set longline fishery, 2005- 2018.

Year	Laysan	Black-footed
2005	62	7
2006	8	3
2007	39	8
2008	33	6
2009	81	29
2010	40	39
2011	49	19
2012	61	37
2013	46	28

Year	Laysan	Black-footed
2014	36	29
2015	45	41
2016	26	40
2017	6	51
2018	2	9

Source: WPFMC (2018a), NMFS (2019c)

In 2012, the U.S. FWS issued a special permit for the shallow-set fishery under the MBTA. This permit authorizes incidental take of certain seabirds in the Hawaii shallow-set fishery over a period of three years (U.S.FWS 2012). The permit and ITS were renewed in 2015 (Table 38).

Table 38. 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 U.S.FWS (2012)

On December 27, 2017, the Ninth Circuit Court of Appeals issued a split decision that reversed the district court's decision upholding the MBTA permit. *Turtle Island Restoration Network v. NMFS & FWS*, 13-17123 (9th Cir. 2017). The Ninth Circuit majority opinion found that FWS improperly relied upon the special use permit to authorize the incidental take of sea birds by a commercial fishery. The permit expired on its own terms in March 2018 and NMFS determined that it would not reapply for the permit.

NMFS consulted with the U.S. FWS on effects to endangered species from the Hawaii longline fisheries in a 2012 BiOp (U.S.FWS 2012). U.S. FWS considered that the shallow-set fishery might affect short-tailed albatross and authorized the take of one short-tailed albatross every five years, even though there were no documented interactions with this species. For purposes of analysis, U.S. FWS used the same methods described for the deep-set fishery in section 3.3.3.1. U.S. FWS estimated 13.1 annual injuries and mortalities of black-footed albatrosses in the shallow-set longline fleet, which results in an estimated take of 0.034 short-tailed albatross per year or less than one (0.17) albatross over five years (U.S.FWS 2012). This is 0.001 percent of the population (proportion of the population = 0.034/3,181 = .00001).

U.S. FWS conducted a population viability analysis in 1999, which found that an annual loss of about 82 subadults and 12 adults would lead to eventual extinction of the species based on a population size at that time of 1,362 birds. The population had increased to 3,181 birds at the time of the 2012 BiOp, and the current total annual estimated loss of reproductive contribution due to adverse effects by US fisheries fell short of 94 birds (three birds over five years in Hawaii fisheries and three per year in Alaska). Based on this information, U.S. FWS concluded that the

shallow-set longline fishery in Hawaii may slow population growth of short-tailed albatross, but is not anticipated to jeopardize the continued existence of the species (U.S.FWS 2012).

3.3.3.3 American Samoa Longline Fishery

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, one unidentified frigate bird, and 13 black-footed albatross (in the NPO) in the American Samoa longline fishery from 2006-2018 (NMFS 2019a; WPFMC 2018a).

3.3.3.4 Guam and CNMI Longline Fisheries

Seabird interactions have not been reported or observed in the Guam or CNMI longline fisheries. Since 2012, there have been no active longline vessels in Guam or CNMI. Thus, there are no reports of interactions with seabirds.

3.3.4 Sharks and Rays

ESA-listed shark or ray (elasmobranch) species that have been observed or may occur in the area where Pelagics FEP fisheries operate include the scalloped hammerhead shark, oceanic whitetip shark, and giant manta ray. Sharks and rays are vulnerable to longline fisheries through hooking and entanglement.

The Council and NMFS manage the longline fisheries permitted under the Pelagics FEP through several measures that mitigate the potential for shark and ray interactions. These measures include the requirement to carry an observer on a fishing trip if requested, and a requirement for owners and operators of longline vessels to attend a protected species education workshop annually. Additionally, in accordance with WCPFC CMM 2011-01, Hawaii and American Samoa longline vessels release all oceanic white tip sharks incidentally caught in the WCPO. In the EPO, the IATTC has banned retention of oceanic whitetip shark and mobulid rays, including giant manta rays.

After considering a range of potential effects to scalloped hammerhead shark, NMFS, in its 2014 and 2015 BiOps, determined that the Hawaii and American Samoa deep-set fisheries operating in accordance with the Pelagics FEP and implementing regulations, would not jeopardize the survival or recovery of scalloped hammerhead sharks. NMFS has authorized a certain level of interactions (incidental take) of scalloped hammerhead sharks which the fishery may interact with through ITS for these fisheries.

On April 20, 2018, NMFS reinitiated formal consultation for the Hawaii shallow-set longline fishery to evaluate the impact of the fishery on oceanic whitetip shark and giant manta ray, among other reasons. On October 4, 2018, NMFS reinitiated formal consultation for the Hawaii deep-set longline fishery to evaluate the impact of the fishery on oceanic whitetip shark and giant manta ray, among other reasons.

NMFS intends to promptly reinitiate formal consultation for the American Samoa longline fishery, as required by 50 CFR 402.16.

3.3.4.1 Hawaii Deep-set Longline Fishery

Table 39 shows the fleet-wide interaction estimates for the Hawaii deep-set longline fishery from 2006-2017.

Table 39. Estimated total ESA-listed shark and ray interactions with the Hawaii deep-set longline fishery for 2004-2017.

Year	Scalloped Hammerhead	Oceanic Whitetip	Giant Manta Ray
2004	9	1764	4
2005	0	1307	8
2006	0	1561	9
2007	5	1303	10
2018	0	664	9
2009	0	1184	19
2010	0	1199	81
2011	0	1108	5
2012	0	843	10
2013	0	961	5
2014	0	1798	14
2015	0	2578	10
2016	0	2104	20
2017	0	1186	5

Source: WPFMC (2018a)

Scalloped hammerhead shark interactions in the Hawaii deep-set fishery are rare, unpredictable events. Since 2004, there have been three observed interactions with scalloped hammerhead sharks in the Hawaii deep-set fishery in the area of the threatened Indo-West Pacific DPS (NMFS 2014). NMFS has no records of any interactions with scalloped hammerhead sharks from the Eastern Pacific DPS (NMFS Observer Program, unpublished data). NMFS in its no-jeopardy 2014 BiOp authorized the take of six Indo-West Pacific scalloped hammerhead sharks, with up to three mortalities over a three year period (NMFS 2014).

In the request for reinitiation of ESA Section 7 consultation for the Hawaii deep-set longline fishery, NMFS estimated that there could be up to 5 interactions with scalloped hammerhead sharks annually in the fishery. At a 65.7 percent post-release survival rate, we anticipate that 4 (5 x 0.657 = 3.2, rounded to 4) of the 5 sharks would be released alive while one would be released dead (NMFS 2018d).

Based on a population estimate of 11,280 adults, NMFS estimates one annual mortality represents 0.009 percent (1/11,280*100=0.00886) of the population. In the 2014 BiOp, NMFS determined the takes of scalloped hammerhead sharks associated with the operation of the fishery are not expected to cause an appreciable reduction in the likelihood of both the survival and recovery of the DPS (NMFS 2014). Due to the small level of take NMFS considered the fishery's effects on the Indo-West Pacific scalloped hammerhead shark DPS from the Hawaii deep-set longline fishing operations to be negligible (NMFS 2018d).

Consultation for the oceanic whitetip shark and giant manta ray were included in the ongoing consultation reinitiated on October 4, 2018 (NMFS 2018d). In our request for reinitiation of ESA Section 7 consultation on the operation of the Hawaii deep-set longline fishery, NMFS estimated the fishery could interact with up to 3,185 oceanic white tips sharks and 84 giant manta rays. The observer interaction data also includes other mobulidae categories that may include giant manta rays. These categories are "unidentified ray" and "manta/mobula," which NMFS prorates to provide an estimate of giant manta ray interactions. These predictions, generated by PIFSC using Bayesian data analysis methods appropriate for count data used observed interactions in the fishery from 2002-2017.

The stock assessment for the oceanic whitetip shark (Rice and Harley 2012a) estimated current biomass of oceanic whitetip sharks in the WCPO to be 7,295 t and current catch at 2,001 t annually. The FAO (2013) estimates 7,295 t of shark biomass would be equivalent to roughly 200,000 individuals. At an average 76.9 percent post-release survival rate, NMFS estimates that the anticipated level of interactions in any given year of equal to or less than 3,185 oceanic whitetip sharks represents 735 mortalities or 0.367% (735/200,000*100) of the estimated number of individuals in the WCPO (NMFS 2018d). Population estimates of oceanic whitetip sharks in the EPO are unavailable, and thus this population-level impact is a conservative estimate.

A preliminary analysis of annual standardized catch per unit of effort (CPUE) for oceanic whitetip shark for 1995-2014 conducted as part of the 2016 Status Review Report (Young et al. 2016) indicated that the population in the area of the Hawaii longline fishery operation might have stabilized in recent years. Observer data from 2015 and 2016 indicate that the nominal CPUE was approximately the same or slightly higher than 2014 (NMFS Observer data, unpublished), but these data are not standardized and should be interpreted with caution. Based on this information, the negligible proportion of the population that may be affected by the operation of the longline fleet, and the high proportion of sharks released alive, the impact of the Hawaii deep-set longline fishery on the oceanic whitetip shark population is likely to be minimal.

NMFS estimates in the BE that the anticipated level of interactions for giant manta rays in any given year of equal to or less than 84 would lead to 6 giant manta ray mortalities, based on a 92.7 percent post-release survival rate. There is no historical or current global abundance estimates or stock assessments for giant manta rays. Most estimates of subpopulations are based on anecdotal observations, and range from around 100-1,500 (Miller and Klimovich 2016). Little information is available on the abundance of giant manta rays in the high seas area in the central north Pacific where the Hawaii shallow-set longline fishery operates. Nevertheless, the 2016 NMFS Status Review Report for the giant manta ray concluded that the incidental catch of this species in U.S. longline fisheries are likely to be having minimal effects on the population (Miller and Klimovich 2016). Based on this expert opinion, and the high likelihood that giant manta rays will be released alive in this fishery, NMFS does not expect that the fishery's effects on the giant manta ray population are substantial.

3.3.4.2 Hawaii Shallow-set Longline Fishery

Table 40 shows the fleet-wide observed interactions of ESA-listed sharks and rays for the Hawaii shallow-set longline fishery from 2004-2017.

Table 40. Total ESA-listed shark and ray interactions with the Hawaii shallow-set longline fishery for 2004-2017.

Year	Scalloped Hammerhead	Oceanic Whitetip	Giant Manta Ray
2004	0	3	0
2005	0	348	0
2006	0	1	0
2007	0	98	5
2018	0	47	0
2009	0	54	0
2010	0	90	6
2011	0	78	3
2012	0	24	0
2013	0	27	0
2014	0	21	1
2015	0	22	0
2016	0	32	0
2017	0	29	2

Source: WPFMC (2018a)

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 the shallow-set longline fishery in the area of the Eastern Pacific DPS, and therefore NMFS does not expect that impacts to this species are substantial.

Consultation for the oceanic whitetip shark and giant manta ray were included in the ongoing consultation reinitiated on April 20, 2018 (NMFS and WPFMC 2018b). In our request for reinitiation of ESA Section 7 consultation on the operation of the shallow-set longline fishery, NMFS estimated the shallow-set fishery could interact with up to 227 oceanic white tips sharks and 10 giant manta rays, including prorated manta/mobula. Manta/mobula is used when a fisheries observer is unable to distinguish whether the ray is a Manta (giant or reef) or a Mobula, or if the observer is able to confirm it is a Reef Manta (*Manta alfredi*). These predictions, generated by PIFSC using Bayesian data analysis methods appropriate for count data (McCracken 2018), used observed interactions in the fishery from January 1, 2013 through November 18, 2017, as not all relevant catch records were available through the end of 2017.

The stock assessment for the oceanic whitetip shark (Rice and Harley 2012a) estimated current biomass of oceanic whitetip sharks in the WCPO to be 7,295 t and current catch at 2,001 t annually. The FAO (2013) estimates 7,295 t of shark biomass would be equivalent to roughly 200,000 individuals. At an average 87.1 percent post-release survival rate, NMFS estimates that the anticipated level of interactions in any given year of equal to or less than 227 oceanic whitetip sharks represents 29 mortalities or 0.0145% (29/200,000*100) of the estimated number of individuals in the WCPO (NMFS 2018e). Population estimates of oceanic whitetip sharks in

the EPO are unavailable, and thus this population-level impact is a conservative estimate. Based on the negligible proportion of the population that this fishery may affect and the high proportion of sharks released alive, the impact of the Hawaii shallow-set longline fishery on the oceanic whitetip shark population is likely to be minimal.

NMFS estimates in the BE that the anticipated level of interactions for giant manta rays in any given year of equal to or less than 10 would lead to 3 giant manta ray mortalities (NMFS 2018e). There is no historical or current global abundance estimates or stock assessments for giant manta rays. Most estimates of subpopulations are based on anecdotal observations, and range from around 100-1,500 (Miller and Klimovich 2016). Little information is available on the abundance of giant manta rays in the high seas area in the central north Pacific where the Hawaii shallow-set longline fishery operates. Nevertheless, the 2016 NMFS Status Review Report for the giant manta ray concluded that the incidental catch of this species in U.S. longline fisheries are likely to have minimal effects on the population (Miller and Klimovich 2016). Based on this expert opinion, NMFS does not expect the effects of this fishery on the giant manta ray population are substantial.

3.3.4.3 American Samoa Longline Fishery

Table 41 shows the fleet-wide interaction estimates for the American Samoa longline fishery from 2006-2017.

Table 41. Estimated total ESA-listed shark and ray interactions with the American Samoa longline fishery for 2006-2017.

Year	Scalloped Hammerhead	Oceanic Whitetip	Giant Manta Ray
2006	13	568	0
2007	15	873	0
2018	0	750	0
2009	0	584	13
2010	17	520	12
2011	7	348	9
2012	0	359	15
2013	0	454	10
2014	6	536	5
2015	3	764	0
2016	5	1015	0
2017	5	315	0

Source: WPFMC (2018a)

Scalloped hammerhead shark interactions in the American Samoa longline fishery are rare, unpredictable events. Since 2006, there have been ten observed interactions with Indo-West Pacific scalloped hammerhead sharks in the American Samoa longline fishery (NMFS 2015a). In the 2015 BiOp for the American Samoa longline fishery, NMFS estimated that there could be up to twelve interactions with scalloped hammerhead sharks annually in the American Samoa longline fishery and authorized the fishery to interact with up to 36 Indo-Western Pacific scalloped hammerhead sharks, with up to 12 mortalities over a three year period (NMFS 2015a).

Applying a conservative population size of 11,280 adults, NMFS estimated four annual mortalities represent 0.04 percent (4/11,280*100=0.03546) of the population. Due to the small level of take NMFS considered the risk to the scalloped hammerhead shark DPS from the American Samoa longline fishery to be negligible (NMFS 2015a). NMFS in its 2015 BiOp concluded that the American Samoa 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 stock assessment for the oceanic whitetip shark (Rice and Harley 2012) estimated current biomass of oceanic whitetip sharks in the WCPO to be 7,295 t and current catch at 2,001 t annually. The FAO (2012) estimates 7,295 t of shark biomass would be equivalent to roughly 200,000 individuals. The American Samoa longline fishery caught an average of 591 oceanic whitetip sharks annually during 2006-2017. At an average 68% post-release survival rate (NMFS unpublished data), NMFS estimates the anticipated level of interactions in any given year of equal to or less than 591 sharks represents 189 mortalities or 0.0945% (189/200,000*100) of the estimated number of individuals in the WCPO. Based on the negligible proportion of the population affected by the operation of the longline fleet and the high proportion of sharks released alive, the impact of the American Samoa longline fishery on the oceanic whitetip shark population is likely to be minimal.

The American Samoa longline fishery caught an average of 5.33 giant manta rays annually during 2006-2017. Based on an average post-release survival rate of 99%, NMFS expects up to one mortality annually (5.33 x 0.01 = 0.05, rounded to 1) (NMFS unpublished data). There is no historical or current global abundance estimates or stock assessments for giant manta rays. Most estimates of subpopulations are based on anecdotal observations, and range from around 100-1,500 (Miller and Klimovich 2016). Little information is available on the abundance of giant manta rays in U.S. EEZ around American Samoa here the American Samoa longline fishery operates. Nevertheless, the 2016 NMFS Status Review Report for the giant manta ray concluded that the incidental catch of this species in U.S. longline fisheries are likely to have minimal effects on the population (Miller and Klimovich 2016).

3.3.4.4 Guam and CNMI Longline Fisheries

Since 2012, there have been no active longline vessels in Guam or CNMI. Thus, there are no reports of interactions with sharks or rays by longliners in the Marianas

3.3.5 Corals and Chambered Nautilus

On September 10, 2014, NMFS listed 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, NMFS assumes only eight occur in waters under U.S. jurisdiction (79 FR 53851). NMFS listed the chambered nautilus, which occurs in waters around American Samoa, as threatened under the ESA on September 28, 2018 (83 FR 48976).

Coral reefs form 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 occurs immediately within waters from 0-3 nm of shore, although some coral reef habitat can be found further offshore.

Chambered nautilus are opportunistic scavengers which live in close association with steep-sloped fore reefs and associated sandy, silty or muddy-bottomed substrates, ranging from shallow water (rarely) to about 500 m (CITES 2016). The animals may be vulnerable to longline fisheries through impacts from fishing gear, collisions with vessels or exposure to wastes and discharges.

Pelagic fisheries generally operate dozens to hundreds of miles offshore, far away from the islands and coral reef habitat areas, to target pelagic fish species in the water column. Federal regulations prohibit longline fishing generally within 50-75 nm from shoreline of Hawaii, 50 nm from the shoreline of Guam, and 30 nm from the shoreline of the CNMI. In American Samoa, federal regulations prohibit all fishing vessels greater than 50 ft in length, including longline vessels, from fishing generally within 50 nm of the shoreline. In the Pacific Remote Islands, federal regulations prohibit all commercial fishing generally within 50 nm of all islands, and within the entire U.S. EEZ around Jarvis, Wake, and Johnston Atoll.

To access fishing grounds, pelagic fishing vessels have to transit areas where ESA-listed corals may occur. In American Samoa, vessels also have to transit areas where the chambered nautilus may occur. Fishing vessels actively avoid preferred habitats of the listed corals and chambered nautilus, such as coral reef structures, steep-sloped reefs, and fore reefs, to avoid damage to their hulls.

Longline vessels do not deploy gear in waters above coral reef structures, steep-sloped reefs, or fore reefs to mitigate the loss of gear through snagging and entanglements. Although longline vessels fish at 100-400 m deep – within the vertical range of the chambered nautilus – fisherman are far more likely to deploy gear in the open water column where the chambered nautilus does not occur (due to risk of predation and physiological constraints). There have been no observer interactions with longline fishing gear and the chambered nautilus. Additionally, pelagic fishing activities do not involve anchoring and, therefore, there is no potential for anchor damage during fishing activities.

While exposure of corals and the chambered nautilus to waste from fishing vessels may occasionally occur, NMFS does not anticipate that this would be a serious stressor for the chambered nautilus or listed corals. Federal laws and regulations strictly regulate the discharge of oil, garbage, waste, plastics, and hazardous substances into ocean waters under a variety of laws, including the Clean Water Act, Oil Pollution Act of 1990, the Act to Prevention Pollution from Ships, MARPOL 1973/1978, and the Ocean Dumping Act. Violations of these laws may result in severe civil penalties, criminal fines, and imprisonment. Although disposal of plastics at sea is prohibited at both the federal and international level, discharges of other legally allowable vessel wastes have the potential to impact ESA-listed species, including the chambered nautilus. However, the pelagic longline fisheries operate over a large area, and due to the spatial separation between fishery operations and areas where the chambered nautilus may occur (i.e. vessel transiting areas and reef structures), any hydrocarbon-based chemicals such as fuel oils, gasoline, lubricants, and hydraulic fluids that may enter the marine environment during fishing

operations will likely be infrequent, small, and quickly diluted or dispersed. The same is true for vessel transit in and out of port.

3.4 Marine Habitats, Critical Habitat, and Essential Fish Habitat

3.4.1 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 Washington, Oregon, and California (77 FR 4170). Because Hawaii longline vessels 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 the 2014 BiOp for the deep-set fishery (NMFS 2014). Because NMFS prohibits longline fishing within the EEZ off the west coast, NMFS determined that the deep-set longline fishery may affect, but is not likely to adversely modify designated critical habitat for leatherback sea turtles. NMFS came to a similar conclusion for the shallow-set longline fishery in its 2012 BiOp (NMFS 2012).

3.4.2 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 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. Specific critical habitat boundaries can be found in the final rule.

In response to the critical habitat designation, NMFS reinitiated ESA Section 7 consultation to evaluate the potential effects of the Hawaii deep-set longline fishery on monk seal critical habitat. Because monk seals do not prey on species targeted by the Hawaii deep-set longline fishery and longline vessels are prohibited from fishing within the footprint of monk seal critical habitat, NMFS determined that the Hawaii deep-set longline fishery may affect, but is not likely to adversely modify monk seal critical habitat. NMFS documented its determinations in a memorandum of concurrence dated September 16, 2015. NMFS came to a similar conclusion for the shallow-set fishery in its 2012 BiOp (NMFS 2012).

3.4.3 Main Hawaiian Islands Insular False Killer Whale Critical Habitat

On July 24, 2018, NMFS designated critical habitat for the MHI IFKW DPS (83 FR 35062). The critical habitat area encompasses waters from 45 to 3,200 m deep around the MHI. Based on considerations of economic and national security impacts, NMFS excluded certain areas from designation because the benefits of exclusion outweigh the benefits of inclusion, and exclusion would not result in extinction of the species. NMFS identified a single essential feature with four characteristics that describe how island-associated marine habitat is essential to MHI IFKWs, as follows:

1. Adequate space for movement and use within shelf and slope habitat;
2. Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth;
3. Waters free of pollutants of a type and amount harmful to insular false killer whales; and
4. Sound levels that will not significantly impair false killer whales' use or occupancy.

Additional details are available in the Biological Report (NMFS 2018f) and draft Economic Report (Cardno 2018) associated with the final rule.

Federal regulations prohibit longline fishing in the MHI longline prohibited area, which extends about 50 to 75 nm around the MHI, depending on the location (Figure 9). This results in an effective closure of the deep-set longline fishery in most of MHI IFKW range.

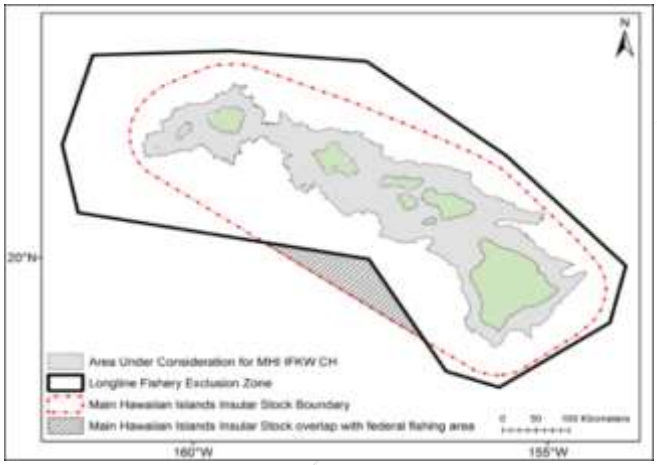

Figure 9. Map depicting the overlap of federal longline fishing area with the MHI IFKW range.

Fishing activities that may affect MHI IFKW DPS critical habitat include those that reduce the quantity, quality, or availability of MHI IFKW DPS prey species. The MHI IFKW DPS Status Review indicated that fisheries might affect MHI IFKW prey resources in two ways: (1) by removing potential prey in the immediate vicinity of false killer whales, and (2) by contributing to the long-term reduction of prey biomass over the range of the fish stocks that these whales encounter (Oleson et al. 2012).

MHI IFKW critical habitat was included in the request for reinitiation for the Hawaii deep-set and shallow-set longline fisheries. Overlapping species in longline fishery catches and the MHI IFKW diet include opah, wahoo, mahimahi, monchong, swordfish, blue marlin, and bigeye, skipjack, yellowfin, and albacore tuna Available information on the stock status of pelagic fish species known to be part of MHI IFKW prey indicate that stocks are generally stable or improving (see Section 3.1). U.S. landings in the WCPO compared to each stock’s total estimated biomass are less than one percent for prey species with estimated biomass (NMFS 2018b), and international and domestic management measures strive to ensure the sustainability of these stocks. Additionally, the diversity in IFKW diet likely indicates the whales shift to available prey items to meet their energetic needs. The longline fisheries do not harvest MHI IFKW prey in the area designated as critical habitat.

Based on this information, NMFS concluded that the longline fisheries have insignificant effects on prey species considered a component of the MHI IFKW critical habitat and that the operation of the Hawaii longline fisheries represents an insignificant contribution to the long-term reduction in quantity, quality, or availability of MHI IFKW prey species over the range of the fish stocks that these whales encounter (NMFS 2018d; 2018e).

3.4.4 Essential Fish Habitat

The Magnuson-Stevens Act defines essential fish habitat (EFH) as those waters and substrate necessary for federally managed species to spawn, breed, feed, and/or grow to maturity. Federal agencies whose action may adversely affect EFH must consult with NMFS in order to conserve and enhance federal fisheries habitat. Habitat areas of particular concern (HAPC) are subsets of EFH that merit special conservation attention because they meet at least one of the following four considerations:

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 and HAPC designations 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 and HAPC designations for coral reef ecosystem species in 2004 as part of the implementation of the Coral Reef Ecosystem FMP (69 FR 8336, February 24, 2004). NMFS also approved EFH designations 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 archipelagic-based fishery ecosystem plans (FEPs). The FEPs incorporated and reorganized elements of the Councils' species-based FMPs into a spatially oriented management plan (75 FR 2198, January 14, 2010). EFH definitions and related provisions for all FMP fishery resources were subsequently carried forward into the respective FEPs. In 2016, the WPFMC revised EFH and HAPC designations for Hawaii bottomfish and seamount groundfish through an amendment to the Hawaii Archipelago FEP (81 FR 7494). Finally, EFH and HAPC designations for crustacean and coral reef ecosystem MUS in American Samoa, Guam, and the CNMI and coral reef

ecosystem MUS in Hawaii were removed as a result of a separate Council and NMFS action to reclassify MUS as ecosystem component species (84 FR 2767, February 8, 2019).

NMFS considers all EFH in determining whether a proposed fishery management action may affect EFH. Table 42 provides the designated areas of EFH and Table 43 provides the HAPC for all FEP MUS by life stage. U.S. and U.S. participating territory longline fisheries are not known to adversely affect EFH.

Table 42. EFH designations for all MUS of Western Pacific FEPS.

FEP	Fishery	Stock or Stock Complex	Life Stage(s)	EFH Designation
Pelagic	All pelagic fisheries	Tropical and temperate	Egg/larval	The water column down to a depth of 200 m (100 fm) from the shoreline to the outer limit of the EEZ
			Juvenile/adult	The water column down to a depth of 1,000 m (500 fm)
American Samoa, Mariana, and Pacific Remote Island Area (PRIA)	Bottomfish	Shallow-water and deep-water complexes	Egg/larval	The water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm)
			Juvenile/adult	The water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)
PRIA	Coral Reef Ecosystem	Currently harvested coral reef taxa, Labridae	Egg/larval	The water column and all bottom habitat from the shoreline to the outer boundary of the EEZ to a depth of 100 m (50 fm)
		Currently harvested coral reef taxa, Octopodidae	Egg	All coral, rocky, and sand-bottom areas from 0 to 100 m (50 fm)
		Currently harvested coral reef taxa , Carcharhinidae	Egg/larval	No designation
		All other currently harvested coral reef taxa	Egg/larval Egg/larval/juvenile – Kyphosidae only Larval – Octopodidae only	The water column from the shoreline to the outer boundary of the EEZ to a depth of 100 m (50 fm)

FEP	Fishery	Stock or Stock Complex	Life Stage(s)	EFH Designation
PRIA	Coral Reef Ecosystem	Currently harvested coral reef taxa, Carcharhinidae, Labridae	Juvenile/adult	All bottom habitat and the adjacent water column from 0 to 100 m (50 fm) to the outer extent of the EEZ.
		Currently harvested coral reef taxa, Holocentridae and Muraenidae	Juvenile/adult	All rocky and coral areas and the adjacent water column from 0 to 100 m (50 fm)
		Currently harvested coral reef taxa, Kuhliidae	Juvenile/adult	All bottom habitat and the adjacent water column from 0 to 50 m (25 fm)
		Currently harvested coral reef taxa, Kyphosidae	Adult	All rocky and coral bottom habitat and the adjacent water column from 0 to 30 m (15 fm)
		Currently harvested coral reef taxa, Mullidae, Octopodidae, Polynemidae, Priacanthidae	Juvenile/adult	All rocky/coral bottom and sand bottom habitat and the adjacent water column from 0 to 100 m (50 fm)
		Currently harvested coral reef taxa, Mugilidae	Juvenile/adult	All sand and mud bottom and the adjacent water column from 0 to 50 m (25 fm)
		Currently harvested coral reef taxa, Scombridae (dogtooth tuna), Sphyraenidae	Juvenile/adult	Only the water column from the shoreline to the outer boundary of the EEZ to a depth of 100 m (50 fm)
		Currently harvested coral reef taxa, Aquarium Species/Taxa	Juvenile/adult	Coral, rubble, and other hard-bottom features and the adjacent water column from 0 to 100 m (50 fm)
		All other currently harvested coral reef taxa	Juvenile/adult	All bottom habitat and the adjacent water column from 0 to 100 m (50 fm)

FEP	Fishery	Stock or Stock Complex	Life Stage(s)	EFH Designation
PRIA	Coral Reef Ecosystem	Potentially harvested coral reef taxa	All life stages	The water column and all bottom habitat from the shoreline to the outer boundary of the EEZ to a depth of 100 m (50 fm)
Hawaii	Crustaceans	Kona crab	Egg/larval	The water column from the shoreline to the outer limit of the EEZ down to a depth of 150 m (75 fm)
			Juvenile/adult	All of the bottom habitat from the shoreline to a depth of 100 m (50 fm)
		Deepwater shrimp	Egg/larval	The water column and associated outer reef slopes between 550 and 700 m
			Juvenile/adult	The outer reef slopes at depths between 300-700 m
Hawaii	Bottomfish	Shallow stocks: *Aprion virescens*	Egg	Pelagic zone of the water column in depths from the surface to 240 m, extending from the official US baseline to a line on which each point is 50 miles from the baseline
			Post-hatch pelagic	Pelagic zone of the water column in depths from the surface to 240 m, extending from the official US baseline to the EEZ boundary
		Shallow stocks: *Aprion virescens*	Post-settlement	Benthic or benthopelagic zones, including all bottom habitats, in depths from the surface to 240 m bounded by the official US baseline and 240 m isobath
			Sub-adult/adult	Benthopelagic zone, including all bottom habitats, in depths from the surface to 240 m bounded by the official US baseline and 240 m isobath.

FEP	Fishery	Stock or Stock Complex	Life Stage(s)	EFH Designation
Hawaii	Bottomfish	Intermediate stocks: *Aphareus rutilans, Pristipomoides filamentosus, Hyporthodus quernus*	Eggs	Pelagic zone of the water column in depths from the surface to 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*) extending from the official US baseline to a line on which each point is 50 miles from the baseline
			Post-hatch pelagic	Pelagic zone of the water column in depths from the surface 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*), extending from the official US baseline to the EEZ boundary
			Post-settlement	Benthic (*H. quernus* and *A. rutilans*) or benthopelagic (*A. rutilans* and *P. filamentosus)* zones, including all bottom habitats, in depths from the surface to 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*) bounded by the 40 m isobath and 100 m (*P. filamentosus)*, 280 m (*A. rutilans*) or 320 m (*H. quernus*) isobaths
			Sub-adult/adult	Benthic (*H. quernus*) or benthopelagic (*A. rutilans* and *P. filamentosus)* zones, including all bottom habitats, in depths from the surface to 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*) bounded by the 40 m isobath and 280 m (*A. rutilans and P. filamentosus*) or 320 m (*H. quernus*) isobaths
		Deep stocks: *Etelis carbunculus, Etelis coruscans, Pristipomoides seiboldii, Pristipomoides zonatus*	Eggs	Pelagic zone of the water column in depths from the surface to 400 m, extending from the official US baseline to a line on which each point is 50 miles from the baseline

FEP	Fishery	Stock or Stock Complex	Life Stage(s)	EFH Designation
Hawaii	Bottomfish		Post-hatch pelagic	Pelagic zone of the water column in depths from the surface to 400 m, extending from the official US baseline to the EEZ boundary
			Post-settlement	Benthic zone, including all bottom habitats, in depths from 80 to 400 m bounded by the official US baseline and 400 m isobath
		Deep stocks: *Etelis carbunculus, Etelis coruscans, Pristipomoides seiboldii, Pristipomoides zonatus*	Sub-adult/adult	Benthic (*E. carbunculus* and *P. zonatus*) or benthopelagic (*E. coruscansi*) zones, including all bottom habitats, in depths from 80 to 400 m bounded by the official US baseline and 400 m isobaths
		Seamount groundfish	Eggs and post-hatch pelagic	Pelagic zone of the water column in depths from the surface to 600 m, bounded by the official US baseline and 600 m isobath, in waters within the EEZ that are west of 180°W and north of 28°N
			Post-settlement	Benthic or benthopelagic zone in depths from 120 m to 600 m bounded by the 120 m and 600 m isobaths, in all waters and bottom habitat, within the EEZ that are west of 180°W and north of 28°N
			Sub-adult/adult	Benthopelagic zone in depths from 120 m to 600 m bounded by the 120 m and 600 m isobaths, in all waters and bottom habitat, within the EEZ that are west of 180°W and north of 28°N
	Precious Coral	Deep-water	Benthic	Six known precious coral beds located off Keahole Point, Makapuu, Kaena Point, Wespac bed, Brooks Bank, and 180 Fathom Bank

FEP	Fishery	Stock or Stock Complex	Life Stage(s)	EFH Designation
Hawaii	Precious Coral	Shallow-water	Benthic	Three beds known for black corals in the MHI between Milolii and South Point on the Big Island, the Auau Channel, and the southern border of Kauai

Table 43. Habitat areas of particular concern for MUS of all Western Pacific FEPs.

FEP	Fishery	Stock or Stock Complex	HAPC
Pelagic	All pelagic fisheries	Temperate and tropical species	Water column from the surface down to a depth of 1,000 m (500 fm) above all seamounts and banks with summits shallower that 2,000 m (1,000 fm) within the EEZ
American Samoa, Mariana, Pacific Remote Island Areas (PRIA)	Bottomfish	Shallow- and deep-water	All slopes and escarpments between 40 m and 280 m (20 and 140 fm)
PRIA	Coral Reef Ecosystem	Currently and potentially harvested coral reef taxa	All coral reef habitat in the Pacific Remote Island Areas
Hawaii	Crustaceans	Kona crab	All banks in the NWHI with summits less than or equal to 30 m (15 fm) from the surface
	Precious Coral	Deep-water	Makapuu, Wespac, and Brooks Bank bed
		Shallow-water	Auau Channel bed
	Bottomfish	All bottomfish stocks	Discrete areas at Kaena Point, Kaneohe Bay, Makapuu Point, Penguin Bank, Pailolo Channel, North Kahoolawe, and Hilo (please see Amendment 4 to the Hawaii Archipelago FEP, Section 3.3.3 for GPS coordinates of the locations and Appendix 2 for maps)
		Seamount groundfish	Congruent with EFH (See Table 42).

3.5 Management Setting

NMFS and the Council conduct several administrative processes relevant to managing territorial bigeye tuna catch and effort limits, including but not limited to monitoring the effectiveness of catch or effort limits; in-season catch monitoring; enforcement; and publication of catch limits, specified fishing agreements, and closures.

Annually, the Council reviews whether territorial catch, effort and allocation limits are consistent with the conservation needs of fish stocks, management objectives of the WCPFC and the Pelagics FEP, and the needs of fishing communities. The Council has performed this review annually since the implementation of Amendment 7 in 2014. Additionally, NMFS determines the status of internationally managed stocks through stock assessments produced by various

scientific bodies. These bodies provide advice to the WCPFC in the WCPO and IATTC in the EPO. NMFS reviews the assessments and notifies the appropriate Council if overfishing is occurring or if a stock is overfished. If the Council and NMFS consider that the stock is overfished due to international fishing pressure, NMFS and the Councils work with the State Department to put management measures into place internationally. If U.S. fisheries are responsible for the stock status, Councils and NMFS develop management measures to end overfishing. This work would not change under the alternatives.

NMFS PIFSC forecasts when applicable catch or allocation limits may be reached by collecting and correcting catch data, and attributing catch to either the U.S. bigeye tuna catch limit in the WCPO or EPO, territory attributed catch, or American Samoa catch by dual permitted vessels. PIFSC estimates the in-season monitoring to cost about half of a full-time employee salary per year and $75,000 in administrative costs (WPFMC 2014). PIFSC has performed in-season catch monitoring throughout the year since 2011.

Regarding enforcement, the NOAA Office of Law Enforcement (OLE) and U.S. Coast Guard (USCG) monitor vessel compliance with applicable regulations and laws, including territorial catch/effort or allocation limits, through vessel monitoring systems and vessel boarding at sea.

Publication of catch, effort and allocation limits occurs after the Council makes a recommendation regarding the limits. NMFS implements the recommendations through notice-and-comment rulemaking, which involves a review for consistency with the Pelagics FEP, Magnuson-Stevens Act, WCPFC decisions, and other applicable laws. NMFS has implemented Council-recommended territorial catch and allocation limits for bigeye tuna under the Pelagics FEP every year since 2014.

Publication of specified fishing agreements occurs after receipt of the agreement from vessels party to the agreement and territorial governments. The Council and NMFS review each agreement for consistency with the Pelagics FEP and implementing regulations, the Magnuson-Stevens Act, and other applicable laws. Then, NMFS authorizes the agreements through notice in the Federal Register. NMFS and the Council have reviewed and NMFS has authorized one or two specified fishing agreements under the Pelagics FEP every year since 2014. The territorial catch, effort and allocation limit measure's implementing regulations at 50 CFR 665.819 require that specified fishing agreements direct funds to the 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. The administration of this funding is not considered part of the proposed action, and is analyzed as project details become available. The requirements for fishing agreements, and the approval and notice process would not change under the alternatives.

NMFS publishes notice of closures of the WCPO in the Federal Register seven days before we expect the fishery to reach the U.S. limit in the WCPO, territorial catch limits, or an allocation limit authorized through a specified fishing agreement. NMFS also sends letters to notify permit holders of impending closures. NMFS has closed the WCPO bigeye tuna fishery in 2015, 2016,

and 2017 for 65, 48, and 39 days, respectively, (Ayers et al. 2018), through one Federal Register notice per year.

3.6 Resources Eliminated from Detailed Study

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 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. Additionally, longline fishing activities are not known to result in adverse effects to scientific, historic, archeological or cultural resources because fishing activities occur generally miles offshore. Therefore, the proposed action is not likely to affect historic resources.

The pelagic longline fleets under the proposed action do not operate within estuarine waters or have the potential to affect wetlands. Because pelagic longline fishing activities authorized occur offshore and in deep oceanic waters away from land, populated areas, and marine protected areas such as marine national monuments, the alternatives considered would not have an effect on air/water quality, coral reefs, or benthic marine habitats.

Longline fishing is not known to be a potential vector for spreading alien species as most vessels fish far away from coastal areas offshore. The proposed action 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.

NMFS is not aware of studies that show effects from pelagic longline fisheries to species fecundity or negative predator/prey relationships that result in adverse changes to food web dynamics. Without management to ensure fishing is sustainable, the removal of top predator pelagic species such as bigeye tuna, yellowfin tuna, and billfish above natural mortality rates has the potential to cause major imbalances or wide-ranging change to ecosystem functions, biodiversity, and habitats. However, both international and domestic fishery managers are controlling catches throughout the Pacific. NMFS expects such control to improve stock status and prevent imbalances or wide-ranging changes to ecosystem function. Therefore, NMFS does not analyze effects on biodiversity and/or ecosystem function in this assessment.

4 ENVIRONMENTAL EFFECTS OF THE ALTERNATIVES

This section describes the potential effects of the alternatives on the components of the affected environment or other socio-economic elements identified in Section 3. 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 effects to fishery participants, fishing communities, and the management setting. We discuss climate change impacts in the cumulative effects section.

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 funded projects. For this reason, potential effects of future fishery development projects are not analyzed in detail in this EA. Such projects are subject to separate environmental review when project details are known. Table 44 summarizes the potential environmental effects of the alternatives.

Table 44. Summary of potential effects of the alternatives on the human environment.

Topic	Alternative 1: No catch/effort or allocation limits for U.S. participating territories	Alternative 2: 2,000 t bigeye tuna catch limit and 1,000 t bigeye tuna allocation limit for each U.S. participating territory	Alternative 3: 2,000 t bigeye tuna catch and allocation limit for each U.S. participating territory
Maximum projected WCPO bigeye tuna stock status in 2045[1]	$F_{2045}/F_{MSY:}$ 0.82 $SB_{2045}/SB_{F=0:}$ 0.38	$F_{2045}/F_{MSY:}$ 0.86 $SB_{2045}/SB_{F=0:}$ 0.37	$F_{2045}/F_{MSY:}$ 0.87 $SB_{2045}/SB_{F=0:}$ 0.36
Catch of non-target stocks	Similar to recent years or reduced in Hawaii deep-set longline (HI DSLL) fishery Similar to recent years in other longline fisheries	Similar to recent years in all fisheries	Similar to recent years or increase associated with maximum authorized catch of bigeye tuna in HI DSLL fishery Similar to recent years in all other fisheries
Fishery participants – effort	Similar to recent years with WCPO closures or reduced in HI DSLL fishery Similar to recent years in other longline fisheries	Similar to recent increasing trend in HI DSLL fishery Similar to recent years in other longline fisheries	Similar to recent increasing trend in HI DSLL fishery or increase associated with maximum authorized catch of bigeye tuna Similar to recent years in other longline fisheries
Fishery participants – area fished	Effort shifts to EPO if fishery closes Similar to recent years in other fisheries	Similar to recent years in HI DSLL fishery Similar to recent years in other fisheries	Similar to recent years in HI DSLL fishery Similar to recent years in other fisheries
Fishery participants – target species	HI longline vessels may switch to targeting swordfish if fishery closes if shallow-set fishery is open; Hawaii troll and handline vessels may switch to target bigeye Similar to recent years in other fisheries	HI longline vessels will choose which species to target Similar to recent years in other fisheries	HI longline vessels will choose which species to target Similar to recent years in other fisheries

Topic	Alternative 1: No catch/effort or allocation limits for U.S. participating territories	Alternative 2: 2,000 t bigeye tuna catch limit and 1,000 t bigeye tuna allocation limit for each U.S. participating territory	Alternative 3: 2,000 t bigeye tuna catch and allocation limit for each U.S. participating territory
Fishery participants – socio-economic	Hawaii troll and handline vessels may see increased revenue during closures while HI DSLL fishery may see reduced revenue and differential impacts on different segments of fleet. HI vessels incentivized to fish in rougher conditions during closures.	Similar to recent years in HI and other longline fisheries	Similar to recent years in HI and other longline fisheries, except under F, American Samoa longline fishery would forego revenue from bigeye tuna
American Samoa cultural fishing	No effect	No effect	No effect
Territorial fishing communities	No fisheries development funding	Benefits similar to recent years associated with fisheries development funding and establishing catch history with WCPFC	Potential increase in benefits to territorial fishing communities from higher allocation limits; territories without specified fishing agreements would not receive funding in years when additional agreements are not necessary to prevent closure
Protected species	Interactions within ITS or levels analyzed in BEs	Interactions within ITS or levels analyzed in BEs	Interactions within ITS or levels analyzed in BEs
Marine Habitat, Critical Habitat, EFH	No effect	No effect	No effect
Management Setting	Least administrative tasks	No change from recent years	No change from recent years

[1]Maximums correspond to the highest assumed WCPO bigeye tuna mortality in the group of outcomes in Kingma and Bigelow (2019).

4.1 Potential Effects on WCPO Bigeye Tuna

The analysis of the alternatives under this topic includes effects to WCPO bigeye tuna. Council staff with assistance from NMFS PIFSC and SPC conducted an analysis to evaluate the effects of various catch limit specifications on future WCPO bigeye stock status (Appendix A, Kingma and Bigelow 2019). These evaluations form the basis of the outcomes analyzed with regards to WCPO bigeye tuna.

At the WCPFC's 15th Regular Session held December 10–14, 2018, in Honolulu, the SPC presented an evaluation of the outcomes of CMM 2017-01 on bigeye tuna stock status in year 2045 (SPC 2018b). This evaluation was based on the 2017 bigeye tuna stock assessment (McKechnie et al. 2017) as updated (Vincent et al. 2018). The SPC conducted a thirty-year projection from 2015, rather than a 20-year projection, because the stock would not reach equilibrium within 20 years under the purse seine effort, longline catch, and recruitment assumptions used (G. Piling SPC, pers. comm. January 2018).

The analysis presented in Kingma and Bigelow (2019) utilizes the same modeling framework as utilized by the SPC in the evaluation for the WCPFC15 (SPC 2018b), but presents only the bigeye recruitment scenario. The WCPFC Science Committee has agreed that for the purpose of evaluating the CMM that the recent 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). Due to the computational complexity of the weighted models within the structural uncertainty grid, only deterministic projections were conducted based on scalars applied to the assumed bigeye tuna longline catch per region under each fishery outcome. The alternative scenarios assume implementation of CMM 2018-01, including the 3-month purse seine FAD closure within EEZs and the high seas and an additional two sequential months on the high seas by member countries. For longline catches, the alternative scenarios assume that countries with specified annual longline bigeye limits in excess of 2,000 t would each catch their full annual limit, even if actual catches have been less (e.g., Japan and Indonesia). Japan, for example, caught nearly 6,000 t less than its limit in 2017, and Indonesia reported catches of 12 t in 2017, whereas its limit under CMM 2018-01 is maintained at 5,889 t. Therefore, the analysis of alternatives is conservative, assuming greater effects to WCPO bigeye under full implementation of CMM 2018-01 than have been realized in recent years. For member countries that have bigeye longline catches less than 2,000 t and for SIDS and PTs without limits specified in CMM 2018-01, SPC assumed that the catches of these fleets would continue at their average 2013-2015 levels.

As indicated above, Kingma and Bigelow did not evaluate full utilization of the measure as it is not realistic; however, stock projections indicate the $F_{2041\text{-}44}/F_{MSY}$ to be 0.89 under full implementation of CMM 2017-01 (SPC 2018). In other words, if CMM 2017-01 were fully implemented, bigeye tuna would not be subject to overfishing in 2045 under the Pelagics FEP and WCPFC SDCs. SPC (2017) did not calculate spawning biomass and total biomass in 2045 versus biomass at MSY, focusing instead on the spawning biomass ratio in the absence of fishing (SB2045/SBF=0), which is WCPFC's adopted interim LRP for bigeye tuna. Because Kingma and Bigelow (2019) applies the same modeling approach used by SPC (2018), they could not generate SB/SBMSY projections under the outcomes considered in this analysis. However, the SC14 summary report indicated that recent SB2012-2015/SBMSY had a mean of 1.39 (WCPFC

2018), which is well above the established overfished reference point (0.6 SB/SBMSY) for bigeye tuna under the Pelagics FEP.

SPC conducted model scenario runs for Kingma and Bigelow (2019). The baseline scenario reflects the average catch of all purse seine and longline fisheries between 2013-2015, and 2015 bigeye catch for Hawaii-permitted longline vessels inclusive of two specified fishing agreements in 2015. The alternative scenarios include the same assumptions for non-U.S. longline and purse seine fleets, but applies scalars on the 2015 U.S. longline or territorial bigeye catch components to account for increased catch by the Hawaii-based longline fleet.

The Option 1 scenario in Kingma and Bigelow (2018) represents no action and no transfers of U.S. participating territory allocation to Hawaii longline vessels. Thus, the projection includes lower U.S. longline and U.S. territory catch than the 2015 level. This scenario is equivalent to Alternative 1 identified in this draft EA.

The four potential outcomes for Option 2 in Kingma and Bigelow (2018) include total catch limits of 2,000 t per U.S. participating territory and allocation limits of 1,000, 2,000, or 3,000 metric tons of bigeye to permitted U.S. longline vessels from 1, 2, or 3 territories (A-C, respectively). Option 2 scenarios also include full utilization of territorial catch limits up to a maximum of 6,000 metric tons (D).

Effects from Alternative 3 that reflect the implementation of fewer than 3 agreements or allocation limits below the maximum of 2,000 t are within the range provided under Outcomes E or F and for brevity are not repeated. For Outcomes E and F under Alternative 3, this analysis uses similar scenarios from the Council/PIFSC paper to characterize potential effects on bigeye tuna based on upper and lower, or bracketed, theoretical catches of bigeye tuna.

Table 45 provides the assumptions in total longline catch, scaled catch, and projected LRPs for WCPO bigeye tuna in 2045 under each of the alternatives. The WCPO bigeye tuna stock would not be overfished or subject to overfishing in 2045 under any of the fishery outcomes associated with the alternatives. The Kingma and Bigelow (2018) analysis models repeated catch of the maximum authorized amount of bigeye tuna each year through 2045, and so inherently accounts for the impact of authorizing bigeye tuna limits and specified fishing agreements annually on the WCPO bigeye tuna stock.

Table 45. F/F_{MSY} and $SB/SB_{F=0}$ values in 2045 based on SPC projections for each of the alternatives.

	Alternative 1: No Action		**Alternative 2: 2,000 t Catch Limit and 1,000 t Allocation Limit for each U.S. Territory**								**Alternative 3: 2,000 t Catch Limit and up to 2,000 t Allocation Limit for each U.S. Territory**			
			Potential Outcome A		***Potential Outcome B***		***Potential Outcome C***		***Potential Outcome D***		***Lower Bracket Scenario***		***Upper Bracket Scenario***	
No. of Specified Fishing Agreements	No Fishing Agreements and No BET Transfers		1 Fishing Agreement and 1,000 t of BET Transfers		2 Fishing Agreements and 2,000 t of BET Transfers		3 Fishing Agreements and 3,000 t of BET Transfers		3 Fishing Agreement and 3,000 t of BET transfers and Full Utilization of BET in Territories		3 Fishing Agreements and 4,500 m of BET Transfers		3 Fishing Agreements and 6,000 t of BET Transfers	
Total assumed BET Catch by U.S. and U.S. Participating Territory Longline Vessels*	4,095 t		5,095 t		6,095 t		7,095 t		9,554 t		8,595 t		10,095 t**	
Scaled U.S. Longline BET Catch (Regions 2 and 4)	3,998 t HI: 3,554 HI/AS Dual: 444 Transfers: 0		4,998 t HI: 3,554 HI/AS Dual: 444 Transfers: 1,000		5,998 t HI: 3,554 HI/AS Dual: 444 Transfers: 2,000		6,998 t HI: 3,554 HI/AS Dual: 444 Transfers: 3,000		9,554 t HI: 3,554 AS: 1,000 GU: 1,000 CNMI: 1,000 Transfers: 3,000		8,498 t HI: 3,554 HI/AS Dual: 444 Transfers: 4,500		9,998 t HI: 3,554 HI/AS Dual: 444 Transfers: 6,000	
		Percent Change		Percent Change		Percent Change		Percent Change		Percent Change		Percent Change		Percent Change
F_{2045}/F_{MSY}	0.82	0.00	0.83	1.2	0.84	2.4	0.85	3.6	0.86	4.9	0.86	4.9	0.86	4.9
$SB_{2045}/SB_{F=0}$	0.38	0.00	0.37	-2.6	0.37	-2.6	0.37	-2.6	0.37	-2.6	0.37	-2.6	0.37	-2.6

Note: Under the Pelagic FEP, a stock is experiencing overfishing when $F/F_{MSY} > 1.0$. Because Kingma and Bigelow 2019 could not generate an MSY-based biomass reference point, we use the WCPFC's adopted limit reference point to evaluate impacts to the bigeye tuna stock. WCPFC considers bigeye tuna overfished when $SB/SB_{F=0} < 0.2$.

* includes average catch (97 t) of bigeye from American Samoa longline permitted vessels based in the SPO

** this value includes 6,000 mt of territory allocations, US limit of 3,554 t, and American Samoa (NPO and SPO) longline bigeye catch average of 541 mt.

Source: Kingma and Bigelow 2019.

4.1.1 Alternative 1: No specification of territorial catch or allocation limits (No Action)

In this scenario, NMFS would not specify a bigeye tuna catch or allocation limit for any U.S. participating territory. Without specified fishing agreements, NMFS assumes the combined catch of bigeye tuna by the longline fisheries of the U.S. participating territories of American Samoa (541 t), Guam (0 t) and the CNMI (0 t) and the U.S. longline fisheries (3,554 t) in the WCPO would be 4,095 t (541 + 0 + 0 + 3,554 = 4,095 t).

Applying the Council/PIFSC analysis to Alternative 1, the WCPO bigeye tuna F_{2045}/F_{MSY} would be 0.82. This supports a conclusion that, under Alternative 1, in combination with the full implementation of CMM 2018-01, WCPO bigeye tuna would not be subject to overfishing in 2045.

With respect to spawning biomass, the analysis indicates that $SB_{2045}/SB_{F=0}$ is 0.38, which is above the WCPFC LRP ($SB_{2045}/SB_{F=0}$ = 0.20) and Pelagics FEP's MSST (B/B_{MSY} 0.6).[12] These values are above the MSST of 0.6 and above the level necessary to produce MSY on a continuing basis. Under this alternative, bigeye stock status would not be in an overfished condition when projected to 2045. Therefore, potential effects on WCPO bigeye tuna from this alternative are not substantial.

4.1.2 Alternative 2: Specify for each U.S. participating territory a 2,000 t bigeye catch limit and 1,000 t bigeye allocation limit (Preferred/Status Quo)

This section provides the projected stock status of WCPO bigeye tuna from Outcomes A-D. Outcomes A-D do not result in a change in the stock status of WCPO bigeye tuna, and the potential effects on WCPO bigeye tuna from these outcomes are not substantial.

Outcome A: One specified fishing agreement
Based on the information described in Section 2.2.1, under one specified fishing agreement, NMFS expects 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 to be 5,095 t per year (541 + 0 + 0 + 3,554 + 1,000 = 5,095 t).

Under Outcome A, the Council/PIFSC analysis indicates that the projected F_{2045}/F_{MSY} = 0.83, and $SB_{2045}/SB_{F=0}$ = 0.37 (see Appendix A). These values a indicate bigeye tuna would not be subject to overfishing and not overfished in 2045.

Compared to Alternative 1, Outcome A would result in a slight increase in the fishing mortality rate (F_{2045}/F_{MSY} = 0.83 vs 0.82 under Alternative 1) and a slight decrease in spawning biomass ($SB_{2045}/SB_{F=0}$ = 0.38 vs 0.37 under Alternative 1). However, these changes are minor, such that

[12] Under the Pelagics FEP, WCPO bigeye tuna is overfished when SB/SB_{MSY} = 0.6. This is equivalent to $SB/SB_{F=0}$ = 0.14.

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 t of bigeye tuna from two U.S. participating territories. Therefore, under Outcome B, the combined catch of bigeye tuna would be 6,095 t, which includes the longline fisheries of the U.S. territories of American Samoa (541 t), Guam (0 t), and the CNMI (0 t), plus the U.S. longline fisheries based in Hawaii (3,554 t) and the allocation of 2,000 t (541 t + 0 + 0 + 3,554 + 2,000 = 6,095 t).

Applying the Council/PIFSC analysis to Outcome B, the projected $F_{2045}/F_{MSY} = 0.84$, and $SB_{2045}/SB_{F=0} = 0.37$. These values are similar to projected values under one specified fishing agreement (described above). Compared to Alternative 1, Outcome B would result in a slight increase in the fishing mortality rate ($F_{2045}/F_{MSY} = 0.84$ vs. 0.82 under Alternative 1) and a slight decrease in spawning biomass ($SB_{2045}/SB_{F=0} = 0.37$ vs. 0.38 under Alternative 1). These changes are minor, such that the effects do not represent a change in the status of bigeye tuna stocks compared to Alternative 1. The projections associated with Outcome B indicate bigeye tuna would not be subject to overfishing and not overfished in 2045.

Outcome C: Three specified fishing agreements and Partial Utilization of Terr. Limits
Three specified fishing agreements would allocate up to 3,000 t of bigeye tuna from three U.S. participating territories. Therefore, under Outcome C, the combined catch of bigeye tuna would be 7,095 t. This figure represents the longline fisheries of the U.S. territories, American Samoa (541 t), Guam (0 t) and the CNMI (0 t), plus the U.S. longline fisheries in Hawaii (3,554 t), and the allocation (3,000 t) (541 + 0 + 0 + 3,554 + 3,000 = 7,095 t).

Applying the Council/PIFSC analysis to Outcome C, the projected $F_{2045}/F_{MSY} = 0.85$ and spawning biomass would be $SB_{2045}/SB_{F=0} = 0.37$. Compared to Alternative 1, Outcome C would result in a slight increase in the fishing mortality rate ($F_{2045}/F_{MSY} = 0.85$ vs. 0.82 under Alternative 1) and a slight decrease in spawning biomass ($SB_{2045}/SB_{F=0} = 0.37$ vs 0.38 under Alternative 1). These values are less favorable for bigeye tuna compared to the recruitment projections under Outcomes A and B. However, these changes are minor, such that the effects do not represent a change in the status of bigeye tuna stocks compared to Alternative 1. The projections associated with Outcome C indicate bigeye tuna would not be subject to overfishing and not overfished in 2045.

Outcome D: Three specified fishing agreements and Full Utilization of Territorial Limits
Under this outcome, NMFS assumes three specified fishing agreements would allocate 3,000 t of bigeye and each territory would fully utilize the remaining 1,000 t of their 2,000 t limit. In Outcome D, the 2018 expected bigeye catch would be 9,554 t, which represents an assumed catch of the U.S. territories' non-allocated limits, American Samoa (1,000 t), Guam (1,000 t), and the CNMI (1,000 t), added to the catch by U.S. longline fisheries from Hawaii (3,554 t), plus 3,000 t allocated under three specified fishing agreements (1,000 + 1,000 + 1,000 + 3,554 + 3,000 = 9,554 t).

Applying the Council/PIFSC's analysis to Outcome D, the projected F_{2045}/F_{MSY} = 0.86 and the projected $SB_{2045}/SB_{F=0}$ = 0.37. The projections associated with Outcome C indicate bigeye tuna would not be subject to overfishing and not overfished in 2045.

These values are similar to projections under Outcomes A, B and C; however, 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 t of bigeye tuna (i.e., 3,000 t combined) every year in addition to 1,000 t allocations for each territory. As previously discussed, NMFS does not expect longline vessels in CNMI or Guam to catch bigeye tuna in the near future because there are currently no active longline vessels based in those islands and fisheries development would be incremental. Additionally, it is unlikely that American Samoa permitted vessels would increase their catch to 1,000 t as participation in the American Samoa-based fishery has declined in recent years.

Compared to Alternative 1, Outcome D would result in a small increase in the fishing mortality rate (F_{2045}/F_{MSY} = 0.86 vs. 0.82 under Alternative 1) and a decrease in spawning biomass ($SB_{2045}/SB_{F=0}$ = 0.37 vs 0.38 under Alternative 1). Although these values are less favorable for bigeye tuna compared to the values under Alternative 1, the effects of Outcome D do not represent a change in the status of bigeye tuna stocks and the WCPO stock would remain not subject to overfishing and not overfished in 2045; the same as under Alternative 1.

4.1.3 Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 t of the catch limit

This section provides the projected stock status of WCPO bigeye tuna under Outcomes E-F. Outcomes E-F do not result in a change in the stock status of WCPO bigeye tuna, and the potential effects on WCPO bigeye tuna from these outcomes are not substantial.

Outcome E
Under Outcome E, with three specified fishing agreements totaling 6,000 t in allocation, the combined catch of bigeye tuna would be 9,554 t. This figure represents the longline fisheries of the U.S. participating territories of American Samoa (0 t), Guam (0 t) and the CNMI (0 t), plus the U.S. longline fisheries in Hawaii (3,554 t), and the allocation of 6,000 t (0 + 0 + 0 + 3,554 + 6,000 = 9,554 t). This is the same as Outcome D, resulting in a small increase in the fishing mortality rate (F_{2045}/F_{MSY} = 0.86 vs. 0.82 under Alternative 1) and a decrease in spawning biomass ($SB_{2045}/SB_{F=0}$ = 0.37 vs 0.38 under Alternative 1).

The Council/PIFSC analysis also included two scenarios that bracket the Outcome E catch levels.

Specifically, the Council/PIFSC analysis included Outcome M, where all three territories each allocate their entire 2,000 t limit (e.g., 6,000 t of allocations) and American Samoa vessels also maintains catch of 541 t and the U.S. fleet catches 3,554 t. Therefore, the combined catch of bigeye tuna under this upper bracket scenario would be 10,095 t, which can be used as an upper limit to evaluate the effect of Outcome E. This figure represents the longline fisheries of the U.S. participating territories, American Samoa (541 t), Guam (0 t) and the CNMI (0 t), plus the U.S. longline fisheries in Hawaii (3,554 t), and maximum allocations under three fishing agreements (6,000 t) (541 + 0 + 0 + 3,554 + 6,000 = 10,095 t).

Applying the Council/PIFSC analysis, in the upper bracket scenario the projected F_{2045}/F_{MSY} = 0.87 and spawning biomass would be $SB_{2045}/SB_{F=0}$ = 0.36. The stock would not be subject to overfishing or overfished in 2045 as a result of Potential Outcome M. Compared to the Alternative 1, this scenario would result in an increase in the fishing mortality rate (F_{2045}/F_{MSY} = 0.87 vs. 0.82 under Alternative 1) and a decrease in spawning biomass ($SB_{2045}/SB_{F=0}$ = 0.36 vs 0.38 under Alternative 1).

The Council/PIFSC analysis also included a lower bracket scenario, where all three territories would each allocate 1,500 t (4,500 t allocations) and American Samoa vessels also maintains catch of 541 t and the U.S. fleet catches 3,554 t, or Outcome J. Therefore, the combined catch of bigeye tuna under this lower bracket scenario would be 8,595 t. This figure represents the longline fisheries of the U.S. territories, American Samoa (541 t), Guam (0 t) and the CNMI (0 t), plus the U.S. longline fisheries in Hawaii (3,554 t), and the 1,500 t allocation under three specified fishing agreements (4,500 t) (541 + 0 + 0 + 3,554 + 4,500 = 8,595 t).

Applying the Council/PIFSC analysis, under the lower bracket scenario, the projected F_{2045}/F_{MSY} = 0.86 and spawning biomass would be $SB_{2045}/SB_{F=0}$ = 0.37. The stock would not be subject to overfishing or overfished in 2045 as a result of this scenario. Compared to Alternative 1, this scenario would result in a slight increase in the fishing mortality rate (F_{2045}/F_{MSY} = 0.86 vs. 0.82 under Alternative 1) and a slight decrease in spawning biomass ($SB_{2045}/SB_{F=0}$ = 0.37 vs 0.38 under Alternative 1).

Outcome F

Under Outcome F, with three specified fishing agreements totaling 5,500 t in allocation (2,000 t each allocation for Guam and CNMI, and 1,500 t allocation for American Samoa with 500 t reserved for catch limit), the combined catch of bigeye tuna would be 9,554 t. This figure represents the longline fisheries of the U.S. territories, American Samoa (500 t), Guam (0 t) and the CNMI (0 t), plus the U.S. longline fisheries in Hawaii (3,554 t), and the allocation (5,500 t) (500 + 0 + 0 + 3,554 + 5,500 = 9,554 t). Council and NMFS staff did not evaluate this scenario, as the model assumes a baseline catch of 541 t for American Samoa permitted vessels. However, two similar scenarios that bracket Outcome F catch levels were included in the analysis. These are described above and are not repeated here for brevity. The fishing mortality rate and spawning biomass ratios under Outcome F would fall within the values identified in the two bracket scenarios described under Outcome E. Thus, the effects on bigeye tuna associated with Outcome F indicate the WCPO bigeye tuna stock would be similar to Outcome E.

4.2 Potential Effects on EPO Bigeye Tuna

This section describes the potential effects of the alternatives on the EPO bigeye tuna stock. The Hawaii-based longline fishery is the only longline fishery which catches EPO bigeye tuna, and therefore, the only fishery discussed in this section. Because NMFS, the Council, and RFMOs adjust fishery management measures based on the best available information to prevent overfishing and NMFS does not expect the U.S. longline catch of EPO bigeye tuna would influence stock status, the potential effects on WCPO bigeye tuna from these outcomes are not substantial.

4.2.1 Alternative 1: No specification of territorial catch or allocation limits (No Action)

Under Alternative 1, it is likely that the U.S. longline fishery would reach the U.S. bigeye limit of 3,554 t each year by November or earlier. If this occurs, NMFS would restrict retention of bigeye tuna in the WCPO by Hawaii longline fishing vessels. However, in accordance with federal regulations at 50 CFR 300.224, the limit does not apply to bigeye tuna caught by longline gear in the EPO (generally east of 150° W). 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. participating 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 EEZ around Hawaii. NMFS attributes catches of bigeye tuna by exempted vessels to the applicable U.S. participating territory to which the vessel is associated in accordance with 50 CFR 300.224.

During a restriction in the WCPO, we would expect some U.S. longline vessels based in Hawaii 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 750 t established by the IATTC. The IATTC has not restricted the catch of vessels shorter than 24 m in the EPO. When the fishery reaches the EPO limit, NMFS would restrict retention of bigeye tuna by vessels longer than 24 m. Within the last five years, the U.S. EPO limit adopted by the IATTC was 500 t. During that time, when the limit was reached, vessels longer than 24 m were restricted from retaining bigeye tuna in the EPO between 50 and 141 days of the year; for the EPO and WCPO both, these vessels were restricted between 32 and 61 days of the year (Ayers et al. 2018). Between 2013 and 2017, under various closure scenarios, catch of U.S. longline bigeye tuna ranged between 2,043 and 3,050 t or less than 3 percent of the overall fishing mortality on bigeye tuna in the EPO (Table 17).

In the year 2015, NMFS closed the WCPO for about a fifth of the year (65 days), which is comparable, in terms of shifting effort, to the fishery closing at the end of October for the remainder of the year under this outcome. Total U.S. longline catch in the EPO during 2015 was 3,050 t, or 2.91 percent of total bigeye tuna fishing mortality for that year in the EPO (Table 17). Given the U.S. longline fleet's small contribution to overall fishing mortality, NMFS does not anticipate that the Hawaii-based longline fleet would influence stock status of bigeye tuna in the EPO. The Council and NMFS monitor overfishing of all pelagic MUS and adjust management measures to prevent overfishing; therefore, NMFS does not expect Alternative 1 to substantially affect the EPO bigeye tuna stock in 2019 and beyond.

4.2.2 Alternative 2: Specify for each U.S. participating territory a 2,000 t bigeye catch limit and 1,000 t bigeye allocation limit (Preferred/Status Quo)

Hawaii longline vessels operating under specified fishing agreements under Outcomes A-D 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.

Under Alternative 2, catch of EPO bigeye tuna is not expected to increase by any appreciable amount compared to recent levels when the fishery operated under a specified fishing agreement.

This is because Hawaii longline vessels would likely remain in the WCPO and not fish in the EPO. Because the EPO is distant from the Port of Honolulu, which increases the cost of fishing, (Ayers et al. 2018), NMFS expects fishing effort in the EPO to be lower when the WCPO is available for targeting bigeye tuna as vessels seek to keep fuel and other operating costs low.

The most recent stock assessment of bigeye tuna in the EPO indicates that $F/F_{MSY} = 1.15$ and $SB_{2014\text{-}2016}/SB_{MSY} = 1.02$ (Xu et al. 2018). These results are uncertain (see Section 3.1.1), and NMFS has not accepted the assessment for purposes of stock status determinations. In 2017, total bigeye tuna landings in the EPO by the longline fisheries in Hawaii, American Samoa, Guam, and the CNMI was 2,690 t (WPFMC 2018a) or 2.8 percent of the estimated MSY of 95,491 t (Xu et al. 2018) and 2.8 percent of the total 2017 catch of 97,519 t (IATTC 2018). The impact of the purse-seine fishery on the bigeye stock is far greater than that of the longline fishery (Xu et al. 2018). Given the U.S. longline fleet's small contribution to overall fishing mortality, NMFS does not anticipate that the Hawaii-based longline fleet would influence stock status of bigeye tuna in the EPO. The Council and NMFS monitor overfishing of all pelagic MUS and adjust management measures to prevent overfishing; therefore, NMFS does not expect Alternative 2 to substantially affect the EPO bigeye tuna stock in 2019 and beyond. Compared to Alternative 1, NMFS expects less EPO bigeye tuna mortality because vessels would fish preferentially in the WCPO when the WCPO remains open.

4.2.3 Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 t of the catch limit

Under Alternative 3, 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. Vessels would preferentially fish in the WCPO, as described in Section 4.2.2. Therefore, under these scenarios, we would expect a similar level of catch to Alternative 2. Given the U.S. longline fleet's small contribution to overall fishing mortality, NMFS does not anticipate that the Hawaii-based longline fleet would influence stock status of bigeye tuna in the EPO in 2019 and beyond. The Council and NMFS monitor overfishing of all pelagic MUS and adjust management measures to prevent overfishing; therefore, NMFS does not expect Alternative 3 to substantially affect the EPO bigeye tuna stock. Compared to Alternative 1, NMFS expects less EPO bigeye tuna mortality because vessels would fish preferentially in the WCPO as long as the WCPO remains open.

4.3 Potential Effects on Non-Target Stocks

This section describes the potential effect of each of the bigeye tuna outcomes on non-target stocks identified in Section 3.1. Because NMFS, the Council, and RFMOs adjust fishery management measures based on the best available information to prevent overfishing and NMFS does not expect the U.S. longline catch of non-target stocks would influence stock status of these species, the potential effects on non-target stocks of the alternatives are not substantial.

4.3.1 Alternative 1: No specification of territorial catch or allocation limits (No Action)

Under Alternative 1, NMFS would not authorize any specified fishing agreements and would close the WCPO if the fishery reaches the U.S. limit for the WCPO, likely before November.

Hawaii longline fisheries
As described in Section 3.2.1, 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.

NMFS expects that if the fishery reaches the WCPO U.S. longline limit for bigeye tuna and NMFS subsequently restricts retention of the species, a number of Hawaii longline vessels would likely shift fishing effort for bigeye tuna to the EPO, while other vessels may stop fishing altogether or switch to targeting swordfish if the shallow-set fishery is open. NMFS expects the catch of non-target species to be less than or similar to catch in recent years when the fishery has not operated throughout the year, because effort for bigeye tuna drives the catch of non-target species. Under Alternative 1, a shift to the EPO may potentially result in increased catch of EPO stocks.

If the shallow-set fishery is open, Hawaii shallow-set longline catches of non-target stocks and swordfish could continue under Alternative 1, as vessels may switch to targeting swordfish in the event of a WCPO closure. Without territorial catch or allocation limits, the fishery may close by November or earlier and more vessels may switch to targeting swordfish. NMFS expects catches of non-target stocks similar to those in recent years in the shallow-set longline fishery under Alternative 1, as the WCPO bigeye tuna fishery has closed in recent years for portions of the year. The shallow-set fishery closed in May 11, 2018 and on March 19, 2019 for the remainder of each year. The shallow-set longline fishery may close when they catch a NMFS authorized limit of loggerhead or leatherback sea turtles. In years when the shallow-set fishery is closed, NMFS expects less overall catch from the shallow-set sector of the longline fleet. During a shallow-set closure, NMFS would not expect territorial bigeye tuna allocation limits to affect the operation of the shallow-set longline fishery.

Because the Council and NMFS closely monitor catches based on landings data, we expect to detect changes in the catch of non-target stocks and develop additional management measures, as appropriate. 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 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 consider recommending future management measures to the Secretary of Commerce to rebuild the stock or reduce fishing mortality in consideration of the relative impact of the U.S. fleet on the stock. For these reasons, the Hawaii longline fisheries would not have a substantial effect on non-target stocks under Alternative 1.

SPC (2018) projected yellowfin and skipjack stock status to 2045 assuming implementation of CMM 2017-01. Even under the most pessimistic scenarios associated with the measure, both yellowfin and skipjack stock statuses are not shown to breach any limit reference points through to 2045 (SPC 2018).

American Samoa longline fishery

As described in Section 3.2.2, the largest pelagic fishery in American Samoa is the commercial longline fishery targeting albacore tuna, which vessels sell to the local Pago Pago cannery. The amount of albacore landed by the American Samoa longline fishery in 2017 was 3,045,774 lb (1,381 t) (WPFMC 2018a). WCPFC estimated the 2017 WCPO catch of south Pacific albacore at 90,664 t (Stephen Brouwer 2018), thus the American Samoa longline fishery represents approximately 1.5 percent of the total annual south Pacific albacore catch. The stock of south Pacific albacore is not overfished and overfishing is not occurring (Tremblay-Boyer et al. 2018), but catch rates have declined over the last decade (WPFMC 2018a), resulting in difficult economic operating conditions for the American Samoa-based longline fleet.

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). Some vessels holding Class B, C, and D American Samoa permits are also registered to a Hawaii longline permit, which allows them to fish in the EEZ around Hawaii and adjacent high seas and land fish in Hawaii.

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 fishermen do not retain due to little or no market value and mostly return alive. Bycatch levels are shown in Section 3.2.2.6. The majority of sharks caught in the fishery are returned alive to the sea. NMFS expects catches similar to those in recent years under Alternative 1; therefore, there are no potential effects from the American Samoa longline fishery on non-target stocks as a result of Alternative 1.

CNMI and Guam longline fisheries

As noted in Section 3.2.3, there has been no longline fishing in the EEZ around the CNMI or Guam since 2011, and NMFS does not expect longline fishing activities to occur in the near future under Alternative 1. 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 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, including catch of target or non-target species, area fished, seasonality, or intensity of fishing. Therefore, there are no effects on non-target stocks as a result of the Guam and CNMI longline fisheries under Alternative 1.

4.3.2 Alternative 2: Specify for each U.S. participating territory a 2,000 t bigeye catch limit and 1,000 t bigeye allocation limit (Preferred/Status Quo)

Under Alternative 2, NMFS could authorize up to three specified fishery agreements allocating 1,000 t each to the Hawaii-based longline fleet.

Hawaii longline fisheries

Fishing effort for bigeye tuna drives catches of non-target species in the Hawaii deep-set longline fishery. 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. Based on recent levels of bigeye tuna catch by vessels to which the limit applies, it is likely that the fishery will reach the U.S. bigeye longline catch limit of 3,554 t by November or earlier. 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.

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 the Outcomes A-D could potentially be higher than under Alternative 1, and as such, the catch of non-target species could be higher than under Alternative 1. NMFS expects the catch to be similar to that of recent years, however, as Alternative 2 represents actions the Council recommended and NMFS implemented in 2014 through 2018. NMFS expects catch in the shallow-set sector, which resumed operation in 2019, would be similar to catch in years 2014-2017, as the shallow-set sector was authorized to operate during these years and vessels were authorized to fish for bigeye tuna pursuant to specified fishing agreements.

As described in Section 3.1, recent catch levels of non-target stocks by the U.S. longline fleet, including the Hawaii longline fisheries, 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 the Alternative 2 scenarios 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 $B_{2012}/B_{MSY} = 1.87$ (ISC 2014). Based on federal logbook records, the catch of swordfish by Hawaii longline vessels operating within the boundary of the EPO stock is less than 5 t annually (NMFS unpublished data). This level of catch is around 1 percent of the stock's estimated MSY of 5,490 t.

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. Because the EPO is distant from the Port of Honolulu, which increases the cost of fishing (Ayers et al. 2018), NMFS expects fishing effort in the EPO to be lower when the WCPO is available for targeting bigeye tuna as vessels seek to keep fuel and other operating costs low.

As noted in Section 3.1.8, WCNPO 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 t) is lower than the MSST of 1,628 t (ISC 2015b). In 2017, total striped marlin catch by all U.S. longline fisheries and tropical troll fisheries in the NPO was 336 t. This level of catch is below the WCPFC-agreed upon U.S. catch limit of 457 t as proscribed in CMM 2010-01.

Since 2014, the U.S. longline fisheries in Hawaii operated under the same catch and allocation limits assumed for Alternative 2. For this reason, under Outcomes A-D, NMFS expects catch of WCNPO striped marlin to be similar to the level reported since 2014 which does not exceed the WCPFC-agreed upon limit of 457 t. 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 NMFS projects 95 percent of the limit (or 435 t) to be reached. NMFS and the Council are currently developing an amendment to the Pelagics FEP to implement the limit and associated accountability measures.

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 U.S. participating territories do not target North Pacific albacore or bluefin tuna. Therefore, under Outcomes A-D, NMFS expects catches of North Pacific albacore by U.S. longline fisheries operating in the North Pacific to be similar to the level reported in 2017, which was 90 t (WPFMC 2018a), and represents less than 1 percent of the stock's estimated MSY. For Pacific bluefin tuna, NMFS expects catches to be similar to the level reported in 2017, which was only 1 t (WPFMC 2018a).

Under Alternative 2, NMFS expects the yellowfin catch of all U.S. longline vessels operating in the WCPFC statistical area to be around the five year average of 1,477 t per year (NMFS 2018b). Yellowfin tuna is not subject to overfishing or in an overfished condition in the WCPO, according to the most recent stock assessment (Tremblay-Boyer et al. 2017).

The most recent stock assessment of yellowfin tuna in the EPO indicates that the stock is subject to overfishing ($F/F_{MSY} = 1.01$) and is not overfished ($SB_{2015\text{-}2017}/SB_{MSY}=1.08$) (Minte-Vera et al. 2018). The 2017 U.S. longline total catch of yellowfin tuna in the EPO is 0.25 percent of the 2017 total catch of yellowfin in the EPO (IATTC 2018), and therefore negligible. Given the U.S. longline fleet's small contribution to overall fishing mortality, NMFS does not anticipate that the Hawaii-based longline fleet would influence stock dynamics of yellowfin tuna in the EPO. NMFS does not expect Alternative 2 to substantially affect the EPO yellowfin tuna stock. Yellowfin catches in the EPO are dominated by purse seine vessels, with around 4% of the total EPO yellowfin catch attributed to longline gear (IATTC 2018).

Under Alternative 2, all U.S. vessels will continue to be prohibited from retaining onboard oceanic white tip sharks and silky sharks. Because most sharks are released alive in this fishery, NMFS does not expect substantial impacts to these species under Alternative 2.

Hawaii shallow-set longline catches of non-target stocks and swordfish would be similar to their catch described in Section 3.2.1.4 as vessels may choose which fish to target and NMFS has implemented the recommendation associated with Alternative 2 from 2014-2018. The shallow-set longline fleet reopened on January 1, 2019.

For the reasons described above, the Hawaii longline fisheries would not have substantial effects on non-target stocks under Alternative 2. Catches of non-target stocks would be higher compared to Alternative 1, as the fishery would continue operating under specified fishing agreements after it reaches the U.S. bigeye tuna limit in the WCPO.

American Samoa, Guam, and CNMI longline fisheries
Because the component of the American Samoa longline fishery that operates in the SPO primarily targets south Pacific albacore tuna, NMFS does not expect the fishery's effects on non-target stocks to increase above recent years.

If fisheries development leads 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 the Alternative 2 scenarios 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 the Pelagic FEP caps participation in 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 recent levels at this time. For these reasons, there would be no substantial effects to target or non-target stocks from this fishery under Alternative 2.

NMFS expects incremental, not rapid, fisheries development in the U.S. participating territories that NMFS would monitor through logbooks and observer requirements; therefore, NMFS and the Council would develop appropriate management measures to respond to any fishery management concerns for non-target stocks. The American Samoa longline fleet operates entirely within the WCPO. However, under Outcome D, NMFS assumes that American Samoa, Guam and the CNMI would catch their full limit of 1,000 t for bigeye tuna. Catch of non-target species would increase to a level associated with the increased catch of bigeye tuna. Using the figures associated with the Hawaii longline fisheries as a predictor of potential effect for these inactive fisheries, NMFS expects that the proportion of increased fishing mortality would remain low in comparison to MSY for all species. NMFS expects this potential impact would not affect the stock dynamics of the non-target stocks, and therefore the Guam and CNMI longline fisheries would not substantially affect non-target stocks under Outcome D, or maximum use of the 2,000 t catch limit with 1,000 t allocated to the U.S. longline fisheries.

The Council and NMFS will continue to monitor domestic catches of all pelagic MUS, and continue to consider information from stock status reports as changes to fishery management are contemplated and implemented. Ongoing and future monitoring and research will allow fishery managers and scientists to consider and respond to new information regarding non-target stocks, particularly those with unknown status.

4.3.3 Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 t of the catch limit

Fishing effort for bigeye tuna drives catches of non-target species in the Hawaii deep-set longline fishery. 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. Based on recent levels of bigeye tuna catch by vessels to which the limit applies, it is likely that the fishery will reach the assumed U.S. bigeye longline catch limit of 3,554 t by November or earlier every year. 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.

Under Alternative 3, U.S. participating territories could enter into a specified fishing agreement with pelagic permitted vessels in Hawaii. This draft EA evaluates the impact to non-target stocks based on the assumption that three specified fishing agreements would be executed. 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. Under a specified fishing agreement, pelagic permitted vessels would be able to fish to the allocation limit. Therefore, fishing effort under this alternative could potentially be higher than under Alternative 1, and as such, the catch of non-target species could be higher than under Alternative 1.

Hawaii shallow-set longline catches of non-target stocks and swordfish would be similar to their catch described in Section 3.2.1.4 as vessels may choose which fish to target. The shallow-set longline fleet re-opened on January 1, 2019.

Even with an increase in catch in the deep-set sector of the Hawaii longline fishery, NMFS expects the proportion of increased fishing mortality would remain low in comparison to MSY or total catch for all species in 2019 and onward. Bigeye tuna limits and the limited entry permit program would continue to constrain the fishery. NMFS expects this potential impact would not affect the stock status of the non-target stocks, and that allocation limits will ensure that U.S. and U.S. participating territory longline fisheries continue to be managed sustainably, consistent with WCPFC CMMs and the Magnuson-Stevens Act. The process includes review of the best scientific information available by the Council to determine whether limits should be approved for the fishing year.

Under Outcome E, NMFS assumes American Samoa would allocate all of its bigeye tuna catch limit in a specified fishing agreement; therefore, NMFS would prohibit retention of bigeye tuna by American Samoa permitted vessels. NMFS assumes that the American Samoa-permitted vessels would continue fishing in the SPO in this circumstance, but would not retain bigeye tuna, so the catch of this non-target stock would not be affected.

For these reasons, the effects of the U.S. and U.S. participating territory longline fleets would not result in substantial effects on non-target stocks under Alternative 3.

4.4 Potential Effects on Socio-economic Setting

This section describes the potential effects of the bigeye tuna outcomes on the socio-economic setting identified in Section 3.2.

4.4.1 Alternative 1: No specification of territorial catch or allocation limits (No Action)

Hawaii Longline Fisheries

Under Alternative 1, NMFS would not specify bigeye tuna catch limits for the U.S. participating territories, and therefore a territory could not allocate any bigeye tuna to FEP-permitted vessels under a specified fishing agreement. This alternative would have effects on fisheries in the territories, the Hawaii longline fishery, and Hawaii seafood consumers, the magnitude of which depends upon when the fisheries reach the U.S. bigeye limit. This alternative would not take advantage of a mechanism to infuse capital into fisheries development projects identified in the MCPs, which result from the implementation of specified fishing agreements. Therefore, the

fishing communities in American Samoa, Guam, and the CNMI would not receive funding from specified fishing agreements in order to implement fisheries development projects under Alternative 1.

If the U.S. longline limit for bigeye tuna is reached in 2019, NMFS would prohibit by notice 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 targeting swordfish if the shallow-set fishery is open, or fish for bigeye tuna in the EPO. There could be a negative economic effects on certain longline vessels based in Hawaii that would not be able to fish in the EPO. For example, some of the Hawaii longline fleet's smaller vessels may not transit to the EPO to fish. During WCPO closures, average trip costs increase and Hawaii longliners spend an average of two extra days at sea not fishing. These additional costs are associated with fishing in the more distant EPO (Ayers et al. 2018). Closures also may result in differential effects on certain segments of the Hawaii longline fleet. Hawaii and American Samoa dual-permitted vessels report high earnings during closures, when other vessels may not be able to fish or must travel farther (Ayers et al. 2018).

In addition to potential economic impacts described above, potential safety-at-sea issues arise under Alternative 1. Federal regulations limit Hawaii longline vessels to 101 ft and many active vessels range from 60 to 75 ft long. Fishing in the EPO for bigeye tuna generally involves longer trips and greater distances from the home port. During one of the most active hurricane seasons in the EPO on record in 2015, higher market prices due to reduced availability during a closure of the WCPO may have incentivized smaller vessels to fish in the EPO rather than tie up (Ayers et al. 2018). Fishing during the winter months, when strong storms are common in the North Pacific, may pose safety-at-sea concerns. Therefore, safety-at-sea issues arise if vessels have to travel greater distances and their operational areas are limited spatially while fishing for bigeye tuna in the WCPO is prohibited.

A prohibition on retention 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 27 and November 22, 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 reduced availability 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. 2015). Many smaller longline 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 troll and handline fishermen increased their catch of bigeye tuna and benefited economically from the sales of those tuna. In December 2010, revenue from bigeye tuna caught 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

(Richmond et al. 2015; WPFMC 2012). Adjusted revenue for the MHI troll fishery over the year in 2010, however, was 16% below its long-term average (WPFMC 2012). Under Alternative 1, if a longline fishery closure for WCPO bigeye tuna occurs, small vessels may experience economic benefits by providing fresh bigeye tuna for local markets, with longer closures resulting in potential greater economic benefits. However, these small vessel fleets are not able to replace the Hawaii longline fleet in terms of volume and value, as typically bigeye tuna caught by longline receives a higher price at market than troll- or handline-caught bigeye tuna. Therefore, there is a potential for limited supply of bigeye tuna for the larger seafood markets and higher prices for consumers.

Hawaii Fishing Community

During a catch and retention restriction in the WCPO, NMFS expects that fish vendors would import an increased amount of foreign caught bigeye tuna to Honolulu to fill any market gaps. Fresh bigeye tuna imports into Hawaii showed a large increase in 2012, declined some and then remained stable through 2017 indicating that there is substantial market demand for bigeye tuna in Hawaii, and vendors will likely find alternative sources when U.S. vessels cannot provide tuna (NMFS 2018c).

A potential consequence of Alternative 1 is that when U.S. fisheries are closed, 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 (See Chan and Pan (2016)). Chan and Pan (2016) and Rausser et al. (2009) describe this "market transfer" effect for closures in the shallow-set longline fishery. Factors other than the absence of U.S. caught fish in the market may cause foreign fleets to increase catch of target species (Scorse et al. 2017). Consumer preference for sustainably caught fish may encourage consumers to forego bigeye tuna in the event of a closure rather than purchase imported seafood.

American Samoa Fishing Community

Under Alternative 1, NMFS would not authorize specified fishing agreements. Therefore, the fishing communities in American Samoa would not receive funding from specified fishing agreements, and the territory would derive funding for fisheries development projects identified in the MCP from other sources.

Alternative 1 is not expected to have an impact on American Samoa cultural fishing practices, because the outcome does not change where American Samoa longliners are allowed to fish, or where other gear types can fish, or how the fishermen use or share their fish. Thus, we expect that Alternative 1 would not adversely affect existing cultural fishing practices. NMFS would solicit comments from the public regarding impacts to American Samoa cultural fishing after receiving a Council recommendation.

Guam and CNMI Fishing Community

Under Alternative 1, NMFS would not authorize specified fishing agreements. Therefore, the fishing communities in Guam and the CNMI would not receive funding from specified fishing agreements, and the jurisdictions would derive funding for fisheries development projects identified in the MCPs from other sources.

4.4.2 Alternative 2: Specify for each U.S. participating territory a 2,000 t bigeye catch limit and 1,000 t bigeye allocation limit (Preferred/Status Quo)

Under Alternative 2, the U.S. participating territories would have an annual 2,000-t longline limit for bigeye tuna and a limit of 1,000 t for bigeye tuna that could be allocated each year to FEP-permitted vessels. Alternative 2 is likely to have positive benefits for participants in Hawaii longline fisheries, and the fishing communities of Hawaii and the U.S. participating territories for the reasons described in this section.

Hawaii Longline Fisheries
Under Alternative 2, the Hawaii longline fishery participants may receive 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 sustainable, fresh, high quality tuna and lower consumer prices due to consistent product availability, especially during times of peak demand such as the holiday season.

If the fishery reaches the U.S. bigeye tuna limit, some Hawaii longline vessels would begin to fish under a specified fishing agreement and NMFS would attribute their catch to the U.S. territory party to the agreement. As specified fishing agreements involve funding contributions from fishery participants, vessels have a choice of whether to enter into fishing agreements. 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 is seasonal.

Since the Hawaii longline fleet fishes predominately in the WCPO, fishermen are able to optimize their fishing schedule by choosing when to fish in certain areas, based on transit times and costs. As a less desirable option, fishing in the EPO usually means longer transit times, which results in higher trip costs (Ayers et al. 2018), fewer numbers of sets, and potentially poorer quality fish at auction. Further, profits could be lower for fishermen who must fish in the EPO due to the aforementioned factors including the seasonal and inter-annual availability of bigeye tuna in the EPO.

American Samoa Longline Fishery
The American Samoa-based longline fishery has around 15 active vessels, but the Pelagic FEP caps the fishery 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 t limit in the near term. However, if American Samoa entered into a specified fishing agreement, which allocated 1,000 t of bigeye tuna to other vessels, catches by American Samoa longline vessels fishing in the SPO and NPO, combined with the 1,000 t of allocated bigeye tuna could approach a 2,000 t limit. In 2012, for example, longline bigeye catches attributed to American Samoa totaled 1,505 t, with 771 t of that amount caught by Hawaii longline vessels operating under a specified fishing agreement with the territory (NMFS unpublished data).

If the American Samoa longline fishery reached the 2,000 t catch limit, and if the fishery was prohibited from retaining or landing bigeye tuna, adverse effects to fishery participants could result. However, any U.S. participating territory government that makes agreements with FEP-permitted vessels controls the amount of catch allocated (i.e., not allocate all 1,000 t), and thus could reserve a greater portion of the 2,000 t limit to local vessels and reduce potential effects to local fishery participants. If American Samoa reached the catch limit, the adverse effects would include foregone revenue from bigeye tuna. NMFS expects that American Samoa longliners would continue to fish in the SPO and not retain bigeye tuna in order to comply with a potential restriction. Dual-permitted vessels fishing for bigeye tuna in the NPO would fish under a specified fishing agreement from Guam or CNMI.

Under Alternative 2, the fishing community in American Samoa would benefit indirectly through fishery improvement projects funded from specified fishing agreements, with the number of territories benefiting depending on the number of agreements. Benefits are expected to vary per fisheries development project in magnitude of impact, depending on the fishery improvement projects implemented. If the government of American Samoa were to reserve a greater portion of its limit for local vessels, it may forego access to fisheries development funds. Fishery improvement 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. Funding from recent agreements have supported fisheries development projects in the U.S. participating territories including longline dock extension in American Samoa, Hagtna Fishing Platform in Guam, and Garapan Fishing Base Improvements. (Kingma 2016) (Kingma 2016)

Also under Alternative 2, the U.S. participating territories may receive positive benefits from developing catch history within WCPFC managed fisheries. American Samoa has domestic longline capacity with a history of targeting albacore, but not other species. The authorization of specified fishing agreements require attribution of catch 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. Catch history is important for maintaining fisheries access should the WCPFC agree to catch limits for PTs, as historical catch has been used in the development of longline catch limits for bigeye tuna.

American Samoa Fishing Community

Territorial catch and allocation limits are intended to support fisheries development in American Samoa, consistent with MSA's National Standards. NMFS does not expect Alternative 2 to have an impact on American Samoa cultural fishing practices, because the limits would not change where American Samoa longliners are allowed to fish, or where other gear types can fish, or how the fishermen use or share their fish. While under this alternative, the Government of American Samoa might allocate some bigeye quota to territory fishing arrangements that otherwise would be available for use by cultural fishers, the limit reserved to the territory (1,000 t) significantly exceeds the amount of bigeye annually harvested by American Samoa fishermen. Moreover, this action does not mandate that any territory allocate any portion of its allocation limit to fishing arrangements. Thus, we expect that this action will not adversely affect existing cultural fishing practices. NMFS would solicit comments from the public regarding impacts to American Samoa cultural fishing after receiving a Council recommendation.

Guam and CNMI Fishing Communities
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 Marianas.

Under Alternative 2, the fishing community in Guam and the CNMI 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 in magnitude of impact, depending on the fishery improvement projects implemented. Fishery improvement 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. Funding from past agreements have supported fisheries development projects in the U.S. participating territories including a 250 ft fishing platform on Guam, and community MCP projects and improvements to Garapan Fishing Base in CNMI (Kingma 2016).

Also under Alternative 2, the U.S. participating territories may receive 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. The authorization of specified fishing agreements require attribution of catch 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. Catch history is important for maintaining fisheries access should the WCPFC agree to catch limits for PTs, as historical catch has been used in the development of longline catch limits for bigeye tuna.

4.4.3 Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 t of the catch limit

Alternative 3 is likely to have positive benefits for participants in Hawaii longline fisheries, and the fishing communities of Hawaii and the U.S. participating territories for the reasons described in this section.

Hawaii Longline Fisheries
As opposed to Alternative 1, the Hawaii longline fishery participants may benefit from the ability to enter into agreements with a U.S. participating territory. In general, benefits from arrangements for fishery participants include a reduced incentive to fish for seasonally variable bigeye tuna in the EPO (which saves money), the ability to supply locally caught fish, consistent fishing grounds, 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.

Like Alternative 2, if the fishery meets the U.S. bigeye tuna limit, Hawaii longline vessels could enter into a specified fishing agreement under which NMFS attributes their catch to the U.S. participating territory party to the agreement. 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. Increases

from status quo in bigeye allocation limits could reduce disruption in the fishery as the fishery may not need their full authorized allocation limits in three specified fishing agreements in order to fish throughout the year in the WCPO. Fishing in the EPO during November and December is a less desirable option, as fishermen report that bigeye catches increase near the MHI during these months, whereas fishing in the EPO usually means longer transit times, which results in higher trip costs (Ayers et al. 2018), fewer numbers of sets, and potentially poorer quality fish at auction. Profits could be lower for fishermen who must fish in the EPO due to the aforementioned factors including the seasonal and inter-annual availability of bigeye tuna in the EPO.

American Samoa Longline Fishery

Alternative 3 would involve specified fishing agreements between the U.S. participating territories and FEP-permitted vessels, which results in funding to support fisheries development projects identified in a U.S. participating territory's MCP. Fishing communities in American Samoa would benefit indirectly through fishery improvement projects funded from specified fishing arrangements. Under higher allocation limits, fewer specified fishing agreements may be necessary in order to minimize disruption in the Hawaii-based longline fishery and the funding may increase for higher amounts of bigeye tuna. Depending on which territories enter into specified fishing agreements, there may be reduced or increased funding available to American Samoa under Alternative 3. Benefits are expected to vary per fisheries development project in magnitude of impact, depending on the fishery improvement projects implemented. Fishery improvement 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. Funding from past agreements have supported fisheries development projects in the U.S. participating territories including boat ramps, ice machines and designs for longline dock extension in American Samoa (Kingma 2016).

Also under Alternative 3, the U.S. participating territories may receive positive benefits from developing catch history within WCPFC managed fisheries. American Samoa has domestic longline capacity with a history of targeting albacore, but not other species. The authorization of specified fishing agreements require attribution of catch 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. Catch history is important for maintaining fisheries access should the WCPFC agree to catch limits for PTs, as historical catch has been used in the development of longline catch limits for bigeye tuna.

Alternative 3 Outcome E may lead to increased effects on the American Samoa longline fishery if the territory chooses to allocate its entire quota in a specified fishing agreement. These impacts could be alleviated through monitoring and forecasting of fleet catches and the process by which the Council reviews specified fishing agreements prior to authorization. The government of American Samoa could control the amount of catch allocated and thus reserve a greater portion of the 2,000 t limit for local vessels and cultural fishers and reduce potential effects to local fishery participants. If American Samoa were to enter into a specified fishing agreement for all 2,000 t, NMFS would have to prohibit retention of bigeye tuna in the local albacore targeting fleet and retention by dual-permitted vessels. NMFS attributes the bigeye tuna caught by dual-permitted vessels outside the EEZ around Hawaii to American Samoa. NMFS expects that

American Samoa permitted vessels fishing in the SPO would continue fishing, but would forego revenue associated with bigeye tuna landings in the event of a bigeye tuna restriction.

American Samoa Fishing Community

The measure for establishing catch and/or allocation limits is intended to support fisheries development in American Samoa, consistent with MSA's National Standards. NMFS does not expect Alternative 3 to have an impact on American Samoa cultural fishing practices, because the limits do not change where American Samoa longliners are allowed to fish, or where other gear types can fish, or how the fishermen use or share their fish. While under Alternative 3 Outcome E we assume the Government of American Samoa allocates all of its bigeye quota to territory fishing arrangements that otherwise would be available for use by cultural fishers, this is not a realistic scenario and the territory would retain the ability to protect some bigeye quota for the use of cultural fishers. This action does not mandate that any territory allocate any portion of its allocation limit to fishing arrangements. Thus, we expect that this action will not adversely affect existing cultural fishing practices. NMFS would solicit comments from the public regarding impacts to American Samoa cultural fishing after receiving a Council recommendation.

Guam and CNMI Longline Fisheries and Fishing Communities

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 Marianas.

Under Alternative 3, NMFS expects the fishing community in Guam and the CNMI 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 in magnitude of impact, depending on the fishery improvement projects implemented. Fishery improvement 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. Funding from past agreements have supported fisheries development projects in the U.S. participating territories including a 250 ft fishing platform on Guam, and community MCP projects and improvements to Garapan Fishing Base in CNMI (Kingma 2016).

Under higher allocation limits, fewer specified fishing agreements may be necessary in order to minimize disruption in the Hawaii-based longline fishery and the funding may increase for higher amounts of bigeye tuna. Depending on which territories enter into specified fishing agreements, there may be reduced or increased funding available to Guam or the CNMI under Alternative 3.

Also under Alternative 3, the U.S. participating territories may receive 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. The authorization of specified fishing agreements require attribution of catch 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. Catch history is important for maintaining fisheries

access should the WCPFC agree to catch limits for PTs, as historical catch has been used in the development of longline catch limits for bigeye tuna.

4.5 Potential Effects on Protected Species

This section describes the potential effects of the alternatives on protected species identified in Section 3.3. Under all outcomes associated with the alternatives, the current and maximum foreseeable 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, in accordance with MMPA false killer whale take reduction plan regulations, deep-set longline fishing was temporarily prohibited in an area of the EEZ south of Hawaii, the SEZ, between July and December 2018 due to the fishery's observed serious injury interactions with four false killer whales (83 FR 33484, July 18, 2018). As noted in Section 3.3, NMFS is required to re-initiate consultation under ESA Section 7 if any ITS applicable to any longline fishery is exceeded or another criterion for reinitiation is triggered.

4.5.1 Alternative 1: No specification of territorial catch or allocation limits (No Action)

Under Alternative 1, NMFS would not authorize any specified fishing agreements and would close the WCPO after the fishery reaches the U.S. limit for the WCPO, likely before November.

Hawaii longline fisheries
During a bigeye catch and retention restriction under Alternative 1, NMFS expects Hawaii longline fishing effort to shift to the EPO, where interactions with protected species may also occur. Due to the distance and cost involved in transiting to the EPO, and potential for fewer boats to venture to that zone due to safety at sea issues, NMFS expects less overall effort than if the WCPO remained open to fishing for bigeye tuna. Some boats may switch to targeting swordfish if the shallow-set fishery is open in the event of a WCPO closure.

In the 2014 BiOp and 2017 BiOp, NMFS assumed the deep-set fishery would continue to operate throughout the year, deploying approximately 46,117,532 hooks. 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 increasing trend beginning in 2013. In 2017, 145 deep-set longline vessels made 1,539 trips with 19,674 sets and deployed 53.5 million hooks (WPFMC 2018a). Figure 10 shows the effort trend in millions of hooks set annually compared to the level of effort analyzed in the 2014 BiOp and 2017 BiOp. Although the number of hooks deployed has risen slightly, interactions have remained within expected levels with the exception of east Pacific green sea turtle DPS.

The 2018 BE supporting reinitiation of Section 7 consultation for the deep-set longline fishery assumes that the recent increasing trend in fishing effort will continue, the fishery will remain open throughout the year, and that the Council may recommend up to 2,000 t allocation limits for each U.S. participating territory. NMFS assumes the fishery could potentially deploy up to 60,938,785 hooks annually over the next five years, taking into account the potential increase in fishing effort from current participants in the fishery, as well as new entrants into the fishery under latent permits (NMFS 2018d). The 2018 BE supporting reinitiation for the shallow-set

fishery assumed that the fishery would remain open throughout the year fishing within the range of effort that has occurred in the time period (NMFS 2018d).

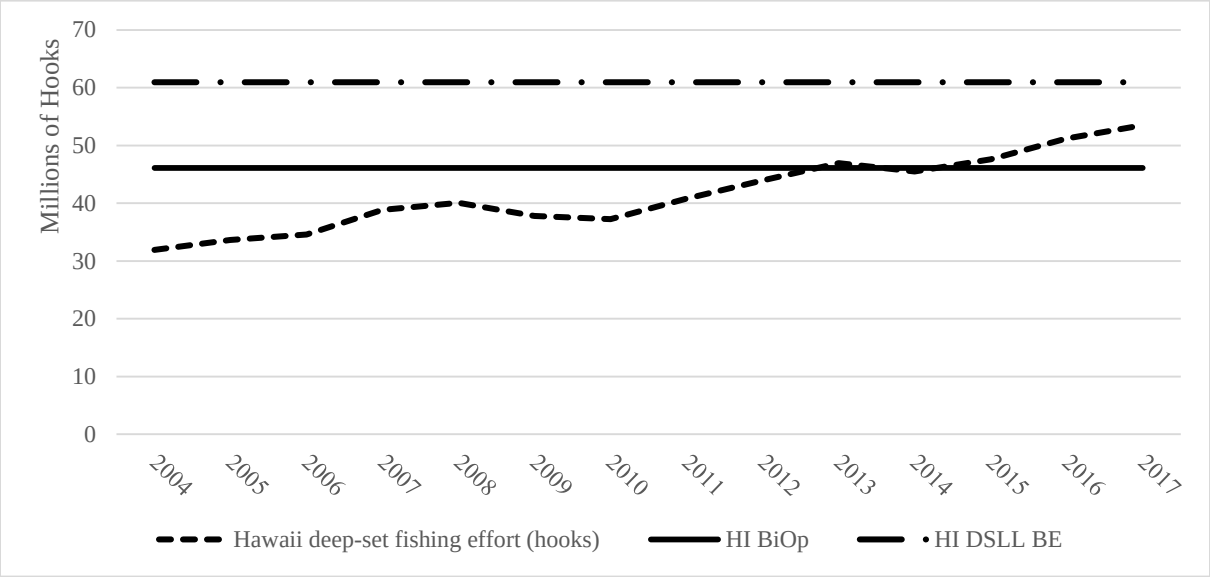

Figure 10. Deep-set fishing effort in the Hawaii longline fishery in millions of hooks as compared to the level of effort evaluated in the 2014 BiOp, as supplemented (2017) and 2018 BE.
Sources: WPFMC (2018a), NMFS (2014), NMFS (2017a) and NMFS (2018d).

Fishing effort under Alternative 1 may be lower than baseline conditions, and therefore anticipated levels of interactions with protected species may be correspondingly lower. Accordingly, NMFS expects Alternative 1 to result in protected species interactions within the levels described in the 2014 BiOp as supplemented (2017) on the operation of the deep-set fishery, 2018 BE, and Section 3.3 which do not represent substantial effects on any species.

NMFS expects protected species interactions similar to those in recent years in the shallow-set longline fishery under Alternative 1, as the WCPO bigeye tuna fishery has closed in recent years for portions of the year. Therefore, NMFS expects Alternative 1 to result in protected species interactions within the level described in the 2012 BiOp on the operation of the shallow-set fishery, 2018 BE,and Section 3.3 which do not represent substantial effects on any species.

The Hawaii deep-set and shallow-set longline fisheries may interact with the newly listed oceanic whitetip shark and giant manta ray. These species were not included in the 2014 BiOp, as supplemented (2017) on the operation of the deep-set longline fishery or the 2012 BiOp on the operation of the shallow-set longline fishery. NMFS reinitiated ESA Section 7 consultation for the Hawaii deep-set longline fishery on October 4, 2018 and for the Hawaii shallow-set longline fishery on April 20, 2018.

The stock assessment for the oceanic whitetip shark (Rice and Harley 2012a) estimated current biomass of oceanic whitetip sharks in the WCPO to be 7,295 t and current catch at 2,001 t annually. The FAO (2013) estimates 7,295 t of shark biomass would be equivalent to roughly 200,000 individuals. At an average 76.9 percent post-release survival rate, NMFS estimates that

the anticipated level of interactions in the deep-set fishery in any given year of equal to or less than 3,185 oceanic whitetip sharks represents 735 mortalities or 0.367% (735/200,000*100) of the estimated number of individuals in the WCPO (NMFS 2018d). At an average 87.1 percent post-release survival rate, NMFS estimates that the anticipated level of interactions in the shallow-set fishery in any given year of equal to or less than 227 oceanic whitetip sharks represents 29 mortalities or 0.0145% (29/200,000*100) of the estimated number of individuals in the WCPO (NMFS 2018e). Population estimates of oceanic whitetip sharks in the EPO are unavailable, and thus this population-level impact is a conservative estimate.

A preliminary analysis of annual standardized CPUE for oceanic whitetip shark for 1995-2014 conducted as part of the 2016 Status Review Report (Young et al. 2016) indicated that the population in the area of the Hawaii longline fishery operation might have stabilized in recent years. Observer data from 2015 and 2016 indicate that the nominal CPUE was approximately the same or slightly higher than 2014 (NMFS Observer data, unpublished), but these data are not standardized and should be interpreted with caution. Based on this information, the negligible proportion of the population that may be affected by the operation of the longline fleet, and the high proportion of sharks released alive, the impact of the Hawaii longline fisheries on the oceanic whitetip shark population is likely to be minimal.

NMFS estimates in the 2018 BE for the deep-set fishery that the anticipated level of interactions for giant manta rays in any given year of equal to or less than 84 would lead to 6 giant manta ray mortalities, based on a 92.7 percent post-release survival rate (NMFS 2018d). NMFS estimates that for the shallow-set fishery, the anticipated level of interactions for giant manta rays in any given year of equal to or less than 10 would lead to 3 giant manta ray mortalities (NMFS 2018e). There is no historical or current global abundance estimates or stock assessments for giant manta rays. Most estimates of subpopulations are based on anecdotal observations, and range from around 100-1,500 (Miller and Klimovich 2016). Little information is available on the abundance of giant manta rays in the high seas area in the central north Pacific where the Hawaii deep-set longline fishery operates. Nevertheless, the 2016 NMFS Status Review Report for the giant manta ray concluded that the incidental catch of this species in U.S. longline fisheries are likely to have minimal effects on the population (Miller and Klimovich 2016).

Based on available information to date, and as discussed in sections 3.3.4.1, NMFS expects the impacts to these species by this fishery to be minimal. NMFS also notes that the protective regulations under Section 4(d) of the ESA were not deemed necessary or appropriate for the conservation of these two species at this time.

American Samoa Longline Fishery

In 2015, NMFS evaluated the potential impact of the American Samoa longline fishery on ESA-listed species under its jurisdiction.

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 (NMFS 2015b). NMFS issued a BiOp on October 30, 2015 that specifically evaluated the potential effects of the American Samoa longline fishery on leatherback and olive ridley sea turtles, the Indo-West Pacific scalloped hammerhead DPS and the six ESA listed reef corals. NMFS determined that the fishery is not likely to jeopardize the continued existence of ESA-listed species under NMFS

jurisdiction. The American Samoa longline fishery has not exceeded the authorized ITS for any species issued in the 2015 BiOp. Therefore, NMFS findings and conclusions described in the BiOp remain valid for this fishery.

NMFS also determined that, because there is no new information on fishery interactions with humpback, sperm, blue, fin, or sei whales, the previous NMFS determination of July 27, 2010, remains valid, i.e., the fishery is not likely to adversely affect those species.

Under Alternative 1, NMFS expects fishing effort to remain at recent levels for the American Samoa longline fishery. Anticipated levels of interactions with protected species would be similar to or below recent levels (see Section 3.3), which are below the levels evaluated in the most recent biological opinion (17,554,000 hooks). The potential effects at the level of effort analyzed in the 2015 BiOp are not substantial for any species. As of 2017, effort by millions of hooks had declined to about half of that analyzed in the 2015 BiOp (Figure 11).

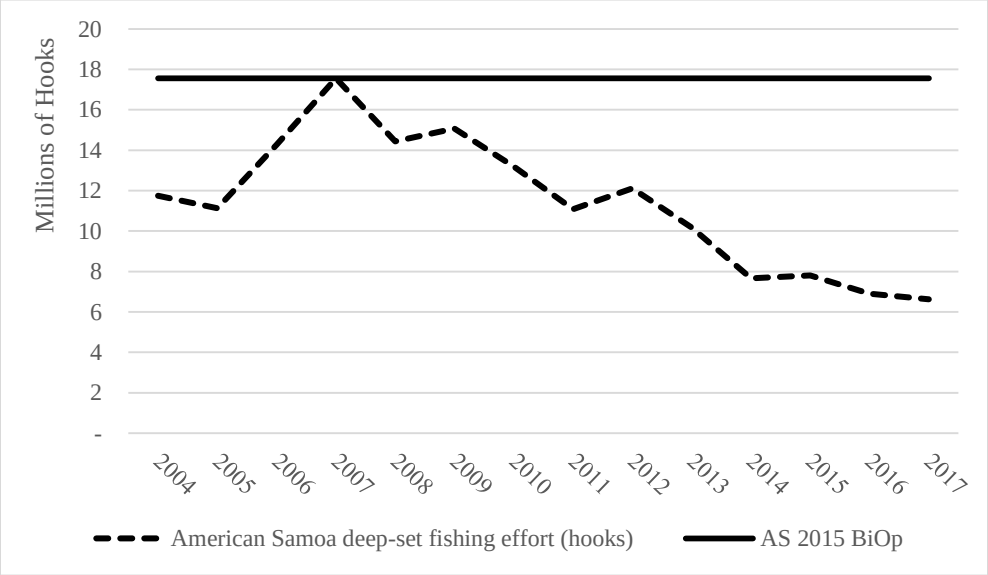

Figure 11. Deep-set fishing effort in millions of hooks in the American Samoa longline fishery as compared to the level of effort analyzed in the 2015 BiOp.
Source: WPFMC (2018a) and NMFS (2015b).

The American Samoa longline fishery may interact with the newly listed oceanic whitetip shark and giant manta ray. These species were not included in the 2015 BiOp. NMFS intends to promptly reinitiate consultation on the operation of this fishery, as required by 50 CFR 402.16.

The stock assessment for the oceanic whitetip shark (Rice and Harley 2012a) estimated current biomass of oceanic whitetip sharks in the WCPO to be 7,295 t and current catch at 2,001 t annually. The FAO (2013) estimates 7,295 t of shark biomass would be equivalent to roughly 200,000 individuals. The American Samoa longline fishery caught an average of 591 oceanic whitetip sharks annually during 2006-2017. At an average 68% post-release survival rate (NMFS unpublished data), NMFS estimates the anticipated level of interactions in any given year of equal to or less than 591 sharks represents 189 mortalities or 0.0945% (189/200,000*100) of the estimated number of individuals in the WCPO. Based on the negligible proportion of the

population affected by the operation of the longline fleet and the high proportion of sharks released alive, the impact of the American Samoa longline fishery on the oceanic whitetip shark population is likely to be minimal.

The American Samoa longline fishery caught an average of 5.33 giant manta rays annually during 2006-2017. Based on an average post-release survival rate of 99%, NMFS expects up to one mortality annually (5.33 x 0.01 = 0.05, rounded to 1) (NMFS unpublished data). There is no historical or current global abundance estimates or stock assessments for giant manta rays. Most estimates of subpopulations are based on anecdotal observations, and range from around 100-1,500 (Miller and Klimovich 2016). Little information is available on the abundance of giant manta rays in U.S. EEZ around American Samoa here the American Samoa longline fishery operates. Nevertheless, the 2016 NMFS Status Review Report for the giant manta ray concluded that the incidental catch of this species in U.S. longline fisheries are likely to have minimal effects on the population (Miller and Klimovich 2016).

Based on available information to date, and as more fully discussed in section 3.3.4.3, NMFS expects the impacts to these species by this fishery to be minimal. NMFS also notes that the protective regulations under Section 4(d) of the ESA were not deemed necessary or appropriate for the conservation of these two species at this time.

NMFS does not expect large adverse impacts to the chambered nautilus. Longline vessels avoid deploying gear in areas where chambered nautilus may occur; the animals live in close association with the substrate on coral reefs, fore reefs and deep reef slopes, which fishermen avoid to reduce the potential for loss of gear. This minimizes the risk of hooking and entanglement. Vessel strikes from transiting are unlikely, as the longline fishery avoids shallow areas to protect the vessel's hull. Pelagic longline vessels do not anchor and therefore there are no impacts from anchoring or impacts to habitat from anchoring. Finally, discharge of pollutants from vessels will likely be infrequent, small, and quickly diluted or dispersed during transit and fishing operations. Due to the spatial separation between the fishery and the habitat of chambered nautilus and the reasons described above, NMFS expects that impacts to chambered nautilus from the operation of the fishery are extremely unlikely to occur.

Guam and CNMI Longline Fisheries
Because the CNMI and Guam longline fisheries are not in operation, NMFS does not expect any interactions with protected species. Therefore, there would be no potential effects to protected species under Alternative 1.

4.5.2 Alternative 2: Specify for each U.S. participating territory a 2,000 t bigeye catch limit and 1,000 t bigeye allocation limit (Preferred/Status Quo)

Hawaii Longline Fisheries
Hawaii longline vessels operating under specified fishing agreements under Alternative 2 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. The 2012 shallow-set BiOp and 2014 deep-set BiOp as supplemented (2017) evaluated the effects of the fisheries 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. The BE on the

deep-set longline fishery evaluated effects to the eastern Pacific green sea turtle DPS, oceanic whitetip shark, and giant manta ray and found impacts to these populations are insubstantial (NMFS 2018d). The BE supporting reinitiation for the shallow-set fishery came to a similar conclusion for Guadalupe fur seal, oceanic whitetip shark, giant manta ray, and loggerhead sea turtles (NMFS 2018e).

Under Alternative 2, NMFS expects impacts to protected species from Hawaii longline vessels operating under one, two or three fishing agreements are expected to be within baseline levels identified in Section 3.3, which are not expected to result in large adverse effects to any protected species.

American Samoa Longline Fishery
Because the American Samoa longline fishery primarily targets south Pacific albacore tuna, the fishery's impact on protected species under Alternative 2 is expected to be similar to levels identified in Section 3.3. 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 similar to recent years and interactions currently authorized by NMFS are not expected to be exceeded under Alternative 2. Potential effects to protected species from the American Samoa longline fishery would not be substantial under Alternative 2.

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 interactions with 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.

4.5.3 Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 t of the catch limit

Hawaii Longline Fisheries
Hawaii longline vessels under Alternative 3 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 2012 shallow-set BiOp and 2014 deep-set BiOp as supplemented (2017) evaluated the effects of the fisheries 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. The BE on the deep-set longline fishery evaluated effects to the eastern Pacific green sea turtle DPS, oceanic whitetip shark, and giant manta ray and found impacts to these populations are insubstantial (NMFS 2018d). The BE supporting reinitiation for the shallow-set fishery came to a similar conclusion for Guadalupe fur seal, oceanic whitetip shark, giant manta ray, and loggerhead sea turtles (NMFS 2018e).

The 2018 deep-set longline BE assumed the fishery would operate throughout the year under allocation limits up to 2,000 t. NMFS has determined that impacts to protected species would be insubstantial under assumed increased levels of effort (NMFS 2018g). Under Alternative 3, impacts to protected species from Hawaii longline vessels operating under one, two or three fishing agreements are expected to be within levels identified Section 3.3, which are not expected to result in large adverse effects to any protected species. NMFS expects Hawaii shallow-set longline interactions with protected species would be similar to those described in Section 3.3 under Alternative 3, as vessels may choose which fish to target.

American Samoa Longline Fishery

Because the American Samoa longline fishery primarily targets south Pacific albacore tuna, the fishery's impact on protected species is expected to be similar to levels identified in Section 3.3. As a result of Alternative 3, 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. In Alternative 3 Outcome E, American Samoa would not retain any of its bigeye tuna catch limit, but NMFS expects that the fishery would continue fishing and not retain bigeye tuna rather than discontinue fishing. Therefore, fishing effort levels are expected to be similar to recent years and interactions currently authorized by NMFS are not expected to be exceeded under Alternative 3. Potential effects to protected species from the American Samoa longline fishery would not be substantial under Alternative 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 interactions with 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.

4.6 Potential Effects on Marine Habitats, Critical Habitat and Essential Fish Habitat

Under all outcomes associated with the alternatives, NMFS does not anticipate any adverse effects to 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 effects 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. Longline fishing does not occur in MPAs, marine sanctuaries or marine monuments, so marine protected areas would not be impacted.

MHI IFKW prey species are a characteristic of the essential feature of critical habitat for this DPS. U.S. landings in the WCPO compared to each stock's total estimated biomass are generally less than one percent for prey species with estimated biomass (NMFS 2018b), and international and domestic management measures strive to ensure the sustainability of these stocks. Additionally, the diversity in IFKW diet likely indicates the whales shift to available prey items

to meet their energetic needs. The longline fisheries do not harvest MHI IFKW prey in the area designated as critical habitat. Based on this available information, NMFS does not expect the Hawaii longline fisheries to contribute to the long-term reduction in quantity, quality, or availability of MHI IFKW prey species over the range of the fish stocks that these whales encounter (NMFS 2018d; 2018e).

Longline fishing involves suspending baited hooks in the upper surface layers of the water column, which 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; however, the loss of longline gear during normal fishing operations is not believed to be at levels that result in substantial or adverse effects to EFH, HAPC, or the marine habitat (WPFMC 2014).

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. 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 do not continue to ghost fish indefinitely since baits 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 seabed 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, Hawaii longline fishermen have participated in the Honolulu Harbor Derelict Fishing Gear Port Reception Program since 2006. Fishermen voluntarily dispose of retrieved derelict nets and spent longline gear in a receptacle in Honolulu Harbor. After transport to Schnitzer Steel Corporation, the nets are cut up for incineration at Honolulu City and County's H-Power plant. The H-Power facility then incinerates the derelict fishing gear to generate electricity. This model private/public partnership will continue under all alternatives.

4.7 Potential Effects on Management Setting

This section describes the potential effects of the bigeye tuna outcomes on the managements setting identified in Section 0.

4.7.1 Alternative 1: No specification of territorial catch or allocation limits (No Action)

Under Alternative 1, NMFS would experience a reduced administrative burden compared to recent years. While the Council is considering WCPFC decisions and whether to recommend catch/effort and allocation limits for pelagic MUS during the year, if the Council does not recommend any limits PIFSC could halt in-season catch monitoring when the Hawaii longline fisheries reach the U.S. limit in the WCPO and EPO; NMFS would not review or implement catch/effort or allocation limits; the Council and NMFS would not review any specified fishing agreements; and NMFS would not authorize any specified fishing agreements. NMFS would still publish a closure of the WCPO if the fishery reaches the U.S. limit and notify permit holders, and OLE and the USCG would enforce the closure. NMFS would continue to monitor the stock status of pelagic MUS and notify the Council of overfishing and overfished determinations.

4.7.2 Alternative 2: Specify for each U.S. participating territory a 2,000 t bigeye catch limit and 1,000 t bigeye allocation limit (Preferred/Status Quo)

Under Alternative 2, the administrative costs would be similar to that described in Section 0, including in-season monitoring of the U.S. WCPO longline catch limits for bigeye tuna, and regulatory and management costs associated with announcing a catch prohibition and notifying fishermen. Additional costs above Alternative 1 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 throughout the year, and authorizing each specified fishing agreement.

4.7.3 Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 t of the catch limit

Under Alternative 3, the administrative costs would be similar to those described in Alternative 2. Under 1,500 t and 2,000 t allocation limits, however, the vessels may enter into 1 specified fishing agreement rather than 1 to 2 each year. Also, if American Samoa were to allocate its entire quota, NMFS would issue a prohibition on retention of bigeye tuna for American Samoa permitted longline vessels and only attribute catch from vessels authorized to fish under a specified fishing agreement between American Samoa and longline vessels permitted under the Pelagics FEP to American Samoa.

4.8 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. 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 the alternative actions considered may affect, or the baseline for assessing the direct and indirect effects of the proposed action, as presented in Section 2.

The cumulative effects analysis is organized by the following issues: target and non-target species, protected species, and the socio-economic setting. 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, the alternatives considered would not have an effect on air/water quality, coral reefs, or benthic marine habitats. As such, we do not consider these resources in the cumulative effects analysis.

4.8.1 Cumulative Effects on Target and Non-Target Stocks

4.8.1.1 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 before approval by NMFS. These include the following actions:

- Modifications to the territorial catch and/or effort and allocation limits measure to allow for multi-year limits and establishing allocation limits without catch limits;
- American Samoa longline limited access permit program modifications to support fishery participation by small vessels (< 50ft) in the fishery and reduce program complexity;
- Exemption to the American Samoa LVPA;
- Establishing a framework for domestic catch and effort limits and specifying a striped marlin limit;
- Revising FEP management objectives and converting the FEPs to living documents;
- Modification to the American Samoa longline swordfish trip limit;
- Annual catch limits for American Samoa, Guam, and CNMI bottomfish and MHI Kona crab for fishing year 2019; and
- Annual catch limits for MHI non-deep seven bottomfish, deepwater shrimp, and precious corals for fishing years 2019-2021.

In general, the alternatives considered would not have interactive effects with the proposed actions listed as they vary in management scope and impact. The public is afforded the opportunity to review and comment on the actions. The modification to the territorial catch and/or effort and allocation limits measure, however, is the mechanism used in this action to establish territorial longline bigeye tuna catch limits. The potential environmental effects of establishing limits for bigeye tuna each year have been considered in the previous sections in this chapter, as NMFS intends to use this EA to support future territorial bigeye tuna specifications, and so will not be repeated in this section. The potential cumulative environmental effects of establishing bigeye tuna allocation limits without catch limits or multi-year limits for the territories are considered throughout this chapter, where relevant. Because the Council has not considered territorial catch or allocation limits for other species in the past, we only consider the effects of multiyear catch limits and allocation limits without catch limits for bigeye tuna.

International Management Actions

Regardless of which alternative is selected and which fishery outcome occurs, both the WCPFC and IATTC will continue to review fishery performance, stock status, and adopt management measures that are applicable to fisheries that catch bigeye tuna. To meet the conservation and management objectives of these regional fishery management organizations, international cooperation is required. The United States will continue to participate in these organizations and implement conservation and management measures that apply to U.S. fisheries.

External Factors

NMFS identified four major exogenous factors, other than fishing pressure from non-U.S. pelagic fisheries considered in the baseline description of the affected environment, 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 pelagic MUS 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 effects to 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, scientists need accurate and timely fisheries information to produce stock assessments that enable fishery managers to regulate harvests based on observed stock conditions.

Oceanic Noise Pollution

In the last 50 years, sound producing activities such as commercial shipping, hydrocarbon exploration and research, military sonar and other defense related-actions have increased ambient sound in the ocean (Hildebrand 2005). Ambient noise from shipping in the Pacific Ocean has doubled every decade for the last 40 years (McDonald et al. 2006). Noise pollution can affect commercially important fish stocks and marine mammals 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 influence 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 life stage, increases in oceanic noise levels could potentially have adverse effects to 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 is not quantified nor is the amount of fish species killed by ghost nets known. 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. Purse seine fisheries often used FADs to aggregate fish. While workers equip many of these FADs with radio transponders or 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[13] 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 affecting the abundance of target and non-target species. In general, Polovina et al. (1994) have shown that large-scale climate cycles can affect winds, currents, ocean mixing, temperature regimes, nutrient recharge, and affect the productivity of all trophic levels in the North Pacific Ocean.

For example, a scientific study using the spatial ecosystem and population dynamics model (SEAPODYM) showed an eastern shift in the biomass of skipjack and yellowfin tuna over time, with a large and increasing uncertainty for the second half of the century. The effects of fishing on biomass strongly outweighed the decreases contributed to climate change in the first half of this century (Senina et al. 2018). 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.

4.8.1.2 Cumulative Effects Analysis on Target and Non-Target Stocks

As described in Section 4, NMFS expects the direct and indirect impact of the alternatives considered would have minor positive and negative effects 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 CMMs. Fishermen use a range of fishing gears to harvest bigeye tuna, with primary impacts from longline and purse seine fisheries. In the WCPO, bigeye tuna is not overfished or experiencing overfishing according to LRPs described in the Pelagics FEP (WPFMC 2018a).

Alternatives 2 and 3 would involve NMFS oversight of limited allocation of bigeye tuna under three fishing arrangements. If the Council recommends multi-year catch or allocation limits, under the Council action to modify the territorial catch, effort, and allocation limits measure, NMFS expects that catches of non-target stocks by the Hawaii-based deep-set fishery would increase over catches in recent years. A reduced administrative burden under the establishment of multi-year limits may prevent a fishery closure in later years of implementation, so that the

[13] Meaning waters where relatively little plant life or nutrients occur, but which are rich in dissolved oxygen.

Hawaii-based longline fishery has an opportunity to harvest up to the maximum authorized catch and/or allocation limit, if all specified fishing agreements are authorized. If the deep-set fishery operates throughout the year, NMFS would expect reduced catches of EPO stocks, including EPO bigeye tuna, associated with the fishery remaining within the WCPO throughout the year, and increased catches of WCPO stocks over recent years. NMFS expects Hawaii shallow-set longline catches of non-target stocks and swordfish would be similar to their catch described in Section 3.2.1.4 under multi-year limits, as vessels may choose which fish to target, provided that the shallow-set sector is authorized to operate.

In accordance with federal regulations at 50 CFR 665.819, FEP permitted longline 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 3,554 t, and the current and expected levels of vessel participation, it is likely that the level of effort and associated catches will be within historical baseline levels or continue along the same modest increasing trend. Furthermore, the location of most U.S. longline fishing effort for bigeye tuna is expected to occur under all outcomes is an area in the central North Pacific with lower fishing mortality, as compared to the equatorial Pacific, which represents approximately 88 percent of fishing mortality on bigeye tuna in the WCPO. As discussed in Section 3.1.1, the majority of fishing effort by the Hawaii longline fishery occurs north of 20° N, 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).

Fishing effort for bigeye tuna drives catches of non-target species in the Hawaii longline fishery. If fishing effort for bigeye tuna increases, NMFS expects the catches of other target and non-target stocks to increase commensurate with the increases in catch of bigeye tuna. Even with an increase in catch in the deep-set fishery, however, NMFS expects the proportion of increased fishing mortality would remain low in comparison to MSY or total catch for all species. Bigeye tuna limits and the limited entry permit program would continue to constrain the fishery. NMFS expects this potential impact would not affect the stock status of the non-target stocks, and that multi-year limits will ensure that U.S. and U.S. participating territory longline fisheries continue to be managed sustainably, consistent with WCPFC CMMs and Magnuson-Stevens Act. The process includes review of the best scientific information available by the Council to determine whether limits should be established, modified, or rescinded. For these reasons, the U.S. and U.S. participating territory longline fleets are not expected to substantially impact non-target stocks when considering the cumulative effect of operating under multi-year bigeye tuna limits.

As described above, several exogenous factors may affect target and non-target species. The industrial scale purse seine and longline fisheries have the largest influence on the condition of the stocks. The Council/PIFSC analysis of the proposed action on the status of bigeye tuna in 2045 in Appendix A assumed full implementation of all bigeye tuna longline quotas in each of the proposed action scenarios, other sources of fishing mortality, and that the U.S. fisheries would continue to comply with applicable domestic and international conservation and management measures. If the Council did not recommend territorial bigeye tuna catch limits but did recommend a 2,000 t allocation limit for each of the territories, the total WCPO bigeye tuna fishing mortality for all U.S. and participating territory fleets would be 10,095 t (541 t for American Samoa, 0 t for Guam, 0 tons for CNMI, 3,554 t for the U.S. longline fleet, and 6,000 t in allocations). Applying the Council/PIFSC analysis to this scenario (Option M), the projected

F_{2045}/F_{MSY} = 0.87 and spawning biomass would be $SB_{2045}/SB_{F=0}$ = 0.36. The Council/PIFSC analysis also evaluated an option considering allocation limits up to 3,000 t without catch limits; under 3 fishing agreements, the projected F_{2045}/F_{MSY} = 0.88 and spawning biomass would be $SB_{2045}/SB_{F=0}$ = 0.36. The projections associated with the maximum WCPO bigeye tuna fishing mortality considered under the alternatives in this EA and cumulative impacts associated with the Council's action to modify the territorial catch, effort and allocation limits measure indicate bigeye tuna would not be subject to overfishing and not overfished in 2045.

Domestic bigeye tuna landings under the U.S. catch limit cannot supply the substantial demand for fresh and frozen tuna in the Hawaii market, which opens the market to foreign imports. NMFS expects that foreign imports would fill the market demand for bigeye tuna if NMFS restricts fishing for bigeye tuna in the WCPO, which is likely under Alternative 1. In this circumstance, we would assume the same amount of bigeye fishing mortality to satisfy the Hawaii market. Because foreign longline fisheries are not as well monitored in terms of target and non-target catches and landings and protected species interactions as compared to U.S. longline fisheries, the action alternatives would maintain the U.S. production of bigeye tuna through the highly monitored, environmentally responsible domestic longline fisheries. NMFS does not expect the effects to target and non-target stocks from the fishery outcomes under the alternatives, when combined with the cumulative effects, to result in large adverse effects on these stocks.

4.8.2 Cumulative Effects on Socio-Economic Setting

4.8.2.1 Past, Present, and Reasonably Foreseeable Future Management Actions

As noted in Section 3.2.7, 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

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 fishing costs. 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, for example 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.[14] 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, U.S. fishermen may find it difficult 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 may affect 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 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 effects 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 whereas Alternatives 2 and 3 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. participating territories.

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, which may impact Hawaii communities. Alternatives 2 and 3 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.

4.8.2.2 Cumulative Effects Analysis on Fishery Participants and Fishing Communities

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

Regardless of the alternative, NMFS and the Council would continue to manage Western Pacific pelagic fisheries 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.

Multi-year limits under a modified territorial catch, effort, and allocation limit measure may benefit fishery participants and fishing communities by eliminating the gap between a WCPO closure for reaching the U.S. limit and fishing under a specified fishing agreement. While unexpected, the Hawaii-based deep-set longline fishery has closed under Alternative 2 due to reaching the catch limit before the allocation limits were in place in 2015, 2016, and 2017. Under multi-year implementation, the administrative burden of annually specifying bigeye tuna catch limits would be reduced in years past the first year of implementation, provided that the Council and NMFS do not modify or rescind the catch limits. The Council's annual review would determine whether established limits should be modified or rescinded, and a recommendation would trigger NMFS review and the associated administrative process. Multi-year limits could therefore ameliorate all of the fishery impacts resulting from a WCPO closure on the Hawaii longline fishery participants and fishing community identified under a modified measure, in years other than the first year of implementation. NMFS does not expect that multi-year limits would have any additional effects on the longline fisheries of American Samoa, Guam, or the CNMI, or on the U.S. participating territory fishing communities.

Also under a modified measure, if the Council does not recommend bigeye tuna catch limits but does recommend allocation limits, American Samoa would not need to reserve a portion of its catch limit for the local albacore targeting fleet or dual-permitted vessels in order to prevent a restriction on catch. Without an annual total catch limit, American Samoa longline limited entry permit holders would not be subject to potential closure for exceeding the catch limit.

Alternatives 2 and 3 would provide minor to moderate benefits to fishery participants and provide fisheries development funding to the U.S. territories through the WP SFF. NMFS expects these alternatives 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 long-term stability in the commercial pelagic fisheries. Such stability would result in fewer cumulative effects of external stressors on fishing participants and communities, as compared to Alternative 1.

4.8.3 Cumulative Effects on Protected Species

4.8.3.1 Past, Present, and Reasonably Foreseeable Future Management Actions

Through data collected from observer programs and other sources, the Council and NMFS will continue to monitor interactions between managed fisheries and protected species. 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 protected species and how to reduce and mitigate interactions. Due to the recent listing of oceanic whitetip shark and giant manta ray, NMFS will reinitiate ESA-consultation on pelagic deep-set longline fisheries managed under the Pelagics FEP. NMFS has reinitiated consultation on the operation of the Hawaii shallow-set fishery and deep-set fishery.

4.8.3.2 Cumulative Effects Analysis on Protected Species

As previously described in Section 3, the Council and NMFS have taken significant steps to reduce sea turtle and seabird interactions in longline fisheries, and conducts work and research to further reduce interactions. Longline fisheries managed under the Pelagics FEP are the benchmark for successful sea turtle and seabird interaction reductions (WPFMC 2009), and the successes of the Council and NMFS' work have been transferred to other fleets in the region and serve as the basis for management measures in the WCPFC and IATTC.

Hawaii longline vessels operating under specified fishing agreements under multi-year catch or allocation limits 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 2012 shallow-set BiOp and 2014 deep-set BiOp as supplemented (2017) evaluated the effects of the fisheries 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. The BE on the deep-set longline fishery evaluated effects to the eastern Pacific green sea turtle DPS, oceanic whitetip shark, and giant manta ray and found impacts to these populations are insubstantial (NMFS 2018d). The BE supporting reinitiation for the shallow-set fishery came to a similar conclusion for Guadalupe fur seal, oceanic whitetip shark, giant manta ray, and loggerhead sea turtles (NMFS 2018e).

The 2018 deep-set longline BE assumed the fishery would operate throughout the year under allocation limits up to 2,000. NMFS has determined that impacts to protected species would be insubstantial under assumed increased levels of effort (NMFS 2018g). NMFS expects Hawaii shallow-set longline interactions with protected species would be similar to those described in Section 3.3 under multiyear limits, as vessels may choose which fish to target, or less in years when the shallow-set fishery is not authorized to operate throughout the year. Under multi-year catch or allocation limits, impacts to protected species from Hawaii longline vessels operating under one, two or three fishing agreements are expected to be within the levels identified Section 3.3 and are not expected to result in large adverse effects to any protected species.

Because the American Samoa longline fishery primarily targets south Pacific albacore tuna, the fishery's impact on protected species is expected to be the around levels identified in Section 3.3. As a result of multi-year allocation limits, 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 similar to recent years and interactions currently authorized by NMFS are not expected to be exceeded under multi-year catch or allocation limits. Potential effects to protected species from the American Samoa longline fishery would not be substantial under multi-year limits.

Under all alternatives and in consideration of potential modifications to the territorial catch, effort, and allocation limit measure, U.S. longline vessels would 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, effects to protected species would be similar to current operation under all alternatives. The levels of interactions that NMFS authorizes in each fishery do consider the estimated effects to the same species by all fisheries where the domestic fishery operates, as well as cumulative effects including conservation actions, environmental factors, and activities affecting the same resources. Cumulative effects of the U.S. fleets have been considered and authorized in the BiOps that apply to the domestic longline and other pelagic fisheries in the western Pacific. None of the alternatives would result in substantial changes to western Pacific pelagic longline fisheries; therefore, NMFS does not anticipate substantial impacts to protected species.

4.8.4 Climate Change

NMFS and the Council evaluated the potential effects of climate change on the resources considered in this document. We also considered the potential effects 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 effects of climate change on these resources may be positive if climate change effects benefit a species' prey base or otherwise enhance the species' ability to survive and reproduce, or effects may be negative if the impacts reduce a species' ability to survive and reproduce. Effects may also be neutral.

For the current proposed specifications, the effects 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. NMFS considers the effects of climate change on ESA-listed species in the BiOp for each fishery when issuing the ITS.

Climate change would have similar effects to the resources regardless of which alternative is selected. 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 effects 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
NMFS authorizes the U.S. longline fishery to conduct fishing with or without territorial bigeye tuna limits. Management measures do not control any particular level of fishing effort other than capping vessel length and the number of permits available 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 made by individual fishermen. For this reason, our comparison of potential greenhouse gas emissions will be qualitative.

Under Alternative 1, NMFS would prohibit the Hawaii deep-set longline fishery from retaining bigeye tuna caught in the WCPO when the fishery reaches the U.S. limit, usually before the end of the year. When this happens, the Hawaii longline fleet may shift effort to the EPO (east of 150° W) or some vessels may switch to targeting swordfish if the shallow-set fishery is open. Under Alternatives 2 and 3 vessels in the Hawaii deep-set longline fleet are expected to travel farther throughout the year 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, none of the outcomes is expected to result in a large change in greenhouse gas emissions.

5 APPLICABLE LAWS

Section 303 of the Magnuson-Stevens Act requires that any fishery management plan prepared by any fishery management council or by the Secretary of Commerce contain conservation and management measures that are consistent with the National Standards of the Act, other provisions of the Act, regulations implementing recommendations by international fishery management organizations and any other applicable law. This section identifies provisions of the other applicable laws that the NMFS and the Council has identified the proposed action must comply with, and rational for why this action is consistent with each applicable law.

5.1 National Environmental Policy Act

In accordance with the National Environmental Policy Act (NEPA) and CEQ implementing regulations, and NOAA Administrative Order (NAO) 216-6A – *Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetland*, NMFS must consider the effects of its proposals on the environment before taking action. 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. NMFS and the Council prepared this EA in accordance with NEPA and its implementing regulations, as well as NAO 216-6A. The Council and NMFS also developed the proposed action described in this EA in coordination with various federal and local government agencies that are represented on the Council.

The NMFS Regional Administrator will use this draft EA to consider the effects 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 requiring the preparation of an environmental impact statement.

5.2 Coastal Zone Management Act

The Coastal Zone Management Act requires a determination that a recommended management measure has no effect on the land, water uses, or natural resources of the coastal zone or is consistent to the maximum extent practicable with an affected state's enforceable coastal zone management program. On March 25, 2019, 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 and requested the programs review of and concurrence with its determinations.

5.3 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 effects to ESA-listed species under the jurisdiction of NMFS. The conclusions of these consultations are briefly summarized below.

Hawaii Deep-Set Longline Fishery

On January 6, 2012, the U.S. FWS completed a biological opinion (BiOp) that concluded the Hawaii deep-set fishery would not jeopardize the short-tailed albatross, and included an incidental take statement for that species. The Hawaii deep-set longline fishery has not exceeded the authorized incidental take statement (ITS) for the short-tailed albatross.

On September 19, 2014, NMFS completed a no-jeopardy BiOp for the continued operation of the Hawaii deep-set pelagic longline fishery. NMFS determined that the fishery is not likely to jeopardize the continued existence or recovery of humpback whales, sperm whales, MHI insular false killer whale distinct population segment (DPS), North Pacific loggerhead turtles, leatherback turtles, olive ridley turtles, green turtles, or the Indo-West Pacific DPS of scalloped hammerhead sharks. NMFS anticipated that the fishery could interact with and adversely affect these species, and authorized ITS for each of these species.

On September 16, 2015, NMFS concurred with the agency determination that the continued authorization of the Hawaii deep-set longline fishery is not likely to adversely affect Hawaiian monk seal critical habitat, and fin whales.

On March 24, 2017, NMFS completed a no-jeopardy supplement to the 2014 BiOp for the continued operation of the Hawaii deep-set pelagic longline fishery. NMFS determined that the

fishery is not likely to jeopardize the continued existence or recovery of the N. Pacific loggerhead sea turtle DPS, olive ridley sea turtles (endangered Mexico population and threatened global species), East Pacific green sea turtle DPS, Central North Pacific green sea turtle DPS, East Indian-west Pacific DPS, Southwest Pacific DPS, Central West Pacific DPS, and Central South Pacific DPS. NMFS anticipated that the fishery could interact with and adversely affect these species, and authorized incidental take statement (ITS) for each of these species.

On January 22, 2018, NMFS issued a final rule to list the giant manta ray as threatened species under the ESA (83 FR 2916). On January 30, 2018, NMFS issued a final rule to list the oceanic whitetip shark as threatened under the ESA (83 FR 4153). Both species occur in the action area of the Hawaii deep-set longline fishery. Neither species is subject to protective regulations under ESA section 4(d); and accordingly, take is not prohibited under ESA.

On October 4, 2018, NMFS reinitiated ESA Section 7 consultation for the deep-set fishery for all ESA-listed species under NMFS jurisdiction occurring in the action area due to three re-initiation triggers: listing of the oceanic whitetip shark and giant manta ray; designation of main Hawaiian Islands insular false killer whale critical habitat; and exceeding the ITS for east Pacific green sea turtle DPS in mid-2018. The 2014 BiOp as supplemented (2017) remains valid for all species which the fishery may likely adversely affect except oceanic whitetip shark, and giant manta ray. On October 4, 2018, NMFS determined that the conduct of the fishery during the period of consultation will not violate ESA Sections 7(a)(2) and 7(d).

Hawaii Shallow-set Longline Fishery

On January 6, 2012, the USFWS completed a BiOp that concluded the Hawaii shallow-set fishery would not jeopardize the short-tailed albatross, and included an incidental take statement for that species. NMFS previously evaluated the potential impacts of this fishery on ESA-listed species under NMFS jurisdiction and their designated critical habitat NMFS documented the determination in a no-jeopardy BiOp (January 30, 2012) and four separate letters of concurrence or no-effect determinations (August 27, 2008, October 6, 2014, March 2, 2015, and September 16, 2015).

In the 2012 BiOp, NMFS concluded that the continued operation of the shallow-set fishery would adversely affect, but was not likely to jeopardize the continued existence of the humpback whale, the loggerhead turtle, the leatherback turtle, the olive ridley turtle, or the green turtle, or result in destruction or adverse modification of designated critical habitat. The 2012 BiOp also included not likely to adversely affect determinations for the Hawaiian monk seal, the blue whale, the fin whale, the sei whale, the sperm whale, the North Pacific right whale, and the hawksbill sea turtle.

On September 10, 2014, NMFS 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 that seven occur in the EEZ. On October 6, 2014, NMFS determined that Pacific Island pelagic fisheries, including the shallow-set fishery, would not affect ESA-listed species of shallow reef-building corals. On March 2, 2015, NMFS determined that the continued authorization of the Hawaii shallow-set longline fishery is not likely to adversely affect the main Hawaiian Islands (MHI) insular false killer whale DPS and the Eastern Pacific scalloped hammerhead shark DPS. On

September 16, 2015, NMFS determined that the continued authorization of the Hawaii shallow-set fishery is not likely to adversely affect Hawaiian monk seal critical habitat and fin whales.

On October 16, 2014, NMFS issued a permit under Section 101(a)(5)(E) of the Marine Mammal Protection Act also authorizing the shallow-set fishery to incidentally take humpback whales from the Central North Pacific stock (79 FR 62105). Please note that, since the date of that permit, the CNP humpback whale was designated a DPS and is not a listed species under the ESA (81 FR 62259, September 8, 2016).

On December 27, 2017, the United States Ninth Circuit Court of Appeals found that NMFS' no jeopardy determination with respect to the impact of the shallow-set fishery on North Pacific loggerheads was arbitrary and capricious. *Turtle Island Restoration Network, et al..,* v. *Department of Commerce, et al..,* 878 F.3d 725 (2017). Upon remand to the district court and pursuant to a court-approved settlement agreement, the portions of the 2012 Bi Op discussing the North Pacific loggerhead were vacated.

This fishery also may interact with the newly listed giant manta ray and oceanic white tip shark. On April 20, 2018, NMFS reinitiated ESA Section 7 consultation for the shallow-set fishery for all ESA-listed species under NMFS jurisdiction occurring in the action area. On April 24, 2018, NMFS determined that the conduct of the fishery during the period of consultation will not violate ESA Sections 7(a)(2) and 7(d). On March 19, 2019, pursuant to the court-approved settlement agreement discussed above, NMFS closed the Hawaii-shallow set fishery through December 31, 2019 (Awaiting FR citation) for reaching the loggerhead sea turtle interaction hard cap. Therefore, the fishery is not authorized to operate for the remainder of 2019, and would have no effect on ESA-listed species for the remainder of 2019.

American Samoa Longline Fisheries

On October 30, 2015, NMFS issued a no-jeopardy BiOp on the continued operation of the American Samoa longline fishery. NMFS determined that the fishery is not likely to jeopardize the continued existence of green, leatherback, olive ridley, and hawksbill sea turtles, the South Pacific loggerhead sea turtle DPS, or the Indo-West Pacific scalloped hammerhead shark DPS. NMFS anticipated that the fishery could interact with and adversely affect these species, and authorized an ITS for each species. The American Samoa longline fishery has not exceeded the authorized levels of take for leatherback or loggerhead sea turtles or the Indo-West Pacific DPS of scalloped hammerhead shark in the BiOp.

NMFS also determined that, because there is no new information on fishery interactions with humpback, sperm, blue, fin, or sei whales, the previous NMFS determination of July 27, 2010, remains valid, i.e., the fishery is not likely to adversely those species. NMFS also determined that the continued authorization of the fishery is not likely to adversely affect ESA-listed species of shallow-reef building corals because there is very limited reef habitat in the EEZ, and longline vessels fish far offshore, well beyond 3 nm from shore.

On January 22, 2018, NMFS issued a final rule to list the giant manta ray as threatened species under the ESA (83 FR 2916). On January 30, 2018, NMFS issued a final rule to list the oceanic whitetip shark as threatened under the ESA (83 FR 4153). Both species occur in the action area

of the Hawaii deep-set longline fishery. Neither species is subject to protective regulations under ESA section 4(d); and accordingly, take is not prohibited under ESA. NMFS listed the chambered nautilus, which occurs in waters around American Samoa, as threatened under the ESA on September 28, 2018 (83 FR 48976).

NMFS intends to promptly reinitiate formal consultation regarding the effect of this fishery on the two recently listed species, oceanic whitetip shark and giant manta ray, as required by 50 CFR 402.16. For a discussion of the likely effects of this fishery on these species, see section **Error! Reference source not found.**. Neither species is subject to protective regulations under ESA section 4(d); and accordingly, take is not prohibited under ESA.

Guam and the Northern Mariana Islands

On March 29, 2001, NMFS completed a BiOp on the continued operation of the pelagic fisheries of the western Pacific, which considered the effects of all longline, troll, handline, and pole and line fisheries based in Hawaii, American Samoa, Guam, and the CNMI. NMFS determined that western Pacific pelagic fisheries are not likely to adversely affect any threatened or endangered marine mammal or the hawksbill sea turtle. In addition, NMFS determined that these fisheries were not likely to jeopardize the continued existence of green sea turtles, leatherback turtles, loggerhead turtles or olive ridley turtles and authorized an ITS for each of these species, which applied primarily to longline fisheries, although separate ITS were also provided non-longline fisheries of the western Pacific. The Guam and CNMI fisheries have not exceeded the authorized ITS for any species issued in the 2001 BiOP and is currently inactive. Therefore, the proposed action is not expected to affect endangered and threatened species or critical habitat in a manner not considered in previous ESA consultations.

5.4 Marine Mammal Protection Act

The 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.

According to the 2018 List of Fisheries (83 FR 5349, February 7, 2018), 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. Because there has been no documented interaction with marine mammals in longline fisheries of Guam and the CNMI and because those fisheries have been inactive since 2011, they are not classified in the 2018 List of Fisheries.

On October 16, 2014, NMFS issued a permit under the MMPA section 101(a)(5)(E), addressing the Hawaii deep-set and shallow-set longline fisheries' interactions with depleted stocks of marine mammals (79 FR 62105). The permit authorizes the incidental, but not intentional, taking of ESA-listed humpback whales, sperm whales, and main Hawaiian insular false killer whales. In authorizing this permit, NMFS determined that incidental taking by the Hawaii longline fisheries would have a negligible impact on the affected stocks of marine mammals. NMFS has prepared a draft negligible impact determination, and the permit under MMPA section 101(a)(5)(E) remains valid and effective until replaced in accordance with 5 U.S.C. § 558(c).

Under the proposed action, and due to existing fishery requirements (e.g., limited entry), NMFS does not expect U.S. longline fisheries to expand or change operations (e.g., area fished, number of vessels fishing, number of trips per year, number of hooks per set, depth of hooks, or gear deployment techniques).

NMFS does not expect longline vessels in the CNMI or Guam to catch bigeye tuna in the reasonably foreseeable future because there are currently no active longline fisheries based in those islands. In American Samoa, NMFS expects bigeye tuna catches by American Samoa longline vessels to be similar to the average annual catch in 2012-2017, approximately 541 t. As of 2017, effort in the American Samoa longline fishery by millions of hooks had declined to about half of that analyzed in the 2015 BiOp. Under this action, NMFS does not expect the proposed action would modify American Samoa longline, CNMI, or Guam fisheries operations in a manner that would result in an effect on any marine mammals that was not considered in previous ESA consultations or by the LOF's classification and MMPA Section 118 commercial fishery take authorization.

Longline fishing effort over time may gradually increase if latent permits in the Hawaii-based longline fishery are activated; however, NMFS does not anticipate new entry and subsequent fishing effort into the fishery in the near future because the number of vessels that have participated in the past ten years has been relatively stable with only a slight increase in recent years. 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 increasing trend beginning in 2013. In 2017, 145 deep-set longline vessels made 1,539 trips with 19,674 sets and deployed 53.5 million hooks. Although the number of hooks deployed in represents an increase of 3.21% from 2014 to 2017, interaction rates remain within levels authorized, and NMFS has no information to believe that this increase will result in a material change in the future conduct of the fishery that will introduce effects to marine mammals to an extent not considered in previous ESA consultations or by the LOF's classification and the Section 118 commercial fishery take authorization. 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 each year.

Because the proposed action would not modify vessel operations or other aspects of the longline fisheries of American Samoa, Guam, the 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.

5.5 National Historic Preservation Act

The National Historic Preservation Act requires federal agencies undergo a review process for all federally funded and permitted projects that will affect 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 EEZ around American Samoa, Guam, CNMI, Hawaii, and the Pacific Remote Island Areas, or in adjacent areas of the high seas in international waters where pelagic longline fishing activities are conducted. Because longline fisheries are conducted in deep waters far offshore and do not affect bottom features, neither current nor future longline fishing activities would be expected to affect submerged resources such as shipwrecks that could occur in offshore areas.

5.6 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 discussed in the Draft RIR (Appendix B) and the above criteria, none of the alternatives appears to have the potential to constitute a "significant" action under EO 12866.

5.7 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 affect 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.

5.8 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 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 EA. Furthermore, all reference materials utilized in the discussion and analyses are properly referenced within the appropriate sections of the EA. 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.

5.9 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to minimize the paperwork burden on the public resulting from the collection of information by or for the Federal government. It is intended to ensure 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 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.

Territorial catch and allocation limit actions comply with the provisions of the APA. In developing annual specifications and AM recommendations, the Council holds public meetings, provides opportunities for the public to comment on the proposed methods, specifications and recommendations, and the Council considers comments from the public and advisory bodies in making its recommendations. NMFS will publish proposed specifications and solicit public comments on the proposed rule and this draft EA in the *Federal Register*. 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.

5.11 Regulatory Flexibility Act

The Regulatory Flexibility Act (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.

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 $11 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 rule also will not place a substantial number of small entities, or any segment of small entities, at a significant competitive disadvantage to large entities.

NMFS does not expect the proposed action to have a significant economic impact on a substantial number of small entities. As such, an initial regulatory flexibility analysis is not required and none has been prepared.

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.[15]

The longline fisheries of Hawaii, American Samoa, Guam, and the Northern Mariana Islands are not known to have a large adverse environmental effect 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 effects to human health or on marine life. NMFS and the Council manage fisheries through federal regulations that 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.

NMFS does not expect the proposed action to have large effects 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, other environmental effects, or health effects if NMFS implements the proposed action.

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[15] "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).

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APPENDIX A: EVALUATION OF PROPOSED TERRITORIAL BIGEYE TUNA CATCH AND ALLOCATION LIMITS

Evaluation of US Territorial Bigeye Tuna Catch and Allocation Limits (Draft)

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Background

This report evaluates impacts on bigeye tuna stock status of a proposed U.S. management action that considers longline bigeye catch limits for the U.S. Participating Territories[1] of American Samoa, Guam, and Northern Mariana Islands. Consideration also includes limits on the amount of bigeye the U.S. Participating Territories could potential allocate under specified fishing agreements with Hawaii-permitted longline vessels. This report evaluates the impact on bigeye stock status of the various catch and allocation limit specifications under consideration by the Western Pacific Regional Fishery Management Council.

Bigeye tuna is considered a Pacific-wide stock, but is assessed separately in the western and central Pacific Ocean (WCPO) and the eastern Pacific Ocean (EPO). The most recent stock assessment for WCPO bigeye tuna was completed in July 2017 (McKechnie et al. 2017) and updated in 2018 (Vincent et al. 2018). The latest assessment incorporated bigeye catch data through 2015, and investigated alternative regional bigeye tuna spatial structure in combination with a new bigeye tuna growth curve, with the latter suggesting bigeye tuna is more productive than previously assumed.

The WCPFC Scientific Committee (SC) reviewed and endorsed the 2017 bigeye stock assessment at its Thirteenth Regular Session (SC13) as the most advanced and comprehensive assessment yet conducted for this species. At the Fourteenth Regular Session of the Science Committee (SC14), the SC also endorsed the use of the assessment model uncertainty grid as best available scientific information to characterize stock status and management advice. SC14 recommended to retain only model runs with the newest growth information, comprising 36 model configurations and noted variance in the assessment results with respect to regional stock structure. The consensus weighting considered all options to be equally likely within the four axes of uncertainty for steepness, tagging dispersion, size frequency and regional structure. The resulting uncertainty grid was used to characterize stock status, summarize reference points and to calculate the probability of breaching the Commission-adopted spawning biomass limit reference point ($0.2*SB_{F=0}$) and the probability of F_{recent} being greater than F_{MSY} (WCPFC 2018).

Based on the uncertainty grid adopted by SC14, the WCPO bigeye tuna spawning biomass is likely above the MSST of the Pelagics FEP and the WCPFC's biomass LRP. Additionally, recent

[1] American Samoa, Guam, and the Northern Mariana Islands have Participating Territory status within the WCPFC and are provided different catch and effort limits than the United States under WCPFC conservation and management measures.

F is likely below F_{MSY} (MFMT). Therefore noting the level of uncertainties in the current assessment it appears that the stock is not experiencing overfishing (94% probability, 34 of 36 models) and it appears that the stock is not in an overfished condition (100% probability) in 2015 with respect to Commission-adopted LRP (SB_{latest}/SB_{MSY}). The central tendency of relative recent SB under the selected new growth curve model weightings in the absence of fishing was median ($SB_{recent}/SB_{F=0}$) = 0.36 with a range of 0.25 to 0.45 and (median SB_{latest}/SB_{MSY} = 1.62) with a range of 1.15 and 2.19.

At the WCPFC's 15th Regular Session held December 10–14, 2018, in Honolulu, the SPC presented an evaluation of the implementation of CMM 2017-01 on bigeye tuna stock status projected to year 2045 (SPC 2018).[2] This evaluation was based on the 2017 bigeye tuna stock assessment (McKechnie et al. 2017) and updated by Vincent et al. 2018.

In 2017, the WCPFC adopted CMM 2017-01 which includes, as an objective to have the bigeye spawning biomass depletion ratio ($SB/SB_{F=0}$) to be maintained at or above the average $SB/SB_{F=0}$ for 2012-2015. To achieve this objective, the CMM includes a number of provisions to be implemented including longline catch bigeye limits for certain member countries, seasonal purse seine Fish Aggregation Device (FAD) closures in exclusive economic zones (EEZs) and the high seas in the area between 20˚N and 20˚S. At WCPFC15, the commission adopted CMM 2018-01, which is essentially a roll-over of CMM 2017-01 and effective through 2020. Under CMM 2018-01, for example, the U.S. longline bigeye limit is maintained at the 2016 level of 3,554 t. Five other members have longline bigeye catch limits specified in the measure, which also were set back to their 2016 levels (Table 1), with the exception of China, which obtained a 500 t higher limit than provided in 2016 through a transfer from Japan. Under CMM 2018-01, other members catching less than 2,000 t are allowed to harvest up to 2,000 t, while Small Island Developing States (SIDS) and Participating Territories (PTs) longline bigeye catches continued to be unlimited under the measure. The U.S. territories of American Samoa, Guam and the Commonwealth of the Northern Mariana Islands are PTs, and under CMM 2018-01 have no catch limits on bigeye tuna.

Evaluation of Territorial Bigeye Tuna Catch and Allocation Limits

Pursuant to Amendment 7 of the PFEP, the Council is considering recommending the specification of bigeye tuna catch and allocation limits for each of the U.S. territories. Specification options under consideration include the following:

1. No specification of longline catch or allocation limits for any U.S. participating territory in 2019 (No catch or allocation limit);

2. (Status quo): Specify for each U.S. participating territory, a 2,000- t longline catch limit and 1,000- t allocation limit in 2019 (Status Quo);

[2] The SPC conducted a 30-year projection from 2016, rather than a 20-year projection due to the stock not reaching equilibrium in the 20-year horizon with the assumed purse seine effort and longline catch, and under the recruitment assumptions used. (G. Piling. SPC, pers. comm. January 2018).

3. Specification of a total longline bigeye limit of 2,000 t and allocation limits of up to 2,000 t for each US participating Territory. For the purposes of this analysis, various allocation scenarios below are evaluated.
    a. 1,000 t allocation limit per territory
    b. 1,500 t allocation limit per territory
    c. 2,000 t allocation limit per territory

For each option, there are different levels of bigeye tuna limits that NMFS and the Council would authorize each U.S. territories to catch, or to transfer for use by Hawaii-permitted longline vessels under specified fishing agreements. Therefore, there are a range of potential outcomes with respect to a variable number (1, 2, or 3) of specified fishing agreements that could be established in a given year, and the magnitude of the catch (e.g., 1,000; 1,500; or 2,000 t) per agreement. For Option 2, there are four potential outcomes (A-D) and 9 potential outcomes for Option 3 (Table 1).

Table 1: Potential outcomes associated with Options 2 and 3

Option 2	Option 3
Potential Outcome A: 1 agreement (1,000 t)	Potential Outcome E: 1 agreement (1,000 t)
Potential Outcome B: 2 agreements (2,000 t)	Potential Outcome F: 2 agreements (2,000 t)
Potential Outcome C: 3 agreements (3,000 t)	Potential Outcome G: 3 agreements (3,000 t)
Potential Outcome D: 3 agreements and full utilization of each Territory's 2,000 t limit (6,000 t)	Potential Outcome H: 1 agreement (1,500 t)
	Potential Outcome I: 2 agreements (3,000 t)
	Potential Outcome J: 3 agreements (4,500 t)
	Potential Outcome K: 1 agreement (2,000 t)
	Potential Outcome L: 2 agreements (4,000 t)
	Potential Outcome M[3]: 3 agreements (6,000 t)

For comparison purposes, Option 4 is also included herein. Option 4 would be total catch limits of 3, 000 t per territory and potential allocations of up to 3,000 t per territory. The various outcomes listed above were not included for Option 4 as there would substantial repetition between potential outcomes associated with Options 2 and 3. However, two outcomes N and O for option 4 were evaluated: N = would be at total catch limit of 3,000 mt per territory and potential allocation of up to 2,000 mt per territory, with total catch capped at 12,544; O= allocation limit of up to 3,000 mt per territory and potential catch of 12,998 (which includes an additional nominal amount of 541 t of American Samoa longline bigeye catch).

At the request of the Council and NMFS, SPC conducted projections with respect to the options listed above and their associated potential outcomes in relation to the implementation of CMM 2018-01 with respect to future (2045) bigeye stock status. The projections were based on scalars

[3] The projections for Outcome M includes an additional nominal amount of 541 t of American Samoa longline bigeye catch.

to the Hawaii-permitted longline catch within the MULTIFAN-CL bigeye assessment model framework that represent the potential outcomes under the various options.

The SPC analysis assumes implementation of the CMM 2018-01, including the 3-month purse seine FAD closure within EEZs and the high seas and an additional two sequential months on the high seas by member countries. For longline catches, the SPC analysis assumed that countries with specified annual longline bigeye limits in excess of 2,000 t would each catch their full annual limit, even if actual catches have been less (e.g., Japan and Indonesia; Table 2). For member countries that have bigeye longline catches less than 2,000 t, and for SIDS and PTs without limits specified in CMM 2018-01, the SPC analysis assumed that the catches of these fleets would continue at their average 2013–2015 levels.

Table 2: 2019 and 2020 longline bigeye catch limits and 2017 reported longline bigeye catches for six WCPFC members.

Member Countries, Participating Territories, and Cooperating Non-Members	2019 and 2020 Longline Bigeye Catch Limit (t)	2017 Longline Bigeye Catch (t) Reported to WCPFC
Japan	17,765	11, 669
Korea	13,942	10,220
Chinese Taipei	10,481	9,638
China	8,724	7,023
Indonesia	5,889	13
United States	3,554	2,968

Source: CMM 2018-01
Source: 2017 catch as reported by members to the WCPFC
Note: Hawaii longline vessels operating under the US limit and US Participating Territory agreements landed the respective tonnage of bigeye into Honolulu for years 2015, 2016, 2017: 5,723 t, 6,144 t and 5,295.

It is noted that member flag States with longline catches of bigeye of less than 2,000 t could increase their catch to this level and remain compliant with the CMM 2018-01, and further that longline fleets of SIDS and PTs are currently unrestricted and could increase their catches of bigeye to any level.

The SPC projections utilized the short-term future bigeye tuna recruitment hypothesis. Under the short-term recruitment hypothesis, future recruitment would remain on average consistent with 2004 to 2013 conditions. The WCPFC Science Committee has agreed that for the purpose of evaluating the CMM that the recent 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).

To evaluate the impacts on bigeye tuna stock status from the alternatives listed above, the SPC conducted 17 model scenario runs. The baseline scenario represents 2013–2015 average catch or 2015 for bigeye catch by Hawaii-permitted longline vessels inclusive of two specified fishing agreements in 2015, one with the CNMI and the other with Guam. All of the scenarios runs reflect implementation of CMM 2018-01, including the assumption that Japan and Indonesia would catch the full amount of their bigeye catch limit. Evaluation of the options and their

associated scenarios utilize scalars applied to the 2015 U.S. longline bigeye catch to account for various bigeye tuna transfer levels associated with 0, 1, 2 or 3 specified fishing agreements. The Option 1 scenario represents no action in relation to the U.S. proposal to set territorial catch and allocation limits. Thus, with no transfers of Territorial allocation to Hawaii longline vessels, the Option 1 projection includes less catch than the 2015 level. The four potential outcomes for Option 2 include territorial transfers of 1,000, 2,000, and 3,000 t mt of bigeye to longline vessels from 1, 2, or 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). For Option 3, nine potential outcomes were evaluated that reflect 1, 2, or 3 specified fishing agreements subject to various allocation limits per territory (1,000 t, 1,500 t, and 2,000 t).

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 and projections were calculated using the scalars illustrated in Table 4. In accordance with Federal regulations at 50 CFR 300.224, bigeye tuna caught 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, and were not scaled as they are already included in the baseline.

Results

Results of the projections are presented in Tables 5 to 8. With respect to spawning biomass and total biomass in 2045 versus biomass at MSY, SPC (2018) did not calculate these values, focusing instead on the spawning biomass ratio to that in the absence of fishing ($SB/SB_{F=0}$), which is WCPFC's adopted interim Limit Reference Point (LRP) for bigeye tuna. Specifically, WCPFC considers bigeye tuna to be overfished when $SB/SB_{F=0}$ falls below 20 percent ($SB/SB_{F=0} < 0.20$).

The SC14 summary report indicated that recent $SB_{2012\text{-}2015}/SB_{MSY}$ had a mean of 1.39, which is well above the established overfished reference point (0.6 SB/SB_{MSY}) for bigeye tuna under the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region (PFEP). Notwithstanding, for all the projections, there is low probability that the ratio of biomass to biomass at MSY would breach the PFEP overfished stock status criteria and biomass would be greater than the level necessary to produce MSY on a continuing basis.[4]

Under Option 1, if CMM 2018-01 was implemented, and the total catch of bigeye by U.S. longline fisheries were held at the U.S. limit of 3,554 t, 541 t for the American Samoa longline fishery, and no specified fishing agreements, then the F_{2045}/F_{MSY} is projected to be 0.82,

[4] The WPFMC reference point of 0.6SBmsy is approximately 0.14 $SB_{F=0}$ for bigeye tuna. The potential outcome with the greatest impact to bigeye stock status is Option 4, Potential Outcome O, which is projected to result in $SB_{2045}/SB_{F=0} = 0.36$. However, under this scenario, bigeye tuna stock status would remain above the WCPFC overfished limit reference point and the stock would not be overfished.

indicating the bigeye tuna would not be subject to overfishing, and spawning biomass ($SB_{2045}/SB_{F=0}$ = 0.38) would be above the WCPFC's LRP.

Under Option 2, there are four distinct possible fishery outcomes depending on the number of specified fishing agreements authorized. Under Potential Outcome 2A, the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t, which is the average catch for 2012-2017. With one specified fishing agreement with 1,000 t of bigeye catch allocation transferred to Hawaii longline vessels from a U.S. territory, the projected F_{2045}/F_{MSY} = 0.83 and $SB_{2045}/SB_{F=0}$ = 0.37. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome A.

Under Potential Outcome 2(B), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With two specified fishing agreements with 2,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected F_{2045}/F_{MSY} = 0.84 and $SB_{2045}/SB_{F=0}$ = 0.37. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome B.

Under Potential Outcome 2(C), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With three specified fishing agreements with 3,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected F_{2045}/F_{MSY} = 0.85 while $SB_{2045}/SB_{F=0}$ = 0.37. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome C.

Under Potential Outcome 2(D), the U.S. Hawaii longline fleet would catch 3,554 t. With three fishing agreements, with 3,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories and full utilization of the remaining portion of their specified catch limit of 1,000 t) by longline fisheries of American Samoa, Guam and the Northern Mariana Islands (for a total of 3,000 t), the projected F_{2045}/F_{MSY} = 0.86 while $SB_{2045}/SB_{F=0}$ = 0.37. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome D.

Under Option 3, there are an additional 9 potential outcomes (E-M). Under Potential Outcome 3(E), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With only one specified fishing agreement 1,000 t of bigeye catch allocated to Hawaii longline vessels, the projected F_{2045}/F_{MSY} = 0.83 and $SB_{2045}/SB_{F=0}$ = 0.37. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome E.

Under Potential Outcome 3(F), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With two specified fishing agreements with 2,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected F_{2045}/F_{MSY} = 0.84 and $SB_{2045}/SB_{F=0}$ = 0.37. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome F.

Under Potential Outcome 3(G), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With three specified fishing agreements with 3,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected $F_{2045}/F_{MSY} = 0.85$ while $SB_{2045}/SB_{F=0} = 0.37$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome G.

Under Potential Outcome 3(H), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With only one specified fishing agreement with 1,500 t of bigeye catch allocated to Hawaii longline vessels, the projected $F_{2045}/F_{MSY} = 0.83$ and $SB_{2045}/SB_{F=0} = 0.37$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome H.

Under Potential Outcome 3(I), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With two specified fishing agreements with 3,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected $F_{2045}/F_{MSY} = 0.85$ while $SB_{2045}/SB_{F=0} = 0.37$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome I.

Under Potential Outcome 3(J), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With two three specified fishing agreements with 4,500 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected $F_{2045}/F_{MSY} = 0.86$ while $SB_{2045}/SB_{F=0} = 0.37$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome J.

Under Potential Outcome 3(K), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With one specified fishing agreement with 2,000 t of bigeye allocation transferred to Hawaii longline vessels from U.S. territories, the projected $F_{2045}/F_{MSY} = 0.84$ and $SB_{2045}/SB_{F=0} = 0.37$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome K.

Under Potential Outcome 3(L), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With two specified fishing agreements with 4,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, the projected $F_{2045}/F_{MSY} = 0.85$ and $SB_{2045}/SB_{F=0} = 0.37$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome L.

Under Potential Outcome 3(M), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With three specified fishing agreements with up to 6,000 t of bigeye catch allocation transferred to Hawaii longline vessels from U.S. territories, including an additional nominal amount of 541 t of American Samoa longline bigeye catch, the projected $F_{2045}/F_{MSY} = 0.87$ and $SB_{2045}/SB_{F=0} = 0.36$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome M.

Under Potential Outcome 4(N), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With three specified fishing agreements of up to 3,000 t each of bigeye catch allocation (9,000 t total) transferred to Hawaii longline vessels from U.S. territories, the projected $F_{2045}/F_{MSY} = 0.88$ and $SB_{2045}/SB_{F=0} = 0.36$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome N.

Under Potential Outcome 4(O), the U.S. Hawaii longline fleet would catch 3,554 t, and the American Samoa longline fishery would catch 541 t. With three specified fishing agreements of up to 3,000 t each bigeye catch allocation (total 9,000 t) transferred to Hawaii longline vessels from U.S. territories, including an additional nominal amount of 541 t of American Samoa longline bigeye catch , the projected $F_{2045}/F_{MSY} = 0.88$ and $SB_{2045}/SB_{F=0} = 0.36$. This indicates that bigeye tuna would not be subject to overfishing and not overfished in 2045 as a result of Potential Outcome O.

Table 3: Bigeye Tuna Catch (t) by U.S. and Territorial Longline Fisheries in the Western and Central Pacific Ocean 2012-2017.

Longline Fishery	2017	2016	2015	2014	2013	2012	Ave. 2012-2017
U.S. Hawaii longline permitted vessels	2,968	3,747	3,427	3,823	3,654	3,660	3,547
Catch allocated to Hawaii longline vessels through a specified fishing agreement with American Samoa	758					815	787
Catch allocated to Hawaii longline vessels through a specified fishing agreement with the CNMI	997	879	999	1,000	492		873
Catch allocated to Hawaii longline vessels through a specified fishing agreement with Guam		932	856				894
Dual permitted U.S. Hawaii/American Samoa longline vessels	572	588	441	236	305	523	444
American Samoa longline permitted vessel	64	72	116	82	84	164	97
Guam longline vessels		0	0	0	0	0	0

Longline Fishery	2017	2016	2015	2014	2013	2012	Ave. 2012-2017
CNMI longline vessels		0	0	0	0	0	0
Total Longline Bigeye Catch	**5,359**	**6,216**	**5,839**	**5,141**	**4,535**	**5,162**	**5,375**

Source: PIFSC 2018 U.S. Annual Part 1 Report to the WCPFC

Table 4: Methodology to determine scalars on U.S. longline bigeye catches to evaluate potential outcomes of the proposed action.

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)*	Scalar on 2015 U.S. Longline BET catch in SPC data (Regions 2 & 4)+
2015 Baseline	3,427	441	116	1,855	5,723	1
Option 1: No action	3,554	444[1]	97	0	3,998	0.69
Option . 2: 2,000 t catch limit /1,000 t allocation limit	See below	See below	See below	See below	See below	See below
Potential Outcome A	3,554	444[1]	97	1,000	4,998	0.87
Potential Outcome B	3,554	444[1]	97	2,000	5,998	1.05
Potential Outcome C	3,554	444[1]	97	3,000	6,998	1.22
Potential Outcome D	3,554	0 (see next column)	6,000[2]	3,000	9,554	1.67
Option 3: 2,000 mt limit; allocation limits (1,000, 1,500, 2,000)	See below	See below	See below	See below	See below	See below
Potential outcome E (1,000)	3,554	444[1]	97	1,000	4,998	0.87
Potential outcome F (2,000)	3,554	444[1]	97	2,000	5,998	1.05
Potential outcome G (3,000)	3,554	444[1]	97	3,000	6,963	1.22
Potential outcome H (1,500)	3,554	444[1]	97	1,500	5,498	0.95
Potential outcome I (3,000)	3,554	444[1]	97	3,000	6,998	1.22
Potential outcome J (4,500)	3,554	444[1]	97	4500	8,498	1.48

Runs	U.S. HI Longline Permitted Vessel BET Catch	AS/HI Dual Longline Permitted Vessel BET Catch	AS/GU/CN MI Longline BET Catch*	BET Transfers to HI Longline Vessels	Projected U.S. Longline BET Catch (Regions 2 and 4)*	Scalar on 2015 U.S. Longline BET catch in SPC data (Regions 2 & 4)+
Potential outcome K (2,000)	3,554	444[1]	97	2,000	5,998	1.05
Potential outcome L (4,000)	3,554	444[1]	97	4,000	7,998	1.40
Potential Outcome M (6,000)	3,554	444[1]	97	6,000	9,998	1.75
Option 4 Potential Outcome N	3,554	444[1]	2,546	6,000	12,554	2.19
Option 4 Potential Outcome O	3,554	444	97	9,000	12,998	2.27

Notes:
* The model accounts for BET catch by U.S longline vessels landing in AS in Region 6, which was 116 in 2015 and averaged 120 t for the 2011–2016 period. The projected U.S. and American Samoa catches are accounted for in deterministic projections of BET stock status in 2045 in Tables 4–8. There were no reported longline BET landings in Guam or CNMI in 2015, and currently, there are no U.S. longline vessels active in Guam or CNMI.
[1] AS/HI LL dual permit catch (441 t) = average catch from dual American Samoa/Hawaii longline permitted vessels from 2012 to 2017.
[2] Potential Outcome D assumes each U.S. territory allocates 1,000 t to Hawaii longline permitted vessel and the remainder (1,000 t) of its specified catch limit is caught by longline vessels operating in the respective territory.

Table 5: Projections related to Options 1, and 2 and percent change in F_{2045}/F_{MSY}, $SB_{2045}/SB_{F=0}$, at various scalars.

	Baseline Catch	Option 1: No Action		Option 2: 2,000 t Catch Limit and 1,000 t Allocation Limit for each U.S. Territory							
				Potential Outcome A		*Potential Outcome B*		*Potential Outcome C*		*Potential Outcome D*	
No. of Specified Fishing Agreements	**2015**	**No Fishing Agreements and No BET Transfers**		**1 Fishing Agreement and 1,000 t of BET Transfers**		**2 Fishing Agreements and 2,000 t of BET Transfers**		**3 Fishing Agreements and 3,000 t of BET Transfers**		**3 Fishing Agreement and 3,000 t of BET transfers and Full Utilization of BET in Territories**	
Scaled U.S. Longline BET Catch (Regions 2 and 4)	**5,723 t** HI: 3,427 HI/AS Dual:441 Transfers: 1,855	**3,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 0		**4,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 1,000		**5,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 2,000		**6,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 3,000		**9,554 t** HI: 3,554 AS: 1,000 GU: 1,000 CNMI: 1,000 Transfers: 3,000	
			Percent Change		**Percent Change**		**Percent Change**		**Percent Change**		**Percent Change**
F_{2045}/F_{MSY}	**0.73**	**0.82**	**0.00**	**0.83**	**1.2**	**0.84**	**2.4**	**0.85**	**3.6**	**0.86**	4.9
$SB_{2045}/SB_{F=0}$	**0.42**	**0.38**	**0.00**	**0.37**	**-2.6**	**0.37**	**-2.6**	**0.37**	**-2.6**	**0.37**	-2.6

Note: The percent change is calculated with respect to values associated with Alternative 1, which includes full implementation of CMM 2017-01, with no US territory catch transfers under specified fishing agreements. The baseline catch is the average (2013–2015) total purse seine associated effort and longline catch levels within the bigeye tuna stock assessment. All alternatives assume full implementation of CMM 2017-01.

Table 6: Projections related to Option 3(a) and percent change in F_{2045}/F_{MSY}, $SB_{2045}/SB_{F=0}$, at various scalars.

	Option 1: No Action		Option 3: 2,000 mt catch limits, but allocations of 1,000 per territory					
			Potential Outcome E		***Potential Outcome F***		***Potential Outcome G***	
No. of Specified Fishing Agreements	**No Fishing Agreements and No BET Transfers**		**1 Fishing Agreement and 1,000 t of BET Transfers**		**2 Fishing Agreements and 2,000 t of BET Transfers**		**3 Fishing Agreements and 3,000 t of BET Transfers**	
Scaled U.S. Longline BET Catch (Regions 2 and 4)	**3,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 0		**4,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 1,000		**5,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 2,000		**6,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 3,000	
		Percent Change		**Percent Change**		**Percent Change**		**Percent Change**
F_{2045}/F_{MSY}	**0.82**	**0.00**	**0.83**	**1.2**	**0.84**	**2.4**	**0.85**	**3.6**
$SB_{2045}/SBF=0$	**0.38**	**0.00**	**0.37**	**-2.6**	**0.37**	**-2.6**	**0.37**	**-2.6**

Table 7: Projections related to Option 3 (b) and percent change in F_{2045}/F_{MSY}, $SB_{2045}/SB_{F=0}$, at various scalars.

	Alternative 1: No Action		**Alternative 3: 2,000 mt Total Catch Limits, allocation of 1,500 per Territory**					
			Potential Outcome H		***Potential Outcome I***		***Potential Outcome J***	
No. of Specified Fishing Agreements	**No Fishing Agreements and No BET Transfers**		**1 Fishing Agreement and 1,500 t of BET Transfers**		**2 Fishing Agreements and 3,000 t of BET Transfers**		**3 Fishing Agreements and 4,500 t of BET Transfers**	
Scaled U.S. Longline BET Catch (Regions 2 and 4)	**3,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 0		**5,498 t** HI: 3,554 HI/AS Dual: 444 Transfers: 1,500		**6,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 3,000		**8,498 t** HI: 3,554 HI/AS Dual: 444 Transfers: 4,500	
		Percent Change		**Percent Change**		**Percent Change**		**Percent Change**
F_{2045}/F_{MSY}	**0.82**	**0.00**	**0.83**	**1.2**	**0.85**	**3.6**	**0.86**	**4.9**
SB_{2045}/SBF=0	**0.38**	**0.00**	**0.37**	**-2.6**	**0.37**	**-2.6**	**0.37**	**-2.6**

Table 8: Projections related to Option 3(c) and percent change in F_{2045}/F_{MSY}, $SB_{2045}/SB_{F=0}$, at various scalars.

	Alternative 1: No Action		**Alternative 3: 2,000 mt Total Catch Limits, Allocations of 2,000 per Territory**					
			Potential Outcome K		***Potential Outcome L***		***Potential Outcome M***	
No. of Specified Fishing Agreements	**No Fishing Agreements and No BET Transfers**		**1 Fishing Agreement and 2,000 t of BET Transfers**		**2 Fishing Agreements and 4,000 t of BET Transfers**		**3 Fishing Agreements and 6,000 t of BET Transfers**	
Scaled U.S. Longline BET Catch (Regions 2 and 4)	**3,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 0		**5,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 2,000		**7,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 4,000		**9,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 6,000	
		Percent Change		**Percent Change**		**Percent Change**		**Percent Change**
F_{2045}/F_{MSY}	**0.82**	**0.00**	**0.84**	**2.4**	**0.85**	**3.6**	**0.87**	**6.0**
$SB_{2045}/SBF=0$	**0.38**	**0.00**	**0.37**	**-2.6**	**0.37**	**-2.6**	**0.36**	**-5.5**

Table 9: Projections related to Option 4 and percent change in F2045/FMSY, SB2045/SBF=0, at various scalars.

	Option 1: No Action		**Option 4: 3,000 mt Total Catch Limits, Allocations of up to 3,000 per Territory**			
			Potential Outcome N		***Potential Outcome L***	
No. of Specified Fishing Agreements	**No Fishing Agreements and No BET Transfers**		**3 Fishing Agreements and 3,000 t of BET Transfers and 6,000 mt of US territory catch combined**		**3 Fishing Agreements and 9,000 t of BET Transfers**	
Scaled U.S. Longline BET Catch (Regions 2 and 4)	**3,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 0		**12,554 t** HI: 3,554 CNMI/GU/AS 6,000 Transfers: 3,000		**12,998 t** HI: 3,554 HI/AS Dual: 444 Transfers: 9,000	
		Percent Change		**Percent Change**		**Percent Change**
F_{2045}/F_{MSY}	**0.82**	**0.00**	**0.88**	**7.3**	**0.88**	**7.3**
$SB_{2045}/SBF=0$	**0.38**	**0.00**	**0.36**	**-5.2**	**0.36**	**-5.2**

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APPENDIX B. 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 statute requires another regulatory approach.*

This RIR is for NMFS' implementation of the Council's recommendations for territorial bigeye tuna catch and allocation limits, for fishing years 2019-2023. The Council would recommend and NMFS would authorize each U.S. territory to allocate and transfer bigeye tuna limits to a U.S. longline fishing vessel(s) permitted under the Pelagics FEP and identified in a specified fishing agreement applicable to the territory. Criteria for a specified fishing agreement 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 are codified in 50 CFR 665.819. Under existing regulations, the specified catch and allocation limits would be in effect until they expire at the end of the relevant fishing year.

NMFS proposes to specify a Council-recommended catch limit of 2,000 metric tons (t) of longline-caught bigeye tuna for each of the pelagic longline fisheries of American Samoa, Guam and the Northern Mariana Islands in 2019. Along with the proposed specification, NMFS also proposes to authorize each U.S. territory to allocate and transfer, up to 1,000 t of its 2,000 t bigeye tuna limit to a U.S. longline fishing vessel or vessels identified in a specified fishing agreement. NMFS would evaluate this RIR at the time that it receives a Council recommendation for bigeye tuna catch or allocation limits for fishing years 2020-2023, and supplement, if new information affects the conclusion in this RIR.

2. Problem Statement and Management Objective

The purpose of this action is to establish bigeye tuna catch and allocation limits for longline fisheries of each U.S. participating territory (American Samoa, Guam, and the CNMI) for fishing

years 2019-2023, 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 2019-2023 are needed to 1) prevent bigeye overfishing, 2) support fisheries development in US territories, and 3) promote the availability of sustainably caught bigeye from U.S. vessels supplying the Hawaii seafood market during the culturally important end of year season of peak demand. The need for this action is to ensure that NMFS and the Council manage allocations of longline caught bigeye tuna under specified fishing agreements consistent with the conservation needs of the stock.

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 U.S. participating territories and Hawaii. These include the Hawaii longline fishery (Section 3.2.1); American Samoa longline fishery (Section 3.2.2), Mariana Archipelago longline fishery (Section 3.2.3); and Hawaii troll and handline (Section 3.2.4). Section 3.2.5 presents specific information on U.S. longline catches of bigeye tuna in the Pacific, and Section 3.2.6 presents specific information on U.S. purse seine catches of bigeye in the Western and Central 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 2019-2023. Please see Section 2 of the EA for more details on each of the alternatives that NMFS 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.

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

Under Alternative 2, NMFS would implement the Council's recommendation by specifying a catch limit of 2,000 t of bigeye tuna for each U.S. participating territory. NMFS would also authorize the three U.S. participating territories to each allocate up to 1,000 t of their 2,000 t bigeye limit to FEP-permitted longline vessels identified in a specified fishing agreement with a U.S. territory. Alternative 2 is identical to the bigeye tuna catch and allocation limit specifications implemented annually beginning with the 2014 fishing year. As an accountability measure (AM), NMFS would prohibit the retention of longline-caught bigeye tuna by vessels in the applicable U.S. territory (if NMFS projects the territorial limit will be reached), and/or by vessels operating under the applicable specified fishing agreement (if NMFS projects the allocation limit will be reached).

Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and that each territory can allocate up to 2,000 of the catch limit

Under Alternative 3, NMFS would specify a catch limit of 2,000 t of bigeye tuna for each U.S. participating territory. NMFS would also authorize the three U.S. territories to each allocate up to their entire 2,000 t bigeye limit to FEP-permitted longline vessels identified in a specified fishing agreement with a U.S. territory. As an AM, NMFS would prohibit the retention of longline-caught bigeye tuna by vessels in the applicable U.S. territory (if NMFS projects the territorial limit will be reached), and/or by vessels operating under the applicable specified fishing agreement (if NMFS projects the allocation limit will be reached).

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.

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

Under Alternative 1, longline fisheries of American Samoa, Guam, and the CNMI would not be subject to a bigeye tuna catch limit and they would not be able to allocate any catch under a specified fishing agreement. Section 4.4.1 of the EA provides more information on impacts to longline fishery participants and fishing communities.

U.S. longline fishery (Hawaii-based)

The U.S. longline fishery based in Hawaii would be subject to a catch limit of 3,554 t. This fishery would likely reach the catch limit by November or earlier. 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 WCPO upon reaching the catch limit.

Once the limit is reached, owners and operators of vessels in the Hawaii fleet have few other options besides tying up their boats for the remainder of the calendar year. Vessels that also have an American Samoa longline limited access permit (dual-permit holders) would be able to catch and retain bigeye tuna as long as it is caught outside the U.S. EEZ surrounding the Hawaiian Archipelago. Based on recent fishery performance from 2012-2017, NMFS anticipates that vessels operating in the longline fishery of American Samoa would catch approximately 541 t of bigeye tuna each year, although catch attributed to American Samoa would be expected to be higher during a period of extended closure. This is because vessels with dual permits might choose to fish for and land more bigeye tuna into Hawaii (which can be attributed to American Samoa) if the Hawaii-based boats are subject to a closure, because the closure would reduce the overall supply of fish landed in Hawaii leading to a higher price per pound of bigeye tuna.

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. 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 the next five years. The American Samoa longline fishery sees more activity by comparison. Bigeye tuna catches by longline vessels possessing an American Samoa limited entry permit averaged 541 t from 2012 through 2017. 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 541 t caught by American Samoa longline vessels, dual AS/HI longline permitted vessels fishing on the high seas accounted for an average 444 t, while vessels possessing a single American Samoa permit accounted for 97 t. of the 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 fishery reaching the limit. 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 3,554 t, 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 November or earlier and continue through the remainder of the calendar year. 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 750 t bigeye tuna catch limit in the EPO (32-34 out of 140 vessels in the Hawaii longline fishery exceed 24 meters in length). Some longline vessels would have the option of switching to shallow-set longline fishing, targeting swordfish, especially among those vessels already outfitted to make this switch. However, NMFS closes the shallow-set longline fishery if it reaches a loggerhead sea turtle interaction hard cap. Some vessels might stop fishing altogether until the end of the fishing year, if the option to switch to targeting swordfish is not available.

Markets, consumers, and wholesalers:

Alternative 1 will result in a drop in the supply of locally-caught 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 under Alternative 1. 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, 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 t catch limit and 1,000 t allocation limit (Preferred/Status Quo)

Under Alternative 2, longline fisheries in the U.S. participating territories would each be subject to a 2,000 t catch limit for bigeye tuna. Each territory would also be able to allocate up to 1,000 t of its 2,000 t catch limit to FEP-permitted longline vessels under specified fishing agreements. The proposed allocation would provide up to 3,000 t of bigeye tuna to the U.S. longline fleet based in Hawaii through specified fishing agreements, in addition to the 3,554 t provided under the U.S. bigeye tuna limit. 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, submitted to and approved by NMFS each year. 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 Section 4.4.2 of the EA. With the timing of reaching the catch limit projected to be by November or earlier, a single fishing agreement allocating 1,000 t 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.

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 with no active vessels based in those locations. As mentioned under Alternative 1, during a fishery closure, dual AS/HI longline permit holders can expect a boost in revenue if they continue to fish. This could come from higher price per pound for bigeye tuna because of the continued demand for locally caught fresh tuna as well as a potential increased fishing effort to take advantage of the higher prices. As the number of fishing agreements increases, with the reduced likelihood of extended closure to U.S. longline vessels to retain bigeye tuna, it becomes less likely that this increase in fishing effort by dual AS/HI longline vessels would 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. NMFS expects American Samoa limited entry permit holders that are not dual permit holders to fish about the same amount 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 utilizing the full amount, and with

an early enough closure of the U.S. fishery, the American Samoa longline fishery may possibly reach the allocation limit of 1,000 t.

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 impacts similar to no action. Since most participants in this fishery primarily fish for bigeye tuna in the WCPO, rather than the EPO, 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 locally-caught 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.

Alternative 3: Specify for each U.S. participating territory, a 2,000 t catch limit and up to 2,000 t allocation limit

Under Alternative 3, longline fisheries in the U.S. participating territories would each be subject to a 2,000 t catch limit for bigeye tuna. Each territory would also be able to allocate up to 2,000 t of its 2,000 t 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 3, several potential scenarios may occur, depending on the number of specified fishing agreements developed, submitted to and approved by NMFS each year. 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 Section 4.4.3 of the EA. With the timing of reaching the catch limit projected to be in November or earlier, a single fishing agreement allocating 2,000 t of catch might not allow the U.S. longline vessels to fish and supply locally-caught bigeye tuna through the end of the year, whereas two specified fishing agreements would likely be sufficient to allow the U.S. longline vessels to fish through the end of the year.

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 and Alternative 2, because of the lack of recent longline activity with no vessels currently based in these locations. Guam and CNMI would also be more likely to allocate the full 2,000 t. American Samoa-based vessels possessing a limited access permit would likely catch about 541 t of bigeye tuna based on annual average catch between 2012 and 2017. Because of this, the American Samoa government could control the amount of catch to be allocated in order to reserve some portion of the 2,000 t limit for the local vessels in order to reduce potential effects to local fishery participants. However, if the American Samoa government did allocate the entire 2,000 t limit to the U.S. longline fleet, NMFS would have to prohibit retention of bigeye tuna in the local albacore targeting fleet and by dual-permitted vessels. This would also mean that during the time that the U.S. longline fleet is closed to fishing for bigeye tuna, dual permitted vessels would not be able to land bigeye tuna caught outside the U.S. EEZ around Hawaii in Hawaii and earn the temporarily higher revenue during the closure period.

Hawaii longline fisheries:

Under Alternative 3, 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 no action. Since most participants in this fishery primarily fish for bigeye tuna in the WCPO, rather than the EPO, 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, and similar to Alternative 2, Alternative 3 would yield a higher supply of locally-caught 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:

Similar to Alternative 2, specified fishing agreements under Alternative 3 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 3 would be slightly higher than under Alternative 1 and similar to Alternative 2. 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 Alternatives 1 and 2.

Comparing Net Benefits between alternatives:

Implementing the Council-preferred action (Alterative 2), or Alternative 3, may generate a positive net benefit relative to the no action alternative. The preferred 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.