ACTION PLAN TEAM WORKING DRAFT

Amendment X to the Fishery Ecosystem Plan for Pelagics

US Catch Limits for Striped Marlin within the Western and Central Pacific Fisheries Commission Convention Area North of the Equator

Regulatory Identification Number (RIN) 0648-XXXX

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Cover Page

Amendment X to the Fishery Ecosystem Plan for Pelagic
Including a Draft Environmental Assessment
If needed, include Initial Regulatory Flexibility Analysis and Regulatory Impact Review

US Catch Limits for Striped Marlin within the Western and Central Pacific Fisheries Commission Convention Area North of the Equator

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Abstract

United States is a member of both the Western and Central Pacific Fisheries Commission (WCPFC) and Inter-American Tropical Tuna Commission (IATTC), two international regional fisheries management organizations (RFMOs) that manage fisheries for highly migratory species (HMS) (e.g., striped marlin) in the Pacific Ocean. These RFMOs develop and agree on management measures for HMS caught by WCPFC and IATTC members and participating territories in the Pacific Ocean. The RFMOs may agree on conservation and management measures (CMMs), such as catch and effort limits, which are applicable to U.S. pelagic fisheries managed in the Fishery Ecosystem Plan for Pacific Pelagic Fisheries of the Western Pacific Region (Pelagics FEP).

Western and Central North Pacific (WCNPO) striped marlin, caught within the WCPFC Convention Area and north of the Equator ("North Pacific"striped marlin stock) is deemed overfished and experiencing overfishing per the WCPFC 15th Science Committee based on a stock assessment by the International Science Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC) in 2019. The condition was also corroborated per status determination in the Council's Pelagic Fisheries Ecosystem Plan (Pelagic FEP) and in a letter to the Council from the Regional Administrator on June 4, 2020. The Council was notified of its obligation to act within one year of notification pursuant to Magnuson Stevens Act (MSA) Section 304(i) to: 1) Develop and submit recommendations to the Secretary of Commerce for domestic regulations to address the relative impact of fishing vessels of the United States on the WCNPO striped

marlin stock; and 2) Develop and submit recommendations to the Secretary of State and to Congress for international actions that will end overfishing and rebuild the WCNPO striped marlin stock, taking into account the relative impact of vessels of other nations and vessels of the United States on the stock.

Striped marlin stocks are managed through the IATTC and WCPFC and are exempt for requirements of annual catch limits or rebuilding timelines. The Western Pacific Fishery Management Council (Council) is considering final action at the 185th Meeting to amend the Pelagic FEP to set catch limits to ameliorate the overfished condition of the WCNPO striped marlin stock, moving the stock towards ending overfishing, while accounting for the relative impact of US vessels on the stock

How to Comment

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ACRONYMS AND 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
MSA	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 Background Information

The National Marine Fisheries Service (NMFS) and the Western Pacific Fishery Management Council (Council) manage fishing for pelagic management unit species (PMUS) in the Exclusive Economic Zone (EEZ or federal waters, generally 3-200 nautical miles or nm from shore) around American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI) and Hawaii, and on the high seas through the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region (Pelagic FEP) as authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. § 1801 *et seq.*). PMUS under the purview of the Council include striped marlin stocks, for which pelagic fisheries under the Pelagic FEP catch with regularity. The principal pelagic fisheries under Council management that capture striped marlin are longline fisheries based out of Honolulu, Hawaii.

In 2019, the International Science Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC), conducted a stock assessment of Western and Central North Pacific (WCNPO) striped marlin, caught within the WCPFC Convention Area (delineated as westward of 150°W) and north of the Equator ("North Pacific" striped marlin stock) (Figure 1). The assessment covered years from 1975 to 2017 using catch and effort information from fisheries (longline, drift net, purse seine, and others) from the United States, Japan, Taiwan, and other nations reporting catch of WCNPO striped marlin at any time.

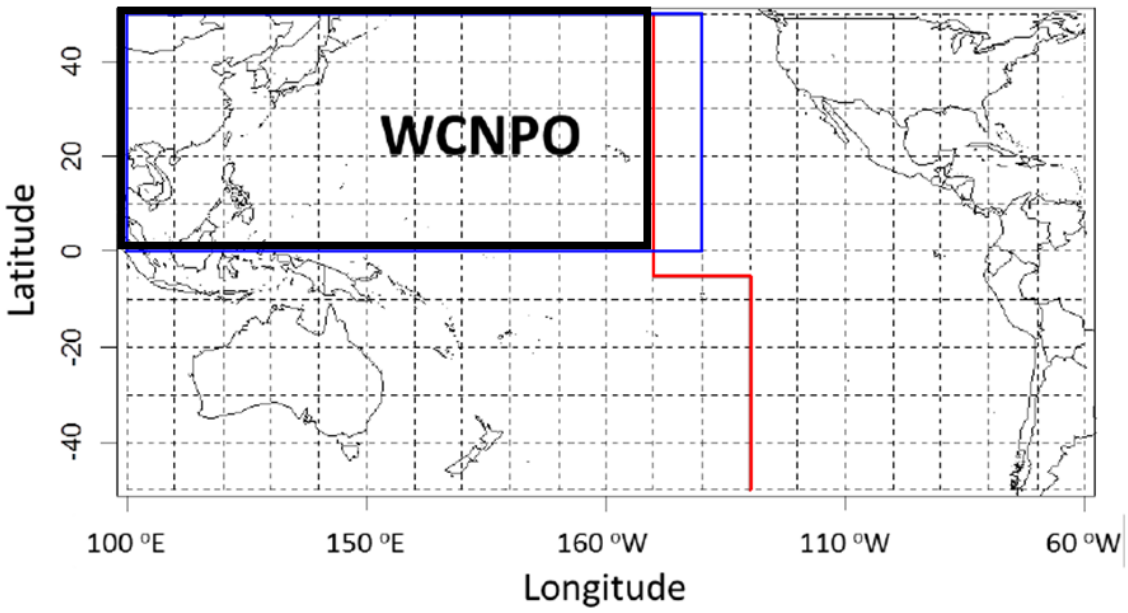

Figure 1. WCPFC and IATTC areas of jurisdiction delineated in the Pacific Ocean and WCNPO striped marlin stock boundaries. Black rectangle is management unit for 2019 assessment (ISC, 2019), blue rectangle is 2015 management unit (ISC, 2015), red line is RFMO boundary.

In February 2021, the stock assessment was updated by the Pacific Islands Fisheries Science Center (PIFSC) based on new information on catch estimates from the United States fleet.

Updated stock assessment results are summarized in Table 1 and Figures 2-4 and do not depart considerably from those in the 2019 assessment. The stock assessment estimated spawning biomass through time falling below spawning biomass at maximum sustainable yield (SSB_{MSY}) from 1994 and onward with relative stable biomass since (Figure 2). Terminal year spawning biomass in 2017 (SSB_{2017}) was 849mt which equates to 34% that of SSB_{MSY}, which is 2543 mt. Fishing mortality has exceeded fishing mortality at maximum sustainable yield (F_{MSY}) every year since 1994, with the exception of 2016 (Figure 3). However, fishing mortality has exhibited a declining trend since 2001. Terminal fishing mortality for 2015-2017 ($F_{2015\text{-}2017}$) was 0.69, which is 1.14 times higher than F_{MSY}. Maximum sustainable yield (MSY) for the stock is 4820 mt. Catch biomass accounted for in the stock assessment in 2017 was 2409 mt, with an average of 2100 mt for the last five years in the stock assessment, 2013-2017 (Figure 4). The 2019 ISC stock assessment indicated recruitment increases in the stock over the terminal years (ISC, 2019)

Table 1. Summary of the updated 2019 stock assessment of WCNPO striped marlin (PIFSC, 2021).

$F_{2015\text{-}2017}$	0.69
F_{MSY}	0.61
$SPR_{2015\text{-}2017}$	0.16
SSB_{2017}/SSB_{MSY}	0.34
$F_{2015\text{-}2017}/F_{MSY}$	1.14
SSB_{2017}	849 mt
SSB_{MSY} or B_{MSY}	2534 mt
20% $SSB_{F=0}$	3493 mt

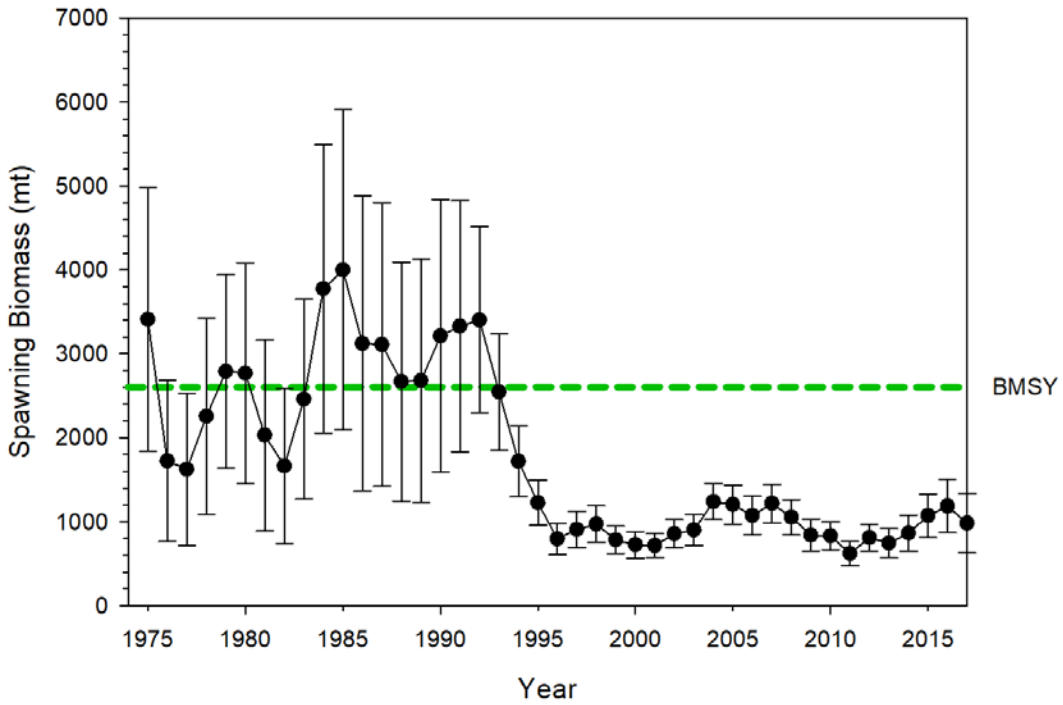

Figure 2 - WCNPO striped marlin estimates of spawning biomass relative to BMSY, 1975-2017.

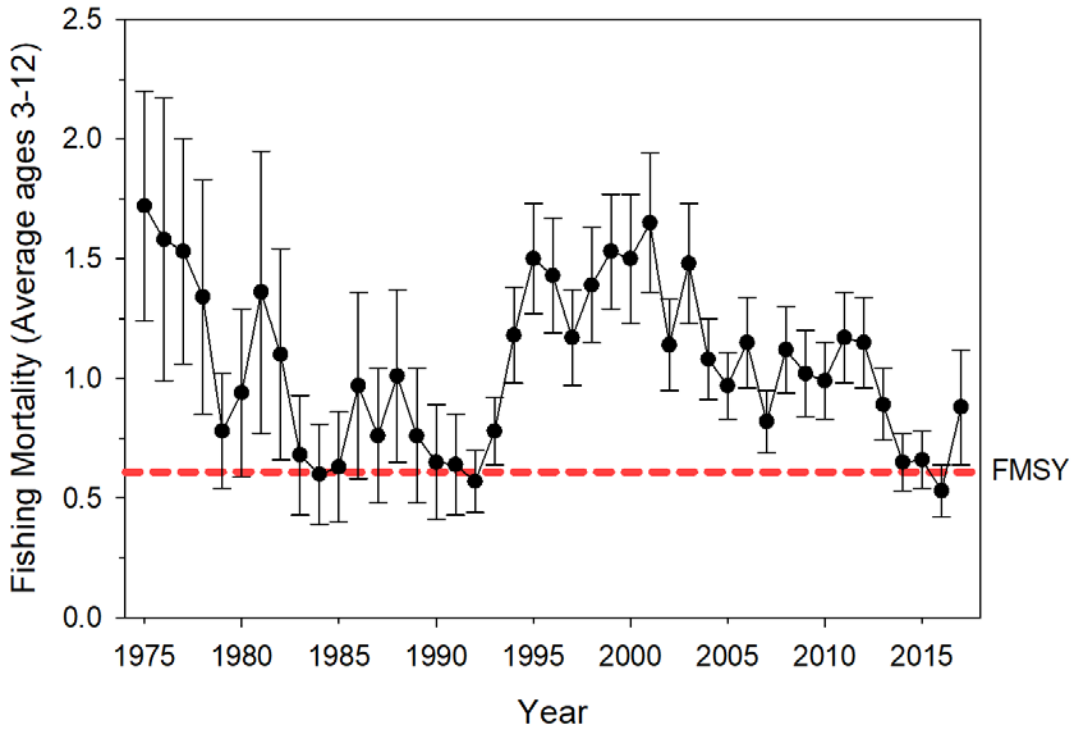

Figure 3 - WCNPO striped marlin estimates of fishing mortality relative F_{MSY}, 1975-2017.

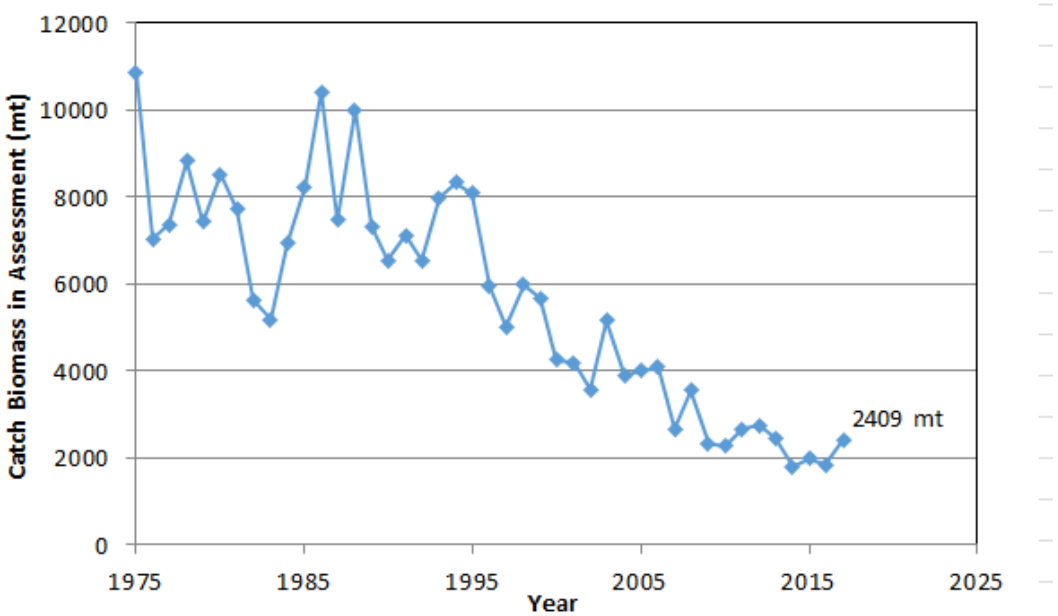

Figure 4 - Catch biomass (mt) of WCNPO striped marlin used in the 2021 update of the 2019 stock assessment

The regional fishery management organization (RFMO) responsible for management of the WCNPO striped marlin stock, the Western Central Pacific Fisheries Commission (WCPFC), does not have adopted limit reference points (LRP) for istiophorid billfishes, including striped marlin stocks. However, the stock is deemed overfished and experiencing overfishing per the 15th Regular Session of the WCPFC Scientific Committee based commonly used LRPs for tuna

and tuna-like species, such as 20% spawning biomass in absence of fishing (20% $SSB_{F=0}$) as a biological limit and fishing mortality at maximum sustainable yield (F_{MSY}). The condition was also corroborated per status determination in the Council's Pelagic FEP (as described in following sections) and indicated in a letter to the Council from the Regional Administrator on June 4, 2020.

The Council was notified of its obligation to act within one year of notification pursuant to Magnuson Stevens Act (MSA) Section 304(i) to: 1) Develop and submit recommendations to the Secretary of Commerce for domestic regulations to address the relative impact of fishing vessels of the United States on the WCNPO striped marlin stock; and 2) Develop and submit recommendations to the Secretary of State and to Congress for international actions that will end overfishing and rebuild the North Pacific striped marlin stock, taking into account the relative impact of vessels of other nations and vessels of the United States on the stock. The Council is considering final action at the 185th Meeting to amend the Pelagic FEP to set catch limits to ameliorate the overfished condition of the WCNPO striped marlin stock, moving the stock towards ending overfishing, while accounting for the relative impact of US vessels on the stock

1.2 Proposed Action

Striped marlin stocks are managed through the IATTC and WCPFC and are exempt for requirements of annual catch limits or rebuilding timelines. The Council is considering final action to amend its Pelagics FEP to establish a measure where at the Council may recommend and the National Marine Fisheries Service (NMFS) may implement catch limits to ameliorate the condition of the striped marlin stock, move the internationally-managed stock towards ending overfishing, while accounting for the relative impact of the stock. Stocks under international agreements are exempt to Section 303(a)(15) of the MSA implement annual catch limits, but Section 304(i) specifies Councils must address relative impacts which could be through catch and/or effort limits.

In the Pacific Ocean, RFMOs made up of member countries with fishing interests manage fisheries resources by adopting consensus resolutions or measures. Generally, when RFMO members endorse a fishery management measure, the individual members are responsible for implementing the requirements under domestic regulations for their fisheries and vessels flying their flag. For the United States to become a contracting party to an RFMO, the U.S. Congress must ratify the international convention that formed the RFMO. Congress then implements conventions in the form of legislation that includes provisions providing the secretaries of the U.S. departments of State and Commerce (DOS and DOC) with the authority to participate in the RFMO, promulgate regulations, and enforce measures related to the RFMO. The United States is a member of both the WCPFC and IATTC, which are two international RFMOs that manage fisheries for highly migratory species (HMS) (e.g., striped marlin) in the Pacific Ocean.

Congress implemented U.S. membership to the WCPFC through the WCPFC Implementation Act (WCPFCIA; P.L. 109-479). As a signatory to the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention), the United States is a member of WCPFC, along with over 40 other member countries, cooperating non-members, and participating territories. The primary responsibility of the WCPFC is to develop and agree upon conservation and management measures (CMMs) for

HMS caught by fisheries in the WCPFC Convention Area, including striped marlin. The WCPFC Convention Area is generally the western Pacific Ocean to 150° W (Figure 1), while the Western and Central Pacific Ocean (WCPO) refers to the western Pacific Ocean to 150° W, For the purpose of WCPFC membership, the United States is a cooperating member while the U.S. territories of American Samoa, Guam and the Commonwealth of the Northern Mariana Islands (CNMI) are each a participating territory (PT) to the WCPFC (hereafter, U.S. participating territory).

Section 505 of the WCPFCIA (16 U.S.C. § 6901, et seq.) authorizes the Secretary of Commerce (Secretary) to implement regulations adopted by the WCPFC under the authority of the WCPFCIA. Specifically, the act authorizes the Secretary, in consultation with the Secretary of State and, with respect to enforcement measures, the secretary of the department in which the U.S. Coast Guard is operating, to promulgate such regulations as may be necessary to carry out the United States' international obligations under the WCPFC Convention, including recommendations and decisions adopted by the RFMO, under the authority of the WCPFCIA. In cases where the Secretary has discretion in the implementation of one or more measures adopted by the RFMO that would govern fisheries under the authority of a regional fishery management council (RFMC), the Secretary may, to the extent practicable within the implementation schedule of the WCPFC Convention and any recommendations and decisions adopted by the RFMO, promulgate such measures in accordance with the procedures established by the Magnuson-Stevens Act.

The WCPFC has developed and agreed on several CMMs for fisheries in the WCPO since its 1st Regular Meeting in 2004. These CMMs include catch and effort limits, requirements for vessel monitoring systems, observer coverage, high seas boarding and inspection, and at-sea transshipment.

In 2010, the WCPFC adopted CMM 2010-01, which requires WCPFC member countries to reduce total catches of western central North Pacific Ocean (WCNPO) striped marlin in a phased reduction such that by January 1, 2013, the catch would be at 80 percent of the levels caught in 2000 to 2003 by all fisheries fishing north of the equator in the WCPF convention area. The measure does not apply to fisheries of small island developing states (SIDS) or PTs, which includes the U.S. participating territories. The IATTC does not have a management measure for WCNPO striped marlin, which only occurs in a small portion of its convention area

At its 16th Regular Session in December 2019, in recognition of the status of the stock as reported by the ISC. (2019), the WCPFC adopted the following rebuilding plan under the following terms:

- 20% spawning biomass in absence of fishing (20% $SSB_{F=0}$)is the rebuilding target
- 15 year horizon, by 2034
- Based on catch and effort levels with 60% probability of reaching the target within the rebuilding period

No specific catch or effort strategies have been provided or adopted (which would be updated and incorporated into Pelagic FEP Amendment 8, if adopted). The US proposed a consultative draft for North Pacific striped marlin catch limits to the WCPFC, which would establish catch

limits WCPO fisheries north of the Equator, but with no specific catch limits for the US or other participating members of the WCPFC. Such a measure may or may not be adopted by the WCPFC at its 18th Regular Session in December 2021.

1.3 Purpose and Need for Action

The purpose of this action is to develop a catch limit with an in-season accountability measure for striped marlin caught within the WCPFC Convention Area and north of the Equator by U.S. vessels under auspices of the Pelagic FEP. This is in order to move towards ending overfishing, while accounting for the relative impact of these U.S. vessels on the internationally overfished status and the overfishing that persists.

The action is needed to reduce the relative impact of US fisheries on overfishing and the overfished state of the WCNPO striped marlin stock. This is by reducing fishing mortality commensurate to stock-wide reduction in fishing mortality that would move towards ending overfishing in order to satisfy MSA 304(i) requirements for fisheries under Council purview. These are fisheries that catch, land, or discard striped marlin within the WCPFC Convention Area and north of the Equator. An accountability measure may be enacted to cease landing of WCNPO striped marlin by U.S longline fisheries once 95% of an annual catch limit is met.

1.4 Action Area

The action area for establishing the framework is the management area of the Pelagics FEP, or all areas of pelagic fishing operations in the U.S. EEZ or on the high seas for any domestic vessels that fish for, possess, or transship PMUS within the EEZ waters of the Western Pacific Region (WPR), or land PMUS within the states, territories, commonwealths, or unincorporated U.S. island possessions of the WPR. The WPR includes American Samoa, Guam, Hawaii, the Northern Mariana Islands, and the Pacific Remote Island Areas (PRIA) .
The action area for domestic implementation of catch limits is the stock boundary of WCNPO striped marlin, or the Pacific Ocean north of the equator, east to 150° W (Figure 1)

1.5 Decision(s) to be Made

This document will support a decision by the Regional Administrator (RA) of the NMFS Pacific Island Region, on behalf of the Secretary of Commerce, whether to approve, disapprove, or partially approve the Council's recommendation. The RA will use the information in this EA to make a determination about whether the proposed action would constitute a major federal action that has the potential to significantly affect the quality of the environment. If NMFS determines the action would *not* significantly affect the quality of the environment, NMFS will prepare a Finding of No Significant Impact (FONSI). If NMFS determines the proposed action is a major federal action that would significantly affect the quality of the environment, NMFS would prepare an environmental impact statement (EIS) before taking action.

1.6 List of Preparers

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1.7 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.

1.7.1 Council and SSC Meetings

The Council, at its 161st meeting in 2014 and in response to overfishing and an overfished status for WCNPO striped marlin, recommended the specification of annual WCNPO striped marlin catch limit of 457 mt applicable to US fisheries. As an accountability measure, the Council recommended the specification an annual limit of 434 mt of striped marlin applicable to the Hawaii longline fishery (which is 95% of the 457 mt limit). If the 434 mt limit is reached, the Hawaii longline fishery would not be allowed to retain striped marlin, whereas other fisheries would not be restricted. This recommendation was incorporated into draft Pelagic FEP Amendment 8, which provided a framework to incorporate conservation and management measures (CMMs) by RFMOs such as the WCPFC, into the Pelagic FEP with any subsequent catch/effort limits as internationally agreed upon by the RFMO. The previous catch limit recommendation for striped marlin was based upon CMM-2010-01, which suggested 20% reductions from a baseline level from 2000-2003. In addition to domestic recommendations of a catch limit, the Council also recommended a CMM be developed to limit all nations to limit catch and retention of no more than 500 mt of striped marlin per year.

At the 16th Regular Session of the WCPFC in December 2019, a rebuilding plan was adopted for the stock, but with no specific terms to reach the objectives. The target for the stock is to reach 20% spawning biomass in absence of fishing 20% $SSB_{F=0}$ within a 15 year horizon (by 2034), reaching the target with at least 60% probability by 2034. No specific catch or effort strategies have been provided or adopted (which would be incorporated into Amendment 8, if adopted).

At its 181st Meeting (March 2020), the Council *recommended that NMFS include any new projections with phased catch reductions in any proposal for North Pacific striped marlin to*

WCPFC17. Previous projections in the stock assessment implemented constant catch levels over a ten year horizon and there was debate over recruitment scenarios, *therefore phased reductions were recommended to take advantage of the 15 year rebuilding horizon*. PIFSC staff provided those projections to Council staff prior to this 183rd Council Meeting.

At its 183rd Meeting, the Council recommended that phased catch limits (developed by PIFSC) be used as a basis for the US delegation (of the WCPFC) to propose a CMM which would initiate a total allowable catch of striped marlin among all nations in the North Pacific, with a catch limit of striped marlin by US vessels to be 457 mt, consistent with previous Council actions.

US impacts on the stock could be quantified by its catch history used in the stock assessment or for other years, which could be used in the future to allocate catch levels among states that catch WCNPO striped marlin or develop a recommended catch level for the US alone.

At its 184th Meeting held December 2-4, 2020, the Council considered a preferred option for catch and/or effort levels that demonstrably address relative impacts of US fisheries on international overfishing of the North Pacific striped marlin stock and/or recommend other options for consideration and analysis for final action in March 2021. The limits may be applicable for specific years or within a WCPFC rebuilding plan timeline.

Also at the 184th Meeting, the Council reviewed a proposal by the Hawaii Longline Association (HLA) that proposed the phasing out of steel wire leaders in longline gear for Hawaii-based longline fisheries by July 1, 2021. HLA made the proposal on behalf of the Hawaii-based fleet, for which most vessels are members of HLA. The Council commended comprehensive initiative to further reduce interactions and post-hooking mortality of oceanic whitetip sharks, leatherback turtles, billfishes, and other protected species while also addressing associated crew safety issues. The Council subsequently directed staff to prepare a regulatory amendment to the Pelagic FEP to evaluate options to prohibit the use of wire leaders in the Hawaii deep-set longline fishery for Council action at the March 2021 meeting. A study by Ward et al (2008) suggests striped marlin catchability in longline fisheries would be greatly reduced by transitioning from the use of steel leaders to nylon materials.

2 DESCRIPTION OF THE ALTERNATIVES CONSIDERED

2.1 Development of the Alternatives

The proposed action is focused on catch limits on striped marlin to move towards ending overfishing. Under WCPFC CMM 2010-01, the stock is currently managed through catch limits. *Catches are reported and accountability is based on flag and fishery sector reports of landings for striped marlin within the WCPFC Convention Area, by stock.* The ISC reports catches of US fisheries to include dead discards and corrected misidentification in addition of annual reported landings in the WCPFC Convention Area, north of the Equator. However, other entities within the ISC do not report discards and possible corrective actions on misidentification. Catch biomass in the stock assessment and following stock projections presented in this Section utilize any information on fishery removals, including additional information specific to the US alone. In these analyses, total catch biomass is assumed to be an unbiased indicator of annual removals and fishing mortality. However, catch limits under CMM 2010-01 and likely future catch limits under the WCPFC will apply to landings only. To be consistent with these developed Alternatives, catch limits for US fisheries are herein assumed to be limits to annual landings and not associated with discards (regulatory or operational) or any analytical corrections to total fishing mortality. Catch limits in Alternatives are scaled to reported US landings of WCNPO striped marlin within the WCPFC Convention Area, north of the Equator.

Rebuilding targets adopted by the WCPFC are substantially different from domestic targets or status determination criteria in the Council's approved Pelagic FEP (Table 2). For example, domestically (i.e., under FEP requirements established in accordance with the MSFCMA), the US must end overfishing based on scaled fishing mortality at maximum sustainable yield, F_{MSY}, as a maximum fishing mortality threshold (MFMT) [see section _____ in the Council's Pelagic FEP]. Overfished status under the Pelagic FEP is determined when the biomass of the stock (or spawning stock) is below a scaled proportion of biomass at maximum sustainable yield (B_{MSY}) as a minimum stock size threshold (MSST). MSST for WCNPO striped marlin corresponds to spawning stock of 1774 mt. The WCPFC does not specify a need to end overfishing but that the stock reach a spawning biomass of 3493 mt, (20% $SSB_{F=0}$), in 15 years. For domestic stocks not under international management, rebuilding must be with 10 years (unless otherwise specified) and the rebuilding biomass target is B_{MSY} (or SSB_{MSY}), which is 2534 mt for this stock. This rebuilding requirement does not apply for this stock because WCNPO Striped marlin are under international management.

Table 2 – Comparison of Council Pelagic FEP versus WCPFC status determination criteria and rebuilding metrics for WCNPO striped marlin. Domestic rebuilding metrics (e.g., those in the approved Pelagics FEP) may not apply towards US vessels fishing stocks under international agreements. F_{MSY} equals 0.61 yr^{-1} and SSB_{MSY} equals 2534 mt according to the 2021 update of the 2019 stock assessment. Lowest value of natural mortality (M) was 0.3 yr^{-1}, a value rendering the most conservative minimum stock size threshold (MSST).

Requirement	Domestic and/or Relative Impacts	International (WCPFC)
Guidance	MSA, Council Pelagic FEP	WCPFC, CMM-2010-01, WCPFC17
Minimum Stock Size Threshold or Biological Limit Reference Point	(1-M)*SSB_{MSY} = 0.70*2534mt, 1774 mt	None Adopted (WCPFC), though 20% $SSB_{F=0}$ is proxy, 3493 mt
Maximum Fishing Mortality Threshold or F-based LRP	MFMT = F_{MSY}*(SSB_T/SSB_{MSY}*0.70), or F_{MSY} when SSB_T > SSB_{MSY}	None Adopted, though F_{MSY} and $F_{20\%SSBF=0}$ are proxies
Rebuilding Target - Biomass	SSB_{MSY}, 2534 mt	20% $SSB_{F=0}$, 3493 mt
Certainty of Reaching Target	>50% Probability	60% Probability
Ending Overfishing	Immediately, F < MFMT "rebuild"	Not Specified
Rebuilding Horizon	10 years, with exceptions- including international stocks	15 years

Domestically under MSA and Council	Internationally under WCPFC
Stocks under international agreements are exempt to Section 303(a)(15) of the MSA implement ACLs, but… Section 304(i) specifies Councils must address ***relative Impacts….*** which could be catch and/or effort limits Relative impacts could be with respect to Council FEP metrics	WCPFC CMM-2010-01 and the WCPFC in 2019 adopted a rebuilding plan with no specific terms for fisheries so far, but would rebuild the stock with cooperation of all participants, likely with catch and/or effort limits Rebuilding plan states within 15 years, stock must reach 20% $SSB_{F=0}$ with 60% probability

Based on the objective to develop catch limits for WCNPO Striped marlin that address the relative impact of domestic fishing on the stock status, the Council considered a range of options for determining the best approach. The approach considered different ways of estimating the relative impact of domestic fishing on the stock status and options to manage the fishery to attain the domestic rebuilding targets that would help reduce disruption in the U.S. pelagic longline fisheries and consider continued responsible fisheries development in U.S. Participating Territories. We summarize the Council's deliberations here.

Phased Total Catch Limits to End Overfishing Per Domestic Criteria and Meet International Rebuilding Criteria

At its 181st Meeting (March 2020), the Council recommended that NMFS include any new projections with phased catch reductions in any proposal for North Pacific striped marlin to WCPFC17. Previous projections in the stock assessment implemented only constant catch levels over a ten year horizon and there was debate over recruitment scenarios, therefore phased reductions were recommended to take advantage of the 15 year rebuilding horizon and allow catch limits to adapt over time with improvement in information. PIFSC staff provided those projections to Council staff prior to this 183rd Council Meeting and provided updated projections in February, 2021, prior to the 185th Council Meeting in March 2021. These projections account for biomass dynamics in the 2021 update to the 2019 stock assessment and utilize AGEPRO (Brodziak et al., 1998) to project stock biomass into the future. Projections have not been formally reviewed by the ISC or by the WCPFC Science Committee. However, updated assessment outcomes do not change the nature of stock status and changes are minor.

Constant catch reduction to reach the WCPFC rebuilding target within the timeline would be a 34.4% reduction from 2013-2017 reference levels, with a total catch of 1378 mt if beginning 2021 or 1372 mt if beginning 2022.

Phased catch levels provided by PIFSC suggest the WCNPO striped marlin stock will reach the rebuilding target with 60% probability in four phases of catch levels. The stock will be re-assessed by the end of the first phase (2021-2024 or 2022-2024) under a total catch level of 1810 mt, which is a 13.4% reduction from catch levels in the 'recent' last five years of catch biomass used in the 2021 update to the the 2019 assessment (reference years 2013-2017). The stock will be re-assessed in 2024 and new BSIA information with stock projections will be used to reevaluate catch limits towards reaching the rebuilding target from 2025 and beyond.

PIFSC provided projections based on phased total catch limits for WCNPO striped marlin in four phases, over the rebuilding period 2021-2034, beginning 2021:

1) 2021-2024 (1810 mt), 13.4% reduction in catch biomass from reference years;
2) 2025-2028 (1575 mt);
3) 2029-2032 (1370 mt);
4) and 2033-2034 (1195 mt);

PIFSC also provided projections based on phased total catch limits for WCNPO striped marlin in four phases, over the same rebuilding period, with catch reductions beginning 2022:

1) 2022-2024 (1810 mt), 13.4% reduction in catch biomass from reference years;

2) 2025-2028 (1578 mt);
3) 2029-2032 (1376 mt);
4) and 2033-2034 (1200 mt);

Whether beginning in 2021 or 2022, catch biomass levels for Phase 1 (up to 2024) is exactly the same value, 1810 mt, to effectively end overfishing immediately, move towards rebuilding the stock within the international rebuilding timeline, and increase spawning biomass to above B_{MSY} by 2024, before the next stock assessment is scheduled. A summary of phased catches and a constant catch, which are used to develop alternatives, is presented in Table 3.

The first phase of projected total catches corresponds to an approximate 13% reduction from average catches incorporated in the last five years in 2019 stock assessment (2013-2017) – from 2100 mt to 1810 mt (Table 2). By the end of first year of implementation of a phased total catch of 1810 mt for striped marlin among WCPFC fisheries in 2021, overfishing would end immediately, per Council Pelagic FEP status determination criteria, including MSST and MFMT (Table 2). Projected biomass leading up to a 2021 management is expected to increase as fishing mortality is assumed constant from 2018 to 2020 based on 2018 catches. Even though this is an international stock, an initial reduction in total catch to 1810 mt would also likely remove an overfished status per Pelagic FEP status determination criteria. However, MSST is nearly half of the biomass corresponding to the 20% $SSB_{F=0}$ rebuilding target in the WCPFC measure (1823 mt vs 3610 mt spawning biomass). Therefore, the proposed measure would be considered likely rebuilt per WCPFC criteria by 2033 with over 67% certainty by 2034.

The phased projections also allow the fishery to gradually reduce its catch over time as opposed to a more dramatic reduction (Figure 1), thus likely lessening economic and market burdens. Figure 2 shows that Phase 1 of these projections would likely end overfishing, partially satisfying a requirement under MSA 304(i).

Table 3- Annual projected catch biomass, fishing mortality, and median spawning biomass for catch projection scenarios. Grey highlighted rows indicate stock projections in years since terminal year data in the 2019 stock assessment, assuming constant fishing mortality. Green highlight indicates reaching domestic objectives (Fishing mortality < MFMT and Biomass > B_{MSY}). Blue indicates international objectives achieved, biomass exceeds 20% $SSB_{F=0}$. Scenarios are for phased catches and constant catches, starting either in 2021 or 2022.

	Phased Catch 2021 Start			Phased Catch (mt) 2022 Start			Constant Catch 2021 Start			Constant Catch (mt) 2022 Start		
Year	Catch Biomass (mt)	Fishing Mortality	Median Spawning Biomass (mt)	Catch Biomass (mt)	Fishing Mortality	Median Spawning Biomass (mt)	Catch Biomass (mt)	Fishing Mortality	Median Spawning Biomass (mt)	Catch Biomass (mt)	Fishing Mortality	Median Spawning Biomass (mt)
2018	*1896.8*	*0.69*	*1605*	*1897*	*0.69*	*1604*	*1894.3*	*0.69*	*1605*	*1896*	*0.69*	*1605*
2019	*2386.2*	*0.69*	*2096*	*2387*	*0.69*	*2096*	*2385.8*	*0.69*	*2095*	*2386*	*0.69*	*2096*
2020	*2497.2*	*0.69*	*2499*	*2497*	*0.69*	*2499*	*2495.8*	*0.69*	*2499*	*2498*	*0.69*	*2500*
2021	1810	0.51	2520	*2327*	*0.69*	*2361*	1378	0.38	2650	*2328*	*0.69*	*2365*
2022	1810	0.51	2532	1810	0.56	2265	1378	0.35	2896	1372	0.41	2394
2023	1810	0.51	2548	1810	0.55	2308	1378	0.33	3114	1372	0.37	2670
2024	1810	0.50	2567	1810	0.54	2370	1378	0.32	3297	1372	0.34	2936
2025	1575	0.43	2653	1578	0.45	2499	1378	0.31	3434	1372	0.33	3158
2026	1575	0.41	2791	1578	0.43	2666	1378	0.30	3541	1372	0.31	3333
2027	1575	0.40	2911	1578	0.41	2811	1378	0.29	3626	1372	0.30	3471
2028	1575	0.39	3005	1578	0.40	2930	1378	0.29	3691	1372	0.30	3577
2029	1370	0.33	3144	1376	0.33	3078	1378	0.29	3737	1372	0.29	3656
2030	1370	0.31	3312	1376	0.32	3260	1378	0.29	3769	1372	0.29	3716
2031	1370	0.30	3455	1376	0.31	3411	1378	0.28	3800	1372	0.28	3769
2032	1370	0.30	3566	1376	0.30	3529	1378	0.28	3819	1372	0.28	3805
2033	1195	0.25	3708	1200	0.25	3674	1378	0.28	3839	1372	0.28	3832
2034	1195	0.24	3875	1200	0.24	3845	1378	0.28	3847	1372	0.28	3846

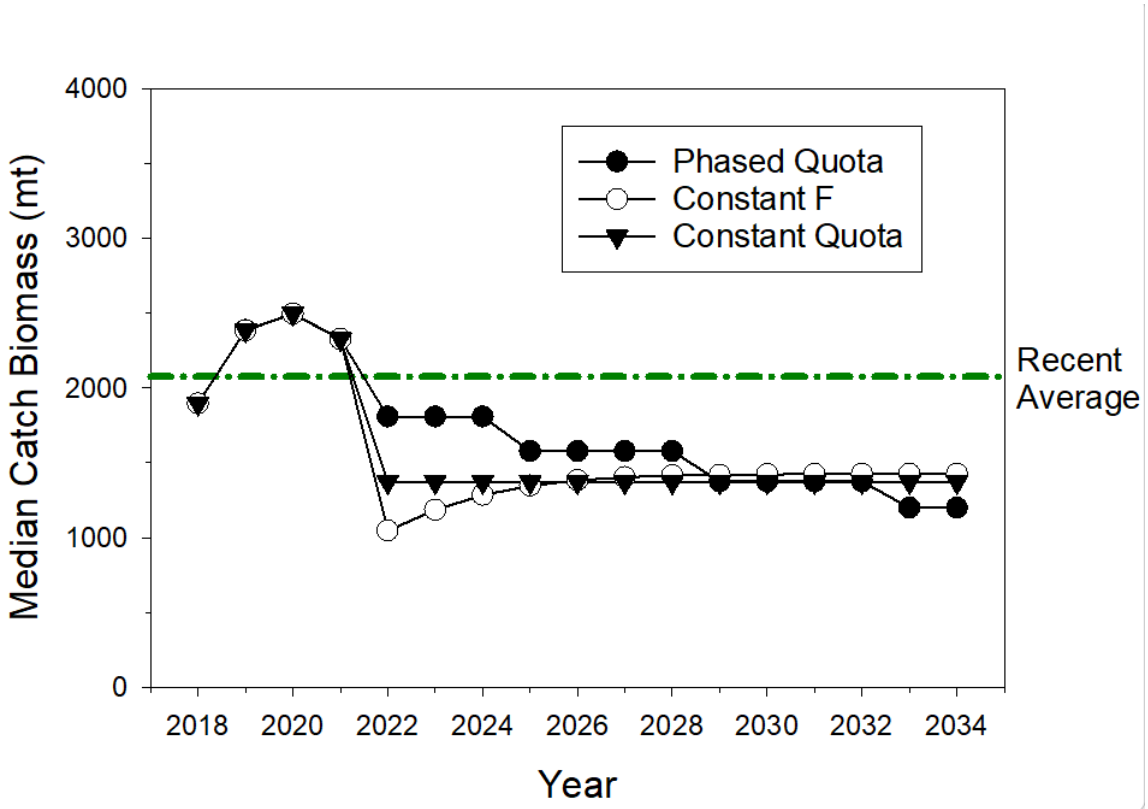

Figure 5 – Comparison of phased vs constant catch limits, 2021-2034 (source: J Brodziak)

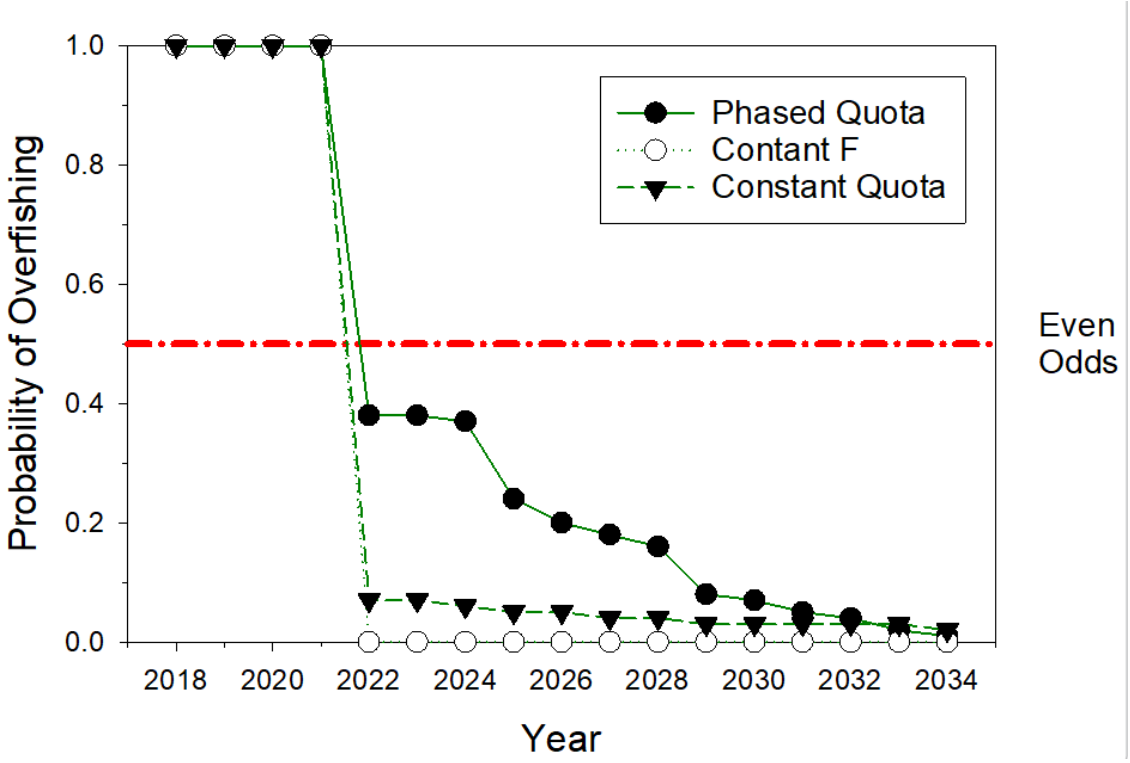

Figure 6 – Probability of overfishing for phased and constant catch limits, 2021-2034 (source: J Brodziak). Red hashed line indicates 50% probability of overfishing

Relative Impacts of US Fishing Vessels on WCNPO Striped Marlin Stock

Stocks managed under international agreements are exempt from annual catch limit requirements, per MSA National Standards 1, 50 CFR§600.310(h)(1)(ii). However, in addressing the relative impacts of US vessels under Council FEP purview on internationally overfished stocks, domestic catch limits may be appropriate. According to best scientific information available (BSIA), which is the 2019 stock assessment, US vessels in the last five years of that assessment (2013-2017) accounted for 21.8% of total catches used to estimate the biomass dynamic of the stock and produce stock projections. Historically, from 1975-2017, US catches account for 6.3% of removals. The Japanese drift net fishery and longline fisheries historically harvested the majority of striped marlin, from 1975-2017. However, catches in these fisheries have declined, although they still collectively remain the largest sources of WCNPO striped marlin mortality. Taiwanese have declined slightly and US catches have increased slightly through time, thus increasing their relative significance as Japanese catches declined significantly from the 1990's.

Table 4 – Average annual catch biomass by WCPFC cooperating member as reported to the ISC Billfish Working Group and implemented in the 2019 stock assessment. "Other WCPFC Countries" includes catches from Korea, China, and small island developing states.

YEARS	JAPAN	USA	TAIWAN	OTHER WCPFC COUNTRIES	TOTAL CATCH
1975-2017	**4678.9**	**355.2**	**508.7**	**100.0**	**5642.8**
	82.9%	6.3%	9.0%	1.8%	100%
1993-2017	**3086.1**	**485.3**	**434.0**	**130.8**	**4136.1**
	74.6%	11.7%	10.5%	3.2%	100%
2008-2017	**1475.1**	**416.6**	**421.9**	**136.4**	**2450.1**
	60.2%	17.0%	17.2%	5.6%	100%
2013-2017	**1253.7**	**474.4**	**345.9**	**99.1**	**2173.1**
	57.7%	21.8%	15.9%	4.6%	100%

US landing by fishery (Table 5) and ISC catch tables (analyzed by ISC members who are responsible for stock assessments) are found in Appendix I. The majority of US catches are comprised of longline catches, with some troll and handline catches that have declined from over 60 mt per year in the 1990's to typically less than 12 mt per year.

Table 5 – US landings (mt) of WCNPO striped marlin for troll and longline sectors operating in the North Pacific as reported to the WCPFC and WPFRMC. Longline fisheries include US (Hawaii-based), US dual-permitted with America Samoa, CMNI online fisheries Source: (WCPFC, 2020; 2015)

Year	Tropical Troll	AS/US Longline	US Longline	CNMI Longline	Total Longline	% Troll	Total
2019	13	56	405		461	2.74%	474
2018	12	44	332		376	3.09%	388
2017	6	50	280		330	1.79%	336
2016	12	48	280		328	3.53%	340
2015	11	36	378		414	2.59%	425
2014	12	14	343		357	3.25%	369
2013	8	23	262	42	328	2.38%	336
2012	11	54	209		263	4.01%	274
2011	16	68	263		331	4.61%	347
2010	19	13	124		137	12.18%	156

2.2 Alternatives Considered in Detail

Regardless of which alternative is selected to be implemented, the U.S. longline fishery would continue to fish in accordance with regulations that limit participation through permits, allow NMFS to monitor the fishery through logbooks, VMS, and observer placement; and monitor and respond to annual catch limits for bigeye tuna or any other Pelagic MUS. As part of current management, NMFS will continue its ongoing management that provides for catch by dual permitted vessels (vessels holding both a Hawaii limited entry longline fishing permit and an American Samoa limited entry longline fishing permit) to be attributed to American Samoa for reporting to the WCPFC, once the bigeye catch limit has been reached, and provided fishing under the American Samoa fishing permit in the North Pacific Ocean is done on the high seas.

However, catch limits of WCNPO striped marlin in each Alternative are applicable to all vessels holding a Hawaii limited entry longline fishing permit. These include those that are also dual-permitted with an American Samoa limited entry longline fishing permit. Catch landings of WCNPO striped marlin from these vessels fishing in the North Pacific Ocean high seas are not differentiated from U.S. landings of the stock in the Alternatives presented in the following sections.

None of the Alternatives considered are applicable to vessels operating under a Western Pacific general longline permit. These permits are authorized under CFR §665.801 to use a vessel shoreward of the outer boundary of the EEZ around Guam, CNMI, Johnston or Palmyra Atolls, Kingman Reef, or Wake, Jarvis, Baker or Howland Islands to fish for western Pacific pelagic MUS using longline gear or to land or to transship western Pacific pelagic MUS that were caught

using longline gear. There have been no active permits since 2013 and only 42 t of WCNPO striped marlin have been reported from these vessels fishing out of the CNMI.

None of the Alternatives considered are applicable to vessels operating solely under an American Samoa longline limited access permit. This is the permit required by CFR §665.801 to use a vessel shoreward of the outer boundary of the EEZ around American Samoa to fish for western Pacific pelagic MUS using longline gear or to land or transship western Pacific pelagic MUS that were caught in the EEZ around American Samoa using longline gear. Vessels operating under an American Samoa longline limited access permit without a Hawaii longline limited access permit, are not known to land striped marlin from the WCNPO striped marlin stock.

Under each of the Alternative below, the Council may select specific implementation years for catch limits. The impacts of selecting differing start dates are contrasted in Table 3.

2.2.1 Alternative 1: No Action (Status Quo/Current Management)

Under Alternative 1, NMFS would not establish a catch limit for striped marlin under the Magnuson-Stevens Act process. NMFS could implement a striped marlin catch limit under the authority of the WCPFCIA; however, since the level of catch has been below the 457 t limit as mandated by CMM-2010-01 with exception of 2019, NMFS has chosen not to implement the catch limit under this authority at this time. Catches of striped marlin would likely not depart from the most recent five year average (2015-2019) of 393 mt per annum. Should catches of striped marlin increase, NMFS could implement the limit outside of the Magnuson-Stevens Act process using solely the authority of the WCFPCIA. This alternative would not meet the stated management objective of addressing the relative impact of U.S. fishing vessels managed under the Pelagics FEP to end overfishing of WCNPO striped marlin and rebuild the stock in accordance with Section 304(i) of the Magnuson-Stevens Act. The alternative does, however, consider the environmental baseline against which the impacts of the proposed action alternatives may be compared, including the possible prohibition of wire leaders and tracers in Hawaii-based U.S. longline fisheries.

Expected Fishery Outcomes

Under this alternative, U.S. fisheries would have no limits on the catch of the WCNPO stock of striped marlin. There would be no change in the operation of the Hawaii longline fisheries in terms of location, target and non-target species, catch, effort, fishermen participation, gear composition, seasonality, intensity, or bycatch. Overfishing of the stock will persist, largely attributed to international fishing.

However, even by taking no action, catches of striped marlin would likely be reduced inherently by the likely future prohibition of wire leaders in Hawaii longline fisheries which the Council will take action on. Ward et al. (2008) determined that catch rates of striped marlin in longline fisheries decline 45% by transitioning from wire leaders and tracers to nylon-based materials. However, these results must be taken with caution due to low sample size and consider that no gear modification ensures that catches will be below levels commensurate with moving towards ending overfishing or accounting for the relative impact of U.S. vessels.

From 2013-2017(the last five years in the stock assessment) US landings of striped marlin from the entire Pacific Ocean north of the equator averaged around 360.6 t of striped marlin and from 2015-2019, landings averaged 393 mt (WPRFMC 2020). The Hawaii troll fishery (commercial troll and charter fishery combined) typically catches less than 5 percent of the commercial striped marlin compared to the longline catch. NMFS expects this level of catch to continue.

The expected fishery outcome of this alternative is that the catch of WCNPO striped marlin in the WCPFC Convention Area would likely remain below 457 t and compliant with CMM-2010-01 but overfishing will still persist internationally. If in the future, the U.S. landings of striped marlin exceeds 457 t, the United States could be in non-compliance with the CMM 2010-01. NMFS can also use its WCPFCIA authority to implement a limit for WCNPO striped marlin independently from the Magnuson-Stevens Act process if warranted.

2.2.2 Alternative 2: Catch limit of 313 mt, 13.4% reduction from 2013-2017 landings

Under Alternative 2, the Council would amend the Pelagic FEP by establishing a catch limit for the WCNPO stock of striped marlin of 313mt each year for vessels of the United States. This would include an accountability measure to cease retention and landing of WCNPO striped marlin in US longline fisheries once US longline vessels have caught 95% of the catch limit, or 297 mt. This alternative is based on catch biomass proportional to phased stock projections described in Section 2.1, Table 3, and depicted in Figures 5 and 6. Specifically, this level of catch is consistent to the proportional reduction in catch in Phase 1 (2021-2024 or 2022-2024) from 2013-2017 reference catch biomass, which is 13.4% reduced from catch in that time period. This reduction from 2013-2017 corresponds to a 13.4% reduction in US landings for 2013-2017 (361 mt), equaling 313 mt in landings for applicable US vessels.

Alternative 2 would include the following vessels:

- U.S. longline vessels possessing a valid Hawaii longline limited-entry fishing permit fishing within the WCNPO striped marlin stock boundary. This would include all U.S. shallow-set (swordfish targeting) and deep-set (tuna targeting) longline vessels based in Hawaii and the U.S. West Coast.
- U.S. longline vessels possessing both a valid American Samoa longline permit and a valid Hawaii longline permit provided the vessel is fishing on the high seas seaward of the U.S. EEZ around Hawaii in the North Pacific.
- U.S.. troll and handline vessels fishing in the WCNPO striped marlin stock boundary. This would include all troll and handline fishing vessels based in Hawaii and potentially troll and handline vessels operating out of ports in the West Coast of the United States.

The proposed action would not affect the following fishing vessels:

- U.S. longline vessels possessing a valid Western Pacific General Permit fishing on the high seas or in the U.S. EEZ around Guam, the Northern Mariana Islands and the PRIA.
- U.S. longline vessels only possessing a valid American Samoa longline fishing permit fishing on the high seas, or the U.S. EEZ around American Samoa.
- Any U.S. longline vessels operating under a specified fishing agreement that identifies WCNPO striped marlin as a PMUS to which the agreement applies.

- U.S. purse seine vessels fishing in the WCPO or EPO

In addition, Hawaii-permitted longline vessels would be subject to a catch target of 290 t for striped marlin each year as an accountability measure, 95% of the total catch limit. NMFS would prohibit retention of striped marlin in the U.S. longline fleet when NMFS projects the fishery will reach the catch target.

NMFS would attribute catch of striped marlin by dual-permitted vessels to the Hawaii longline fleet – would not count towards American Samoa catch – and thus the non-retention provisions would apply to dual-permitted vessels.

Expected Fishery Outcomes

From 2013-2017, landings of striped marlin from the entire Pacific Ocean north of the equator averaged around 360.6 t of striped marlin (WPRFMC 2020). US fisheries would retain 13.4% less striped marlin from this reference level under Alternative 2. The Hawaii troll fishery (commercial troll and charter fishery combined) typically catches less than 5 percent of the commercial striped marlin compared to the longline catch. NMFS expects this level of catch to continue.

Under Alternative 2, there would be a market supply loss and loss of revenue for the longline fishery by reducing annual catch and sales of striped marlin. This may be result of 13.4% (~20% compared to 2015-2019 catch levels)

US relative contribution to overfishing will end immediately and catch limits will fall in line with expected WCPFC catch limits, should a rebuilding measure with a specific catch limit be adopted. The implementation of future WCPFC catch limits is purely speculative. While ending US contribution of overfishing within short order of implementation, the US will only be acting unilaterally and implementing these catch limits will not end overfishing of the WCNPO stock on their own.

2.2.3 Alternative 3: Catch limit of 237 t, 34.4% reduction from 2013-2017 landings

Under Alternative 3, the Council would amend the Pelagic FEP by establishing a catch limit for the WCNPO stock of striped marlin of 237 t each year for vessels of the United States. This would include an accountability measure to cease retention and landing of WCNPO striped marlin in US longline fisheries once US longline vessels have caught 95% of the catch limit, or 225 mt. This alternative is based on catch biomass proportional to constant stock projections beginning in 2021, as described in Section 2.1, Table 3, and depicted in Figures 5 and 6. Specifically, this level of catch is consistent to the immediate proportional reduction in catch relative to 2013-2017 reference catch biomass, which is 34.4% reduced from catch in that time period. This reduction from 2013-2017 corresponds to a 34.4% reduction in US landings for 2013-2017 (361 mt), equaling 237 mt in landings for applicable US vessels.

Alternative 3 would include the following vessels:

- U.S. longline vessels possessing a valid Hawaii longline limited-entry fishing permit fishing within the WCNPO striped marlin stock boundary. This would include all U.S.

shallow-set (swordfish targeting) and deep-set (tuna targeting) longline vessels based in Hawaii and the U.S. West Coast.

- U.S. longline vessels possessing both a valid American Samoa longline permit and a valid Hawaii longline permit provided the vessel is fishing on the high seas seaward of the U.S. EEZ around Hawaii in the North Pacific.
- U.S.. troll and handline vessels fishing in the WCNPO striped marlin stock boundary. This would include all troll and handline fishing vessels based in Hawaii and potentially troll and handline vessels operating out of ports in the West Coast of the United States.

The proposed action would not affect the following fishing vessels:

- U.S. longline vessels possessing a valid Western Pacific General Permit fishing on the high seas or in the U.S. EEZ around Guam, the Northern Mariana Islands and the PRIA.
- U.S. longline vessels only possessing a valid American Samoa longline fishing permit fishing on the high seas, or the U.S. EEZ around American Samoa.
- Any U.S. longline vessels operating under a specified fishing agreement that identifies WCNPO striped marlin as a PMUS to which the agreement applies.
- U.S. purse seine vessels fishing in the WCPO or EPO

In addition, Hawaii-permitted longline vessels would be subject to a catch target of 204 t for striped marlin each year as an accountability measure, 95% of the total catch limit. NMFS would prohibit retention of striped marlin in the U.S. longline fleet when NMFS projects the fishery will reach the catch target.

NMFS would attribute catch of striped marlin by dual-permitted vessels to the Hawaii longline fleet – would not count towards American Samoa catch – and thus the non-retention provisions would apply to dual-permitted vessels.

Expected Fishery Outcomes

From 2013-2017, landings of striped marlin from the entire Pacific Ocean north of the equator averaged around 360.6 t of striped marlin (WPRFMC 2020). US fisheries would retain 34.4% less striped marlin from this reference level. The Hawaii troll fishery (commercial troll and charter fishery combined) typically catches less than 5 percent of the commercial striped marlin compared to the longline catch. NMFS expects this level of catch to continue.

Like with Alternative 2, there would be a market supply loss and loss of revenue for the longline fishery by reducing annual catch and sales of striped marlin.

US relative contribution to overfishing will end immediately and catch limits will fall in line with expected WCPFC catch limits, should a rebuilding measure with a specific catch limit be adopted. The implementation of future WCPFC catch limits is purely speculative. While ending US contribution of overfishing within short order of implementation, the US will only be acting unilaterally and implementing these catch limits will not end overfishing of the WCNPO stock on their own.

2.2.4 Alternative 4: Catch Limit of 457 t, consistent with CMM 2010-01 and Previous Council Action

Under Alternative 4, the Council would amend the Pelagic FEP by establishing a catch limit for the WCNPO stock of striped marlin of 457 t each year for vessels of the United States as agreed upon by the WCPFC in 2010. This level of catch is consistent with WCPFC CMM 2010-01, which the US has not yet incorporated through the MSA process, but may through WCPFCIA.

This would include the following vessels:

- U.S. longline vessels possessing a valid Hawaii longline limited-entry fishing permit fishing within the WCNPO striped marlin stock boundary. This would include all U.S. shallow-set (swordfish targeting) and deep-set (tuna targeting) longline vessels based in Hawaii and the U.S. West Coast.
- U.S. longline vessels possessing both a valid American Samoa longline permit and a valid Hawaii longline permit provided the vessel is fishing on the high seas seaward of the U.S. EEZ around Hawaii in the North Pacific.
- U.S.. troll and handline vessels fishing in the WCNPO striped marlin stock boundary. This would include all troll and handline fishing vessels based in Hawaii and potentially troll and handline vessels operating out of ports in the West Coast of the United States.

The proposed action would not affect the following fishing vessels:

- U.S. longline vessels possessing a valid Western Pacific General Permit fishing on the high seas or in the U.S. EEZ around Guam, the Northern Mariana Islands and the PRIA.
- U.S. longline vessels only possessing a valid American Samoa longline fishing permit fishing on the high seas, or the U.S. EEZ around American Samoa.
- Any U.S. longline vessels operating under a specified fishing agreement that identifies WCNPO striped marlin as a PMUS to which the agreement applies.
- U.S. purse seine vessels fishing in the WCPO or EPO

In addition, Hawaii-permitted longline vessels would be subject to a catch target of 434 mt for striped marlin each year as an accountability measure, 95% of the total catch limit. NMFS would prohibit retention of striped marlin in the U.S. longline fleet when NMFS projects the fishery will reach the catch target.

Expected Fishery Outcomes

Overfishing would remain to persist and US fisheries would likely not see reduction in catches. Fishery would likely not differ in its outcomes from Alternative 1

Under Alternative 4 NMFS would implement the Council recommended catch limit of 457 t for striped marlin for all vessels of the United States and a catch target of 434 t for Hawaii-permitted longline vessels. This alternative would limit all vessels of the United States that interact with the WCNPO stock of striped marlin to an annual catch limit of 457 t of striped marlin. CMM 2010-01 requires WCPFC member countries to reduce total catches of North Pacific striped marlin in the WCPO to a phased reduction such that by January 1, 2013, the catch would be at 80% of the levels caught in 2000 to 2003. The highest annual catch of striped marlin made by Hawaii-based

fisheries from the WCPO between 2000 and 2003 was 571 t; thus, an 80% reduction results in a limit of 457 t. Unlike past CMMs that have applied to bigeye tuna and were specific to only longline fisheries, CMM 2010-01 applies to all fisheries fishing in the WCPO north of the equator. However, the striped marlin limit would not apply to American Samoa vessels fishing south of the equator as striped marlin in this region are from a different stock; the limit would apply to dually permitted American Samoa/Hawaii longline vessels fishing within the EEZ. Additionally, CMM 20101-01 also has language that specifies the limits of CMM 2010-01 would not apply to "Small Island Developing State Members and participating territories in the Convention Area seeking to develop their own domestic fisheries." Therefore, longline vessels from CNMI or Guam would not be affected; however, there are currently no longline vessels operating from these areas.

Thus, the 457 t limit would apply to all pelagic fisheries of the United States that interact with the WCNPO stock of striped marlin, which are primarily the Hawaii-permitted longline vessels and Hawaii-based troll and handline fisheries. In the unlikely event of an overage of 457 t in any given year, there would be no overage adjustments for the following year. CMM 2010-10 does not require overage adjustments nor did the Council recommend them.

In addition, the Council recommended a catch target of 434 t annually for the Hawaii-based longline fisheries. This would help ensure that the overall 457 t catch limit is not exceeded. NMFS and the Council monitor landings by Hawaii-based longline fisheries through federal logbook reporting. Vessel owners and captains are required to submit logbooks within 72 hours of returning to port and this will greatly expedited with the implementation of electronic reporting. Currently, catch data from pelagic troll and handline fisheries in Hawaii are generally not available until at least six months after the end of the fishing year. Therefore, due to these reporting lags, in-season catch monitoring of the pelagic troll and handline fisheries are not possible at this time. However, 95% of the striped marlin catch comes from the Hawaii longline fishery whereas on 5% of the striped marlin landings arise from the Hawaii troll and handline fisheries. For this reason, to ensure the 457 t catch limit is not exceeded, NMFS and the Council would monitor catches of WCNPO striped marlin by the Hawaii longline fishery only. Monitoring of the catch would distinguish between WCPO caught striped marlin and EPO striped marlin. Only WCPO striped marlin would count towards the catch target. If and when 95% of the 457 t limit is reached, or 434 t, NMFS would restrict longline retention of striped marlin in the WCPO and the portion of the stock that overlap in the EPO through the end of the fishing year. This is currently more restrictive than what was agreed to by the WCPFC, but would help ensure that the United States would be compliance with the CMM 2010-01.

As with Alternative 1 and 4, catch limits for target stocks, such as bigeye tuna, are currently in place and control the amount of fishing for bigeye tuna. Additionally, fishing for bigeye tuna drives most of the incidentally catch of striped marlin and other non-target species. However, if the 434 t longline striped marlin catch target is reached, NMFS does not expect that longline fishing effort for target species would end as NMFS would not require longline fishing effort to cease as it does when the bigeye tuna catch limit is reached. Rather, all striped marlin catch by longline vessels would have to be discarded once the 434 t catch target is reached, which would result in higher discards than what is currently experienced under Alternative 2. However, NMFS expects fishing for target and other non-target species would continue. Neither the deep-set or shallow-set longline fishery sets longline gear to target or maximize striped marlin catches.

As such, the striped catch limit for the Hawaii longline fishery is not likely to alter the pattern or method of fishing.

NMFS would attribute catch of striped marlin by dual-permitted vessels to the Hawaii longline fleet – would not count towards American Samoa catch – and thus the non-retention provisions would apply to dual-permitted vessels.

2.2.5 Comparison in Catch Between Alternatives

Catches of WCNPO striped marlin differ considerably between Alternatives described above. These catch levels are depicted in Figure 7. While catches of striped marlin from 2015-2019 average 393 mt, the Alternatives use 2013-2017 as a reference catch level because these are the last five years in the assessment used to developed catch projections. Reference catches are 361 mt for this period. Alternative 2 is 13.4% reduced from 2013-2017 reference catch levels and 20% reduced from 2015-2019, which includes an anomalous record high catch from 2019. Alterative 3 is below every single annual catch level since 2010 and is a 34.4% reduction from reference catches. Alternative 4 is greater than recent catch averages and exceed annual US catches in every year , with exception of 2019.

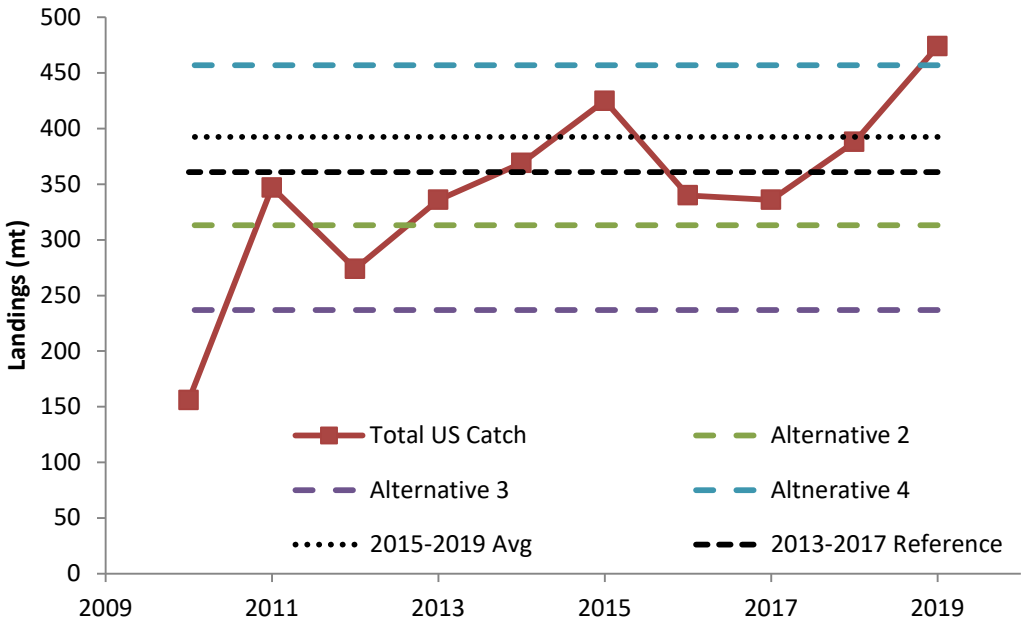

Figure 7 – Comparison of catches of US total WCNPO striped marlin catch, reference catch levels, and catches from Alternatives 2, 3, and 4.

2.3 Alternatives Considered, but Rejected from Further Analysis

Area-based management, effort limits, gear restrictions, and requiring releases of striped marlin were considered by the authors. Area-based management would not be tenable because there is little evidence to show where US vessels operate have a disproportionate impact on the stock in any specific area. The Hawaii longline fishery has already been precluded to fish in many areas of its range. Effort limits and gear restrictions were rejected from analyses because these would

be applicable to the US longline fishery only and may have deleterious impacts on target species catch and fishery performance, which could outweigh conservation benefits. Lastly, the authors considered live releases of striped marlin for striped marlin brought to longline vessels alive at haulback. Figure 8 (from Brodziak, 2020) summarize the impact of releasing al l live fish from longline vessels, using the US Hawaii-based fleet as an indicator for all WCPFC fleets. Live releases alone do not reach stock rebuilding targets and would require over 100% compliance to achieve WCPFC rebuilding targets. 48% of striped marlin are alive at haulback, this number may be different from non-US longline vessels operating in the WCPFC Convention Area.

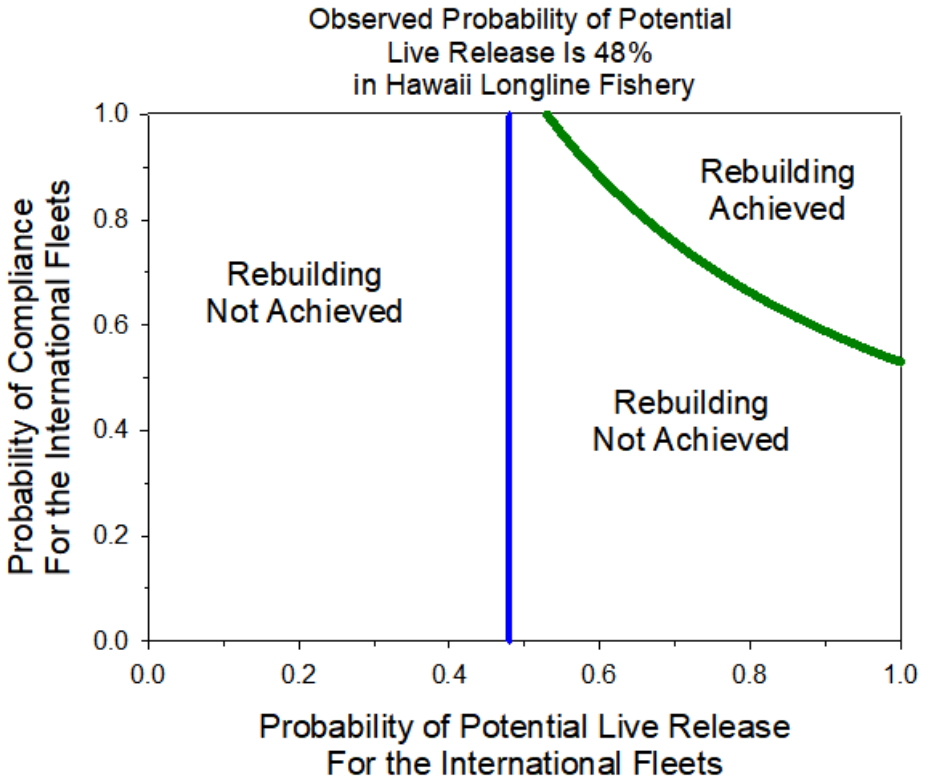

Figure 8 – Impact of stock-wide requirements of live releases of WCNPO striped marlin, using estimated post-release mortality and proportion of striped marlin alive at hauback, using the Hawaii-longline Pacific Island Regional Observer Program data (PIROP). Source: Brodziak, 2020.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter describes the baseline condition of resources in the action area. While the administrative change to instituting catch limits on striped marlin within the WCPFC Convention Area north of the Equator does not have the potential to affect the environment, these catch limits could affect environmental resources, fisheries, and the management setting. In identifying the potential effects of this fishery management action, NMFS asks whether and how the alternatives may change the operation of the regulated fisheries to which the action applies, which are the longline fisheries authorized under the Pelagics FEP. Therefore, the recent operation of the fisheries and their effects on the physical, biological, and human environment form the baseline for comparison of the alternatives in the next chapter.

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 Inter-American Tropical Tuna Commission (IATTC).

3.2 Affected Physical Resources

To be completed - highlighting the physical resources identified in Pelagic FEP.

3.3 Affected Biological Resources

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 4. For a comprehensive discussion of the biology, life history, and factors which affect distribution and abundance of pelagic MUS, see the Pelagics FEP (WPFMC 2009).

The Pelagics FEP (WPFMC 2009) includes status determination criteria (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 BMSY 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 BMSY. 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 6 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 at the time of this publication. Section 3.5 describes the NMFS stock status determination process. The current status of the stock represents the best scientific information available regarding the effects of past and present actions on the target and non-target stocks.

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. For a comprehensive discussion of the biology and life history of pelagic MUS, see the Pelagics FEP. Table 4 provides a summary of the stock status of pelagic MUS under the Pelagics FEP.

Table 6. Stock status of pelagic management unit species under the Pelagics FEP.

Stock	**Overfishing reference point**	**Is overfishing occurring?**	**Approaching Overfishing (2 yr)**	**Overfished reference point**	**Is the stock overfished?**	**Approach Overfished (2 yr)**	**Assessment results[1]**	**Natural mortality[2]**	**MSST**
Skipjack Tuna (WCPO)	F/F_{MSY}=0.45	No	No	SB_{2018}/SB_{MSY}=2.38, $SB_{2018}/SB_{F=0}$=0.41	No	No	Vincent et al. (2019), SC15 report	>0.5 yr^{-1}	0.5 SB_{MSY}
Skipjack Tuna (EPO)	NA	NA	NA	NA	NA	NA	Maunder (2018)	NA	NA
Yellowfin Tuna (WCPO)	F/F_{MSY}=0.74	No	No	SB_{2015}/SB_{MSY}=1.39, $SB_{2015}/SB_{F=0}$=0.34	No	No	Tremblay-Boyer et al. 2017, SC13 report	0.8-1.6 yr^{-1}	0.5 SB_{MSY}
Yellowfin Tuna (EPO)	F/F_{MSY}=1.01	No, because F>MFMT	Not applicable	$SB_{2015-2017}/SB_{MSY}$=1.08, $B_{2015-2017}/B_{MSY}$=1.35	No	No	Vincent et al. (2020)	0.2-0.7 yr^{-1}	0.5 B_{MSY}
Albacore (S. Pacific)	$F_{2012-2014}/F_{MSY}$=0.20	No	No	SB_{2015}/SB_{MSY}=3.42, $SB_{2015}/SB_{F=0}$=0.52	No	No	Tremblay-Boyer et al. (2018)	0.4 yr^{-1}	0.6 SB_{MSY}
Albacore (N.	F/F_{MSY}=0.61	No	No	$SB_{2015}/SB_{F=0}$=0.40	No	No	ISC (2017)	0.4 yr^{-1}	0.6 B_{MSY}

Pacific)									
Bigeye Tuna (WCPO)	$F_{2011-2014}/F_{MSY}$=0.77	No	No	SB_{2015}/SB_{MSY} =1.62, $SB_{22015}/SB_{F=0}$ =0.42	No, because $SSB_{>}MSST$	No	Vincent et al. (2018), SC14 Report	0.4 yr^{-1}	0.6 SB_{MSY}
Bigeye Tuna (EPO)	$F_{2015-2017}/F_{MSY}$=1.15	Yes, because F>MFMT	Not applicable	$SB_{2015-2017}/SB_{MSY}$=1.02, $B_{2012-2015}/B_{MSY}$=0.91	No, because $SSB_{>}MSST$	Not applicable	Aires-da-Silva et al (2018)	0.1-0.25 yr^{-1}	~0.75 B_{MSY}
Pacific Bluefin Tuna	$F20\%_{2015-2016}$ =1.15	Yes, because F>MFMT	Not applicable	$SB_{2016}/SB_{F=0}$ =0.033	Yes, because SSB<MSST	Not applicable	ISC (2018)	0.25-1.6 yr^{-1}	~0.75 B_{MSY}
Blue Marlin (Pacific)	$F_{2012-2014}/F_{MSY}$=0.88	No	Unknown	$SB_{2012-2014}/SB_{MSY}$=1.25	No	Unknown	ISC (2016)	0.22-0.42 yr^{-1}	~0.7 SB_{MSY}
Swordfish (WCNPO)	$F_{2013-2015}/F_{MSY}$=0.45	No	Unknown	SB_{2016}/SB_{MSY} =1.87	No	Unknown	ISC (2018)	0.3 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)	$F_{2015-2017}/F_{MSY}$=1.07	Yes, because F>MFMT	Not applicable	$SB_{2015-2017}/SB_{MSY}$=0.42	Yes, because SSB_{2013}<MSST	Not applicable	ISC (2019)	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)	$F_{2012-2014}/F_{MSY}$=0.38	No	Unknown	SB_{2015}/SB_{MSY} =1.69	No	Unknown	ISC (2017), BSIA	0.145-0.785 yr^{-1}	~0.8 SB_{MSY}
Oceanic white-tip shark (WCPO)[3]	F_{2016}/F_{MSY}=3.30	Yes	Not applicable	SB_{2016}/SB_{MSY} =0.09	Yes	Not applicable	Tremblay-Boyer et al. (2019), SC15 Report	0.18 yr^{-1}	0.82 B_{MSY}
Silky shark (WCPO) [3]	F_{2016}/F_{MSY}=1.61	Yes	Not applicable	SB_{2016}/SB_{MSY} =1.18	No	Unknown	Clarke et al. (2018), SC14 Report	0.18 yr^{-1}	0.82 B_{MSY}
Silky Shark (EPO)[3]	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)	$F_{2013-2015}/F_{MSY}$=0.62	No	Unknown	SB_{2016}/SB_{MSY} =1.36	No	Unknown	ISC (2018)	0.128 yr^{-1}	0.872 B_{MSY}
Common thresher	F/F_{MSY}=0.21	No	Unknown	SB/SB_{MSY}=1.3	No	Unknown	Teo et al. (2018)	0.04 yr^{-1}	0.96 B_{MSY}

shark (N. Pacific)									
Bigeye thresher shark (N. Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
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 Gempylidae, Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
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

Table 7. U.S. and Territorial longline catch (mt) by species in the WCPFC Statistical Area, 2014–2018 (WPRFMC, 2020)

	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				
	2018	**2017**	**2016**	**2015**	**2014**	**2018**	**2017**	**2016**	**2015**	**2014**	**2018**	**2017**	**2016**	**2015**	**2014**	**2018**	**2017**	**2016**	**2015**	**2014**	**2018**	**2017**	**2016**	**2015**	**2014**	**2018**	**2017**	**2016**	**2015**	**2014**
Vessels	136	136	133	135	140	121	119	117	117	109			118	112		113	118	23	22	17	13	15	20	21	23	150	150	151	156	162
Species																														
Albacore, NPO	59	74	208	197	178											11	17	34	19							70	90	243	217	186
Albacore, SPO				0																	1,416	1,411	1,517	1,855	1,430	1,416	1,411	1,517	1,855	1,430
Bigeye tuna	3,392	2,948	3,747	3,427		993	999	879	999	1,000			932	856		798	1,346	586	441		47	65	72	116	82	5,230	5,357	6,216	5,840	5,141
Pacific bluefin tuna	0	1	0													0	0				1	2	0	6	3	1	2	1	6	3
Skipjack tuna	105	156	186	176	167											15	36	26	11	9	67	64	94	67	116	187	255	306	254	291
Yellowfin tuna	1,868	1,750	1,093	681	567											209	312	175	105	30	246	538	386	255	424	2,324	2,600	1,654	1,041	1,021
Other tuna			0	0														0										0	0	0
TOTAL TUNA	**5,424**	**4,928**	**5,234**	**4,482**	**4,734**	**993**	**999**	**879**	**999**	**1,000**			**932**	**856**		**1,034**	**1,710**	**821**	**577**	**283**	**1,776**	**2,079**	**2,069**	**2,299**	**2,055**	**9,227**	**9,717**	**9,936**	**9,214**	**8,072**
Black marlin		0	1	0	1												0		0	0		0					1	1	0	1
Blue marlin	529	485	419	445	428											38	87	57	55	31	32	39	30	25	28	598	612	506	525	486
Sailfish	9	9	15	11	15											1	2	2	2	0	1	1	2	2	2	11	12	19	15	17
Spearfish	171	205	251	188	163											15	27	28	15	11	1	2	2	1	1	187	234	281	204	175
Striped marlin, NPO	332	280	280	378	343											44	50	48	36	14						375	330	327	414	357
Striped marlin, SPO																					1	2	2	3	7	0	2	2	3	7
Other marlins	1	1	1	1													0		0							1	1	1	1	0
Swordfish, NPO	590	918	596	665	865											41	49	43	24	15						631	967	639	690	880
Swordfish, SPO																					6	6	6	8	10	6	6	6	8	10
TOTAL BILLFISH	1,631	1,899	**1,562**	**1,688**	**1,813**											**138**	**215**	**179**	**133**	**72**	**41**	**50**	**41**	**40**	**47**	**1,810**	**2,164**	**1,782**	**1,861**	**1,932**
Blue shark																		0			3	1	1	1	1	3	1	1	1	1
Mako shark	36	30	37	35	35											5	5	9	4	2	0	0	0			42	36	46	39	37
Thresher	2	2	3	5	5												0	0	1	1	1	2	0			2	5	4	6	6
Other sharks		0	0																			0	0				0	0		
Oceanic whitetip shark																							0							
Silky shark		0																			0					0				
Hammerhead shark			0																									0		
Tiger shark																														
Porbeagle																														
TOTAL SHARKS	**38**	**32**	**40**	**40**	**40**											**5**	**6**	**10**	**5**	**2**	**4**	**3**	**1**	**1**	**1**	**47**	**42**	**51**	**45**	**43**
Mahimahi	155	143	202	199	236											14	23	28	21	15	2	14	4	6	12	172	180	234	226	263
Moonfish	390	257	304	279	385											58	63	74	55	22	1	1	2	2	1	449	322	380	336	408
Oilfish	98	94	160	165	169											14	22	29	20	13	0	0	2	0	0	112	116	191	185	182
Pomfret	265	260	339	380	373											32	40	46	39	18	0	0	0	0	0	298	300	386	419	392
Wahoo	264	217	309	256	243											34	37	47	27	18	16	49	47	58	75	314	304	403	340	336
Other fish	4	2	7	7	6											0	0	1	1	0	0	0	1	1	0	4	3	9	9	6
TOTAL OTHER	**1,178**	**975**	**1,322**	**1,285**	**1,411**											**153**	**185**	**224**	**164**	**87**	**19**	**66**	**55**	**66**	**89**	**1,349**	**1,225**	**1,602**	**1,515**	**1,587**
GEAR TOTAL	**8,271**	**7,834**	**8,158**	**7,495**	**7,999**	**993**	**999**	**879**	**999**	**1,000**			**932**	**856**	**0**	**1,330**	**2,116**	**1,235**	**878**	**445**	**1,840**	**2,198**	**2,167**	**2,405**	**2,192**	**12,433**	**13,147**	**13,371**	**12,634**	**11,635**

3.2.1 Target and Non-Target Species

3.2.1.1 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 2019) and the NEPO stock (Hinton and Maunder 2011).

WCNPO

The results of a 2019 stock assessment (ISC 2019) 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 2018c).

In 2019, 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 2018c) 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 2019, 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 2020.

3.2.1.2 WCPO Bigeye Tuna

The Secretariat of the Pacific Community (SPC) prepared the most recent stock assessment for WCPO bigeye tuna August 20202, which covers bigeye tuna from Indonesia in the far western Pacific, to the 150° W. meridian in the central Pacific Ocean (Ducharme-Barth, 2020). The WCPFC Scientific Committee (SC) reviewed and endorsed the 2017 bigeye stock assessment at its Sixteenth Regular Session (SC16) as the most advanced and comprehensive assessment yet conducted for this species. SC16 also endorsed the use of the assessment model uncertainty grid as best available scientific information to characterize stock status and management advice. SC16 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 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 SC16, 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 (100% probability, 36 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 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). SC16 noted that the region where the US fishery operates has some of the lowest relative regional depletion and serves as a 'buffer' for the stock. According to the Pelagics FEP SDCs, the WCPO bigeye tuna stock is not overfished or experiencing overfishing.

3.2.1.3 WCPO Yellowfin Tuna

Vincent et al. (2020) 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. SC16 noted that the central tendency of relative recent spawning biomass was median ($SB_{recent}/SB_{F=0}$) = 0.53 with a probable range of 0.40 to 0.61 (80% probable range), and that there was a roughly 0% probability 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 2017). In 2018, 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.

3.2.1.4 WCPO Skipjack Tuna

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.

3.2.1.5 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.

3.2.1.6 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/FMSY = 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). However, the ISC Bluefin tuna working group noted that the stock has over a 75% probability of achieving its rebuilding target (6.7% SSBF=0) by 2024 and over 80% probability of achieving a secondary target (6.7% SSBF=0) ten years later. Spawning stock biomass has increased from 2.1% SSBF=0 to 3.3% SSBF=0 since the previous stock assessment.

The U.S. longline fleet seldom catches Pacific bluefin tuna (NMFS 2018c). In 2018 and 2019, average total North Pacific bluefin tuna landings by all U.S. longline fisheries was 2.5 t (WPRFMC, 2020), about 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.

3.2.1.7 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 the terminal year of the stock assessment, 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. In 2019, catch of North Pacific swordfish by Hawaii-based U.S. longline fisheries declined to 812.5 t, lowest in over a decade (WPRFMC, 2020). This can be attributed to closures of the shallow-set sector of the fishery due to reaching its limit on loggerhead sea turtle interactions, which was re-evaluated by Pelagic FEP Amendment 10.

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.

3.2.1.8 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 14), 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.

3.2.1.9 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 14). Nearly all blue sharks caught in US longline fisheries are returned to the sea alive, with some discarded dead as well.

3.2.1.10 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 likely (>50%) not subject to overfishing because $F_{2013\text{-}2015}/F_{MSY}$ = 0.62, and is likely (>50%) 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 5), or 2.3 percent of the MSY.

3.2.1.11 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). However, on October 26, 2020, NMFS declared the WCPO stock as BSIA and that the stock is experiencing overfishing. On October 26, 2020, the Council was notified of the change in overfishing status and one year to act to 1) develop and submit recommendations for domestic regulations to address the relative impact of U.S. fishing vessels on silky shark in the WCPO and 2) develop and submit recommendations for international actions that will end overfishing of WCPO silky shark, taking into account the relative impact of vessels of the United States and other nations.Domestic non-retention regulations have been in place since 2015 (02/19/2015 (80 FR 8807))

Estimates of total WCPO silky shark catch from observer data (Peatman et al. 2018a and 2018b) and market data (Clarke et al. 2018a) suggest that the proportion of WCPO catch attributable to U.S. longline fisheries is less than 1% (range 0.2 – 2.0%).

3.2.2 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. This section provides a background on protected species management authorities and associated monitoring, trends in species status, 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 trends in species status and recent interaction levels to be the baseline condition for comparison of environmental effects of the alternatives in Section 4.

3.2.2.1 Species under 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).

The ESA also prohibits the taking[1] of listed species without a special exemption. Taking that is incidental to and not intended as part of a federal action if not considered to be prohibited taking under the ESA provided that such taking is in compliance with the reasonable and prudent measures and terms and conditions of an incidental take statement (ITS). The reasonable and prudent measures are nondiscretionary, and must be undertaken by the federal agency for the take exemption to apply. For biological opinions reaching a jeopardy or adverse modification conclusion, NMFS develops reasonable and prudent alternatives that would avoid the likelihood of jeopardy or adverse modification of critical habitat. Western Pacific fisheries authorized under the Pelagics FEP operate in accordance with ITS set by ESA consultations, including applicable terms and conditions intended to minimize the potential effects of incidental take.

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;

[1] [1] 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.

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.

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:

(https://www.fisheries.noaa.gov/resources/documents?title=&field_category_document_value%5Bbiological_opinion%5D=biological_opinion&field_species_vocab_target_id=&region%5B1000001116%5D=1000001116&sort_by=created) 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.

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.

NMFS. 2019. Biological Opinion on the Continued Authorization of the Hawaii Pelagic Shallow-set Longline Fishery.

In determining whether the operation of the longline fisheries will jeopardize the survival and recovery of a species, the BiOps consider the potential interactions of fisheries with listed species, and the effects of interactions on the survival and recovery of listed species. Analyses in the BiOps are comprised of several steps. 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. In addition to interactions, collisions with fishing vessels represent another potential stressor for some species 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.

NMFS analyzes the potential effects of the operation of the fishery on listed species based on the annual anticipated take level (ATL) derived from predictions generated by PIFSC using a Bayesian inferential approach. The method assumes both that the underlying process that generates the interactions – fishing effort, gear, etc. – do not change; the annual number of interactions is independent between years; and for the shallow-set and American Samoa deep-set fisheries, will remain open year-round (McCracken 2019; McCracken 2018b). The Bayesian methods produce estimates of the credible interval, or the probability that the interaction level is within a specified range of values. In this EA, NMFS uses the mean and 95th percentile, with the percentile value reflecting the probability that the ATL for the predicted period (e.g., 1, 3, or 5 years) would be less than or equal to the value. For example, McCracken (2019) estimates the Hawaii deep-set longline fishery could interact with up to 27 loggerhead sea turtles in a 1-year period at the 95th percentile of the predicted distribution, meaning that in any given year in which the fishery operates throughout the year under similar operational characteristics, NMFS would expect the fishery to take less than or up to 27 loggerhead sea turtles in a given year at 95 percent probability. The 95th percentile value is conservative, as it also means that the probability that NMFS has underestimated the ATL is only 5 percent.

NMFS reinitiated consultation for the Hawaii deep-set fishery 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. 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) (updated April 15,2020). Until NMFS completes the Section 7 consultation and issues a new biological opinion, the 2014 BiOp as supplemented (2017) remains valid for all species and critical habitat considered in the 2014 BiOp as supplemented.

NMFS reinitiated consultation for the American Samoa deep-set longline fishery on April 3, 2019, due to reaching several reinitiation triggers. The fishery exceeded the ITS for the east Indian west Pacific, southwest Pacific, central South Pacific, and east Pacific green sea turtle DPS; hawksbill; and olive ridley sea turtles in 2018. Listing of the oceanic whitetip shark (83 FR 4153), giant manta ray (83 FR 2916), and chambered nautilus (83 FR 48976) as threatened species also triggered the requirement for reinitiated consultation. On April 3, 2019, NMFS determined that the conduct of the fishery during the period of consultation will not violate ESA Sections 7(a)(2) and 7(d) (updated May 6, 2020). Until NMFS completes the consultation process and issues a new biological opinion, the 2015 BiOp remains valid for all species considered in the 2015 BiOp.

3.2.2.2 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 assessment reports (see 16 U.S.C. § 1361, *et seq*.). These reports categorize stocks as either strategic, or not strategic. Strategic stocks are either ESA-listed stocks, depleted stocks under the MMPA, or stocks with estimated human-caused mortality that exceeds its potential biological removal (PBR) level.

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 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 2021 List of Fisheries (86 FR 3028, January 14, 2021), 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 118 of the MMPA requires NMFS to prepare a take reduction plan for each strategic marine mammal stock that interacts with a Category I or Category II fishery. NMFS established the False Killer Whale Take Reduction Team in 2010 (75 FR 2853) and implemented the False

Killer Whale Take Reduction Plan (FKWTRP) in 2012 (72 FR 71260) to reduce mortalities and serious injuries (M&SI) of false killer whales in the Hawaii longline fishery.

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 5, 2020, NMFS authorized a permit under the MMPA section 101(a)(5)(E), addressing the deep-set fishery's interactions with ESA-listed species or depleted stocks of marine mammals (85 FR 62709). The permit authorizes the incidental, but not intentional, taking of ESA-listed humpback whales (central North Pacific or CNP stock) and MHI insular false killer whales to vessels registered in the Hawaii deep-set fishery. In issuing this permit, NMFS determined that incidental taking by the deep-set fishery will have a negligible impact on the affected stocks of marine mammals. The humpback whale CNP stock delineation under the MMPA includes both ESA-listed and non-ESA-listed distinct population segments. However, any potential overlap of the deep-set fishery with humpback whales is with the Hawaii distinct population segment, which is no longer listed under the ESA (81 FR 62259, September 8, 2016).

3.2.2.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it illegal to intentionally take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid Federal permit. 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 (USFWS 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. While NMFS does not apply for incidental take permits, we monitor interactions with seabirds and have implemented take mitigation measures.

3.2.2.4 Analysis and Monitoring Approach

Table 6 lists the species or populations of species protected under the ESA, MMPA, and MBTA or those under consideration for listing under the ESA that have the potential to interact with the active longline fisheries managed under the Pelagics FEP. For the purposes of illustrating which species are considered further in the evaluation of the effects of the alternatives on the listed species, the table includes the ocean zone in which the species are found, which can be coastal, pelagic, or both; and whether the operation of the longline fisheries is likely to have no effect, a discountable effect, or an adverse effect on the species or distinct population. Potential effects on protected species from the operation of fisheries stem from either vessel transiting activity or fishing activity. Because longline fishing activity is prohibited throughout the coastal zone of the action area, those species found exclusively within the coastal zone are only exposed to those effects associated with vessel transiting.

In Table 8, NMFS reserves the no effect descriptor (N) only for those species and populations which do not occur in the area of operation of the fishery under consideration. Because the Guam and CNMI longline fisheries are not currently active, these fisheries have no effect on protected species and are not included in Table 6. NMFS considers discountable effects (D) as those that are highly unlikely to occur, such as those effects from vessel transiting (noise, collisions, waste, discharge, or emissions). NMFS also considers that species which have not been observed as hooked, entangled, or depredating bait or catch, or species with observed interactions that are exceedingly rare, as discountable. Finally, if NMFS observers have recorded instances of hooking and entanglement with a species or population, and these interactions are reasonably expected to continue due to the vulnerability of the species or population to longline gear, NMFS considers that the species is adversely affected by the operation of the subject longline fishery (A).

In general, species or populations only found in the coastal zone are only exposed to potential effects from vessel transiting, and the effects are therefore discountable. Similarly, effects from vessel collisions which may occur during transiting or fishing are extremely unlikely to occur, and therefore discountable. In the rest of this section, we provide an analysis of the adverse effects of the operation of the fisheries on protected species. In chapter 4, we consider whether the alternatives have the potential to change the operation of the fisheries in such a way that the basis for the no effect or discountable effects descriptor has changed, or change the baseline levels of fishery interactions the protected species in such a way that the analysis of the effects of the operation of the fishery as a whole is altered.

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.

Any U.S. citizen may petition to list a species under the ESA. If the range of a newly listed species overlaps with the operation of the longline fisheries, NMFS re-initiates consultation on the operation of the fishery. Given the potential effects of the operation of the fisheries on currently listed species, we expect that the longline fisheries would not adversely affect any newly listed species whose ranges are limited to the coastal zone.

Table 8. ESA-listed and candidate species with the potential to interact with longline vessels permitted under the Pelagics FEP. The codes for the three fisheries (A,N,D). A = Adverse effects, N = No effect , D = Discountable impact

Species or Distinct Population Segment (DPS) Common Name	**Scientific Name**	**Protection Status**	**Population Trend**	**Zone**	**HI DSLL**	**HI SSLL**	**ASL L**
Sea Turtles							
Green sea turtle, Central North Pacific	*Chelonia mydas*	Threatened	Increasing	Coastal / Pelagic	A	A	A
Green sea turtle, Eastern Pacific		Threatened		Coastal / Pelagic	A	A	A
Green sea turtle, Central South Pacific		Endangered		Coastal / Pelagic	A	A	A
Green sea turtle, Central West Pacific		Endangered		Coastal / Pelagic	A	A	A
Green sea turtle, East Indian-West Pacific		Threatened		Coastal / Pelagic	A	A	A
Green sea turtle, Southwest Pacific		Threatened		Coastal / Pelagic	A	A	A
Hawksbill turtle	*Eretmochelys imbricata*	Endangered		Coastal /	D	D	D

				Pelagic			
Leatherback turtle	*Dermochelys coriacea*	Endangered		Coastal / Pelagic	A	A	A
Loggerhead sea turtle, North Pacific	*Caretta caretta*	Endangered		Pelagic	A	A	N
Loggerhead sea turtle, South Pacific		Endangered		Pelagic	N	N	A
Olive ridley turtle	*Lepidochelys olivacea*	Threatened, except for Mexico's nesting population which is Endangered		Pelagic	A	A	A
Marine Mammals							
Blue whale	*Balaenoptera musculus*	Endangered		Pelagic	D	D	N
Fin whale	*Balaenoptera physalus*	Endangered		Pelagic	D	D	N
Hawaiian monk seal	*Neomonachus schauinslandi*	Endangered		Coastal	D	D	N
Main Hawaiian Islands insular false killer whale	*Pseudorca crassidens*	Endangered		Coastal	A	D	N
North Pacific right whale	*Eubalaena japonica*	Endangered		Pelagic	D	D	N
Sei whale	*Balaenoptera borealis*	Endangered		Pelagic	D	D	N

Sperm whale	*Physeter macrocephalus*	Endangered		Pelagic	A	D	D
Guadalupe fur seal	*Arctocephalus townsendi*	Threatened		Pelagic	D	A	N
Humpback whale, Mexico	*Megaptera novaeangliae*	Threatened		Pelagic	D	D	N
Killer whale, Southern Resident	*Orcinus orca*	Endangered		Coastal	D	D	N
Seabirds							
Hawaiian dark-rumped petrel	*Pterodroma phaeopygia sandwichensis*	Endangered					
Newell's shearwater	*Puffinus auricularis newelli*	Threatened					
Short-tailed albatross	*Phoebastria albatrus*	Endangered					
Band-rumped storm petrel Hawaii DPS	*Oceanodroma castro*	Endangered					
Fish							
Scalloped hammerhead shark, Indo-West Pacific	*Sphyrna lewini*	Threatened		Pelagic	A	N	A
Scalloped hammerhead		Endangered		Pelagic	D	D	N

shark, Eastern Pacific							
Oceanic white tip shark	*Carcharhinus longimanus*	Threatened		Pelagic	A	A	A
Giant manta ray	*Manta birostris*	Threatened		Coastal /Pelagic	A	A	A
Coho salmon, Central California coast	*Oncorhynchus kisutch*	Endangered		Coastal	D	D	N
Chinook salmon, Central Valley spring-run	*Oncorhynchus tshawytscha*	Threatened		Coastal	D	D	N
Chinook salmon, Sacramento River winter-run		Endangered		Coastal	D	D	N
Chinook salmon, California coastal		Threatened		Coastal	D	D	N
Steelhead trout, Central California coast	*Oncohynchus mykiss*	Threatened		Coastal	D	D	N
Steelhead trout, California Central Valley		Threatened		Coastal	D	D	N
Steelhead trout, Northern California		Threatened		Coastal	D	D	N
Steelhead trout, South Central California coast		Threatened		Coastal	D	D	N
Steelhead trout, Southern California		Endangered		Coastal	D	D	N

Steelhead trout, Northern California summer-run		Candidate		Coastal	D	D	N
Green sturgeon, Southern North American	*Acipenser medirostris*	Threatened		Coastal	D	D	N
Marine Invertebrates							
Coral	*Acropora globiceps*	Threatened		Coastal	N	N	D
	Acropora jacquelineae	Threatened		Coastal	N	N	D
	Acropora retusa	Threatened		Coastal	N	N	D
	Acropora speciose	Threatened		Coastal	N	N	D
	Euphyllia paradivisa	Threatened		Coastal	N	N	D
	Isopora crateriformis	Threatened		Coastal	N	N	D
	Seriatopora aculeate	Threatened		Coastal	N	N	D
Chambered nautilus	*Nautilus pompilius*	Threatened		Coastal	N	N	D
Black abalone	*Haliotis cracherodii*	Endangered		Coastal	D	D	N
White abalone	*Haliotis sorenseni*	Endangered		Coastal	D	D	N

Cauliflower coral	*Pocillopora meandrina*	Candidate			D	D	D
Giant clam	*Tridacna derasa*	Candidate		Coastal	D	D	D
	Tridacna gigas	Candidate		Coastal	N	N	D
	Tridacna maxima	Candidate		Coastal	N	N	D
	Tridacna squamosa	Candidate		Coastal	D	D	D
	Hippopus hippopus	Candidate		Coastal	N	N	D

3.2.2.5 Sea Turtles

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. Some turtles, however, 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 effects are primarily limited to the potential for collisions with sea turtles.

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. This section describes the baseline status of the sea turtle populations which the proposed action may affect, to facilitate an analysis of the effects of the alternatives under consideration.

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. As a non-regulatory measure, NMFS PIRO funds marine sea turtle management and recovery projects to contribute to NMFS recovery efforts for ESA-listed sea turtles. One of the priorities used for ranking and evaluating candidate proposals is projects that monitor and promote conservation of sea turtle aggregations that are relevant to populations with Pacific Islands Region connections due to commercial fishery interactions (NMFS 2014b).

After considering a range of potential effects to sea turtles, NMFS, in the 2001, 2010, 2014 as supplemented (2017), 2015, and 2019 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.

Hawaii Deep-set Longline Fishery

Table 9 summarizes the fleet-wide sea turtle interaction estimates for the Hawaii deep-set longline fishery from 2008 through 2018.

Table 9. Annual sea turtles interactions (takes) expanded from observed data to fleet-wide estimates for the Hawaii deep-set longline fishery, 2009-2019. Source: WPRFMC (2020).

Year	Sea Turtle Species				
	Green	Leatherback	N. Pacific Loggerhead	Olive Ridley	Unidentified hardshell
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	5	88	0
2019	2	15	0	141	0

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 2014a). 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 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.

In order to estimate the potential effects of the operation of the Hawaii deep-set longline fleet on sea turtle species, NMFS estimated the annual interaction levels with 50, 80, and 95% confidence. For the purposes of this EA, NMFS conservatively used the 95% credible interval and 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. These predictions, generated by PIFSC using Bayesian data analysis methods appropriate for count data (McCracken 2018a), used observed interactions in the fishery from 2002-2017. The unidentified hardshell interactions in 2016 (Table 20) 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 that may occur for each affected sea turtle population from the continued operation of the deep-set longline fleet (Table 8). Because NMFS used the 95% credible interval, we would not expect this level of mortalities each year.

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 conservative take estimate 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 estimated 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 the operation of the fishery 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 8 shows interaction and mortality estimates for sea turtles.

In order to analyze the effect of sea turtle interactions at the population level, NMFS compares 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 for the purposes of this EA based on the frequency of expected adult nester mortality.

Table 8 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 2014a; 2017b) and biological evaluation (BE) 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 female mortalities are expected as a result of the fishery's operation 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, when NMFS reinitiated consultation on the deep-set longline fishery, NMFS also 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 making irreversible or irretrievable commitments of resources during the period of consultation.

As described in Section 3.2.2.1, NMFS develops mitigation measures to minimize the potential effects of incidental take on populations of ESA-listed species through the ESA Section 7 consultation process. Additionally, NMFS modifies the operation of the fishery to avoid the likelihood of jeopardizing listed species or adversely modifying critical habitat. Based on the low likelihood (5%) that NMFS has underestimated the level of annual fleet-wide interactions, the low proportion of mortalities compared to the nesting population abundances that the conservation estimates represent for each year, the low frequency of adult female mortalities expected from the conservative predictions, and the NMFS management process designed to minimize adverse effects to listed species, NMFS expects the annual effect of the operation of the Hawaii deep-set longline fishery on all sea turtle species to be insubstantial.

Table 10. Sea turtle interactions, mortalities, and population level impacts in the Hawaii deep-set longline fleet.Source: NMFS (2018d)

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

Hawaii Shallow-set Longline Fishery

Table 11 summarizes the fleet-wide estimates for the Hawaii shallow-set longline fishery from 2004 to 2018.

Table 11. 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, 2004-2019.

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: WPFMC (2019b) NMFS (2018e; 2019h)

3.3 Fishery and Socio-economic 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.

U.S. vessels also engage in purse seine, troll, and handline fishing for pelagic MUS in the WCPO and EPO. As of 2019, U.S.-flagged purse seine fleet is the largest U.S. fishery targeting pelagic MUS in terms of total catch in the Pacific Ocean. It accounts for about 94% of the total catch of pelagic MUS by the U.S. and the U.S. participating territories, while the longline fisheries account for about 5%, with the small boat pelagic fisheries accounting for about 1% of the catch (NMFS 2020). The proposed action is not expected to affect U.S. purse seine vessels at all. However, it could affect the troll and handline vessels in terms of revenue, catch, effort, or or access to fishing. The proposed catch and allocation limits would only apply to longline vessels. However, Hawaii troll and handline vessels may increase tuna and billfish catch targeting activity in the event of a longline closure or cessation of catch retention of striped marlin by longline fisheries. 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 2020).

3.3.1 Hawaii Longline Fisheries

Domestic longline fishing around Hawaii consists of the shallow-set sector and the deep-set sector, subject to separate mitigation measures based on the characteristics of the fishing activity. 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 17

and 26 over the last five years (NMFS unpublished data). Dual-permitted vessels land their catch in Hawaii or American Samoa. In this section, we summarize the performance of the Hawaii deep-set and shallow-set longline sectors and incorporate Section 3.2.1 of NMFS (2019f) by reference. For the most recent fishery performance information, please see the Pelagic FEP SAFE report available from wpcouncil.org.

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 and on the high seas 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. 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.

Some limited longline fishing occured in the U.S. EEZ around U.S. Pacific Remote Island Areas (PRIA) of Kingman Reef and Palmyra Atoll (5° N) prior to 2016. 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 2019. The distribution of fishing operations over the fishing grounds varies seasonally and from year-to-year. 2019 distribution is shown in Figure 2. Distribution of fishing effort in prior decade 2008-2019 is shown in Figure 3.

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 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.

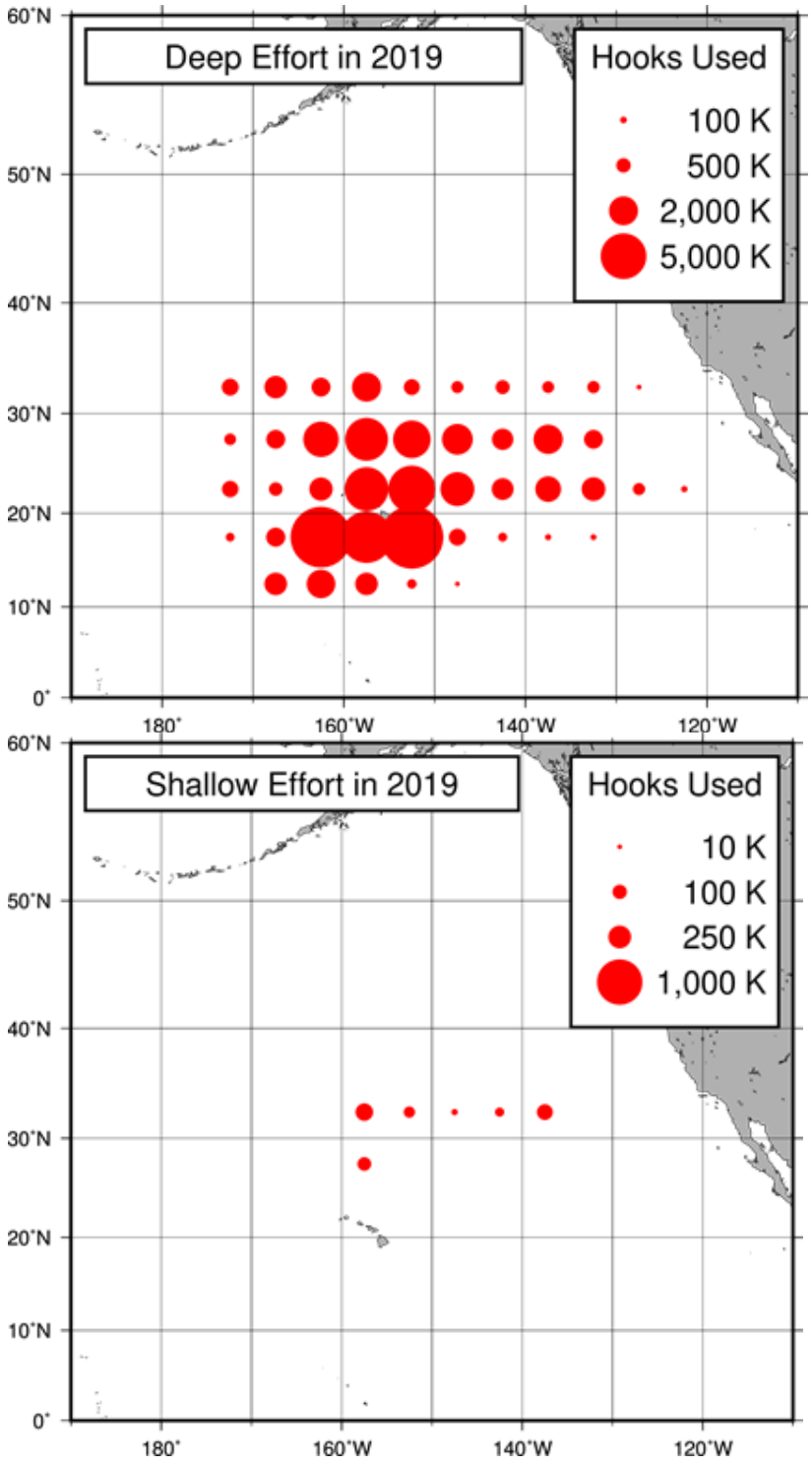

Figure 9. Top: distribution of deep-set fishing effort (hooks deployed) 2019. Bottom: Distribution of shallow-set fishing effort (hooks deployed) 2019. Source: R. Ito report to Council, March 2020.

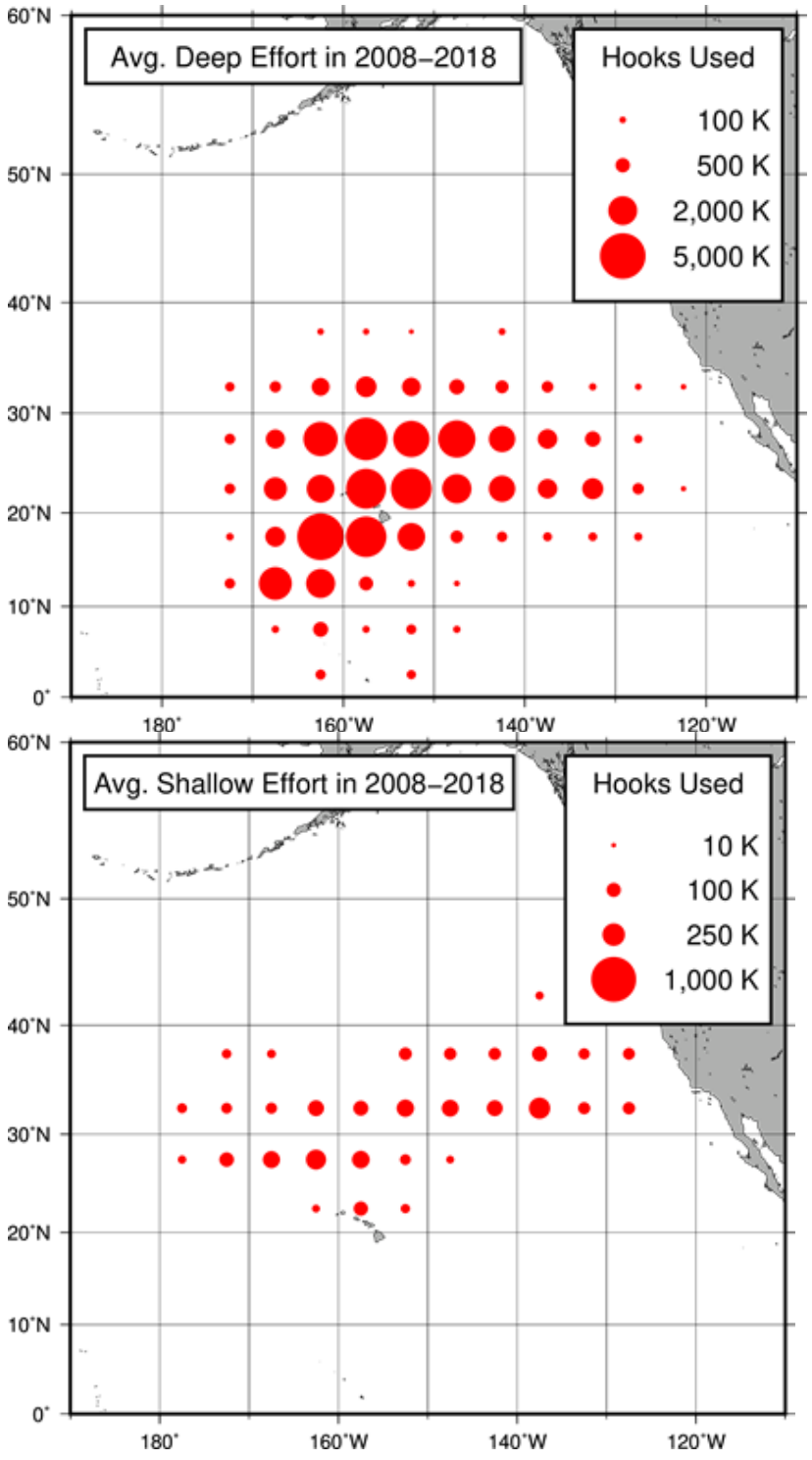

Figure 10. Top: distribution of deep-set fishing effort (hooks deployed) 2008-2018. Bottom: Distribution of shallow-set fishing effort (hooks deployed) 2008-2018. Source: R. Ito report to Council, March 2020.

Fishing effort in the Hawaii deep-set longline fishery has increased over the years. 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 143 vessels operating in 2018 and 150 in 2019. In 2015, 150 deep-set longline vessels made 1,719 trips with 22,478 sets and deployed 61 million hooks (Table 6).

Table 12. Number of active longline vessels and fishing effort in the Hawaii deep-set fishery, 2009-2018 (includes effort in both WCPO and EPO). Source: WPFMC (2020)

Year	Vessels making deep-sets	Deep-set fishing effort (millions of hooks)	Deep-set fishing effort (trips)	Deep-set fishing effort (sets)
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
2018	145	58.4	1,641	20,977
2019	150	61	1,719	22,478

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 11 vessels in 2018 with 14 participants in 2019. The numbers of trips and hooks have been more variable, although well below amounts in years prior (Table13). The shallow-set longline fishery is subject to an annual hard cap for the numbers of interactions with leatherback and loggerhead sea turtles. If the fishery reaches the hard cap, under current regulations, the fishery is subject to closure.

Table 13. Number of active longline vessels and fishing effort in the Hawaii shallow-set fishery, 2009-2018 (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	20	70	994	1.1
2018	11	30	420	0.5
2019	14	25	284	NA

3.3.2 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 1,380 fishers logging

21,663 days fished around the MHI in 2018. There were 428 MHI handline fishers that fished 4,022 days in 2018, both below their respective long-term averages (WPFMC 2020).

3.3.3 Revenue in Hawaii Pelagic Fisheries

In 2018, Hawaii-based deep-set longline vessels landed approximately 32.41 million pounds of pelagic fish valued at $103 million, with that revenue declining nearly 10% to $92.9 million in 2019 (Table 8). The average catch over years 2009-2018 was 26.42 million pounds valued at $87.7 million (WPFMC 2020). Troll and handline fisheries also saw some declines in revenue, most likely attributed to decrease in catch: 2.743 million to 2.460 million pounds for toll fisheries and 778,000 to 675,000 lbs for handline fisheries (Table 8). Average price per pound of pelagic species also declined from $0.25 from 2018 to 2019 while total pelagic fishery ex-vessel revenue declined from $116.4 Million to $105.6 Million.

Table 14. Hawaii commercial pelagic catch, revenue, and average price by fishery, 2018-2019.

	2018			2019		
Fishery	**Catch (1,000 lbs)**	**Ex-vessel revenue ($1,000)**	**Average price ($/lb)**	**Catch (1,000 lbs)**	**Ex-vessel revenue ($1,000)**	**Average price ($/lb)**
Deep-set longline	32,410	$102,981	$3.39	31,955	$92,861	$3.10
Shallow-set longline	1,438	$1,576	$2.13	837	$1,969	$2.82
MHI trolling	2,743	$8,121	$3.69	2,460	$7,229	$3.64
MHI handline	778	$2,427	$3.66	675	$2,152	$3.67
Offshore handline	366	$973	$3.23	470	$1,018	$2.72
Other gear	104	$316	$3.63	131	$349	$3.23
Total	**37,838**	**$116,395**	**$3.39**	**36,529**	**$105,577**	**$3.14**

Striped marlin price per pound has varied by month and year, as indicated in Table 9. Price per pound is lowest in November and December with average price per pound for those months is $1.30 and $1.23, respectively, for the years 2016-2020. Average price per pound over 2016-2020 is $2.02. Although price per pound has declined from 2016 to 2020 by 50% from $2.77 per pound to $1.37 per pound for fish brought to Honolulu Harbor for those years, respectively. Striped marlin has a lower average price per pound as compared to all fish prices indicated in Table 8.

Table 15. Average price per pound (USD) of striped marlin by year and month offloaded at Honolulu Harbor, as reported by United Fishing Agency (UFA). Data courtesy of Cody Schrader, UFA, 2021.

Year	Striped Marlin Average Price/lb (USD)	Month	Striped Marlin Average Monthly Price/lb (USD)
2016	$2.77	January	$ 1.99
2017	$2.54	February	$2.55
2018	$2.11	March	$2.71
2019	$1.31	April	$1.84
2020	$1.37	May	$1.25
		June	$1.31
		July	$2.35
		August	$2.92
		September	$2.65
		October	$2.12
		November	$1.30
		December	$1.23

3.4 Management Setting

NMFS and the Council developed the processes in the measure to ensure that NMFS and the Council administer the U.S. participating territories' use, assignment, allocation, and management of catch limits of pelagic MUS, or fishing effort limits, through agreements with U.S. vessels permitted under the Pelagics FEP consistent with MSA and WCPFC management mandates. NMFS and the Council conduct several administrative processes relevant to managing territorial 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.

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. Additionally, the Council includes information from each newly assessed stock in its annual SAFE report. This work would not change under the alternatives.

Annually, the Council reviews whether territorial catch, effort and allocation limits of bigeye tuna under the auspices of Pelagic FEP Amendment 7 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 since the approval of the measure in 2014. This review typically includes preparation of the analysis included in Appendix A, which evaluates the potential effects of the bigeye tuna catch outcomes on the future status of WCPO bigeye tuna, but could include SPC evaluations of the tropical tuna measure if the range of limits the Council considers falls within the assumptions made in the SPC evaluation.

NMFS PIFSC will ensure the efficacy of an in-season accountability measure by forecasting and monitoring striped marlin catches landed by US vessels inside the WCPFC Convention Area and north of the Equator. Similarly, 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.

NMFS also conducts management activities relevant to managing the longline fisheries as a whole. These include the ESA listing process, the ESA consultation process, and conducting status reviews and recovery planning under the ESA. NMFS also manages the Hawaii longline fishery through a take reduction team to reduce interactions with false killer whales. This management processes would continue under the proposed action without change.

3.4.1 Marine Habitats, Critical Habitat, and Essential Fish Habitat

In this section, we identify critical habitat, essential fish habitat (EFH), and habitat areas of particular concern (HAPC) overlapping with the action area.

Leatherback sea turtle, monk seal, and false killer whale critical habitat occur within the action area. Longline fishing is prohibited within the critical habitat areas, however, as they occur completely within the MHI Longline Prohibited Area and Northwestern Hawaiian Islands (NWHI) Protected Species Exclusion Zone and the U.S. EEZ off California.

3.4.1.1 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 2014a). 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).

3.4.1.2 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 or shallow-set longline fisheries and longline vessels are prohibited from fishing within the footprint of monk seal critical habitat, NMFS determined that the Hawaii deep-set and shallow-set longline fishery may affect, but are not likely to adversely modify monk seal critical habitat. NMFS documented its determinations in a memorandum of concurrence dated September 16, 2015.

3.4.1.3 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 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.

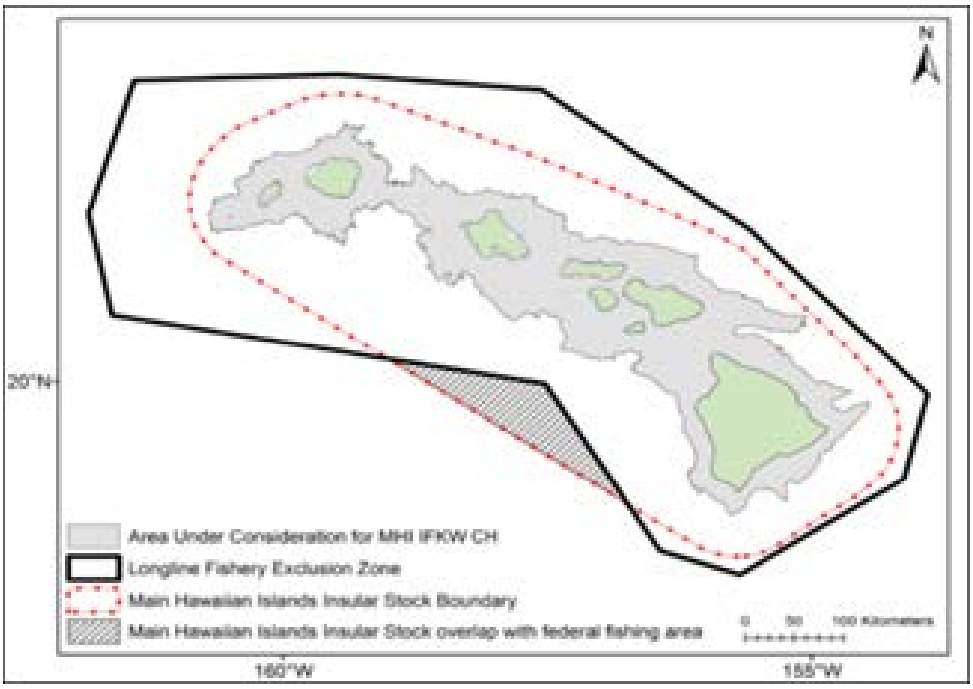

Figure 12. Map depicting the overlap of federal longline fishing area with the MHI IFKW range.

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; 2018f).

3.4.1.4 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.

EFH designations for all pelagic MUS of the Western Pacific Pelagics FEP encumbers all pelagic fisheries. The stock complexes include tropical and temperate waters. Pelagic EFH for egg/larval states is the water column down to a depth of 200 m (100 fm) from the shoreline to the outer limit of the EEZ. Juvenile/adult EFH is the water column down to a depth of 1,000 m (500 fm).

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 9 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 or HAPC.

Table 16. 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**
	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**
Hawaii	**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 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 chapter describes the potential environmental consequences that could result from the alternatives considered. Our analysis relies on the information described in Section 2.1 (development of Alternatives) and Chapter 3 (description of the Affected Environment) as the baseline to evaluate the impacts of the alternatives. The action to establish catch limits for striped marlin does not have the potential to affect the physical environment and may render positive impacts to the striped marlin stock, which is overfished and experiencing overfishing. Economic consequences arise due to removal of a portion of striped marlin landings, and resulting impacts on market demands, with alternatives that limit retained catch. The domestic implementation of catch limits on an internationally overfished stock may affect target and non-target species (including bycatch), protected resources, marine habitat, fishery participants, fishing communities, and the management setting.

Timing of Implementation of Alternatives.

The Council will consider timing of implementation. Table 3 compares catch levels commensurate to Alternative 2 and 3. Timing will have no significant impact on the WCNPO stock if implemented in 2021 or 2022. Objectives discussed in Section 2.1 would not change and would be met under the same conditions. Some caveats to implementing in 2021 or 2022 are discussed in each alternative.

4.1 Potential Effects of Alternative 1: No Action (Status Quo)

The no action alternative would not be expected to affect physical resources, biological resources, socio-economic setting, or management settings as we would expect no change in the recent pattern of fishing as described in Sections 2.1. We briefly summarize the status quo, or baseline, conditions associated with this no action alternative to allow clear contrast between this and other alternatives.

4.1.5 Effects on Physical Resources

To be completed - highlighting the physical resources identified in Pelagic FEP, and the lack of expected impact under the no-action alternative.

4.1.6 Effects on Biological Resources

Under the no action alternative (Alternative 1), we do not expect a change in the operation of the Hawaii longline fisheries or other U.S. fisheries that catch striped marlin that would affect either target or protected species in a way not already analyzed and authorized in biological opinions on the operation of the Hawaii deep-set (NMFS 2014), shallow-set longline fisheries (NMFS 2019), and other fisheries (see Section 3.2.2.1). Longline fisheries are subject to observer coverage and reporting, and must be conducted using a suite of mitigation measures to reduce the number and severity of protected species interactions (see 50 CFR 665 Subpart F and 50 CFR § 229.37).

Annual fishing capacity and effort for Hawaii-based U.S. shallow-set and deep-set longline fisheries have stabilized since 2016, with slight increases in total fishing effort (Table 6 and 7). Catches of target and non-target species, including striped marlin, would not be expected to change from baselines described in Section 3.2.

As catches of striped marlin are likely to not change under no action, overfishing will persist for the WCNPO striped marlin stock, and the US will have contributed 21.8% of the relative impact, as described in Section 2.1. This Alternative would not account for relative impacts of U.S. vessels on international overfishing, nor is it based on proportional reductions in catch consistent with achieving international rebuilding targets or rebuilding criteria consistent with domestic stocks as described in the Pelagic FEP.

4.1.7 Effects on Socio-economic Setting

As this is the no action alternative, we expect no effects on fishery participants and fishing communities. Catches of striped marlin from U.S. fisheries would remain similar to values presented in Table 4 (Section 2.1).

As presented in Section 2.1, US pelagic fisheries in the WCNPO averaged 345 t of striped marlin landings each year from 2010-2019 and 393 t from 2015-2019. Striped marlin landings ranged from 156-461 t each year. The Hawaii-permitted longline vessels have averaged 333 t of striped marlin landings each year from 2010-2019 and 361 t from 2015-2019 with landings ranging from 137-474 t each year over that longer time frame (WCPFC report; Table 4). For our description of baseline socio-economic setting, we assumed that the more recent 2015-2019 average longline landings would be better than the longer 2010-2019 period, as there has been slight increases in catch in recent years relative to earlier (Table 4). Combining these recent average longline landings with the recent average landing value of $2.02/lb for striped marlin (Table 8, Section 3.3.1, courtesy C. Schrader, UFA, 2021) suggests a value of about $1,456,200 is the based value of striped marlin landings in the longline fishery.

4.1.8 Effects on Management Setting

With this no-action alternative, we expect no changes to the management setting as described in Section 3.4.

4.1.9 Other Effects

The no-action alternative is not expected to have an overall significant effect on any other aspect of the human environment. Because there are no expected effects, this alternative would not be controversial, although would not meet the requirements of MSA Section 304(i) regarding required actions to address the U.S. proportion of international fishing impacts for this striped marlin stock, as it is overfished and experiencing overfishing. There is little uncertainty about the effects of this alternative, as recent year fishing patterns - which are relatively stable - are expected to remain the same into the future. One source of uncertainty on future fishing patterns is the ongoing impacts of the COVID-19 pandemic. Our analysis was completed prior to the impacts of the pandemic on 2020 fishing patterns was fully realised and we assumed for this analysis that there would be minimal impacts of the pandemic on future fishing.

4.2 Potential Effects of Alternative 2

4.2.5 Effects on Physical Resources

Alternative 2 would not affect physical resources.

4.2.6 Effects on Biological Resources

Catch limits of 313 t for striped marlin under Alternative 2 would have no impact on target species, similarly to baseline impacts under Alternative 1. However, this reduction in catch would reduce the catch in U.S. fisheries to a level that would address the relative contribution of U.S. fisheries to the overfishing condition of the WCNPO striped marlin stock within internationally agreed stock rebuilding timelines, assuming international management adopted this approach.

The striped marlin catch limit in Alternative 2 corresponds to the results of analyses presented in Section 2.1 that recommend a phased catch approach to end overfishing. The phased catch approach for total catch biomass defines three proportional reductions in catches for all fleets to end overfishing for the WCNPO striped marlin stock, first from 2021 to 2024, 2025-2029 and 2030 - 2034. If adopted, the striped marlin catch limit for U.S. fisheries under Alternative 2 will result in an appropriate reduction in the relative impact of US fisheries to MSA Section 304(i) requirements.

The first phase of projected total international catches corresponds to a 13.4% reduction from average international catches incorporated in the last five years in 2019 stock assessment (2013-2017) – from 2100 mt to 1810 mt (Table 2 & 3). This first phase would end overfishing, relative to F_{MSY}, for the WCNPO striped marlin stock. By the end of first year of implementation of a phased total catch of 1810 mt for striped marlin among WCPFC fisheries in either 2021 or in 2022, overfishing would end immediately in the first year of implementation, per Council Pelagic FEP status determination criteria, including F_{MSY} and MFMT (Table 2). Projected biomass leading up to a 2021 management is expected to increase as fishing mortality is assumed constant from 2018 to 2020 based on 2018 catches. Even though this is an international stock, an initial reduction in total catch to 1810 mt would also likely remove an overfished status per Pelagic FEP status determination criteria. However, MSST is nearly half of the biomass corresponding to the 20% $SSB_{F=0}$ rebuilding target in the WCPFC measure (1823 mt vs 2453 mt spawning biomass). Therefore, the proposed measure would be considered likely rebuilt per WCPFC criteria by 2033 with over 67% certainty by 2034 .

This Alternative allows for catches of striped marlin to be at relative levels commensurate with the phased total catch projections that would immediately end overfishing. These phased levels of catch will rebuild the stock to levels that rebuild the stock per Council FEP requirements in the first phase (2021-2024) and rebuild the stock by 2033, per the internationally adopted WCPFC rebuilding plan. The catch level in Alternative 2 is a 13,4% reduction in landings from reference years 2013-2017, the last five years in the 2019 stock assessment, thus serving as an equivalent of the US contributing to ending overfishing, relative to its impact on the stock.

Implementing Alternative 2 in 2021 will have a likely slight reduction in fishing mortality on the WCNPO stock as compared in implementing in 2022. However, the US impact on reducing fishing mortality relative to F_{MSY} will occur in the first year if implementation.

4.2.7 Effects on Socio-economic Setting

Under Alternative 2 all vessels of the United States that interact with the WCNPO stock of striped marlin would be subject to a 313 t limit of striped marlin each year. Thus, the Hawaii-based longline, troll and handline fisheries would be subject to the yearly 457 t striped marlin catch limit. Under this alternative, the longline fleet would also be subject to a 297 t catch target, which is 95% of the catch limit. As the longline fleet catches 95% of the striped marlin landings, under this alternative, the longline fleet would also be subject to a 297 t catch target (95% of the 313 t limit) for striped marlin in the WNCPO area, to ensure the overall 313 t catch limit is not exceeded for the WCNPO stock. Once the 297 t catch target for the longline fishery is reached, all striped marlin caught on longline gear in the WCNPO have to be discarded for the remainder of the year. The prohibition on striped marlin retention would not apply to troll or handline fisheries.

As referenced and presented in Section 2.1, US pelagic fisheries in the WCNPO averaged 345 t of striped marlin landings each year from 2010-2019 and 393 t from 2015-2019. The landings ranged from 156-461 t each year. The Hawaii-permitted longline vessels have averaged 333 t of striped marlin landings each year from 2010-2019, and landings have ranged from 137-474 t each year for this time frame (WCPFC report; Table 4). Even if the striped marlin catch target was reached by the longline fishery, the longline fisheries would to continue, and striped marlin catches would be converted to regulatory discards. The non-longline pelagic fisheries would continue to be able to retain striped marlin under the assumption that they would not catch a sufficient amount of striped marlin to exceed the limit under Alternative 2 (313 mt) or the WCPFC limit of 457 t.

Compared to Alternative 1 (status quo), Alternative 2 presents a reduction of 64 t in annual striped marlin longline catch, which - using the same pricing assumptions presented for Alternative 1 - is a reduction of $257,000 from baseline ex-vessel values per annum. Across the roughly 145 - 150 vessels participating in these longline fisheries, per vessel losses would be approximately $1,700 to $1,800 per year. However, as demand has declined and price per pound has dropped 50% since 2016 and may continue to drop, the economic impact may be lessened.

Table 16. Scenarios of Alternatives 1 (expected baseline at status quo), 2, and 3 with differences in catch and revenue. Price per pound assumed to be $2.02 (data courtesy of C. Schrader, UFA, 2021).

Scenario	Longline Catch (t)	Annual Ex-Vessel Revenue/Loss
Alt 1 Annual Average, status quo	361 t	$ 1,456,242.29
Alt 2	297 t	$ 1,199,400.89
Alt2 difference from baseline	-64 t reduction	$ (256,841.40)
Alt 3	225 t	$ 908,637.04
Alt 3 difference from baseline	-136 t reduction	$ (547,605.26)

Implementing Alternative 2 in 2021, may create an issue in which the fishery may respond in-season by certain vessels perceiving a need to maximize their own catches of WCNPO striped marlin leading up to an implementation date. Even though striped marlin is not a target species, it does have market some value. There is a niche market for striped marlin in certain seasons when the flesh is “pumpkin colored”. This is despite price per pound decreases by 50% in recent years. Implementing in 2022 may allow the fisher y to respond through the 2021 fishing year and develop its own non-regulatory plan to maintain supply of striped marlin through the fishing year without supply interruption. There will not be a perceived “race” to maximize catch.

4.2.8 Effects on Management Setting

With this alternative, we expect no changes to the management setting as described in Section 3.4.

4.2.9 Other Effects

Alternative 2 is not expected to have an overall significant effect on any other aspect of the human environment. Because the effects of the alternative are limited to U.S. longline fisheries, effects will be limited to individuals fishing in these fisheries, This alternative may be controversial among U.S. longline fisheries, but would meet the requirements of MSA Section 304(i) regarding required actions to address the U.S. proportion of international fishing impacts for this striped marlin stock, as it is overfished and experiencing overfishing. As the fishery would not be limited once the striped marlin limit is reached, there would be no other expected effects of this alternative. Our analysis was completed prior to the impacts of the pandemic on 2020 fishing patterns was fully realized and we assumed for this analysis that there would be minimal impacts of the pandemic on future fishing.

4.3 Potential Effects of Alternative 3

4.3.5 Effects on Physical Resources

Alternative 3 would not affect physical resources.

4.3.6 Effects on Biological Resources

Catch limits of 237 t for striped marlin under Alternative 3 would have no impact on target species, similarly to baseline impacts under Alternative 1. However, the reduction in catch would, if combined with reductions of international catches, end overfishing of the WCNPO striped marlin stock immediately. With proportional reductions in catch by international fisheries, this alternative would result in the stock reaching WCPFC rebuilding targets in 3 years.

This Alternative 3 catch limit corresponds to analyses presented in Section 2.1. A constant catch is an alternative to the phased approach presented in Alternative 2. This constant catch approach would require proportional reductions in catches for all international fleets to end overfishing for the WCNPO striped marlin stock immediately. This constant catch reduction approach has been rejected by the WCPFC, so it is unlikely to be adopted internationally. We have included it as an alternative because it is the approach to achieve an immediate end to overfishing.

Projected total international catches under this constant catch approach correspond to a 34.4% reduction in total international striped marlin catch from average catches in the most recent five years included in the 2019 stock assessment (2013-2017) – from 2100 mt to 1378 mt (Table 2 & 3, Section 2.1). This constant catch reduction would end overfishing, relative to F_{MSY}, for the WCNPO striped marlin stock. By the end of first year of implementation of a constant catch reduction to 1810 mt for striped marlin across all WCPFC fisheries in either 2021 or in 2022, overfishing would end immediately, relative to Council Pelagic FEP status determination criteria, including F_{MSY} and MFMT (Table 2). Within 3 years, biomass would exceed levels corresponding to the 20% $SSB_{F=0}$ rebuilding target in the WCPFC measure.

This Alternative allows for catches of striped marlin to be at relative levels commensurate with the constant total catch projections that would immediately end overfishing and rebuild the stock soonest. The catch level in Alternative 3 is a 34,4% reduction in landings from reference years 2013-2017, the last five years in the 2019 stock assessment, thus addressing the relative impact of U.S. fisheries relative to international fisheries, and meeting the requirements under MSA Section 304(1).

Implementing Alternative 3 in 2021 will have a likely slight reduction in fishing mortality on the WCNPO stock as compared in implementing in 2022. However, the US impact on reducing fishing mortality relative to F_{MSY} will occur in the first year if implementation.

4.3.7 Effects on Socio-economic Setting

Similar to Alternative 2, there would be loss in ex-vessel revenue for longline fisheries, specifically, due to non-retention requirements once the limit was reached. It could also present some market limitations and present market instability for the striped marlin product.

Compared to Alternative 1 (status quo), Alternative 3 presents a reduction of 136 t in annual striped marlin longline catch, which - using the same pricing assumptions presented for Alternative 1 - is a reduction of $548,000 from baseline ex-vessel values per annum. Across the roughly 145 - 150 vessels participating in these longline fisheries, per vessel losses would be approximately $3,700 to $3,800 per year. However, as demand has declined and price per pound has dropped 50% since 2016 and may continue to drop, the economic impact relative to baseline conditions may be lessened. Table 16 provides comparison of revenue (and potential losses) from WCNPO striped marlin harvest in Alternative 2 and 3 against the baseline condition of Alternative 1.

Implementing Alternative 3 in 2021, similar to Alternative 3, may create an issue in which the fishery may respond in-season by certain vessels perceiving a need to maximize their own catches of WCNPO striped marlin leading up to an implementation date. Even though striped marlin is not a target species, it does have market some value. There is a niche market for striped marlin in certain seasons when the flesh is “pumpkin colored”. This is despite price per pound decreases by 50% in recent years. Implementing in 2022 may allow the fisher y to respond through the 2021 fishing year and come up with its own non-regulatory plan to maintain supply of striped marlin through the fishing year without supply interruption.

4.3.8 Effects on Management Setting

With this alternative, we expect no changes to the management setting as described in Section 3.4.

4.3.9 Other Effects

Alternative 3 is not expected to have an overall significant effect on any other aspect of the human environment. Because the effects of the alternative are limited to U.S. longline fisheries, effects will be limited to individuals fishing in these fisheries, This alternative may be controversial among U.S. longline fisheries, but would meet the requirements of MSA Section 304(i) regarding required actions to address the U.S. proportion of international fishing impacts for this striped marlin stock, as it is overfished and experiencing overfishing. As the fishery would not be limited once the striped marlin limit is reached, there would be no other expected effects of this alternative. Our analysis was completed prior to the impacts of the pandemic on 2020 fishing patterns was fully realised and we assumed for this analysis that there would be minimal impacts of the pandemic on future fishing.

4.4 Potential Effects of Alternative 4

4.4.5 Effects on Physical Resources

Alternative 4 would not affect physical resources.

4.4.6 Effects on Biological Resources

Under Alternative 4, setting a limit of 457 mt commensurate to CMM 2010-01 and previous Council actions, NMFS does not expect a change in the operation of the Hawaii longline

fisheries that would affect either target or protected species in a way not already analyzed and authorized in the biological opinions on the operation of the Hawaii deep-set (NMFS 2014) and shallow-set longline fisheries (NMFS 2019). These fisheries are subject to observer coverage and reporting, and must be conducted using a suite of mitigation measures to reduce the number and severity of protected species interactions (see 50 CFR 665 Subpart F and 50 CFR § 229.37). Protected species

Annual fishing capacity and effort for Hawaii-based US shallow-set and deep-set longline fisheries have stabilized since 2016, with slight increases in total fishing effort (Table 6 and 7). Catches of target and non-target species, including striped marlin, would not be expected to change from baselines described in Section 3.2.

As catches of striped marlin are likely to not change Alternative 4, overfishing will persist for the WCNPO striped marlin stock, and the US will have contributed 21.8% of the relative impact, as described in Section 2.1.

4.4.7 Effects on Socio-economic Setting

Alternative 4, which recommends a catch limit of 457 t in order to be consistent with previous Council action and CMM 2010-01, would likely not have major socioeconomic impacts, similar to Alternative 1. As referenced and presented in Section 2.1 and Section 4.2.3, US pelagic fisheries in the WCNPO averaged 345 t of striped marlin landings each year from 2010-2019 and 393 t from 2015-2019 (Section 2.1, this document). The landings ranged from 156-461 t each year. The Hawaii-permitted longline vessels have averaged 333 t of striped marlin landings each year from 2010-2019, and landings have ranged from 137-474 t each year for this time frame (WCPFC report; Table 4). Thus, based on even the highest landings of 474 t per year by all pelagic fisheries, it is not anticipated that the 457 t striped marlin limit would likely impact the Hawaii-based longline and troll and handline fisheries. Even a catch target of 434 t for the Hawaii-permitted longline fleet would likely not change operations of this fleet as the highest landings of 461t of striped marlin by the fleet in 2019 exceeded 457 t in that year alone. The only other year that had catch amounts that approached the 434 t limit was 2015, when catch was 414 t. Thus, major shifts are not anticipated under Alternative 4. Therefore, no direct or indirect economic impacts are anticipated for the fishing participant and communities that interact with striped marlin; overall ex-vessel revenue under Alternative 4 for the pelagic fisheries, in general, is expected to be similar to those described for no action under 4.1.3.

Even if the striped marlin catch target was reached by the longline fishery, given striped marlin is not a target species, the longline fisheries are expected to continue, and striped marlin catches would be converted to discards. The non-longline pelagic fisheries would continue to be able to retain striped marlin under the assumption that they would not catch a sufficient amount of striped marlin to exceed a limit of 457 t. Based on the Council recommendation, any potential overage harvest would not be taken off in the subsequent fishing year. As such, there are no economic impacts associated with a potential overharvest.

4.4.8 Effects on Management Setting

With this alternative, we expect no changes to the management setting as described in Section 3.4.

5 REFERENCES

ACAP. 2017. Report of the Population and Conservation Status Working Group of the Agreement on the Conservation of Albatrosses and Petrels. Paper presented at: 10th Meeting of the Advisory Committee. Wellington, New Zealand

Aires-da-Silva A, Lennert-Cody C, Maunder MN, Roman-Verdesoto M, Hinton MG. 2015. Updated stock status indicators for silky sharks in the eastern Pacific Ocean (1994-2014). Paper presented at: 6th Meeting of the Scientific Advisory Committee of the IATTC. La Jolla, California.

Aires-da-Silva A, Minte-Vera CV, Maunder MN. 2017. Status of bigeye tuna in the eastern Pacific Ocean in 2016 and outlook for the future. Paper presented at: 8th Meeting of the Scientific Advisory Committee of the IATTC. La Jolla, California.

Ambler-Edwards S, Bailey K, Kiff A, Lang T, Lee R, Marsden T, Simons D, Tibbs H. 2009. Food Futures: Rethinking UK Strategy. London.

Ayers AL, Hospital J, Boggs C. 2018. Bigeye tuna catch limits lead to differential impacts for Hawai`i longliners. Marine Policy. 94:93-105.

Boggs C. 2002. Annual Report on the Hawaii longline fishing experiments to reduce sea turtle bycatch under ESA Section 10 Permit 1303. Honolulu, HI. p. 22.

Boggs C, Dalzell P, Essington TE, Labelle M, Mason D, Skillman R, Wetherall J. 2000. Recommended overfishing definitions and control rules for the Western Pacific Regional Fishery Management Council's Pelagic Fishery Management Plan. Honolulu, HI.

Brothers N, Gales R, Reid T. 1999. The influence of environmental variables and mitigation measures on seabird catch rates in the Japanese tuna longline fishery within the Australian Fishing Zone, 1991-1995. Biol Conserv. 88(1):85-101.

Brouwer S, Pilling G, Hampton J, Williams P, Tremblay-Boyer L, Vincent M, Smith N, Peatman T. 2018. The Western and Central Pacific Tuna Fishery: 2017 Overview and Status of Stocks Paper presented at: 15th Regular Session of the WCPFC. Honolulu, HI.

Cardno. 2018. Final Economic Report on Main Hawaiian Islands False Killer Whale Critical Habitat Designation Honolulu, HI. p. 167.

Carretta JV, Forney KA, Oleson EM, Weller DW, Lang AR, Baker J, Muto MM, Hanson B, Orr AJ, Huber H et al. 2018. U.S. Pacific Marine Mammal Stock Assessments: 2017. p. 161.

Carretta JV, Forney KA, Oleson EM, Weller DW, Lang AR, Baker J, Muto MM, Hanson MB, Orr AJ, Huber H et al. 2017. U.S. Pacific Marine Mammal Stock Assessments: 2016. La Jolla, California.

Chan HL, Pan M. 2016. Spillover Effects of Environmental Regulation for Sea Turtle Protection in the Hawaii Longline Swordfish Fishery. Marine Resource Economics. 31(3):259-279.

CITES. 2016. Consideration of Proposals for Amendment of Appendices I and II. Paper presented at: 17th Meeting of the Conference of the PArties to CITES. Johannesbuirg, South Africa.

Clarke SC, Langley A, Lennert-Cody C, Aires-da-Silva A, Maunder MN. 2018. Pacific-wide Silky Shark (*Carcharhinus falciformis*) Stock Status Assessment. Paper presented at: 14th Regular Session of the Scientific Committee of the WCPFC. Busan, Republic of Korea.

FAO. 2013. Report of the fourth FAO Expert Advisory Panel for the Assessment of Proposals to Amend Appendices I and II of CITES Concerning Commercially-exploited Aquatic Species. Rome. No. 1032.

Fossen LV. 2007. Annual Report on Seabird Interactions and Mitigation Efforts in the Hawaii Longline Fishery for 2006. In: PIRO N, editor. Honolulu, HI. p. 40.

Gilman E, Boggs C, Brothers N. 2003. Performance assessment of an underwater setting chute to mitigate seabird bycatch in the Hawaii pelagic longline tuna fishery. Ocean & Coastal Management. 46(11-12):985-1010.

Gilman E, Chaloupka M, Peschon J, Ellgen S. 2016. Risk Factors for Seabird Bycatch in a Pelagic Longline Tuna Fishery. PLoS One. 11(5):e0155477.

Gilman E, Kobayashi D, Chaloupka M. 2008. Reducing seabird bycatch in the Hawaii longline tuna fishery. Endangered Species Research. 5:309-323.

Hazin F, Miller D, Nomura I, Swann J, Spencer J, Kun R, Sarmiento M. 2012. Review of the performance of the WCPFC. Paper presented at: 8th Regular Session of the WCPFC. Tumon, Guam.

Hildebrand JA. 2005. Impacts of Anthropogenic Sound. In: Reynolds III JE, Perrin WF, Reeves RR, Montgomery S, Regen TJ, editors. Marine Mammal Research: Conservation beyond Crisis. Baltimore, Maryland: John Hopkins University Press. p. 101-124.

Hinton MG, Maunder MN. 2011. Status and Trends of Striped Marlin in the Northeast Pacific Ocean in 2009.

IATTC. 2018. Tunas, billfish, and other pelagic species in the eastern Pacific Ocean in 2017. Paper presented at: 93rd Meeting of the IATTC. San Diego, California.

ISC. 2014. North Pacific swordfish (*Xiphiaus gladius*) stock assessment in 2014. Paper presented at: 14th Meeting of the ISC. Taipei, Taiwan.

ISC. 2015a. Indicator-based analysis of the status of shortfin mako shark in the north Pacific Ocean. Paper presented at: 15th Meeting of the ISC. Kona, Hawaii.

ISC. 2015b. Stock assessment update for striped marlin (*Kajikia audax*) in the western and central north Pacific Ocean through 2013. Paper presented at: 15th Meeting of ISC. Kona, Hawaii.

ISC. 2016. Stock Assessment Update for Blue Marlin (*Makaira nigricans*) in the Pacific Ocean through 2014. Paper presented at: 16th Meeting of the ISC. Sapporo, Japan.

ISC. 2017a. Stock assessment and future projections of blue shark in the north Pacific Ocean through 2015. Paper presented at: 17th Meeting of the ISC. Vancouver, Canada.

ISC. 2017b. Stock assessment of albacore tuna in the north Pacific Ocean in 2017. Paper presented at: 17th Meeting of the ISC.

ISC. 2018a. Stock Assesment of Pacific Bluefin Tuna (*Thunnus orientalis*) in the Pacific Ocean in 2018. Paper presented at: 18th Meeting of the ISC. Yeosu, Republic of Korea.

ISC. 2018b. Stock Assessment for Swordfish (*Xiphias gladius*) in the Western and Central North Pacific Ocean through 2016. Paper presented at: 14th Regular Session of the Scientific Committee of the WCPFC Busan, Republic of Korea.

ISC. 2018c. Stock Assessment of Shortfin Mako Shark in the North Pacific Ocean through 2016. Paper presented at: 18th Meeting of the ISC. Yeosu, Republic of Korea.

The IUCN Red List of Threatened Species. 2017. [accessed 2018 May 23, 2018]. http://www.iucnredlist.org/search.

Lehodey P, Bertignac M, Hampton J, Lewis A, Picaut J. 1997. El Nino Southern Oscillation and tuna in the western Pacific. Nature. 389:715-718.

Lennert-Cody C, Aires-da-Silva A, Maunder MN. 2018. Updated stock status indicators for silky sharks in the eastern Pacific Ocean, 1994-2017. Paper presented at: 9th Meeting of the Scientific Advisory Committee of the IATTC. La Jolla, California.

Maunder MN. 2018. Updated indicators of stock status for skipjack tuna in the eastern Pacific Ocean. Paper presented at: 9th Meeting of the Scientific Advisory Committee of the IATTC. La Jolla, California.

Maunder MN, Lennert-Cody C, Roman M. 2018a. Stock status indicators for bigeye tuna. Paper presented at: 9th Meeting of the Scientific Advisory Committee to the IATTC. La Jolla, California.

Maunder MN, Xu H, Minte-Vera CV, Aires-da-Silva A. 2018b. Investigation of the substantial change in the estimated *F* multiplier for bigeye tuna in the eastern Pacific Ocean. Paper presented at: 9th Meeting of the Scientific Advisory Committee of the IATTC.

McCracken M. 2019. Hawaii Permitted Deep-set Longline Fishery Estimated Anticipated Take Levels for Endangered Species Act Listed Species and Estimated Anticipated Dead or Serious Injury Levels for the Listed Marine Mammals. p. 26.

McCracken ML. 2009. Estimation of Incidental Interactions with Sea Turtles and Seabirds in the 2008 Hawaii Longline Deep-Set Fishery.

McCracken ML. 2010. Estimation of Incidental Interactions with Sea Turtles and Seabirds in the 2009 Hawaii Longline Deep-Set Fishery.

McCracken ML. 2011a. Assessment of Incidental Interaction with Marine Mammals in the Hawaii Longline Deep- and Shallow-Set Fisheries from 2006 through 2010.

McCracken ML. 2011b. Estimation of Incidental Interactions with Sea Turtles and Seabirds in the 2010 Hawaii Longline Deep-Set Fishery.

McCracken ML. 2012. Estimation of Incidental Interactions with Sea Turtles and Seabirds in the 2011 Hawaii Longline Deep-Set Fishery.

McCracken ML. 2013. Estimation of Incidental Interactions with Sea Turtles and Seabirds in the 2012 Hawaii Longline Deep-set Fishery.

McCracken ML. 2014a. Assessment of Incidental Interactions with Marine Mammals in the Hawaii Longline Deep- and Shallow-Set Fisheries from 2008 through 2012.

McCracken ML. 2014b. Estimation of Incidental Interactions with Sea Turtles and Seabirds in the 2013 Hawaii Deep-Set Longline Fishery.

McCracken ML. 2014c. Prediction of Future Bycatch of Sea Turtles and Certain Cetaceans in the Hawaii Deep-set Longline Fishery.

McCracken ML. 2015. American Samoa Longline Fishery Protected Species Takes and Cetaceans Takes Resulting in a Classification of Dead or Serious Injury for Years 2010 through 2013.

McCracken ML. 2016. Assessment of Incidental Interactions with Marine Mammals in the Hawaii Longline Deep and Shallow-set Fisheries from 2010 trhough 2014.

McCracken ML. 2017a. American Samoa Longline Fishery Marine Mammal, Seabirds, Sea Turtles, and Fish Bycatch for Years 2014 and 2015.

McCracken ML. 2017b. Assessment of Incidental Interactions with Marine Mammals in the Hawaii Longline Deep- and Shallow-Set Fisheries from 2011 through 2015.

McCracken ML. 2017c. Estimation of Bycatch with Sea Turtles, Seabirds, and Fish in the 2014 and 2015 Hawaii Permitted Deep-Set Longline Fishery.

McCracken ML. 2017d. Estimation of Bycatch with Sea Turtles, Seabirds, and Fish in the 2016 Hawaii Permitted Deep-Set Longline Fishery.

McCracken ML. 2018a. Hawaii Permitted Shallow-set Longlien Fishery Estimated Anticipated Take Level for Endangered Species Act Listed Species p. 18.

McCracken ML. 2018b. Hawaii Permitted Shallow-set Longline Fishery Estimated Anticipated Take Level for Endangered Species Act Listed Species p. 18.

McDonald MA, Hildebrand JA, Wiggins SM. 2006. Increases in deep ocean ambient noise in the Northeast Pacific west of San Nicolas Island, California. Journal of the Acoustical Society of America. 120(2):711-718.

McKechnie S, Hampton J, Pilling G, Davies N. 2016. Stock assessment of skipjack tuna in the western and central Pacific Ocean. Paper presented at: 12th Regular Session of the Scientific Committee of the WCPFC. Bali, Indonesia.

McKechnie S, Pilling G, Hampton J. 2017. Stock assessment of bigeye tuna in the western and central Pacific Ocean. Paper presented at: 13th Regular Session of the Scientific Committee of the WCPFC. Rarotonga, Cook Islands.

Miller MH, Klimovich C. 2016. Endangered Species Act Status Review Report: Giant Manta Ray (*Manta birostris*) and Reef Manta Ray (*Manta alfredi*). In: Office of Protected Resources N, editor. Silver Spring, MD. p. 127.

Minte-Vera CV, Maunder MN, Aires-da-Silva A. 2018. Status of yellowfin tuna in the eastern Pacific Ocean in 2017 and outlook for the future. Paper presented at: 9th Meeting of the Scientific Advisory Committee to the IATTC. La Jolla, California.

NMFS. 2001. Endangered Species Act Section 7 Consultation on the authorization of pelagic fisheries under the Fishery Management Plan for the Pelagic Fisheries of the Western Pacific Region. In: Office SR, editor. p. 202.

NMFS. 2012. Endangered Species Act Section 7 Consultation - Biological Opinion on the 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 Honolulu, HI. p. 168.

NMFS. 2014a. Endangered Species Act - Section 7 Consultation on the continued operation of the Hawaii-based deep-set pelagic longline fishery. In: Office PIR, editor. Honolulu, HI. p. 216.

NMFS. 2014b. Environmental Assessment: Marine Turtle Management and Conservation Program Honolulu, HI p. 119.

NMFS. 2015a. Biological Evaluation. Potential Impact of the American Samoa Pelagic Longline Fishery on Five Species of Sea Turtles, the Indo-West Pacific Scalloped Hammerhead Shark Distinct Population Segment, and Six Species of Reef Corals. Honolulu, HI: Pacific Islands Regional Office. p. 100.

NMFS. 2015b. Endangered Species Act Section 7 Consultation - Biological Opinion and Conference Opinion on the Continued Operation of the American Samoa Longline Fishery In: PIRO, editor. Honolulu, Hawaii. p. 190.

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. 2017a. Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Paper presented at: 13th Regular Session of the Scientific Committee of the WCPFC. Rarotonga, Cook Islands.

NMFS. 2017b. Supplement to the 2014 Biological Opinion on the continued operation of the Hawaii-based deep-set pelagic longline fishery. In: Office PIR, editor. Honolulu, HI. p. 133.

NMFS. 2017c. Supplemental Information Report: Specification of Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in U.S. Pacific Island Territories p. 14.

NMFS. 2018a. 2016 Annual Report Honolulu, HI Pacific Islands Regional Office

NMFS. 2018b. Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics. Paper presented at: 14th Regular Session of the Scientific Committee of the WCPFC. Busan, Republic of Korea.

NMFS. 2018c. Annual Trade Data by Product through U.S. Customs Districts: Fresh Bigeye Tuna through Honolulu, HI 2000-2018. . In: Division FSaE, editor.

NMFS. 2018d. Biological Evaluation on Potential Effects of the Hawaii Deep-set Pelagic Longline Fishery on Endangered Species Act Listed Species and their Designated Critical Habitat. Honolulu, HI p. 78.

NMFS. 2018e. Biological Evaluation: Potential Effects of the Hawaii Shallow-set Pelagic Longline Fishery on Endangered Species Act Listed Species and their Designated Critical Habitat. Honolulu, HI: Pacific Islands Regional Office. p. 68.

NMFS. 2018f. Biological Report on the Designation of Critical Habitat for the Endangered Main Hawaiian Islands Insular False Killer Whale Distinct Population Segment Honolulu, HI. p. 73.

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.

NMFS. 2018h. Memo from Kristen C. Koch to Barry Thom re: Best Scientific Information Available for Pacific Bluefin Tuna (*Thunnus orientalis*), Eastern Pacific Bigeye Tuna (*T. obesus*), Eastern Pacific Yellowfin Tuna (*T. albacares*), Eastern Pacific Skipjack Tuna (*Katsuwanis pelamis*), and Common Thresher Shark (*Alopias vulpinus*). p. 6.

NMFS. 2019a. American Samoa Longline Annual Status Report, January 1 - December 31, 2018. Honolulu, HI.

NMFS. 2019b. Annual Report to the Commission Part 1: Information on Fisheries, Research, and Statistics Paper presented at: 15th Regular Session of the Scientific Committee of the WCPFC Pohnpei, Federated States of Micronesia.

NMFS. 2019c. Biological Evaluation: Potential Effects of the American Samoa Longline Fishery on Endangered Species Act Listed Species. Honolulu, HI. p. 56.

NMFS. 2019d. Biological Opinion on the Continued Authorization of the Hawaii Pelagic Shallow-Set Longline Fishery Honolulu, HI. p. 506.

NMFS. 2019e. Environmental Assessment for the Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in the U.S. Pacific Island Territories. Honolulu, HI. p. 200.

NMFS. 2019f. Environmental Assessment: Bigeye Tuna Catch and Allocation Limits for Pelagic Longline Fisheries in U.S. Pacific Island Territories. p. 213.

NMFS. 2019g. Hawaii Deep-set Longline Annual Status Report, January 1, 2018 - December 31, 2018. Honolulu, HI.

NMFS. 2019h. Hawaii Shallow-Set Annual Status Report, January 1 - December 31, 2018. Honolulu, HI

NMFS 2019. Final Biological Opinion on the Continued Authorization for the Hawaii Pelagic Shallow-Set Longline Fishery. National Marine Fisheries Service. PIR-2018-10335. 506 p. https://www.fisheries.noaa.gov/resource/document/final-biological-opinion-continued-authorization-hawaii-pelagic-shallow-set

NMFS 2014. Final Biological Opinion on the Continued operation of the Hawaii-based deep-set Pelagic Longline Fishery. National Marine Fisheries Service. 216 p. https://media.fisheries.noaa.gov/dam-migration/dsll_final_biop_9-19-2014_508.pdf

Oleson EM, Boggs CH, Forney KA, Hanson MB, Kobayashi DR, Taylor BL, Wade PR, Ylitao GM. 2012. Reevaluation of the DPS Designation for Hawaiian (now Main Hawaiian Islands) Insular False Killer Whales. Honolulu, HI.

Polovina JJ, Howell EA, Abecassis M. 2008. Ocean's least productive waters are expanding. Geophysical Research Letters. 35(3).

Polovina JJ, Mitchum GT, Graham NE, Craig MP, DeMartini EE, Flint EN. 1994. Physical and biological consequences of a climate event in the central North Pacific. Fisheries Oceanography. 3(1):15-21.

Popper AN. 2003. Effects of antrhopogenic sounds on fishes. Fisheries Research. 28(10):24-31.

Rausser G, Hamilton S, Kovach M, Stifter R. 2009. Unintended consequences: The spillover effects of common property regulations. Marine Policy. 33(1):24-39.

Rice J, Harley S. 2012a. Stock assessment of oceanic whitetip sharks in the western and central Pacific Ocean. Paper presented at: 8th Regular Session of the Scientific Committee of the WCPFC. Busan, Republic of Korea.

Rice J, Harley S. 2013. Updated stock assessment of silky sharks in the western and central Pacific Ocean. Paper presented at: 9th Regular Session of the Scientific Committee of the WCPFC. Pohnpei, Federated States of Mirconesia.

Rice JS, Harley SJ. 2012b. Stock assessment of oceanic whitetip sharks in the western and central Pacific Ocean. Paper presented at: 8th Regular Session of the Scientific Committee of the WCPFC. Busan, Republic of Korea.

Richmond L, Kotowicz D, Hospital J. 2015. Monitoring socioeconomic impacts of Hawai‘i's 2010 bigeye tuna closure: Complexities of local management in a global fishery. Ocean & Coastal Management. 106:87-96.

Report of the Workshop on Marine Turtle Longline Post-Interaction Mortality. Workshop on Marine Turtle Longline Post-Interaction Mortality; 15-16 January 2004 2004; Bethesda, Maryland. U.S. Dep. Commerce.

Sara G, Dean JM, D'Amato D, Buscaino G, Oliveri A, Genovese S, Ferro S, Buffa G, Martire ML, Mazzola S. 2007. Effect of boat noise on the behavior of bluefin tuna *Thunnus thynnus* in the Mediterranean Sea. Marine Ecology Progress Series. 331:243-253.

Scorse JD, Richards S, King P. 2017. The Market Transfer Effect in the Hawaiian Longline Fishery: Why Correlation Does Not Imply Causation. Journal of Ocean and Coastal Economics. 4(1).

Senina I, Lehodey P, Camettes B, Dessert M, Hampton J, Smith N, Gorgues T, Aumont O, Lengaigne M, Menkes C et al. 2018. Impact of climate change on tropical Pacific tuna and their fisheries in Pacific Islands waters and high seas areas. Paper presented at: 14th Regular Session of the Scientific Committee of the WCPFC. Busan, Republic of Korea.

SPC. 2014. Evaluation of CMM 2013-01. Paper presented at: 11th Regular Session of the WCPFC. Apia, Samoa.

SPC. 2018. Evaluation of CMM 2017-01 for bigeye tuna with additional evaluations for skipjack and yellowfin tuna. Paper presented at: 15th Regular Session of the WCPFC. Honolulu, HI.

Teo SLH, Rodriguez EG, Sosa-Nishizaki O. 2018. Status of common thresher sharks, *Alopius vulpinus*, along the west coast of North America: updated stock assessment based on alternative life history. La Jolla, California. p. 287.

Tremblay-Boyer L, Hampton J, McKechnie S, Pilling G. 2018. Stock assessment of South Pacific albacore tuna. Paper presented at: 14th Regular Session of the Scientific Committee of the WCPFC. Busan, Republic of Korea.

Tremblay-Boyer L, McKechnie S, Pilling G, Hampton J. 2017. Stock assessment of yellowfin tuna in the western and central Pacific Ocean. Paper presented at: 13th Regular Session of the Scientific Committee of the WCPFC. Rarotonga, Cook Islands.

U.S.FWS. 2012. Biological Opinion of the U.S. Fish and Wildlife Service for the Operation of the Hawaii-based Pelagic Longline Fisheries, Shallow-Set and Deep-Set, Hawaii. Honolulu, HI. p. 53.

USFWS. 2012. Biological Opinion of the U.S. Fish and Wildlife Service for the Operation of the Hawaii-based Pelagic Longline Fisheries, Shallow-Set and Deep-Set, Hawaii. Honolulu, HI. p. 53.

Valero JL, Aires-da-Silva A, Maunder MN, Lennert-Cody C. 2018. Exploratory spatially-structured assessment model for bigeye tuna in the eastern Pacific Ocean. SAC-09-08:60.

Veran S, Gimenez O, Flint E, Kendall WL, Doherty Jr PF, Lebreton J-D. 2007. Quantifying the impact of longline fisheries on adult survival in the black-footed albatross. Journal of Applied Ecology. 44(5):942-952.

Vincent MT, Pilling G, Hampton J. 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. Paper presented at: 14th Regular Session of the Scientific Committee of the WCPFC. Busan, Republic of Korea.

WCPFC. 2007. Conservation and Management Measure to Mitigate the Impact of Fishing for Highly Migratory Fish Stocks on Seabirds. CMM 2007-04. Tumon, Guam, USA. p. 7.

WCPFC. 2012. Summary Report. Paper presented at: 8th Regular Session of the Scientific Committee of the WCPFC. Busan, Korea.

WCPFC. 2017a. Conservation and Management Measure to Mitigate the Impact of Fishing for Highly Migratory Fish Stocks on Seabirds. In: WCPFC, editor. CMM 2017-06. Manila, Phillippines. p. 7.

WCPFC. 2017b. Summary Report. Paper presented at: 13th Regular Session of the Scientific Committee of the WCPFC. Rarotonga, Cook Islands.

WCPFC. 2018a. Summary Report. Paper presented at: 14th Regular Session of the Scientific Committee of the WCPFC. Busan, South Korea.

WCPFC. 2018b. Tuna Fishery Yearbook 2017. Noumea, New Caledonia.

WPFMC. 2005. Additional Measures to Reduce the Incidental Catch of Seabirds in the Hawaii-Based Longline Fishery - A Regulatory Amendment to the Fisheries Management Plan for the Pelagic Fisheries of the Western Pacific Region. Honolulu, HI. p. 212.

WPFMC. 2009. Fishery Ecosystem Plan for Pacific Pelagic Fisheries of the Western Pacific Region. Honolulu, HI. p. 251.

WPFMC. 2012. Pelagic Fisheries of the Western Pacific Region 2010 Annual Report. Honolulu, HI.

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.

WPFMC. 2017a. Stock Assessment and Fishery Evaluation Report Pacific Islands Pelagic Fisheries 2015. Honolulu, Hawaii: Western Pacific Fishery Management Council.

WPFMC. 2017b. Stock Assessment and Fishery Evaluation Report: Pacific Island Pelagic Fisheries 2016. Honolulu, HI: Western Pacific Fisheries Management Council.

WPFMC. 2018a. 172nd Council Meeting Action Memorandum Honolulu, HI. p. 14.

WPFMC. 2018b. Annual Stock Assessment and Fishery Evaluation Report for U.S. Pacific Island Pelagic Fisheries Ecosystem Plan 2017. Honolulu, Hawaii: Western Pacific Fishery Management Council.

WPFMC. 2018c. Preliminary Summary of the Workshop on the Factors Influencing Albatross Interactions in the Hawaii Longline Fishery: Towards Identifying Drivers and Quantifying Impacts. Paper presented at: 172nd Council Meeting Honolulu, HI.

WPFMC. 2018d. Report of the Workshop to Review Seabird Bycatch Mitigation Measures for Hawaii's Pelagic Longline Fisheries, September 18-19, 2018. Honolulu, HI.

WPFMC. 2019a. Action Memorandum: 178th Council Meeting. Honolulu, Hawaii.

WPFMC. 2019b. Annual Stock Assessment and Fishery Evaluation Report for U.S. Pacific Island Fisheries Ecosystem Plan, 2018. Honolulu, HI. p. 512.

Xu H, Minte-Vera C, Maunder MN, Aires-da-Silva A. 2018. Status of bigeye tuna in the eastern Pacific Ocean in 2017 and outlook for the future. Paper presented at: 9th Meeting of the Scientific Advisory Committee to the IATTC. La Jolla, California.

Young CN, Carlson J, Hutchinson M, Hutt C, Kobayashi D, McCandless CT, Wraith J. 2016. Status review report: oceanic whitetip shark (*Carcharhinius longimanus*). In: Resources OoP, editor. p. 1-162.

6 DRAFT PROPOSED REGULATIONS

This section contains the proposed regulations the Council deems necessary or appropriate to implement the conservation and management measures described in the FEP amendment document, based on the preferred alternative.

For the reasons set out in the preamble, NMFS proposes to amend 50 CFR part 665 as follows:

PART 665 -- FISHERIES IN THE WESTERN PACIFIC

1. The authority citation for 50 CFR part 665 continues to read as follows:
Authority: 16 U.S.C. 1801 et seq.

2. In § 665.802 revise paragraph (uu) to read as follows:

§ 665.802 Prohibitions.

* * * * *

(uu) Fail to immediately release any captured striped marlin after the non-retention date, in violation of § 665.813(l).

* * * * *

3. In § 665.813 add paragraph (a) to read as follows:

§ 665.813 Western Pacific longline fishing restrictions.

* * * * *

(a) *Striped Marlin limits.* (1) There is a limit on the maximum number of striped marlin retained each year in the Pacific Ocean north of 0° N latitude and west of 150° W longitude by vessels registered for use with a Hawaii longline limited access permit.

(2) The annual limit for striped marlin (*Kajikia audax*) in the Pacific Ocean north of 0° N latitude and west of 150° W longitude is ___ metric tons.

(3) The Regional Administrator will project a date the limit of striped marlin established under paragraph (l)(2) of this section will be reached (i.e., a non-retention date) by monitoring longline landings, data submitted in logbooks, and other available information.

(4) The Regional Administrator will, as soon as practicable, file for publication at the Office of the Federal Register a notification that the striped marlin limit is projected to be reached, and that retention of striped marlin will be prohibited in the Pacific Ocean north

of 0° N latitude and west of 150° W longitude beginning at a specified date until the end of the calendar year in which the limit was projected to be reached.

(i) *Exception for striped marlin retained prior to the non-retention date*. Any striped marlin already on board a U.S. fishing vessel upon the effective non-retention date may be retained on board, transshipped, and/or landed, to the extent authorized by applicable laws and regulations, provided that the striped marlin is landed within 14 days after the effective non-retention date.

(ii) *Exception for striped marlin caught by vessels included in specified fishing agreements under §665.819(c) of this title*. Striped marlin caught by a vessel that is included in a specified fishing agreement under §665.819(c) of this title will be attributed to the longline fishery of American Samoa, Guam, or the Northern Mariana Islands, according to the terms of the agreement to the extent the agreement is consistent with §665.819(c) of this title and other applicable laws, and will not be counted against the limit.

* * * * *

7 DRAFT PROPOSED FEP AMENDATORY LANGUAGE

This section contains the proposed amendatory language the Council deems necessary and appropriate to amend and update the applicable FEP. [Note: The primary sections of the FEP that will most frequently be amended are (1) Description of fisheries; and (2) Elements of the FEP management program (e.g. conservation and management measures)].