

Annual Stock Assessment and Fishery Evaluation Report for U.S. Pacific Island Pelagic Fisheries Ecosystem Plan 2024



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Cover Photo: Tuna off of the Marianas Photo by: Cassandra Pardee.

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GLOSSARY OF TERMS AND LIST OF ACRONYMS

Term	Definition
Alia	Samoa fishing catamaran, about 30 ft. long, constructed of aluminum or wood with fiberglass. Used for various fisheries including trolling, longline, and bottomfish fishing.
American Samoa	A U.S. territory in the South Pacific Ocean, southeast of Samoa.
Bycatch	Fish harvested in a fishery that are not sold or kept for personal use, including economic discards and regulatory discards, except in a recreational fishery catch and release fishery management program.
Commercial	Commercial fishing, where the catch is intended to be sold, bartered, or traded.
CNMI	A U.S. territory in the Marianas Archipelago. North of and adjacent to Guam.
Council	The Western Pacific Regional Fishery Management Council, one of eight regional fishery management councils established by Congress in 1976. Under the Magnuson-Stevens Fishery Conservation and Management Act, it has authority over fisheries seaward of state/territorial waters of Hawaii and the U.S. Pacific Islands.
Guam	A U.S. territory in the Marianas Archipelago. South of and adjacent to the Commonwealth of the Northern Marianas Islands.
Hawaii	U.S. state. See MHI, NWHI. Composed of the islands, atolls, and reefs of the Hawaiian Archipelago from Hawaii to Kure Atoll, except the Midway Islands. Capitol - Honolulu.
Ika-Shibi	Hawaiian term for night tuna handline fishing method. Fishing for tuna using baited handlines at night with a nightlight and chumming to attract squid and tuna.
Incidental Catch	Fish caught that are retained in whole or part, though not necessarily the targeted species. Examples include monchong, opah, and sharks.
Interaction	Catch of protected species, which is required to be released. Examples: sea turtles, marine mammals, seabirds.
Logbook	Journal kept by fishing vessels for each fishing trip; records catch data, including bycatch and incidental catch. Required in the federally regulated longline and crustacean fisheries in the Hawaiian EEZ.
Longline	Fishing method utilizing a main line that exceeds 1 nm in length, is suspended horizontally in the water column either anchored, floating, or attached to a vessel, and from which branch or dropper lines with hooks are attached; except that, within the protected species zone, longline gear means a type of fishing gear consisting of a main line of any length that is suspended horizontally in the water column either anchored, floating, or attached to a vessel, and from which branch or dropper lines with hooks are attached.
Longliner	Fishing vessel specifically adapted to use the longline fishing method.
Palu-Ahi	Hawaiian term for day tuna handline fishing. Fishing for tuna using baited handlines and chumming with cut bait in a chum bag or wrapped around a stone. Also, drop-stone, make-dog, etc.

Term	Definition
Pelagic	The pelagic habitat is the upper layer of the water column from the surface to the thermocline. The pelagic zone is separated into several subzones depending on water depth: epipelagic - ocean surface to 200 meters depth; mesopelagic – 200 to 1,000 meters depth; bathypelagic – 1,000 to 4,000 meters depth; and abyssopelagic – 4,000 to 6,000 meters depth. The pelagic species include all commercially targeted highly migratory species such as tuna, billfish, and some incidental-catch species such as sharks, as well as coastal pelagic species such as akule and opelu.
Pole-and-Line	Fishing for tuna using poles and fixed leaders with barbless lures and chumming with live baitfish. Poles can be operated manually or mechanically. Also, fishing vessels called baitboats or aku-boats (Hawaii).
PRIA	A group of U.S. island territories in the Central Pacific Ocean.
Protected Species	Refers to species which are protected by federal legislation such as the Endangered Species Act, Marine Mammal Protection Act, and Migratory Bird Treaty Act. Examples: Black-footed and Laysan albatrosses, sea turtles, dolphins.
Purse Seine	Fishing for tuna by surrounding schools of fish with a large net and trapping them by closing the bottom of the net.
Recreational	Recreational fishing for sport or pleasure, where the catch is not sold, bartered, or traded. Also, non-commercial.
Secretary	When capitalized and used in reference to fisheries within the U.S. EEZs, it refers to the U. S. Secretary of Commerce.
Small Pelagics	Species such as akule (big-eye scad - <i>Selar</i> spp.) And opelu (mackerel scad - <i>Decapterus</i> spp). These fish occur mainly in shallow inshore waters but may also be found in deeper offshore waters. Classified as ecosystem component species in the FEP and not part of the PMUS.
Trolling	Fishing by towing lines with lures or live-bait from a moving vessel.

Acronym	Meaning
ACE	Accumulated Cyclone Energy
ACL	Annual Catch Limit
AS	American Samoa. Includes the islands of Tutuila, Manua, Rose and Swains Atolls
ASG	American Samoa Government
AVHRR	Advanced Very High Resolution Radiometer
B	Biomass
B _{FLAG}	Warning Reference Point. Set equal to B _{MSY}
B _{MSY}	Biomass at MSY
BET	Bigeye Tuna
BiOp	Biological Opinion
BOEM	Bureau of Ocean Energy Management
BSIA	Best Scientific Information Available
C	Recent Average Catch
CFEAI	Commercial Fishing Economic Assessment Index
CFR	Code of Federal Regulations
CML	Commercial Marine License data
CNMI	Commonwealth of the Northern Mariana Islands. Also, Northern Mariana Islands, Northern Marianas, and NMI. Includes the islands of Saipan, Tinian, Rota, and many others in the Marianas Archipelago
CO ₂	Carbon Dioxide
CMM	Conservation and Management Measures
CPC	Climate Prediction Center, NOAA
CPDF	Catch-Per-Day-Fished
CPI	Consumer price index
CPUE	Catch-Per-Unit-Effort. A standard fisheries index usually expressed as numbers of fish caught per unit of gear per unit of time, e.g., number of fish per hook per line-hour or number of fish per 1,000 hooks
CV	Coefficient of Variation
DAR	Division of Aquatic Resources, State of Hawaii
DAWR	Division of Aquatic and Wildlife Resources, Guam
DEIS	Draft Environmental Impact Statement
DFW	Division of Fish and Wildlife, Northern Mariana Islands
DIC	Dissolved Inorganic Carbon
DMWR	Department of Marine and Wildlife Resources, American Samoa
DOD	Department of Defense
DOJ	Department of Justice
DPS	Distinct Population Segment
DWFN	Distant Water Fishing Nation
E-A	Euro-American

Acronym	Meaning
EEZ	Exclusive Economic Zone, refers to waters of a nation, recognized internationally under the United Nations Convention on the Law of the Sea as extending 200 nautical miles from shore. Within the U.S., the EEZ is typically between three and 200 nautical miles from shore
EF	Expansion Factor
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ELAPS	Effort Limit Area for Purse Seine
ENSO	El Niño-Southern Oscillation Index
EO	Executive Order
EPO	East Pacific Ocean
ESA	Endangered Species Act. An Act of Congress passed in 1966 that establishes a federal program to protect species of animals whose survival is threatened by habitat destruction, overutilization, disease, etc.
ESD	Equivalent Spherical Diameter
ESRL	Earth System Research Laboratory, NOAA
F	Fishing Mortality
F _{MSY}	Fishing Mortality at MSY
FAD	Fish Aggregating Device; a raft or buoy, drifting or anchored to the sea floor, and under which, pelagic fish will concentrate
FDM	Farallon de Medinilla, CNMI
FEP	Fisheries Ecosystem Plan
FMP	Fishery Management Plan
FR	Federal Register
FWS	Fish and Wildlife Service
GAC	Global Area Coverage
GAM	General Additive Models
GOES	Geostationary Operational Environmental Satellites
GFCA	Guam Fishermen's Cooperative Association
GODAS	Global Ocean Data Assimilation System
GRT	Gross Registered Tonnes
HAPC	Habitat Areas of Particular Concern
HDAR	Hawaii Division of Aquatic Resources. Also, DAR
HLF	Hawaii Longline Fishery
HMRFS	Hawaii Marine Recreational Fishing Survey
HOT	Hawaii Ocean Time Series
HP	Horsepower
HSTT	Hawaii-Southern California Training and Testing
IATTC	Inter-American Tropical Tuna Commission
IFA	Interjurisdictional Fisheries Act
IFP	International Fisheries Program

Acronym	Meaning
ISC	International Scientific Committee
ITS	Incidental Take Statement
K-A	Korean-American
LAA	Likely to adversely affect
LOC	Letter of Concurrence
LOF	List of Fisheries
LRP	Limit Reference Point
LVPA	Large Vessel Protected Area
M	Natural Mortality
M&SI	Mortality and Serious Injury
MSA	Magnuson-Stevens Fishery Conservation and Management Act
ME	McCracken Estimates
MEI	Multivariate ENSO Index
MFMT	Maximum Fishing Mortality Threshold
MHI	Main Hawaiian Islands
MITT	Mariana Islands Training and Testing
MMA	Marine Managed Area
MMPA	Marine Mammal Protection Act
MODIS	Moderate Resolution Imaging Spectroradiometer
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MPCC	Marine Planning and Climate Change
MPCCC	Marine Planning and Climate Change Committee
MRFSS	Marine Recreational Fishing Statistical Survey
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
MUS	Management Unit Species
MW	Megawatt
NA	Not applicable
NCADAC	National Climate Assessment and Development Advisory Committee
NCDC	National Climatic Data Center
NCEI	National Centers for Environmental Information, NOAA
NCRMP	National Coral Reef Monitoring Program
NELHA	Natural Energy Laboratory of Hawaii Authority
NEPA	National Environmental Policy Act
NESDIS	National Environmental Satellite, Data, and Information Service
NLAA	Not likely to adversely affect
NMFS	National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Department of Commerce. Also, NOAA Fisheries
NMSAS	National Marine Sanctuary of American Samoa
NOAA	National Oceanic and Atmospheric Administration, U.S. Department of Commerce

Acronym	Meaning
NOI	Notice of Intent
NS2	National Standard 2
NS8	National Standard 8
NWHI	Northwestern Hawaiian Islands. All islands in the Hawaiian Archipelago, other than the Main Hawaiian Islands (MHI)
NWR	National Wildlife Refuge
OC-CCI	Ocean Color Climate Change Initiative
OEIS	Overseas Environmental Impact Statement
OFP-SPC	Oceanic Fisheries Program of the Secretariat of the Pacific Community
OFL	Overfishing Limit
OLE	Office of Law Enforcement, NOAA
ONI	Oceanic Niño Index
OTEC	Ocean Thermal Energy Conversion
OY	Optimum Yield
PBF	Pacific Bluefin Tuna
PBR	Potential Biological Removal
PDO	Pacific Decadal Oscillation
PICTs	Pacific Island Countries and Territories
PIFSC	Pacific Islands Fisheries Science Center
PIRO	Pacific Islands Regional Office, National Marine Fisheries Service. Also, NMFS PIRO
PMUS	Pacific Pelagic Management Unit Species. Species managed under the Pelagic FEP
POES	Polar Operational Environmental Satellites
PPGFA	Pago Pago Game Fishing Association
ppm	Parts per Million
PPT	Pelagic Fishery Ecosystem Plan Team
PRIA	Pacific Remote Island Areas
RFMA	Regional Fishery Management Agreements
RFMO	Regional Fishery Management Organization
RIMPAC	Rim of the Pacific
RPB	Regional Planning Body
ROD	Record of Decision
SA	Spawning Abundance
SA _{MSY}	Spawning Abundance at MSY
SAFE	Stock Assessment and Fishery Evaluation
SAR	Stock Assessment Report
SB	Spawning Biomass
SB _{MSY}	Spawning Biomass at MSY
SC	Standing Committee of the Western and Central Pacific Fisheries Commission
SDC	Status Determination Criteria

Acronym	Meaning
SEIS	Supplemental Environmental Impact Statement
SEZ	Southern Exclusion Zone, Hawaii
SFA	Saipan Fishermen's Association
SFD	Sustainable Fisheries Division, NMFS PIRO
SFM	Shortfin Mako shark
SHARKWG	Shark Working Group, ISC
SPC	Secretariat of the Pacific Community. A technical assistance organization comprising the independent island states of the tropical Pacific Ocean, dependent territories and the metropolitan countries of Australia, New Zealand, USA, and France; now Pacific Community
SPR	Spawning Potential Ratio. A term for a method to measure the effects of fishing pressure on a stock by expressing the spawning potential of the fished biomass as a percentage of the unfished virgin spawning biomass. Stocks are deemed to be overfished when the $SPR < 20\%$.
SSB	Spawning Stock Biomass
SSB _{MSY}	Spawning Stock Biomass at MSY
SSC	Scientific and Statistical Committee, an advisory body to the Council comprising experts in fisheries, marine biology, oceanography, etc.
SST	Sea Surface Temperature
STD	Standard Deviation
STF	Subtropical Front
SWAC	Seawater Air Conditioning
SWG	Spatial Working Group
SWO	Swordfish
TA	Total Alkalinity
TRP	Target Reference Point
TZCF	Transition Zone Chlorophyll Front
US	United States
USAF	United States Air Force
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service, Department of Interior
V-A	Vietnamese-American
WCNPO	Western and Central North Pacific Ocean
WCP-CA	Western and Central Pacific Fisheries Commission Convention Area
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WETS	Wave Energy Test Site
WPacFIN	Western Pacific Fishery Information Network, NMFS
WPFMC	Western Pacific Regional Fishery Management Council
WPUE	Weight per Unit Effort
WSEP	Weapon Systems Evaluation Program
XBT	Expendable Bathythermographs

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EXECUTIVE SUMMARY

The Western Pacific Regional Fishery Management Council (WPFMC; the Council) manages the pelagic resources specified in the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA) and that occur in the United States (U.S.) Exclusive Economic Zone (EEZ) around American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, Hawaii, and the U.S. possessions in the Western Pacific Region (Johnston Atoll, Kingman Reef and Palmyra, Jarvis, Howland, Baker, Midway, and Wake Islands) known as the Pacific Remote Island Area (PRIA). The Council developed and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) implemented the Fishery Management Plan (FMP) for Pelagic Fisheries of the Western Pacific Region in 1987, which has since been replaced by the Fishery Ecosystem Plan (FEP) implemented in 2010. Since this time, the Council has generated an annual report that provides fishery performance data, including but not limited to landings, value of the fishery, and catch rates, for each of the areas the Council manages.

In July 2013, NMFS issued a final rule (78 FR 43066, July 19, 2013) that revised National Standard 2 (NS2) guidelines and clarified the content and purpose of the Stock Assessment and Fishery Evaluation (SAFE) report to manage fisheries using of the best scientific information available (BSIA) (see Title 50 Code of Federal Regulations [CFR] Part 600.315). In 2015, the Council, in partnership with NMFS Pacific Islands Fisheries Science Center (PIFSC), local fishery resource management agencies, and the NMFS Pacific Islands Regional Office (PIRO), agreed to revise and expand the contents of future annual reports to include the range of ecosystem elements, including protected species interactions, oceanographic parameters, essential fish habitat (EFH) review, and marine planning activities. SAFE reports provide regional fishery management councils and NMFS with information for determining the annual catch limits (ACLs) for each stock in the fishery, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, implementing required EFH provisions, and assessing the relative success of existing relevant state and federal fishery management programs. The annual SAFE report is intended to serve as a source document for developing the FEPs, amendments, and other analytical documents needed for management decisions.

Table ES-1 was developed from a review of NS2 guidelines and the 2013 revisions under the Final Rule for Provisions on Scientific Information for NS2 (78 FR 43066).

Table ES-1. Fulfillment of National Standard 2 requirements within the 2024 annual SAFE report for the U.S. Pacific Island Pelagic Fisheries Ecosystem Plan

Requirement	Data Needs	Citation for Additional Guidance	Section
Description of the Status Determination Criteria (SDC)	Maximum fishing mortality threshold (MFMT), OFL, and minimum stock size threshold (MSST)	600.310(e)(2)	2.6.5.1
Information on Overfishing Level (OFL)	Data collection, estimation methods, and consideration of uncertainty	600.310(f)(2)	2.6.6
Information determining Annual Catch Limits (ACLs)	Needed for each stock to document significant trends or changes in the resource or marine ecosystem	600.310(f)(5)	2.6.6
Information on Optimum Yield (OY)	The harvest level for a species that achieves the greatest overall benefits, including economic, social, and biological considerations	600.310	NA ¹
Information on Acceptable Biological Catch	Most recent stock assessment	600.310(c) 600.310(f)(2)	2.6.7
Fishing mortality	Sources of fishing mortality (both landed and discarded), including commercial and recreational catch and bycatch in other fisheries	600.310(i)	Ch. 2
Bycatch by fishery	Including target and non-target species		Ch. 2
Rebuilding overfished stocks	Best Scientific Information Available ² on biological condition of stocks		NA
Condition of ecosystems	BSIA to assess success of FEP		3.4 + Ch. 4
Condition of EFH	Report on review of available information; full review every five years	600.815(a)(10)	3.5
Socioeconomic conditions of fishery	BSIA to assess success of FEP		3.2
Socioeconomic conditions of fishing communities	BSIA to assess success of FEP		3.2
Socioeconomic conditions of processing industry	BSIA to assess success of FEP		NA
Safety at sea by fishery	BSIA to assess success of FEP		NA
Information/data gaps	Explanation of data gaps and emphasis on future scientific work to address gaps		NA

NA = 'Not Applicable'

¹ A numeric OY is not currently used to manage pelagic fisheries in the Pacific Islands Region.

² The National Standard 2 Guidelines define BSIA as: "Relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review of fishery management information as appropriate. The revised NS2 guidelines do not prescribe a static definition of BSIA because science is a dynamic process involving continuous improvements." (78 FR 43067, July 19, 2013).

SUMMARY OF SAFE STOCK ASSESSMENT REQUIREMENTS

Many of the fish managed under the Pacific Island Pelagic Fisheries Ecosystem Plan (Pelagic FEP) are also managed under the international agreements governing the Western and Central Pacific Fisheries Commission (WCPFC) and/or the Inter-American Tropical Tuna Commission (IATTC), to which the U.S. is a party. Both the WCPFC and IATTC have adopted criteria for ‘overfishing’ and ‘overfished’ designations for certain species that differ from those under the Pelagic FEP. For the purposes of stock status determinations, NMFS will determine stock status of pelagic management unit species (MUS) using the Status Determination Criteria (SDC) described in the Pelagic FEP.

For all pelagic MUS (PMUS) the Council adopted a maximum sustainable yield (MSY) control rule (see Section 2.6.5). The Council has also adopted a warning reference point, B_{FLAG} , set equal to B_{MSY} to provide a trigger for consideration of management action before a stock’s biomass reaches the minimum stock size threshold (MSST). A stock is approaching an overfished condition when there is more than a 50 percent chance that the biomass will decline below the MSST within two years.

For pelagic species in the Pacific Island Region, most stock assessments are conducted by several international organizations. In the eastern Pacific Ocean (EPO), IATTC staff conduct stock assessments for Eastern Pacific Ocean bigeye, yellowfin, striped marlin, and swordfish.

In the western and central Pacific Ocean (WCPO), the Secretariat of the Pacific Community Oceanic Fisheries Program (SPC) conducts stock assessments on tropical tunas, as well as for South Pacific albacore, southwest Pacific swordfish, and striped marlin. In the North Pacific Ocean, the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) conducts similar stock assessments.

In 2022, stock assessments were completed for Western and Central Pacific Ocean skipjack tuna (Castillo-Jordan et al. 2022), Pacific bluefin tuna (ISC 2022a), and North Pacific blue shark (ISC 2022b). Details of these stock assessments can be found in Section 2.6.7. This section also provides an overview of stock status in relation to overfishing and overfished reference points for species managed under this Pelagic FEP. This section has yet to be updated for the 2024 report.

Figure ES-1 provides the current stock status for all species in the Pelagic FEP for which stock assessments have been completed as of last year’s report.

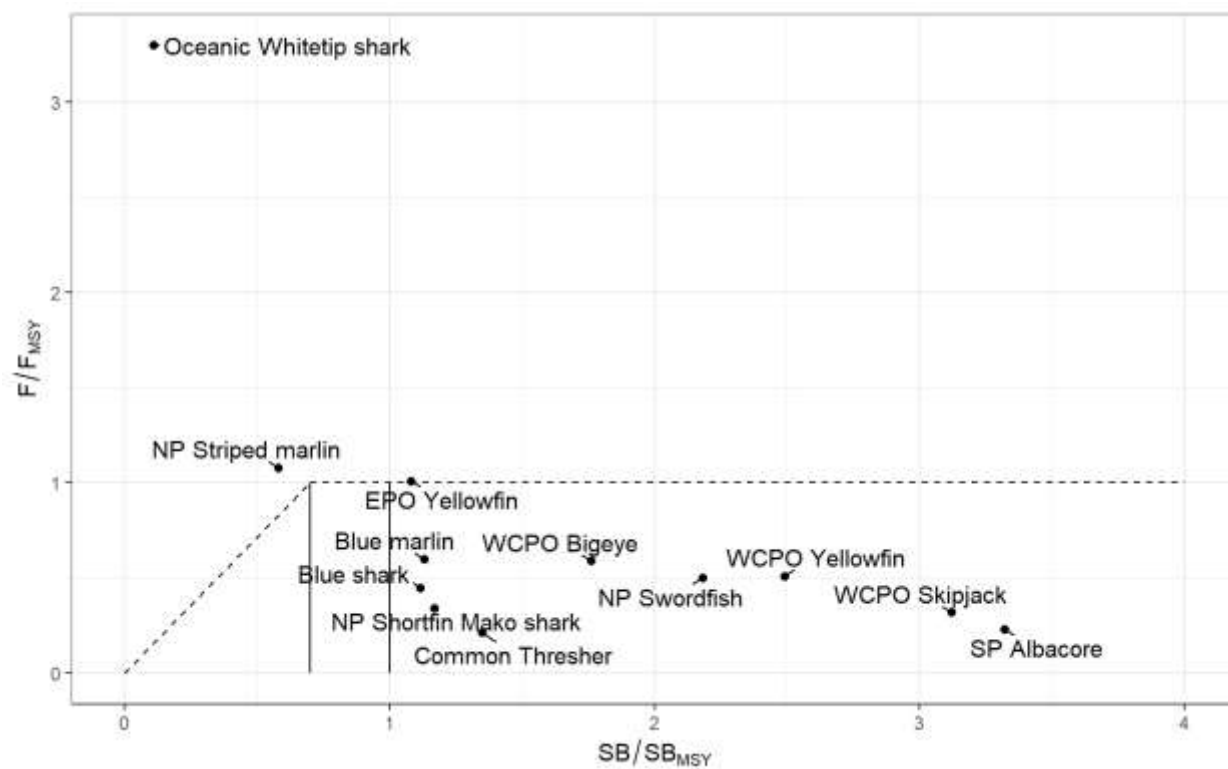


Figure ES-1. Specification of fishing mortality and biomass reference points in the Pelagic FEP and current stock status in the WCPO and EPO. North Pacific albacore is not represented due to the use of different status determination criteria

SUMMARY OF FISHERY DATA IN THE PACIFIC ISLAND REGION

Table ES-2. Summary of the total pelagic landings during 2024 in the Western Pacific and the percentage change between 2023 and 2024

Species	American Samoa		CNMI		Guam		Hawaii	
	Landings (lb)	% Change	Landings (lb)	% Change	Landings (lb)	% Change	Landings (lb)	% Change
Swordfish	6,965	-1.4	-	-	0	-	1,892,044	-7.7
Blue marlin	86,555	-26.3	0	-	14,199	63.0	948,684	-23.7
Striped marlin	3,715	-6.9	-	-	0	-	445,442	-30.9
Other billfish*	4,668	10.3	0	-	2,077	100.5	482,644	49.5
Mahimahi	3,079	-77.0	11,427	-80.3	52,698	-44.6	895,092	14.5
Wahoo	25,557	0.2	13,875	-33.3	45,682	-20.5	899,647	34.6
Opah (moonfish)	296	-76.0	-	-	-	-	492,093	-6.5
Sharks (whole wt.)	90	-	0	-	786	-	8,260	-16.3
Albacore	1,913,266	-23.8	-	-	0	-	1,125,002	146.3
Bigeye tuna	81,664	70.4	-	-	0	-	14,520,258	-1.9
Bluefin tuna	238	-	-	-	-	-	4,411	33.7
Skipjack tuna	104,153	0.8	76,217	-42.2	491,671	16.1	393,000	-14.6
Yellowfin tuna	460,279	35.1	19,368	36.5	97,424	188.0	7,350,841	2.4
Other pelagics**	2,210	21.0	5,606	-37.0	13,805	16.3	503,356	-16.2
Total	2,692,735	-15.3	126,493	-46.7	718,342	13.7	29,960,774	0.7

Note: Total pelagic landings are based on commercial reports and/or creel surveys; % change based on 2023 landings relative to 2024 landings.

*Other billfish include black marlin, spearfish, and sailfish.

**Other pelagics include kawakawa, unknown tunas, pelagic fishes (dogtooth tuna, rainbow runner, barracudas), oilfish, and pomfret. Of these, only oilfish and pomfret are PMUS. While other tables in Chapter 2 excluded or separated out non-MUS, data could not accurately provide individual landings data for these species presented in this total landings table.

AMERICAN SAMOA

Pago Pago Harbor on the island of Tutuila is a regional base for the transshipment and processing of tuna taken by domestic fleets from other South Pacific nations, the distant-water longline fleets, and purse seine fleets. As the NMFS Pacific Island Region does not directly manage these fisheries, data on the purse seine and non-U.S. vessel landings are not included in this report.

Participation. The largest fishery in American Samoa directly managed as part of this FEP is the American Samoa longline fishery. The majority of these vessels are greater than 50 feet (ft), are required to fish beyond 50 nautical miles (nm) from shore, and sell most of their catch, primarily albacore, to the Pago Pago canneries. In 2024, there were nine active longline vessels, all large (> 60 feet). Smaller long-line vessels called *alias* (i.e., locally built, twin-hulled vessels about 30 ft long, powered by 40 horsepower gasoline outboard engines) can fish within 50 nm from shore, but due to the low participation in recent years, these data are confidential and can be reported only in combination with the large vessel fishery. Trolling is the next largest fishery with ten boats that landed pelagic species in 2024, one more than in 2023. Non-commercial pelagic fisheries in American Samoa are less common.

Landings. The estimated annual pelagic landings have varied from 2.0 to 5.6 million lb between 2015 and 2024. The 2024 landings were approximately 3.4 million lb, which is the highest since 2019. Pelagic landings consist mainly of four tuna species (albacore, yellowfin, skipjack, and bigeye), which, when combined with other tuna species, made up 94% of the total landings. Albacore made up 71% of the tuna species in 2024. Blue marlin, wahoo, swordfish, sailfish, striped marlin and mahimahi make up most of the non-tuna species landings. Skipjack, sailfish, wahoo, and blue marlin increased in 2024.

Bycatch. There was no recorded bycatch for the troll fishery in 2024 (Table 14). In the longline fishery, around 2.2% of the tuna catch was released. Yellowfin and bigeye were the most released bycatch tuna species at 5.1 and 5.5%, respectively. Sharks, oilfish, and pomfret had the highest release numbers of non-tunas, from 88% to 100% of each species released (Table 6). In total, 7.3% of all pelagic species caught by the longline fishery were released in 2024, a decrease from 2023. Fish are released for various reasons including quality, handling and storage difficulties, and marketing problems.

Effort. In 2024, there were 22 vessels known to be fishing in the waters of American Samoa according to federal logbooks collected. The 9 vessels that fished in 2024 made 47 trips (averaging 5.2 trips/vessel), deployed 1,359 sets, (151 sets/vessel) using 4.06 million hooks (Table 5). The number of troll trips precipitously decreased from 339 in 2023 to 72 in 2024 at the lowest level since 2015. There were 247 effective trolling hours in 2024, a precipitous drop from 1,577, the lowest since 2015.

Catch Rate. The total pelagic catch rate by all longline vessels was 13.0 fish/1,000 hooks in 2024. The tuna catch rate by longliners increased by 0.4 fish/1,000 hooks in 2024 from 12.6 fish/1,000 hooks in 2023. The catch rates have been increasing since 2020. The 2024 albacore catch rate of 13.0 fish/1,000 hooks is slightly above the average of 11.9 fish/1,000 hooks. Trolling catch rates dramatically increased from 3 lb/hr in 2023 to 22 lb/hr in 2024.

Revenues. In 2024, the total longline fleet revenue (estimated landed value) was \$3.23 million, and albacore composed a majority of the total landed value. Other main species included

yellowfin tuna, bigeye tuna, skipjack tuna, and wahoo. The overall average fish price was \$0.86 per pound in 2024. Albacore price was \$1.15 per pound in 2024, a decrease of \$0.24 from 2023.

Protected Species Interactions. Protected species interactions are monitored in the American Samoa longline fishery with mandatory observer coverage targeting approximately 20% of all trips, however, coverage for 2020 was at 2.13% and for 2021 was at 4.65% due to impacts from the COVID-19 pandemic. Coverage has remained relatively consistent from 2022-2024 between 8.7-9.3%. However, there were still very few protected species interactions observed (i.e., only two sea turtles and 1 giant manta ray).

CNMI

The CNMI's pelagic fisheries occur primarily from the island of Farallon de Medinilla south to the Island of Rota.

Participation. The number of fishers involved in CNMI's pelagic fishery has decreased since 2001, when there were 113 reporting commercial pelagic landings. In 2024, 34 fishers reported landing pelagic species, representing a decrease of nearly 40% from the 87 fishers in 2022.

Landings. Skipjack tuna is the principal species landed, comprising approximately 48% of the total estimated pelagic landings in 2024 based on expanded creel survey data. Commercial landings of skipjack were 65,076 lb. Commercial catch of yellowfin tuna (12,394 lb) and dogtooth tuna (11,650 lb) ranked second and third by weight of commercial pelagic species landings in 2024. The amount of blue marlin landed in 2024 increased substantially in 2024 to close to 40,000 lb based on CREEL data.

Effort. Estimated trolling trips decreased about 30% to 1,668 trips in 2024. From commercial invoices, there were 873 trips that caught pelagic species from 34 fishers. The exact number of vessels registered for non-commercial and commercial fishing is currently unknown.

Catch Rate. In 2024, trolling catch rates increased from 10.3 lb per trolling hour to 12.3 lb per trolling hour, however that is still a decrease compared to the 10-year average (20.0 lb/hr). The skipjack catch rate decreased to 5.8 lb per hour fished. This catch rate is 8.3 lb/hr less than the 10-year average (14.1 lb/hr). Yellowfin catch rate also decreased to 0.3 lb/hr in 2024 (77% decrease from the 10-year average).

Bycatch. Bycatch is not a significant issue in the CNMI, as fishermen retain their catch regardless of species, size, or condition. Based on creel survey interviews, only two fish were caught as bycatch in the trolling fisheries in 2020, both mahimahi. No bycatch was observed during boat-based creel surveys in 2024.

Revenue. The total value of the pelagic fishery in 2024 was \$267,191. The average price for all pelagic species was \$2.69/pound.

Protected Species Interactions. There have not been any reported or observed interactions with protected species in the CNMI pelagic fisheries.

GUAM

Guam's pelagic fishery consists of small, primarily recreational, trolling boats that fish within the local waters of Guam's EEZ or the adjacent EEZ of the Northern Mariana Islands.

Participation. The number of boats involved in Guam's pelagic fishery gradually increased from 193 in 1983 to a high of 546 in 2021. There were 447 boats involved in Guam's pelagic fishery in 2024. The majority of the fishing boats are less than 10 m (33 ft) in length and are usually owner-operated by fishers who earn a living outside of fishing. Most fishers sell a portion of their catch, and it is difficult to make a distinction between recreational, subsistence, and commercial fishers. A small but economically significant segment (~5%) of the pelagic fishery is made up of marina-berthed charter boats that are operated primarily by full-time captains and crews.

Landings. The estimated annual pelagic landings vary widely in the 43-year time series, ranging between 383,000 and 958,000 lb. The average total catch has shown a slowly increasing trend over the reporting period. The 2024 total expanded pelagic landings were 699,120 lb., a decrease of 2.67% when compared with the catch from 2023. Tuna PMUS landings in 2024 were 456,156 lb., a decrease of 22.62%, while non-tuna PMUS increased 105.3% to 237,040 lb. in 2024.

Landings consisted primarily of five major species: mahimahi, wahoo, bonita or skipjack tuna, yellowfin tuna, and Pacific blue marlin, with skipjack comprising over 58.25% of total landings. There are wide year-to-year fluctuations in the estimated landings of the five major pelagic species. Landings for three of the five common species decreased in 2024 from the previous year's levels. Skipjack decreased by 17.15%, and yellowfin decreased by 15.01%. Wahoo catch decreased 43.53%, mahimahi catch increased by 220.0%, and blue marlin increased by 183.6%

Effort. In 2024, the total number of trolling trips and trolling hours remained constant from 2023 levels at 8,386 trips and 38,655 hours respectively.

In early 2010, the U.S. military began exercises in an area south and southeast of Guam designated W-517. W-517 is a special use airspace (approximately 14,000 nm²) that overlays deep open ocean approximately 50 miles south-southwest of Guam. Exercises in W-517 generally involve live fire and/or pyrotechnics. When W-517 is in use, a notice to mariners is issued, and vessels attempting to use the area are advised to be cautious of objects in the water and other small vessels. This discourages access to virtually all banks south of Guam, including Galvez, Santa Rosa, White Tuna, and other popular fishing areas. According to the NTM announcements for 2024, there were 55 days closed in W-517, 171 days closed in Orote Point Firing Range, and 33 days closed at Camp Blaz, due to military exercises.

Also in 2024, there were 66 small-craft advisory days, 96 high-surf advisory/warning days, and 5 typhoon warning days (i.e., seven in May and seven in October)

Catch Rate. Trolling catch rates (lb./per hour fished) for 2024 were 18.0 lb./hr., a decrease from 2023. Total CPUE decreased by 2.70% in 2024. Skipjack tuna showed a decrease in CPUE, while yellowfin tuna showed a decrease in CPUE from 2023 to 2024. Marlin showed an increase in CPUE from 2023 to 2024. Mahi showed an increase in CPUE and wahoo CPUE decreased from 2023 to 2024. The fluctuations in CPUE are possibly due to variability in the year-to-year abundance and availability of the stocks.

Bycatch. There is low bycatch in the charter fishery. In 2024, interview data indicated there was again a low bycatch rate; there were 1011 fish reported as bycatch in 6,692 tallied fish caught, for a 15.10% rate. Bycatch occasionally occurs in the troll fishery including sharks, shark-bitten and undersized fish.

In 2024, fishers were asked if they experienced any shark interactions. There was a total of 664 interviews for boat-based fishing in 2024, with 198 of these inappropriate for determining shark interaction. Of the remaining 466 interviews, 195 reported interactions with sharks and 271 reported no interactions with sharks for a 41.84% positive rate, a decrease from 2023.

Revenues. Commercial data for Guam pelagic fisheries are non-disclosed due to confidentiality rules that prevent data derived from fewer than three sources to be reported. Because there were fewer than three vendors that reported sales of pelagic fish on Guam in 2024, the data are not able to be presented in this report.

Protected Species Interactions. There have not been any reported or observed interactions with protected species in the Guam pelagic fisheries.

HAWAII

Compared to the other regions, Hawaii has a diverse fishery sector which includes shallow- and deep-set longline, Main Hawaiian Islands (MHI) troll and handline, offshore handline, and the aku boat (pole and line) fisheries.

Participation. A total of 2,997 fishermen were licensed in 2024 by HDAR, including 59% (1,775) who indicated that their primary fishing method and gear were intended to catch pelagic fish. There was a 4% decrease in total fishing licenses issued from the previous year, but <2% decrease in fishing licenses with the primary method intended to target pelagic fish. The primary licenses issued were for longline (52%), trolling (28%), and handline methods.

Landings. Hawaii commercial fisheries caught and landed 33.6 million pounds of pelagic species in 2024, an 8.5% increase from the previous year. The vast majority of the pelagic catch is from the deep-set longline fishery (87%) with an increase in 2024 to 29.4 million pounds. The shallow-set longline fishery and MHI troll fisheries catch similar proportions (5% and 4% respectively), with the smallest proportions composed of the MHI and offshore handline and other gear fisheries (3.4%). In 2024, the shallow-set longline fishery caught 2.0 million pounds, the MHI troll fishery 1.3 million pounds, and the MHI and offshore handline and other fisheries caught 1.1 million pounds of pelagic catch.

The largest component of the pelagic catch was tunas, comprising 75% of catch in 2024 with an increase from 2023. The largest proportion of tuna catch was bigeye tuna accounting for 41% of all pelagic catch followed by yellowfin tuna with much smaller proportions of albacore and skipjack tuna. The yellowfin tuna catch has been increasing since 2020. Billfish catch comprised 18% of total catch in 2024. Swordfish catch dominates the billfish catch composition comprising 7% of total pelagic catch; in 2024 swordfish catch declined. Catches of Other PMUS represented 8% of the total pelagic catch in 2024 with ono being the largest component representing 8% of total pelagic catch.

Bycatch. In 2024, fishers reported on logbooks catching 553,804 fish in the deep-set longline fishery with 81% of catch retained and 19% released and 26,320 fish in the shallow-set longline fishery with 54% retained and 46% released. The shallow-set longline fishery likely had a higher

discard rate due to releasing more marketable fish with a prioritization of hold space for large swordfish and not retaining fish with a shorter shelf life, as this fishery typically has longer trips. The majority of releases were blue sharks with 74% of total catch in deep-set and 36% in shallow-set longline fishery. There is almost no market demand for sharks in Hawaii.

Effort. In 2024, the Hawai'i-permitted deep-set longline fishery had 150 active vessels, 1,635 trips, and 65.9 million hooks set with effort similar to 2023 but with a slight overall increase in the last 10 years. The Hawai'i-permitted shallow-set longline fishery had 21 vessels, 54 trips, and 1.1 million hooks set with a decline in trips and vessels in 2024. In 2024, 1,042 fishers participated in the MHI troll fishery with 12,396 days fished, 327 fishers participated in the MHI handline fishery with 2,632 days fished, and 5 fishers participated in the offshore handline fishery with 140 number of days fished.

CPUE. The deep-set longline fishery CPUE for bigeye tuna continued an overall declining trend since 2015 with a slight decline in 2024 (2.3 fish/1000 hooks) compared to 2023 (2.5 fish/1000 hooks). The 2024 yellowfin tuna CPUE (1.9 fish/1000 hooks) increased slightly from 2023 (1.3 fish/1000 hooks). While the 2024 albacore CPUE (0.2 fish/1000 hooks) declined slightly from 2023 (0.5 fish/1000 hooks). In 2024, there were sharp increases in blue and striped marlin CPUE (0.2 fish/1000 hooks for blue marlin and 0.4 fish/1000 hooks) from 2023 (0.1 fish/1000 hooks for blue marlin and 0.1 fish/1000 hooks for striped marlin).

In 2024, the shallow-set longline fishery had an increase in bigeye tuna and yellowfin tuna CPUE (0.7 fish/1,000 hooks and 1.5 fish/1000 hooks respectively). However, there was a decrease in albacore CPUE (0.3 fish/1000 hooks).

The 2024 MHI troll fishery CPUE for yellowfin tuna was lower (27.9 fish/days fished) than 2023 (39.2 fish/days fished). While the skipjack tuna CPUE was similar in 2023 (16.6 fish/days fished) and 2024 (17.1 fish/days fished).

Fish Size. The 2024 deep-set longline fishery average weights for all tuna species, with the exception of Pacific bluefin tuna, were above 10-year averages; all billfish species below, with the exception of sailfish; other PMUS of opah below, mahimahi above, and ono, pomfrets, and oilfish similar to the 10-year averages.

The 2024 shallow-set longline fishery average weights for bigeye, skipjack, and bluefin tuna were above the 10 year averages, yellowfin tuna below, and albacore similar; swordfish above; striped and blue marlin and spearfish below; with Other PMUS species of mahimahi below, pomfrets above, and ono, opah, and oilfish above 10 year averages (Table 31).

The 2024 Hawaii troll and handline fisheries average weights were above the 10-year averages for bigeye, skipjack, and yellowfin tuna with the albacore average weight below. All billfish (blue and striped marlin and swordfish) were below 10-year average weights, and the Other PMUS of mahimahi and ono were above the 10-year average weights (Table 32).

Revenue. The total nominal revenue from Hawai'i's pelagic fisheries was \$110.8 million in 2024 a 7% decline from 2023 (\$119.4 million). The average price per pound continued to drop with a 19% decline in 2024 with an average of \$2.81 compared to \$3.47 in 2023. Nominal revenue from tuna was \$93.9 million or 85% of the total pelagic nominal revenue with bigeye tuna (\$56.3 million) and yellowfin tuna (\$36.2 million) representing 51% and 33%. In 2024, billfish contributed \$8.4 million, 8% of the total pelagic revenue with swordfish accounting for \$5,550, 5% of the total pelagic revenue. The deep-set longline generated the vast majority (88%)

of the pelagic revenue with \$98.4 million while the shallow-set longline fishery generated \$4.5 million, 4% of the total pelagic revenue. The Hawaii small boat fisheries generated \$8.7 million, 8% of total pelagic revenue with the MHI troll at \$6.0 million.

Protected Species Interactions. Protected species interactions are monitored in the Hawaii-based longline fishery with mandatory observer coverage at 100% for shallow-set vessels and a target of a minimum of 20% for deep-set vessels; however, observer coverage in the deep-set longline fishery in 2020 and 2021 was 15.25% and 17.84%, respectively, due to impacts related to pandemic restrictions. Coverage of fishing trips dropped to 17% in 2023 and to 13% in 2024. The shallow-set longline fishery has maintained coverage rates of 100%. Nearly all sea turtles observed in the Hawaii shallow-set longline fishery from 2004 to 2024 were released alive. Observed number of loggerhead turtle interactions in 2024 was lower than in 2023, which had the highest (48) since the reopening of the fishery in 2004. Further, in the shallow-set fishery, trends of interactions with the Laysan albatross had been increasing over time with 54 interactions in 2024. A recent study on the potential use of tori lines to improve mitigation measures for the fishery concluded that the approach is not effective. In the deep-set longline fishery, olive ridley and black-footed albatross interactions have decreased over the last three to four years after four to five years of higher interactions. Prior analyses showed that higher interactions were likely driven by oceanographic factors.

OCEANIC AND CLIMATE INDICATORS

In an effort to improve ecosystem-based fishery management, the Council is utilizing a conceptual model that allows for the application of data from specific climate change indicators that may affect marine systems and ultimately the productivity or catchability of managed stocks. While the indicators that the Council monitors may change as the Council continues to improve ecosystem-based management, this 2024 report provides information on the following list of climate and oceanic indicators being tracked:

- Atmospheric Concentration of Carbon Dioxide (CO₂)
- Oceanic pH (at Station ALOHA)
- Oceanic Niño Index (ONI)
- Pacific Decadal Oscillation (PDO)
- Tropical Cyclones
- Sea Surface Temperature
- Temperature at 200 – 300 m Depth
- Ocean Color (Chlorophyll-*a* concentration)
- North Pacific Subtropical Front (STF)/Transition Zone Chlorophyll Front (TZCF)
- Estimated Median Phytoplankton Size
- Fish Community Size Structure
- Bigeye Tuna Weight-Per-Unit-Effort
- Bigeye Tuna Recruitment Index
- Bigeye Tuna Catch Rate Forecast

Section 3.4.2 provides a description of each of these indicators, a 2024 snapshot of the current conditions accompanied by time series data, and a rationale for how these data may progress ecosystem-based fishery management.

ESSENTIAL FISH HABITAT

NS2 requires that the Council review and revise EFH provisions periodically and to report on this review as part of the annual SAFE report process, with a complete review conducted as recommended by the Secretary at least once every five years. No pelagic EFH reviews were completed in 2024. Non-fishing and cumulative impact components were reviewed from 2016 through 2017 (Minton 2017), and a habitat review for crustaceans in Guam and Hawaii was completed in 2019. The Council expects to amend the EFH for Hawaii precious corals in 2025.

MARINE PLANNING

In 2016, the Council approved a new FEP objective to “consider the implications of spatial management arrangements in Council decision-making”. To monitor implementation of this objective, the 2024 annual SAFE report includes the Council’s spatially based fishing restrictions (or marine managed areas, MMAs), the goals associated with them, and the most recent evaluation. In addition, to meet EFH and National Environmental Policy Act (NEPA) mandates, this annual SAFE report monitors activities of interest to the Council that may contribute to cumulative impact. This includes observing fishing and non-fishing activities and facilities, including aquaculture operations, alternative energy facilities, and military training and testing activities.

1 INTRODUCTION

The Fishery Management Plan (FMP) for Pelagic Fisheries of the Western Pacific Region was implemented by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) on March 23, 1987. The Western Pacific Regional Fishery Management Council (WPFMC; the Council) developed the FMP to manage the pelagic resources under the authority of the Magnuson Fishery Conservation and Management Act of 1976 (MSA) and that occur in the United States (U.S.) Exclusive Economic Zone (EEZ) around American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, Hawaii, and the U.S. possessions in the Western Pacific Region (i.e., Johnston Atoll, Kingman Reef, Palmyra Atoll, and Jarvis, Howland, Baker, Midway, and Wake Islands). In 2010, the Council and NMFS implemented the Fishery Ecosystem Plan (FEP) for the U.S. Pacific Island Pelagic Fisheries (Pelagic FEP), which includes management measures and strives to integrate vital ecosystem elements important to decision-making, including social, cultural, and economic dimensions, protected species, habitat considerations, climate change effects, and the implications to fisheries from various spatial uses of the marine environment.

For more information regarding the FEP's objectives, past amendments, and other information, refer to the Pelagic FEP found on Council [website](#) and regulations at [50 CFR 665](#).

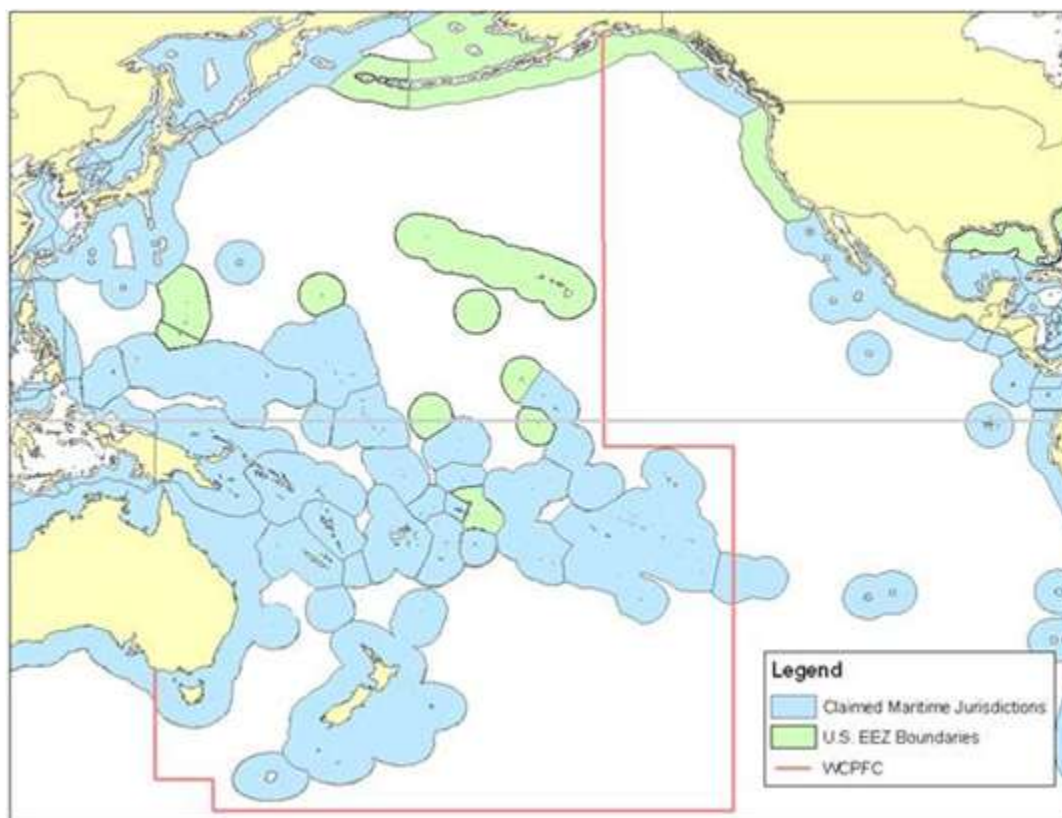


Figure 1. Map of the Western Pacific region

1.1 BACKGROUND TO THE SAFE REPORT

Following the Pelagic FEP requirements, the Council has been generating annual reports that assist the Council and NMFS in assessing the status of the stocks, fisheries, and effectiveness of the management regime. In July 2013, NMFS issued a final rule (78 FR 43066) that revised National Standard 2 (NS2) guidelines to manage fisheries using of the best scientific information available (BSIA) and clarify the content and purpose of the Stock Assessment and Fishery Evaluation (SAFE) Report. In 2015, the Council, in partnership with NMFS Pacific Islands Fisheries Science Center (PIFSC), local fishery resource management agencies, and the NMFS Pacific Islands Regional Office (PIRO), agreed to revise and expand the contents of future annual reports to include the range of ecosystem elements described above. This year marks the seventh iteration of the SAFE report that combines the requirements of reporting for the FEP with those required under NS2 guidelines.

1.2 PELAGIC MUS LIST

The management unit species (MUS) managed under the Pelagic FEP include large pelagic species such as tunas (tribe Thunnini), billfishes (Istiophoridae and Xiphiidae), and other harvested species with distribution straddling domestic and international waters. The MUS excludes some scombrids found predominantly near land, such as little bonitos (tribe Sardini, e.g., dogtooth tuna, *Gymnosarda unicolor*). Although they are sometimes caught by the FEP-managed fisheries and reported herein, the MUS also exclude all jacks (Carangidae, e.g., rainbow runner, *Elagatis bipinnulata*), all barracudas (Sphyraenidae), all sharks except the following nine species: pelagic thresher shark (*Alopias pelagicus*), bigeye thresher shark (*Alopias superciliosus*), common thresher shark (*Alopias vulpinus*), silky shark (*Carcharhinus falciformis*), oceanic whitetip shark, (*Carcharhinus longimanus*), blue shark (*Prionace glauca*), shortfin mako shark (*Isurus oxyrinchus*), longfin mako shark (*Isurus paucus*), salmon shark (*Lamna ditropis*), and squid (class Cephalopoda) except those listed in Table 1. Although caught frequently, most shark MUS are discarded alive and with fins attached in U.S. fisheries managed under the FEP. Shark finning is illegal in U.S. fisheries.

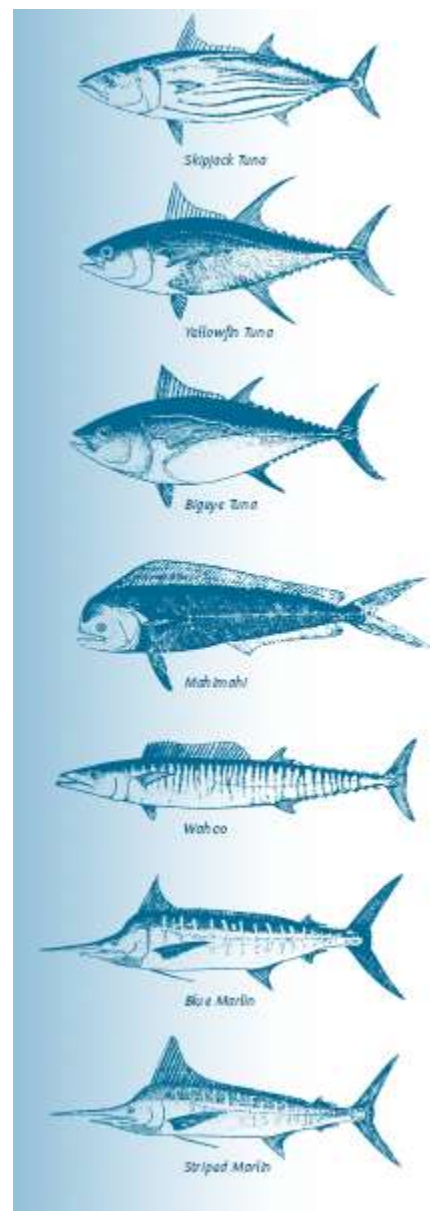
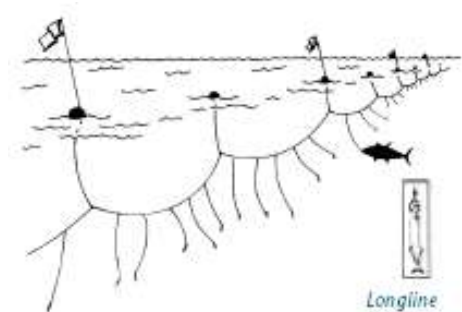


Table 1. Names of U.S. Pacific Island pelagic management unit species

English Common Name	Scientific Name	Samoan or AS local	Hawaiian or HI local	Chamorroan or Guam local	S. Carolinian or CNMI local	N. Carolinian or CNMI local
Mahimahi (dolphinfishes)	<i>Coryphaena</i> spp.	Masimasi	Mahimahi	Botague	Sopor	Habwur
Wahoo	<i>Acanthocybium solandri</i>	Paala	Ono	Toson	Ngaal	Ngaal
Indo-Pacific blue marlin	<i>Makaira mazara</i>	Sa'ula	A'u, Kajiki	Batto'	Taghalaar	Taghalaar
Black marlin	<i>Makaira indica</i>					
Striped marlin	<i>Tetrapturus audax</i>		Nairagi			
Shortbill spearfish	<i>Tetrapturus angustirostris</i>	Sa'ula	Hebi	Spearfish		
Swordfish	<i>Xiphias gladius</i>	Sa'ula malie	A'u kũ, Broadbill, Shutome	Swordfish	Taghalaar	Taghalaar
Sailfish	<i>Istiophorus platypterus</i>	Sa'ula	A'u lepe	Guihan layak	Taghalaar	Taghalaar
Pelagic thresher shark	<i>Alopias pelagicus</i>	Malie	Mano	Halu'u	Paaw	Paaw
Bigeye thresher shark	<i>Alopias superciliosus</i>					
Common thresher shark	<i>Alopias vulpinus</i>					
Silky shark	<i>Carcharhinus falciformis</i>					
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>					
Blue shark	<i>Prionace glauca</i>					
Shortfin mako shark	<i>Isurus oxyrinchus</i>					
Longfin mako shark	<i>Isurus paucus</i>					
Salmon shark	<i>Lamna ditropis</i>					
Albacore	<i>Thunnus alalunga</i>	Apakoa	'Ahi palaha, Tombo	Albacore	Angaraap	Hangaraap
Bigeye tuna	<i>Thunnus obesus</i>	Asiasi, To'uo	'Ahi po'onui, Mabachi	Bigeye tuna	Toghu, Sangir	Toghu, Sangir
Yellowfin tuna	<i>Thunnus albacares</i>	Asiasi, To'uo	'Ahi shibi	'Ahi, Shibi	Yellowfin tuna	Toghu
Northern bluefin tuna	<i>Thunnus thynnus</i>		Maguro			
Skipjack tuna	<i>Katsuwonus pelamis</i>	Atu, Faolua, Ga'oga	Aku	Bunita	Angaraap	Hangaraap
Kawakawa	<i>Euthynnus affinis</i>	Atualo, Kavalau	Kawakawa	Kawakawa	Asilay	Hailuway
Moonfish	<i>Lampris</i> spp	Koko	Opah		Ligehriher	Ligehriher
Oilfish family	Gempylidae	Palu talatala	Walu, Escolar		Tekiniipek	Tekiniipek
Pomfret	Family Bramidae	Manifi moana	Monchong			
Other tuna relatives	<i>Auxis</i> spp, <i>Scomber</i> spp; <i>Allothunus</i> spp	(various)	Ke'o ke'o, saba (various)	(various)	(various)	(various)
Neon flying squid	<i>Ommastrephes bartamii</i>		Squid, ika			
Diamondback squid	<i>Thysanoteuthis rhombus</i>		Squid, ika			
Purple flying squid	<i>Sthenoteuthis oualaniensis</i>		Squid, ika			

1.3 SUMMARY OF PELAGIC FISHERIES AND GEAR TYPES MANAGED UNDER THE FEP

U.S. pelagic fisheries in the Western Pacific Region are, with the exception of purse seining, primarily variations of hook-and-line fishing. These include longlining, trolling, handlining, and pole-and-line fishing. The U.S. purse-seine fishery is managed under an international convention and is therefore not discussed in this report. In addition, while the U.S. fleet of albacore trollers, based at West Coast ports, occasionally operates in the Western Pacific, this fishery is not directly managed by the Council, and is also not described in this report.

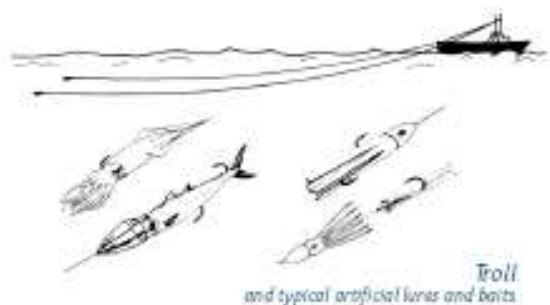


U.S. longline vessels in the Western Pacific Region are based primarily in Hawaii and American Samoa, although Hawaii-based vessels targeting swordfish and bigeye tuna have also fished seasonally out of California. The Hawaii fishery, with 150 active vessels, targets a range of species, with vessels setting shallow longlines to catch swordfish or fishing deep to maximize catches of bigeye tuna. Catches by the Hawaii fleet also include yellowfin tuna, mahimahi, wahoo, blue and striped marlins, opah (moonfish) and monchong (pomfret). The Hawaii fishery does not freeze

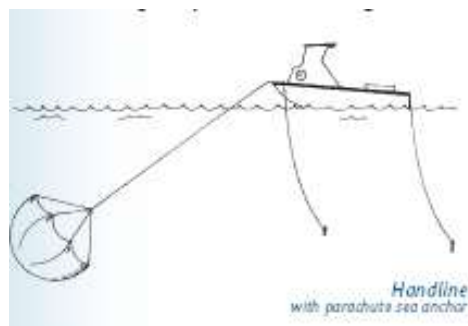
its catch, which is sold to the fresh fish and sashimi markets in Hawaii, Japan, and the U.S. mainland.

The American Samoa longline fleet fishes almost exclusively for albacore, which is landed at the cannery in American Samoa. Pelagic landings consist primarily of four tuna species: albacore, yellowfin, bigeye, and skipjack. The pelagic species wahoo, blue marlin, and mahimahi comprise most of the non-tuna landings.

Trolling and, to lesser extent, handline fishing for pelagic species are the largest commercial fisheries in terms of participation, although they catch a relatively modest volume of fish annually compared to longline and purse seine gears. Troll and handline catches are dominated by yellowfin tuna in Hawaii, skipjack tuna in Guam and the CNMI, and skipjack and yellowfin tuna in American Samoa. Other commonly caught troll catches include mahimahi, wahoo, and blue marlin. Most of the troll and handline landings are made by Hawaii vessels.



Troll fishing for pelagic species is the most common recreational (i.e., non-commercial) fishery in the islands of the Western Pacific region. The definition of recreational fishing, however, continues to be problematic in a region where many fishermen who are fishing primarily for recreation may sell their fish to cover their expenses.



The Western and Central Pacific Ocean (WCPO) supports the world's largest tuna fishery, with a total tuna catch of around 3.3 million mt of fish annually. Most of the catch is taken by fleets of longliners and purse seiners from countries such as Japan, Taiwan, United States (including the U.S. purse seine fleet), Korea and China; however, around a third of purse seine vessels operating in the WCPO are flagged to Pacific Island countries and these fleets are growing. Small scale artisanal longlining

is also conducted in Pacific Island countries like Samoa.

Fishing has been a way of life for millennia across the Pacific Island Region. Each of the archipelagos within this region have a rich and fascinating history, where fishing maintains a critical part in the cultural identity and health of the people. Today, fishing is both a modern enterprise, sustaining an important industry and providing fresh seafood to all of the region's inhabitants, as well as an important pastime that maintains connections to the surrounding environment.

1.3.1 AMERICAN SAMOA

The islands of American Samoa are an area of modest productivity relative to areas to the north and west. The region is traversed by two main currents: the southern branch of the westward-flowing South Equatorial Current from June to October and the eastward-flowing South Equatorial Counter Current from November to April. Surface temperatures vary between 27° and 29° C and are highest from January to April. The upper limit of the thermocline in ocean areas is relatively shallow (27° C isotherm at 100 m depth, approximately 328 ft) but the thermocline itself is diffuse (lower boundary at 300 m depth, approximately 984 ft).

1.3.1.1 TRADITIONAL AND HISTORICAL PELAGIC FISHERIES

The pelagic fishery in American Samoa is and has been an important component of the American Samoan domestic economy. American Samoan dependence on fishing undoubtedly goes back as far as the peopled history of the islands of the Samoan archipelago, about 3,500 years ago. Many aspects of the culture have changed in contemporary times, but American Samoans have retained a traditional social system that continues to strongly influence and depend upon the culture of fishing. Centered around an extended family (*'aiga*) and allegiance to a hierarchy of chiefs (*matai*), this system is rooted in the economics and politics of communally-held village land. It has effectively resisted Euro-American colonial influence and has contributed to a contemporary cultural resiliency unique in the Pacific Island Region.

American Samoa is a landing and canning port for the U.S. purse seine fishery for skipjack and yellowfin tuna, with the largest catch of all U.S. pelagic fisheries in the region. The U.S. longline fishery for South Pacific albacore is conducted primarily in the American Samoa EEZ and comprises the second-largest of the U.S. longline fisheries in the FEP (after Hawaii). The ecosystem based fishery management approach to regulation under the MSA has focused on the socioeconomics of allocating catch and access to EEZ areas by fleet sectors and creating domestic regulations to monitor and mitigate longline fishery impacts to sea turtles and other protected species. American Samoa is a participating U.S. territory in the Western and Central Pacific Fisheries Commission (WCPFC), which status exempts it from certain WCPFC measures so as not to restrict responsible fishery development. The Western and Central Pacific Fisheries

Commission (WCPFC) establishes conservation and management measures that NMFS implements under its authorities, including the MSA.

Prior to the mid-1990s, the pelagic fishery was largely a troll fishery. Horizontal longlining was introduced to the territory by Western Samoan fishermen in 1995. Local fishers have found longlining worthwhile as they land more with less effort and use less gasoline for trips. Initially the vessels used for longlining were “alias”, locally built, twin-hulled (wood with fiberglass or aluminum) vessels about 30 ft. long, powered by 40 horsepower gasoline outboard engines. Larger monohull vessels capable of longer multi-day trips began joining the longline fleet soon after the alias. The number of alias participating in the fishery decreased to below three by 1995 and due to confidentiality requirements cannot be directly reported. Landings from these vessels are added to the total landings. The number of commercial troll vessels has also declined.

Vessels longer than 50 ft are restricted from fishing within 50 nm of Tutuila, Manu‘a, Swains Island and Rose Atoll (see Section 3.6 for details). Albacore is the primary species caught longlining, with the bulk of the longline catch sold to the Pago Pago canneries. Remaining catch is sold to stores, restaurants, and local residents or donated for customary trade or traditional functions. Pago Pago Harbor on the island of Tutuila is a regional base for the transshipment and processing of tuna taken by domestic fleets from other South Pacific nations, distant-water longline fleets, and purse seine fleets. Purse seine vessels land skipjack, yellowfin and other tunas, and a small portion of albacore.

1.3.1.2 CURRENT PELAGIC FISHERIES

The small-scale longline fishery is nearly defunct. Most participants in the small-scale domestic longline fishery were indigenous American Samoans with vessels under 50 ft in length, of which the remaining vessels are *alia* boats under 40 ft in length. The motivation for American Samoa’s commercial fishermen to shift from troll or handline gear to longline gear in the mid-1990s was the fishing success of 28-foot alia catamarans that engaged in longline fishing in the EEZ around Independent Samoa. Following this example, the fishermen in American Samoa deployed a short monofilament longline, with an average of 350 hooks per set, from a hand-powered reel. An estimated 90 percent of the crews working in the American Samoa small-scale alia longline fleet were from Independent Samoa. Like the conventional monohull longline fishery (see below) the predominant catch from the small-scale fishery has been albacore, which is marketed to the local tuna canneries.

American Samoa’s domestic longline fishery expanded rapidly in 2001. Much of the growth was due to the entry of monohull vessels larger than 50 ft in length. The number of permitted longline vessels in this sector increased from seven in 2000 to 38 by 2003. Of these, five permits for vessels between 50.1 ft – 70 ft, and five permits for vessels larger than 70 ft were believed to be held by indigenous American Samoans as of March 21, 2002. Economic barriers have prevented more substantial indigenous participation in the large-scale sector of the longline fishery. The lack of capital appears to be the primary constraint to substantial indigenous participation in this sector. In 2024, there were nine active longline vessels. Poor economic conditions have plagued the large vessel fleet for several years. All other fishing effort indicators from 2024 indicate a declining longline fishery: the number of active vessels was at an all-time low, the number hooks set have decreased since 2021 and was just slightly higher in 2024 than the all-time low of 3.65 million in 2020.

While the smallest (≤ 40 ft) vessels average 350 hooks per set, vessels over 50 ft can set five to six times more hooks and have a greater fishing ranges and capacity for storing fish (from eight to 40 mt on a larger vessel as compared to less than two mt on a small-scale vessel). Larger vessels are also outfitted with hydraulically-powered reels to set and haul mainline, as well as modern electronic equipment for navigation, communications and fish finding. Most are presently being operated to freeze albacore onboard, rather than to land chilled fish.

From October 1985 to the present, catch and effort data in American Samoa troll and handline fisheries have been collected through a creel survey that includes subsistence and recreational fishing, as well as commercial fishing. However, differentiating commercial fishing from non-commercial activity has been difficult, and there have been recent focuses on non-target longline catches that are sold to the local community instead of the cannery.

Recreational fishing underwent a renaissance in American Samoa with the establishment of the Pago Pago Game Fishing Association (PPGFA), founded in 2003 by a group of recreational anglers. The motivation to form the PPGFA was the desire to host regular fishing competitions. Recreational fishing vessels range from 10 ft single engine dinghies to 35 ft twin diesel engine cabin cruisers. The PPGFA has annually hosted international tournaments over the past 15 years, including the Steinlager I'a Lapo'a Game Fishing Tournament (a qualifying event for the International Game Fish Association's Offshore World Championship in Cabo San Lucas, Mexico). The recreational vessels use anchored fish aggregating devices (FADs) extensively, and, during tournaments, venture to the various outer banks which include the South Bank (35 miles south), North East Bank (35 miles northeast), South East bank (37 miles southeast), 2° bank (29 miles east-southeast), and East Bank (24 miles east).

There was no full-time regular charter fishery in American Samoa similar to those in Hawaii or Guam prior to 2015, however, Pago Pago Marine Charters began operating a full-time charter fishery since then.

Estimates of the volume and value of recreational fishing in American Samoa are not precise. A volume approximation of boat based recreational fishing is generated in this annual report based on the annual sampling of catches, conducted by the American Samoa Department of Marine and Wildlife Resources (DMWR) and provided to NMFS PIFSC Fisheries Research and Monitoring Division (FRMD). While boat-based recreational catches were as high as over 46,000 lb in the 2000s, total non-commercial catch was estimated to be over 97,000 lb in 2019. It is likely that non-commercial fishing data in recent years have been affected by impacts associated with the COVID-19 pandemic.

While no permits have been issued to date, non-commercial fishing and recreational charter fishing are permitted within the Rose Atoll Marine National Monument. These permits are available only to community residents of American Samoa or charter businesses established legally under the laws of American Samoa.

1.3.2 COMMONWEALTH OF THE NORTHERN MARIANAS ISLANDS

Generally, the major surface current affecting the Mariana Archipelago is the North Equatorial Current, which flows westward through the archipelago. However, the Subtropical Counter Current affects the Northern Islands and generally flows in an easterly direction. Depending on the season, sea surface temperatures near the Northern Mariana Islands vary between 80.9° – 84.9° Fahrenheit. The mixed layer extends to between depths of 300 – 400 ft.

1.3.2.1 TRADITIONAL AND HISTORICAL PELAGIC FISHERIES

Fishery resources have played a central role in shaping the social, cultural, and economic fabric of the CNMI. The aboriginal peoples indigenous to these islands relied on seafood as their principal source of protein and developed exceptional fishing skills. Later immigrants to the islands from East and Southeast Asia also possessed a strong fishing tradition. Under the MSA, the CNMI is defined as a fishing community.

1.3.2.2 CURRENT PELAGIC FISHERIES

The CNMI's pelagic fisheries occur mainly from the island of Farallon de Medinilla (FDM) south to the island of Rota. Trolling is the primary fishing method utilized in the pelagic fishery. The pelagic fishing fleet consists mostly of vessels less than 24 ft in length, which usually have a limited 20-mile travel radius from Saipan. There were an estimated 1,668 trolling trips in 2024, representing a decrease of nearly 30% from 2023.

The primary target and most marketable species for the pelagic fleet is skipjack tuna (approximately 48% of 2024 landings). Schools of skipjack tuna have historically been common in nearshore waters, providing an opportunity to catch numerous fish with a minimum of travel time and fuel costs. Skipjack is readily consumed by the local populace and restaurants, primarily as sashimi. Yellowfin tuna and mahimahi are also easily marketable, but seasonal, species. During their seasonal runs, these fish are usually found close to shore and provide easy targets for the local fishermen. In addition to the economic advantages of being nearshore and their relative ease of capture, these species are widely accepted by all ethnic groups, which has kept market demand fairly high.

In late 2007, Crystal Seas became the first established longline fishing company in the CNMI to begin its operation out of the island of Rota. However, by 2009, Crystal Seas had become Pacific Seafood and relocated its operation to Saipan. In 2011, there were four licensed longline fishing vessels stationed in the CNMI, but these vessels found it difficult to market their catch and did not perform well. By 2014, there were no active longliners in the CNMI, although a few of the original vessels were experimenting with other types of fishing with limited success.

1.3.3 GUAM

1.3.3.1 TRADITIONAL AND HISTORICAL PELAGIC FISHERIES

Fishing in Guam continues to be important not only in terms of contributing to the subsistence needs of the Chamorro people, but also in terms of preserving their history and identity. Fishing assists in perpetuating traditional knowledge of marine resources and maritime heritage of the Chamorro culture.

1.3.3.2 CURRENT PELAGIC FISHERIES

Pelagic fishing vessels based in Guam are classified into two general groups: (1) distant-water purse seiners and longliners that fish outside Guam's EEZ and transship through the island; and (2) small, primarily recreational, trolling boats that are either towed to boat launch sites or berthed in marinas and fish only within local waters within Guam's EEZ or on some occasions in the adjacent EEZ of the Northern Mariana Islands. This annual report primarily covers the local, Guam-based, small-boat pelagic fishery.

Landings from Guam fisheries primarily consist of five major species: mahimahi (*Coryphaena hippurus*), wahoo (*Acanthocybium solandri*), skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), and Pacific blue marlin (*Makaira mazara*). Other minor pelagic species caught include rainbow runner (*Elagatis bipinnulatus*), great barracuda (*Sphyraena barracuda*), kawakawa (*Euthynnus affinis*), dogtooth tuna (*Gymnosarda unicolor*), double-lined mackerel (*Grammatorcynus bilineatus*), oilfish (*Ruvettus pretiosus*), and three less common species of barracuda.

The number of boats involved in Guam's pelagic or open ocean fishery has gradually increased from about 200 vessels in 1982. There were 447 boats active in Guam's domestic pelagic fishery in 2024. A majority of the fishing boats are less than 10 m (33 ft) in length and are usually owner-operated by fishermen who earn a living outside of fishing. Most fishermen sell a portion of their catch, and it is difficult to make a distinction between recreational, subsistence, and commercial fishers. A small, but significant, segment of Guam's pelagic fishery is made up of marina-berthed charter boats that are operated primarily by full-time captains and crews.

1.3.4 HAWAII

The archipelago's position in the Pacific Ocean lies within the clockwise rotating North Pacific Subtropical Gyre, extending from the northern portion of the North Equatorial Current into the region south of the Subtropical High, where the water moves eastward in the North Pacific Current. At the pass between the Main Hawaiian Islands (MHI) and the Northwestern Hawaiian Islands (NWHI), there is often a westward flow from the region of Kauai along the lee side of the lower NWHI. This flow, the North Hawaiian Ridge Current, is extremely variable and can also be absent at times. The analysis of 10 years of shipboard acoustic Doppler current profiler data collected by the NOAA Ship *Townsend Cromwell* shows mean flow through the ridge between Oahu and Nihoa, and extending to a depth of 200 m.

Embedded in the mean east-to-west flow are an abundance of mesoscale eddies created from a mixture of wind, current, and sea floor interactions. The eddies, which can rotate either clockwise or counterclockwise, have important biological impacts. For example, eddies create vertical fluxes, with regions of divergence (i.e., upwelling) where the thermocline shoals and deep nutrients are pumped into surface waters enhancing phytoplankton production, and also regions of convergence (i.e., downwelling) where the thermocline deepens. Sea surface temperatures around the Hawaiian Archipelago experience seasonal variability, but generally vary between 18° - 28° C (64° - 82° F) with colder waters occurring more often in the NWHI.

A significant source of inter-annual physical and biological variation around Hawaii are El Niño and La Niña events. During an El Niño, the normal easterly trade winds weaken, resulting in a weakening of the westward equatorial surface current and a deepening of the thermocline in the central and eastern equatorial Pacific. Water in the central and eastern equatorial Pacific becomes warmer and more vertically stratified with a substantial drop in surface chlorophyll.

Physical and biological oceanographic changes have also been observed on decadal time scales. These low frequency changes, termed regime shifts, can impact the entire ocean ecosystem. Recent regime shifts in the North Pacific have occurred in 1976 and 1989, with both physical and biological (including fishery) impacts. In the late 1980s, an ecosystem shift from high carrying capacity to low carrying capacity occurred in the NWHI. The shift was associated with the weakening of the Aleutian Low Pressure System (North Pacific) and the Subtropical Counter Current. The ecosystem effects of this shift were observed in lower nutrient and productivity

levels and decreased abundance of numerous species in the NWHI including the spiny lobster, the Hawaiian monk seal, various reef fish, the red-footed booby, and the red-tailed tropic bird.

1.3.4.1 TRADITIONAL AND HISTORICAL PELAGIC FISHERIES

In old Hawaii, fishing in nearshore waters (from the shoreline to the edges of the reefs and where there happens to be no reef, to a distance of nearly a mile from the beach) was regulated by the chiefs and closed seasons were determined by the life history of specific organisms. Areas known as nurseries were not used for fishing. This understanding of natural forces has been captured in the Hawaiian moon calendar, which incorporates the tides and seasons to explain the cycles of scarcity and abundance and provide guidance on what activities should occur at what times of the year. Deep sea fishing (beyond the reefs) was available and open to everyone and conducted based on annual/seasonal weather conditions. Those who fished in the deep ocean sought out these fishing grounds and kept them secret (Kahaulelio 2006). Fish caught in the deep sea included skipjack (aku), dolphinfish (mahimahi), billfish (a‘u), tuna (ahi), and other pelagics.

1.3.4.2 CURRENT PELAGIC FISHERIES

Hawaii’s pelagic fisheries, which include longlining, MHI troll and handline, offshore handline, and the aku boat (pole and line) fisheries, are the State’s largest and most valuable fishery sector. The target species are tunas and billfish, but a variety of other species are also important. Collectively, these pelagic fisheries harvested approximately 33.6 million lb of commercial landings with a total ex-vessel value of \$110.8 million in 2024. The deep-set longline fishery was the largest of all commercial pelagic fisheries in Hawaii and represented 87% of the total commercial pelagic catch and ex-vessel revenue. The shallow-set longline fishery was the second largest fishery in Hawaii and accounted for 5% of the catch and revenue. The MHI troll, MHI handline, aku boat, offshore handline fisheries, and other gear types made up the remainder.

The largest component of the pelagic catch was tunas, which comprised 75% of the total in 2024. Bigeye tuna alone accounted for 41% of all the pelagic catch. Billfish catch made up 18% of the total catch in 2023. Swordfish was the largest of these, at 50% of the billfish and 6% of the total catch. Catches of other PMUS represented 8% of the total catch in 2024 with ono being the largest component at 8% of the total catch.

The Hawaii longline fishery is by far the most important economically, with the deep-set fishery sector accounting for about 88% percent of the estimated ex-vessel value of the total commercial fish landings in the State in 2024. In 2017, it is estimated that the commercial fishing and seafood industries in Hawaii generated \$900.6 million in sales, \$262 million in income, and \$402.2 million in value-added impacts while supporting 9,827 full- and part-time jobs (NMFS 2021a). In 2018, these industries supported 8,086 full- and part-time jobs and generated \$776.2 million in sales, \$233.4 million in income, and \$343.6 million in value-added impacts (NMFS 2021b). More recently, in 2019, 7,693 jobs were supported by the industries, which generated \$786 million in sales, \$229.5 million in income, and \$340.9 million in value-added impacts (NMFS 2022).

Recreational fisheries are also extremely important in the State of Hawaii economically, socially, and culturally. The total estimated pelagic recreational fisheries production in 2020 was nearly 14.5 million lb. The number of small vessels in Hawaii declined to approximately 11,000 in 2018 since a peak of over 16,000 vessels in 2008. Boat-based anglers took 632,088 fishing trips in 2019, with only 7,744 designated charter vessel trips. Although unsold or not entering the typical

commercial channels for fish sales, the total estimated value of the recreational catch was approximately \$20 million in 2018 based on an average of \$3.00/lb provided by PIFSC FRMD.

1.3.5 PACIFIC REMOTE ISLAND AREA

Baker Island lies within the westward flowing South Equatorial Current. Baker Island also experiences an eastward flowing Equatorial Undercurrent that causes upwelling of nutrient and plankton rich waters on the west side of the island (Brainard et al. 2005). Sea surface temperatures of pelagic EEZ waters around Baker Island are often near 30° C. Although the depth of the mixed layer in the pelagic waters around Baker Island is seasonally variable, the average mixed layer depth is around 100 m.

Howland Island lies within the margins of the eastward flowing North Equatorial Counter Current and the margins of the westward flowing South Equatorial Current. Sea surface temperatures of pelagic EEZ waters around Baker Island are often near 30° C. Although the depth of the mixed layer in the pelagic waters around Howland Island is seasonally variable, the average mixed layer depth is around 70 m – 90 m.

Jarvis Island lies within the South Equatorial Current which runs in a westerly direction. Sea surface temperatures of pelagic EEZ waters around Jarvis Island are often 28°- 30° C. Although depth of the mixed layer in the pelagic waters around Jarvis Island is seasonally variable, the average mixed layer depth is around 80 m.

Palmyra Atoll and Kingman Reef lie in the North Equatorial Counter-current, which flow in a west to east direction. Sea surface temperatures of pelagic EEZ waters around Palmyra Atoll are often 27°- 30° C. Although the depth of the mixed layer in the pelagic waters around Kingman Reef is seasonally variable, the average mixed layer depth is around 80 m.

Sea surface temperatures of pelagic EEZ waters around Johnston Atoll are often 27°- 30° C. Although the depth of the mixed layer in the pelagic waters around Johnston Atoll is seasonally variable, the average mixed layer depth is around 80 m.

Sea surface temperatures of pelagic EEZ waters around Wake Island are often 27°- 30° C. Although the depth of the mixed layer in the pelagic waters around Wake Atoll is seasonally variable, the average mixed layer depth is around 80 m.

1.3.5.1 TRADITIONAL AND HISTORICAL PELAGIC FISHERIES

As many tropical pelagic species (e.g., skipjack tuna) are highly migratory, the fishing fleets targeting them often travel great distances. Although the EEZ waters around Johnston Atoll and Palmyra Atoll are over 750 nm and 1000 nm (respectively) away from Honolulu, the Hawaii longline fleet does seasonally fish in those areas. For example, the EEZ around Palmyra is visited by Hawaii-based longline vessels targeting yellowfin tuna, whereas at Johnston Atoll, albacore is often caught in greater numbers than yellowfin or bigeye tuna. Similarly, the U.S. purse seine fleet also targets pelagic species (primarily skipjack tuna) in the EEZs around some Pacific Remote Island Area (PRIA), specifically, the equatorial areas of Howland, Baker, and Jarvis Islands. The combined amount of fish harvested from these areas from the U.S. purse seine on average is less than five percent of their total annual harvest.

1.3.5.2 CURRENT PELAGIC FISHERIES

The U.S. Fish and Wildlife Service (USFWS) prohibits fishing within the Howland Island, Jarvis Island, and Baker Island National Wildlife Refuge boundaries. Currently, Jarvis Island, Howland

Island, and Baker Island are uninhabited. The USFWS manages Johnston Atoll as a National Wildlife Refuge but does allow some recreational fishing within the Refuge boundary.

1.4 ADMINISTRATIVE AND REGULATORY ACTIONS

This section describes NMFS management actions for the pelagic fisheries in the Pacific Islands Region over the course of 2024.

On March 1, 2024, NMFS published a final rule that modifies its seabird interaction mitigation measures to require federally permitted Hawaii deep-set longline vessels that set fishing gear from the stern to use a tori line (i.e., bird scaring streamer) in place of the currently required thawed, blue-dyed bait and strategic offal (i.e., fish, fish parts, or spent bait) discharge when fishing above latitude (lat.) 23° N. This action is expected to improve the overall efficacy and operational practicality of required seabird mitigation measures by reducing seabird bycatch and creating operational and administrative efficiency for fishermen and NMFS. The rule was effective April 1, 2024.

On May 2, 2024, NMFS announced the approval of Amendments to the five fishery ecosystem plans (FEP) for fisheries in the Pacific Islands Region, including the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific. The FEPs are amended to update data collection mechanisms identified as standardized bycatch reporting methodologies (SBRM) and to revise descriptions of SBRM for consistency with current NMFS regulations. These Amendments ensure conformance with national guidance for compliance with the SBRM requirement in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

On August 8, 2024, NMFS published an interim final rule issued under authority of the Western and Central Pacific Fisheries Convention Implementation Act (WCPFC Implementation Act) that implements a recent decision of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the western and central Pacific Ocean (WCPFC or Commission) increasing the WCPFC bigeye tuna catch limit for U.S. longline fishing vessels from 3,554 metric tons (mt) to 6,554 mt. This action is necessary to satisfy the obligations of the United States as a member of the Commission. The interim final rule was effective August 6, 2024.

1.5 TOTAL PELAGIC LANDINGS IN THE WESTERN PACIFIC REGION FOR ALL FISHERIES

A summary of the 2024 total pelagic landings in the Western Pacific and the change between 2023 and 2024 are shown in Table 2.

Table 2. Total pelagic landings (lb) in the Western Pacific Region in 2024 and percent change from the previous year

Species	American Samoa			CNMI			Guam			Hawaii		
	2023 lb	2024 lb	% Change	2023 lb	2024 lb	% Change	2023 lb	2024 lb	% Change	2022 lb	2023 lb	% Change
Swordfish	6,965	9,054	30.0	-	-	-	0	0		2,690,879	2,247,830	-16.5
Blue marlin	86,555	147,574	70.5	-	39,075	-	14,163	40,279	184	1,068,833	1,838,813	72.0
Striped marlin	3,715	4,197	13	-	-	-	0	0		503,499	1,420,498	182.1
Other billfish*	4,708	8,999	91.1	0	0	-	2,063	2,018	-2	495,583	458,161	-7.6
Mahimahi	3,104	2,597	-16.3	11,427	0	-100	52,410	168,668	222	896,895	570,509	-36.4
Wahoo	26,147	38,569	47.5	13,887	875	-93.7	45,262	25,794	-43	903,034	1,276,212	41.3
Opah (moonfish)	296	395	33.4	-	-	-	-	-		504,996	290,495	-42.5
Sharks (whole wt.)	90	271	201.1	0	0	-	786	0	-100	8,260	5,357	-35.1
Albacore	1,942,582	2,258,160	16.2	-	-	-	0	0		1,126,593	608,329	-46.0
Bigeye tuna	82,624	116,332	40.8	-	-	-	0	0		14,525,856	13,775,508	-5.2
Bluefin tuna	238	0	-100	-	-	-	-	-		4,407	6,354	44.2
Skipjack tuna	109,282	354,458	224.4	76,218	39,853	-47.7	488,775	407,346	-17	396,387	547,545	38.1
Yellowfin tuna	487,587	460,191	-5.6	19,393	2,143	-88.9	96,832	48,700	-50	7,358,261	10,117,375	37.5
Other pelagics**	2,193	3,567	62.7	8,520	2,387	-72.0	13,737	6,315	-54	504,084	458,161	-9.1
Total	2,756,086	3,404,364	23.5	129,445	84,333	-34.9	714,028	699,120	-2	30,987,567	33,621,147	-8.5

Note: Total Pelagic Landings based on commercial reports and/or creel surveys. % change based on 2022 landings relative to 2023 landings. Hawaii data reflect commercial reports only.

*Other billfish include black marlin, spearfish, and sailfish.

**Other pelagics include: kawakawa, unknown tunas, pelagic fishes (dogtooth tuna, rainbow runner, barracudas), oilfish, and pomfret. Of these, only kawakawa, unknown tunas, oilfish and pomfret are Pelagic MUS. While other tables in Chapter 2 excluded or separated out non-MUS, data could not accurately provide individual landings data for these species presented in this total landings table.

1.6 PLAN TEAM RECOMMENDATIONS

At its May 2025 meeting, the Pelagic Plan Team made several recommendations:

Regarding crew training, the Pelagic Plan Team supports implementation of the crew training requirement under Alternative 1, and recommends a 2-year certification requirement (Sub-alternative 2), which would reduce burden compared to an annual certification requirement while providing opportunities for refresher training for crew members who stay in the fishery for longer than 2 years. The Plan Team encourages the crew training program to provide opportunities for more frequent refresher trainings on a voluntary basis.

Regarding electronic monitoring, the Pelagic Plan Team supports authorizing electronic monitoring (EM) as a mandatory monitoring program for Hawaii and large vessel American Samoa limited entry fisheries, and recommends implementing EM by randomly selecting vessels (Sub-Alternative 2A) during the phase-in period. The Plan Team notes that random selection is more representative of the fisheries. For American Samoa vessels, the Plan Team recommends flexibility for those vessels as conducted in electronic reporting implementation, acknowledges possible delay in implementation, and recommends that the American Samoa fleet should be considered separately in the random selection process.

Regarding Hawaii pelagic small boat fisheries, the Pelagic Plan Team recommends Plan Team members, Hawaii DAR and Council staff present Hawaii pelagic small boat fishery catch and effort data at Council IRA project and Council advisory group meetings. These include, but are not limited to, the Hawaii AP, FIAC, and NCFAC. This is for the purpose of documenting characteristics of Hawaii pelagic small boat fisheries and gleaning fishery performance by Hawaiian island and gear type reported.

Regarding fishery data collection, the Pelagic Plan Team recommends the Council, in coordination with PIFSC through the Fisheries Data Collection and Research Committee, work with the jurisdictional fisheries management agencies in identifying and removing the barriers that prevents efficient and effective collection of fisheries data resulting in a decline in survey interviews and reporting of the fishery constituents affecting representativeness of data reported in the Annual SAFE Reports and future benchmark assessments.

2 DATA MODULES

2.1 AMERICAN SAMOA

2.1.1 DATA SOURCES

This report contains the most recently available information on American Samoa's pelagic fisheries, as compiled from data generated by the Department of Marine and Wildlife Resources (DMWR) through a program established in conjunction with the National Marine Fisheries Service (NMFS) Pacific Islands Fisheries Science Center (PIFSC) and supported in part through funding from the Interjurisdictional Fisheries Act (IFA). Purse seine and non-U.S. vessel landings are not included in this module but are discussed in general in the International module (see Section 2.6).

Prior to 1985, only commercial landings were monitored. From October 1985 to the present, data have been collected through the Tutuila and Manu'a creel survey program to include subsistence, recreational, as well as commercial fishing. Surveyors have noted that fishermen may not accurately report the number of fish released at sea, although the troll fishery in American Samoa has not been known to release fish. However, the Pago Pago Gamefishing Association, a recreational troll fishery, catches and releases blue marlin.

In September 1990, a commercial purchase system (i.e., receipt book) was instituted requiring all businesses that buy fish commercially in American Samoa, with an exception for the canneries, to submit a copy of their purchase receipts to the DMWR. In January 1996, NMFS implemented a federal longline logbook system. All longline fishermen are required to obtain a federal permit and to submit logs containing detailed data on each of their sets and the resulting catch, including the number of hooks set and number of fish released as bycatch. Confidentiality requirements prohibit providing a breakdown of the catch or effort from alia and monohull longline vessels in recent years. Changes to the data collection and analysis methodology have occurred periodically and are described in previous annual reports. No changes to the data collection or analysis were made in 2020, except that the number of vendors participating in the commercial purchase system decreased.

Participation (i.e., number of boats) is determined through both logbook entries and creel interviews. Effort (i.e., number of trips, hooks) is determined by direct reporting for longline trips, but is indirectly calculated for trolling trips, based on total pounds landed (reported), and average hourly catch rate and duration for trip (from creel interviews). Since 2009 (the year of the tsunami), only the longline logbook database has been useful in determining the number of active boats. Prior to that, DMWR's boat-based creel survey data were also used to assess whether or not longline vessels were active to include information from alia longline vessels that did not frequent the canneries and exclude alias that exclusively conducted bottomfish fishing and/or trolling.

DMWR implemented a fuel subsidy program from 2015 to 2018 that required DMWR to meet fishers at a designated time and location for mandatory surveys in order to receive fuel subsidies. This extended the creel survey schedule and detracted from the random sampling design at other times of the day. The fuel was dispensed to vessel owners, including those who rent their vessels to fishermen. The new program caused changes in fishing behavior that may have impacted catch estimates. Generally, more fuel was used and there were longer and more frequent trips,

but otherwise, catch per unit effort (CPUE) and species composition were not affected. There was an increase in the number of trolling trips and trip length that may have affected the relative amount of pelagic species in the catch.

Average weight (pounds) per fish is calculated directly from creel-weighted fish sampled over the year. In the past, cannery fish weight was determined based on a length to weight conversion from cannery sampling data, since longline boats have been landing their catches gilled and gutted since 1999. However, the cannery sampling program was discontinued in 2015, so those average weight data are no longer available. There is no cannery sampling data available since 2016. Therefore, PIFSC used proxies to estimate the weight and value of fish landings for the longline fishery in American Samoa.

For estimated weights, the current summaries are based on the best available average weight data for 2020, which is from DMWR's creel surveys. It should be noted that the weight of fish from the small boats is somewhat smaller than fish caught on the larger oceangoing vessels, contributing to a somewhat lower weight estimate for the fishery. Over the course of 2016, the PIFSC Fisheries Research and Monitoring Division (FRMD) International Fisheries Program (IFP) began estimating the average weight of fish kept for the longline fishery from observer data. This alternative source provides trip-level average weights for vessels with observers. These weights will be more representative of the longline fishery, but they will not be available for trips that do not carry observers. The protocol for handling unobserved trips is being developed by IFP, which will provide the data for this report in future years, but the information is not yet available. The information will be provided in the Regional Fishery Management Organization (RFMO) report for US Pacific longline fisheries.

Another item lost with the discontinuation of the longline cannery sampling program by the Pacific Islands Regional Office (PIRO) in Pago Pago was data on the proportion of longline fish (by species) sold to the cannery versus local market and village/take home (given, not sold). While the cannery buys a much higher volume of fish, their prices are low. The lesser amount of fish sold to the markets and local restaurants garners a higher price. Another portion of the catch is given away or taken home. In the absence of a cannery sampling program in 2016, PIFSC had to apply a number of estimates. For the top five cannery species (albacore, skipjack, yellowfin and big eye tuna and wahoo) the assumption of 100% sold to the cannery was applied. For other species also previously sampled at the cannery, for which a large percentage are not sold, proxy values from previous years were applied. The net result of using lower average weights (from creel surveys) and lower percentages sold to the market (or sold period) is likely to be responsible in part for a decrease in estimated weight and value of the catch sold.

Total landings data cover all fish caught and brought back to shore, whether it enters the commercial market or not. Commercial landings cover the portion of the total landings that was sold both to the canneries and other smaller local business. The difference between total landings and commercial landings is assumed to be the recreational/subsistence component of the fishery.

This module was prepared by DMWR and PIFSC FRMD and was reviewed by the WPFMC, its Scientific and Statistical Committee (SSC), and its Pelagic FEP Team (PPT).

2.1.2 SUMMARY OF AMERICAN SAMOAN PELAGIC FISHERY

Landings. The estimated annual pelagic landings have varied from 2.0 to 5.6 million lb between 2015 and 2024. The 2024 landings were approximately 3.4 million lb, higher than the 2.7 million lb landings in 2023 and highest since 2019 (Figure 4). Pelagic landings consist mainly of four tuna species (albacore, yellowfin, skipjack, and bigeye), which when combined with other tuna species, made up 94% of the total landings. Albacore made up 71% of the tuna species in 2024. Blue marlin, wahoo, swordfish, sailfish, striped marlin and mahimahi make up most of the non-tuna species landings. Landings of skipjack, blue marlin, wahoo and sailfish increased in 2024.

Longline and Trolling Effort. There were 9 vessels known to be fishing in the waters of American Samoa in 2024, one less than in 2023 according to the PIRO Sustainable Fisheries Division permit program. The vessel size classes were recently changed from four to two: small (< 40 feet) and large vessels (> 60 feet). There were 9 active large vessels and no active small vessels in 2024; there have been no active small longline vessels since 2021. The 9 vessels that fished in 2024 made 47 trips (averaging 5.2 trips/vessel), deployed 1,359 sets, (151 sets/vessel) using 4.06 million hooks and zero light sticks (Table 5). All other historical fishing effort indicators indicate a declining longline fishery. The number of boats is an all-time low. However, there has been a slight increase in other fishing effort indicators with increase in trips, sets and number of hooks. The number of boats trolling was 10, up from nine in 2023 and 2022, and up from five in 2021 at the end of a long-term decline since 2014. However, the number of troll trips precipitously decreased from 339 in 2023 to 72 in 2024 and now the lowest since 2015. There were 247 effective trolling hours in 2024, a precipitous drop from 1,577 and now the lowest since 2015. The catch rate was 22 lb/hr in 2024, a dramatic increase from 3 lb/hr in 2023, with an average catch rate of 23 lb/hr since 2015. The trolling effort estimates seem to wildly vary from year to year probably owing to low fishing participation coupled with the expansion algorithm that does not account for this level of effort. These values are being reviewed by PIFSC and the Council.

Longline CPUE. The total pelagic catch rate by all longline vessels was 13.0 fish/1,000 hooks in 2024. The tuna catch rate by longliners increased by 0.4 fish/1,000 hooks in 2024 from 12.6 fish/1,000 hooks in 2023. The catch rates have been increasing since 2020 and this reflects the monohull albacore catch rates since there have been no alia longlining since 2020. The catch rate of 13.0 fish/1,000 hooks is slightly above the average of 11.9 fish/1,000 hooks. The highest albacore catch rate on record is 32.9 fish/1,000 hooks in 2001.

Lb-Per-Hour Trolling. Trolling catch rates dramatically increased from 3 lb/hr in 2023 to 22 lb/hr in 2024 (Figure 19). Trolling catch rates have fluctuated with peaks in 2016 at 45 lb/hr and 2021 at 34 lb/hr. The fluctuations in catch rates could be attributed to skipjack catch rates and to some extent yellowfin catch rates especially in 2016. The catch rates for skipjack ranged from 17.9 lb/hr in 2016, 26.3 lb/hr in 2021 and 18.8 lb/hr in 2022. The catch rates for yellowfin fluctuated from 17.5 lb/hr in 2016 with the lower ends of 0.05 lb/hr in 2022 and 1.33 lb/hr in 2023. Catch rates for both skipjack and yellowfin increased from 2022 and 2023, respectively (Figure 20).

Fish Size. Since the last year of available data from the cannery sampling program was 2015 average weight-per-fish are no longer presented in this report. Average albacore weight ranged from 38 to 40 lb from 2010 to 2015. However, the boat-based creel surveys recorded

a size range of 35 to 38 lb from 2013 to 2020. Yellowfin and bigeye tuna weight per fish from the cannery sampling program seemed to decline from 2011 to 2015, at 57 to 39 lb and 54 to 38 lb, respectively.

Revenues. In 2024, the total longline fleet revenue (estimated landed value) was \$3.23 million, and albacore composed a majority of the total landed value. Other main species included yellowfin tuna, bigeye tuna, skipjack tuna, and wahoo. The overall average fish price was \$0.86 per pound in 2024. Albacore price was \$1.15 per pound in 2024, a decrease of \$0.24 from 2023. See the Socioeconomics (Section 3.2.2.1) module for additional data on American Samoa pelagic fisheries.

Bycatch. There was no recorded bycatch for the troll fishery in 2024 (Table 14). In the longline fishery, around 2.2% of the tuna catch was released. Yellowfin and bigeye were the most released bycatch tuna species at 5.1 and 5.5%, respectively. These are much higher release rates compared to 2021. Conversely, sharks (98 to 100%), oilfish (99.7%), and pomfret (88.6%) had the highest release numbers of non-tunas (Table 6). In total, 7.3% of all pelagic species caught by the longline fishery were released in 2024, lower than the 9.8% in 2023, and up from 3.8% in 2022. Fish are released for various reasons including quality, handling and storage difficulties, and marketing problems.

2.1.3 PLAN TEAM RECOMMENDATIONS

There were no Plan Team recommendations to the Council relevant to the American Samoa pelagic fisheries data module.

2.1.4 OVERVIEW OF PARTICIPATION - ALL FISHERIES

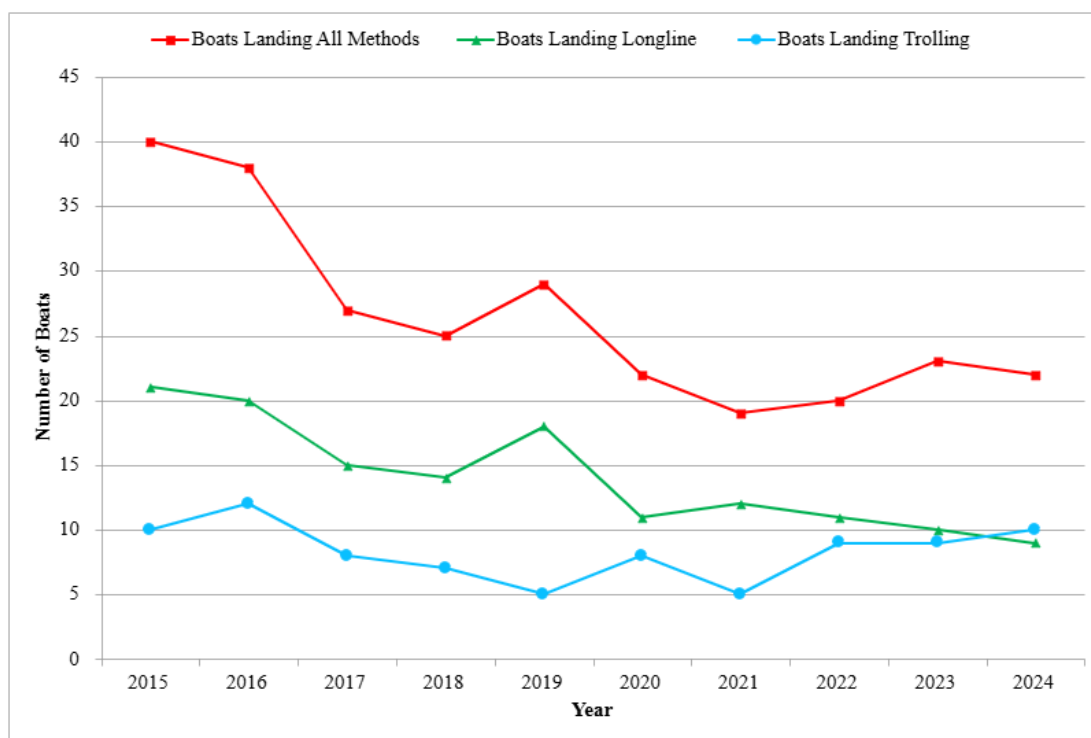


Figure 2. Number of boats landing any pelagic species in American Samoa by longlining, trolling, and all methods

Supporting data shown in Table A-2.

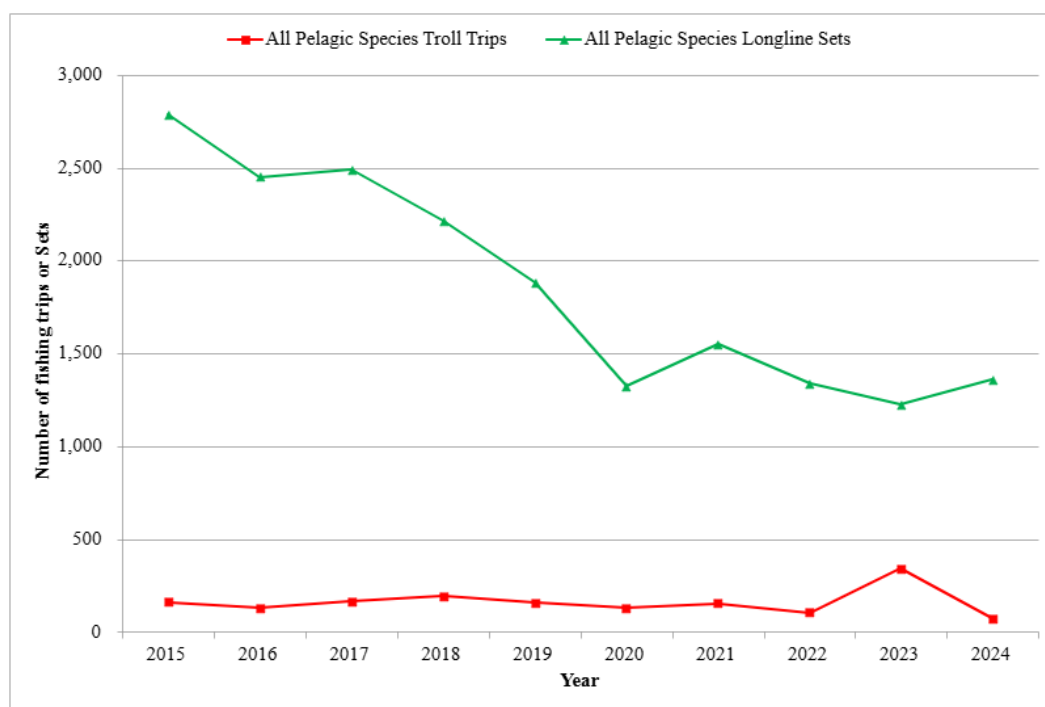


Figure 3. Number of fishing trips and sets for pelagic species in American Samoa
Supporting data shown in Table A-3.

2.1.5 OVERVIEW OF LANDINGS – ALL FISHERIES

Table 3. Estimated total landings (lb) of pelagic species in American Samoa by gear in 2024

Species	Longline Pounds	Troll Pounds	Other Pounds	Total Pounds
Skipjack tuna	352,044	2,414	0	354,458
Albacore tuna	2,258,160	0	0	2,258,160
Yellowfin tuna	458,942	1,249	0	460,191
Kawakawa	0	392	0	392
Bigeye tuna	116,332	0	0	116,332
Bluefin tuna	0	0	0	0
Tunas (unknown)	0	0	0	0
TUNAS TOTAL	3,185,478	4,055	0	3,189,533
Mahimahi	2,597	0	0	2,597
Black marlin	0	0	0	0
Blue marlin	147,574	0	0	147,574
Striped marlin	4,197	0	0	4,197
Wahoo	38,356	213	0	38,569
Swordfish	9,054	0	0	9,054
Sailfish	7,516	0	0	7,516
Spearfish	966	517	0	1,483
Moonfish	395	0	0	395
Oilfish	76	0	0	76
Pomfret	158	0	0	158
Pelagic thresher shark	0	0	0	0
Thresher shark	0	0	0	0
Shark (unknown pelagic)	181	0	0	181
Snake mackerel	0	0	6	6
Bigeye thresher shark	0	0	0	0
Silky shark	0	0	0	0
White tip oceanic shark	0	0	0	0
Blue shark	0	0	0	0
Shortfin mako shark	90	0	0	90
Longfin mako shark	0	0	0	0
Billfishes (unknown)	0	0	0	0
NON-TUNA PMUS TOTAL	211,160	730	6	211,896
Pelagic fishes (unknown)	0	0	0	0
Double-lined mackerel	0	0	10	10
Mackerel	0	0	0	0

Species	Longline Pounds	Troll Pounds	Other Pounds	Total Pounds
Long-jawed mackerel	0	0	0	0
Barracudas	2,322	0	0	2,322
Great barracuda	0	0	0	0
Small barracudas	0	0	0	0
Rainbow runner	79	184	0	263
Dogtooth tuna	0	151	189	340
OTHER PELAGICS TOTAL	2,401	335	199	2,935
TOTAL PELAGICS	3,399,039	5,120	205	3,404,364

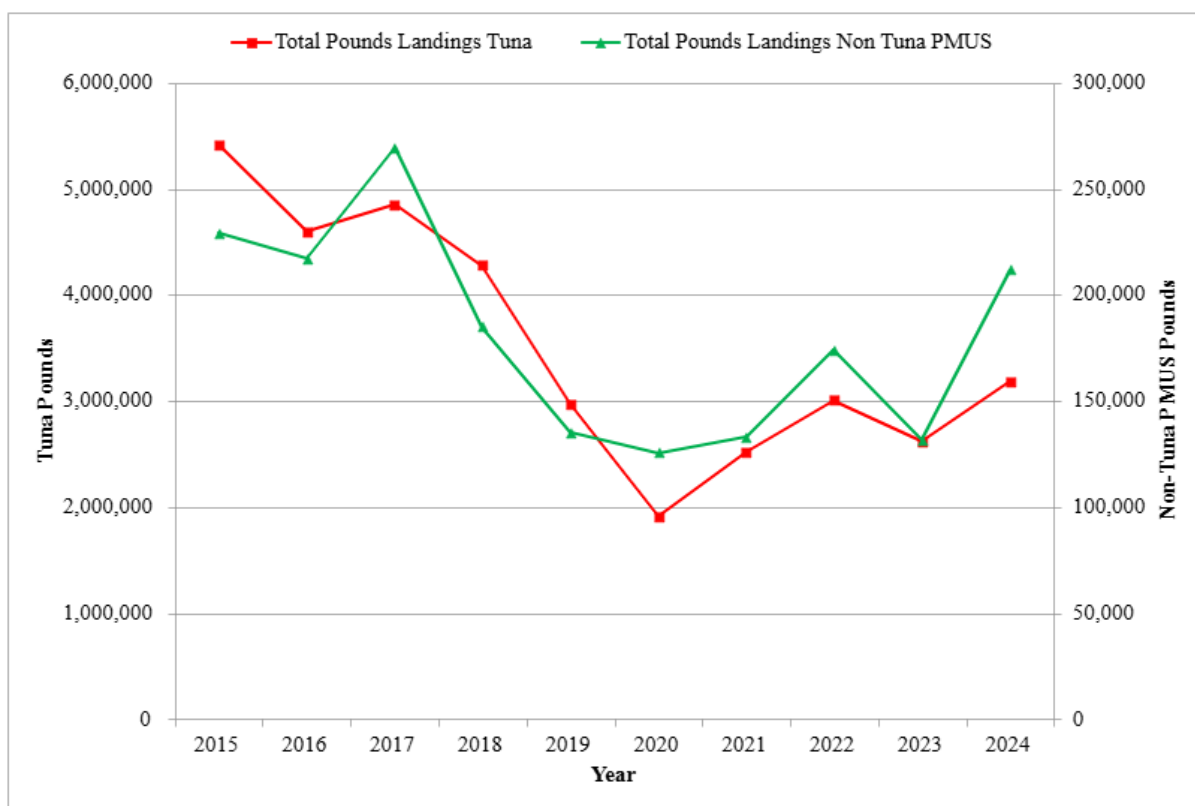


Figure 4. Total estimated landings of tuna and non-tuna PMUS in American Samoa
Supporting data shown in Table A-4.

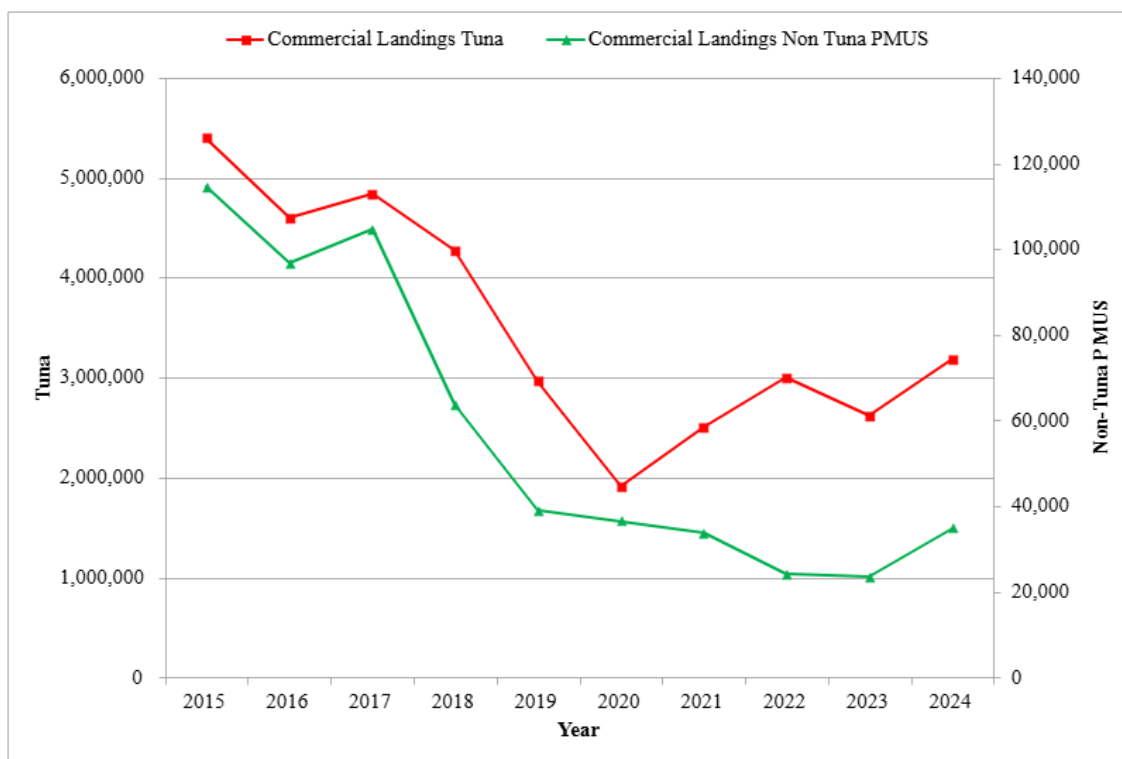


Figure 5. Commercial landings of tuna and non-tuna PMUS in American Samoa
Supporting data shown in Table A-5.

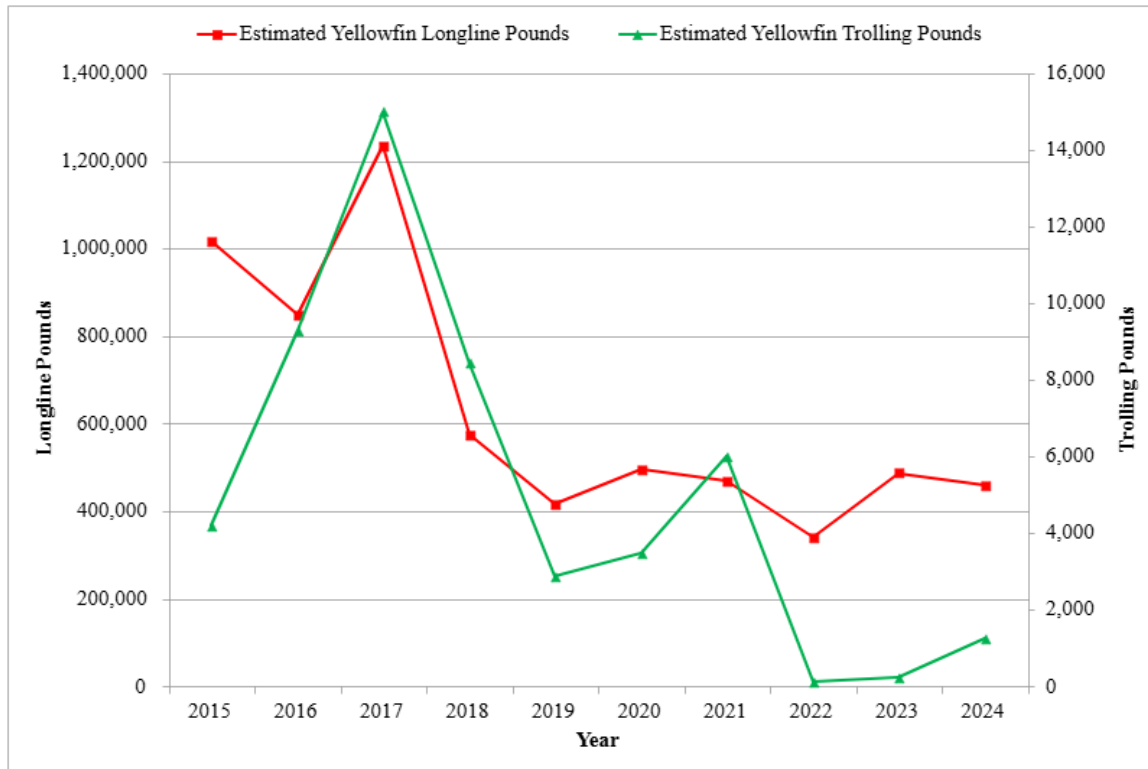


Figure 6. Total estimated landings of yellowfin tuna in American Samoa
Supporting data shown in Table A-6.

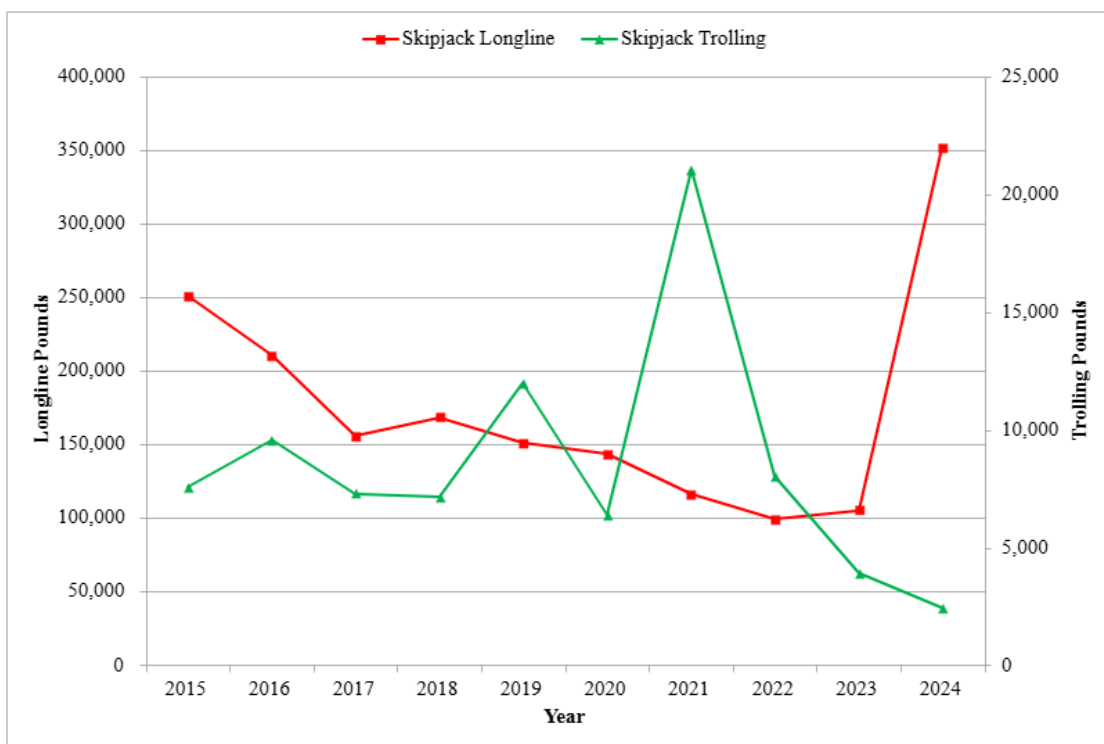


Figure 7. Total estimated landings of skipjack tuna in American Samoa
Supporting data shown in Table A-7.

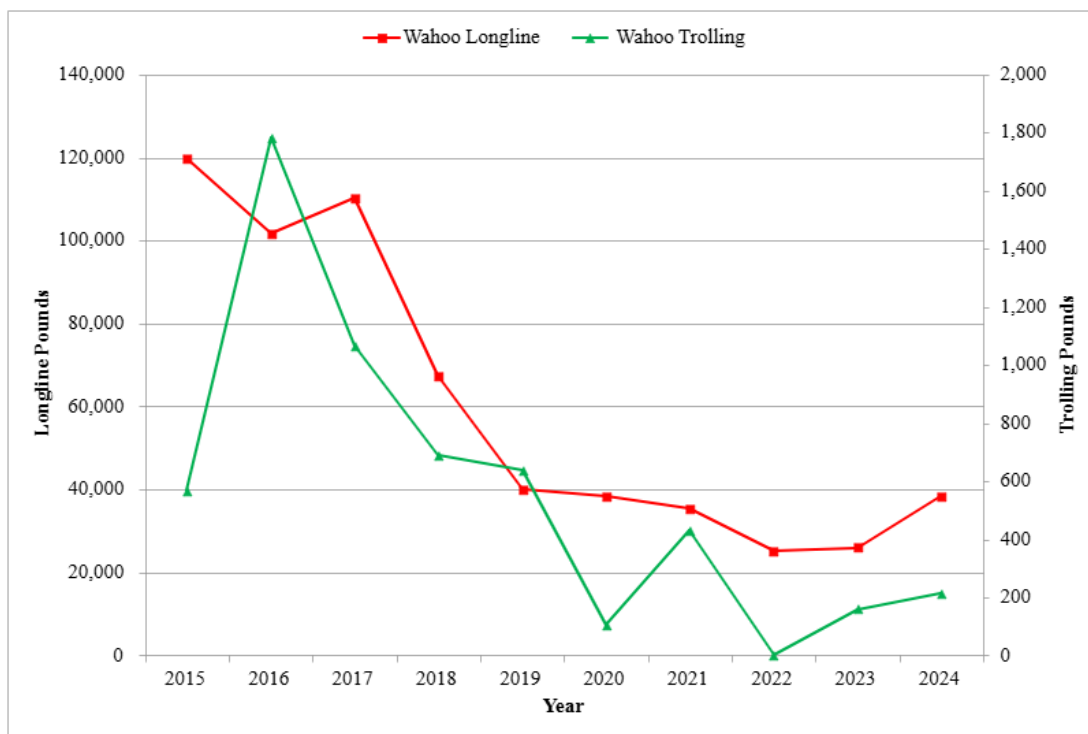


Figure 8. Total estimated landings of wahoo in American Samoa
Note: An unrepresentative amount of wahoo was caught by trolling one day in 2016. Supporting data shown in Table A-8.

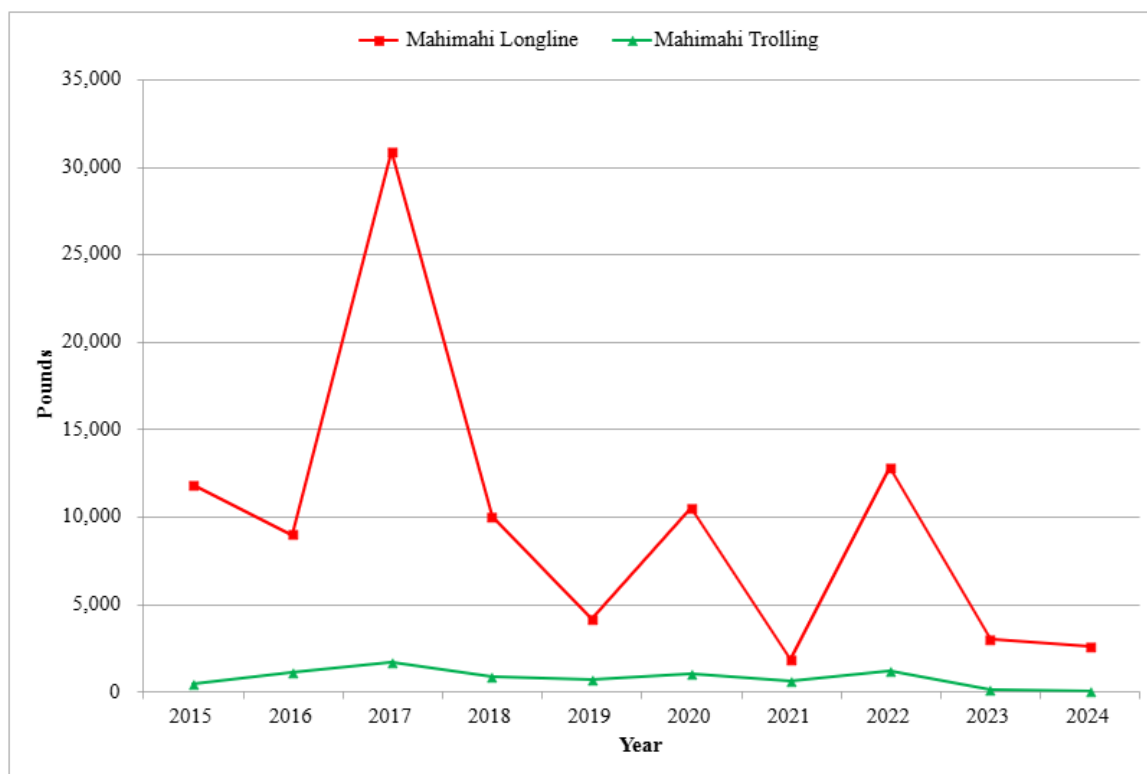


Figure 9. Total estimated landings of mahimahi in American Samoa
Supporting data shown in Table A-9.

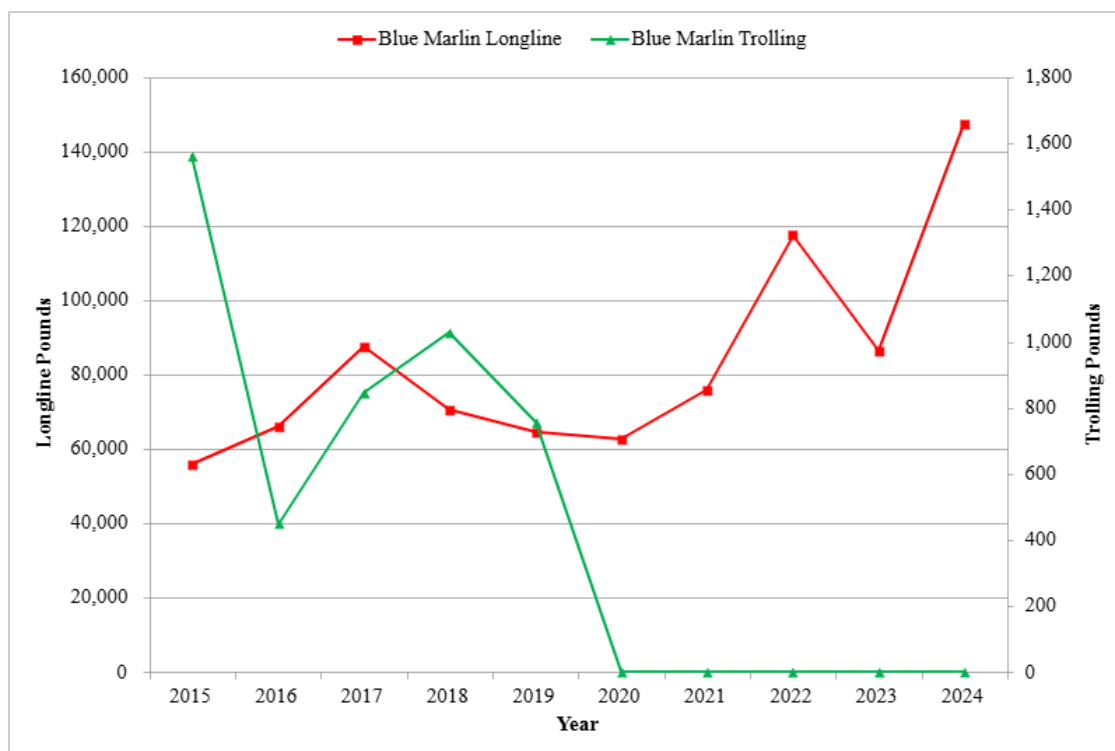


Figure 10. Total estimated landings of blue marlin in American Samoa
Supporting data shown in Table A-10.

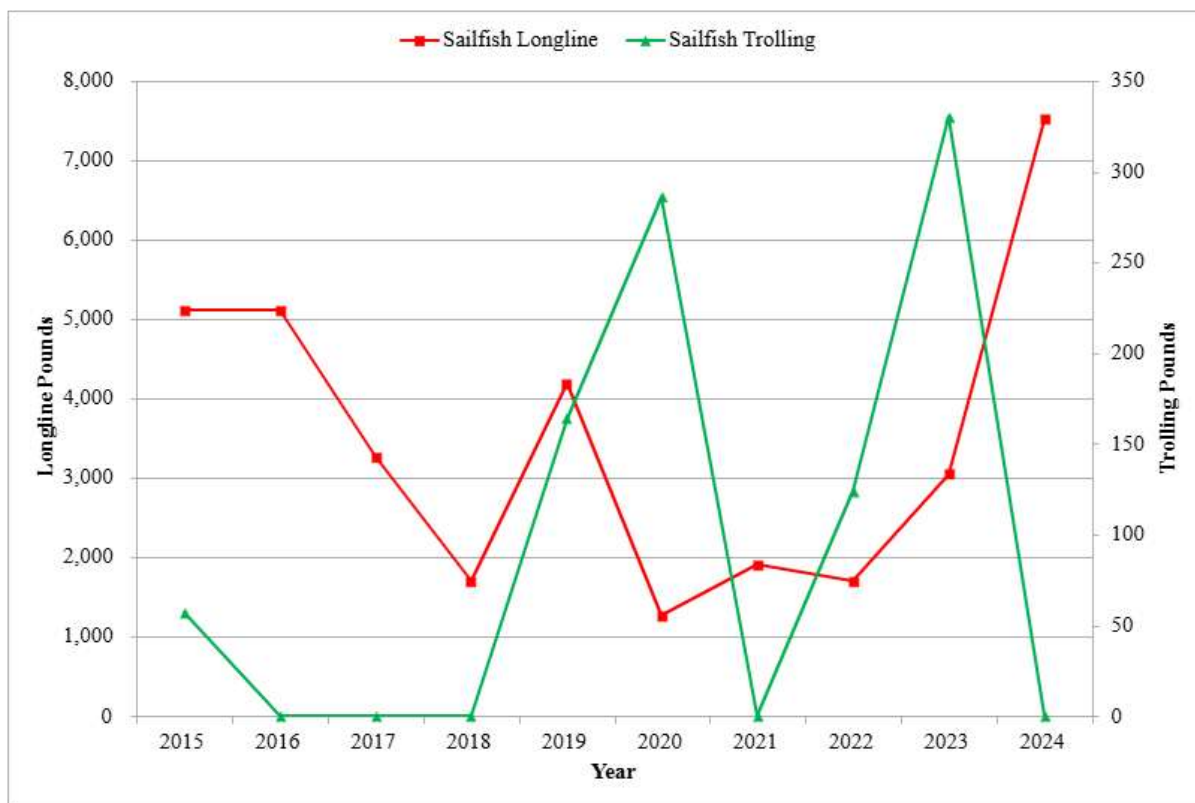


Figure 11. Total estimated landings of sailfish in American Samoa
Supporting data shown in Table A-11.

2.1.6 AMERICAN SAMOA LONGLINE PARTICIPATION, EFFORT, LANDINGS, BYCATCH, AND CPUE

Table 4. Number of permitted and active longline fishing vessels by size class in American Samoa

Year	Class A Permits	Class A Active	Class B Permits	Class B Active	Class C Permits	Class C Active	Class D Permits	Class D Active
2015	0	3	0	0	0	6	0	12
2016	7	2	4	0	12	5	27	13
2017	7	1	3	0	11	5	27	9
2018	0	1	0	0	0	4	0	9
2019	0	3	0	0	0	5	0	10
2020	0	1	0	0	0	3	0	7
2021	0	0	0	0	0	4	0	8
2022	0	0	0	0	0	4	0	7
2023	0	0	0	0	0	5	0	5
2024	0	0	0	0	0	3	0	6

Notes: These data are used for Figure 12 that follows. The “small” size class includes alia vessels, whereas the “large” size class typically includes larger monohull vessels fishing in the Southern Pacific Ocean. Dual-permitted vessels are included. These designations shifted from Classes A through D to Small and Large due to Amendment 9 to the Pelagic FEP (86 FR 55743, October 7, 2021) that reduced the original four size classes to the two presented here.

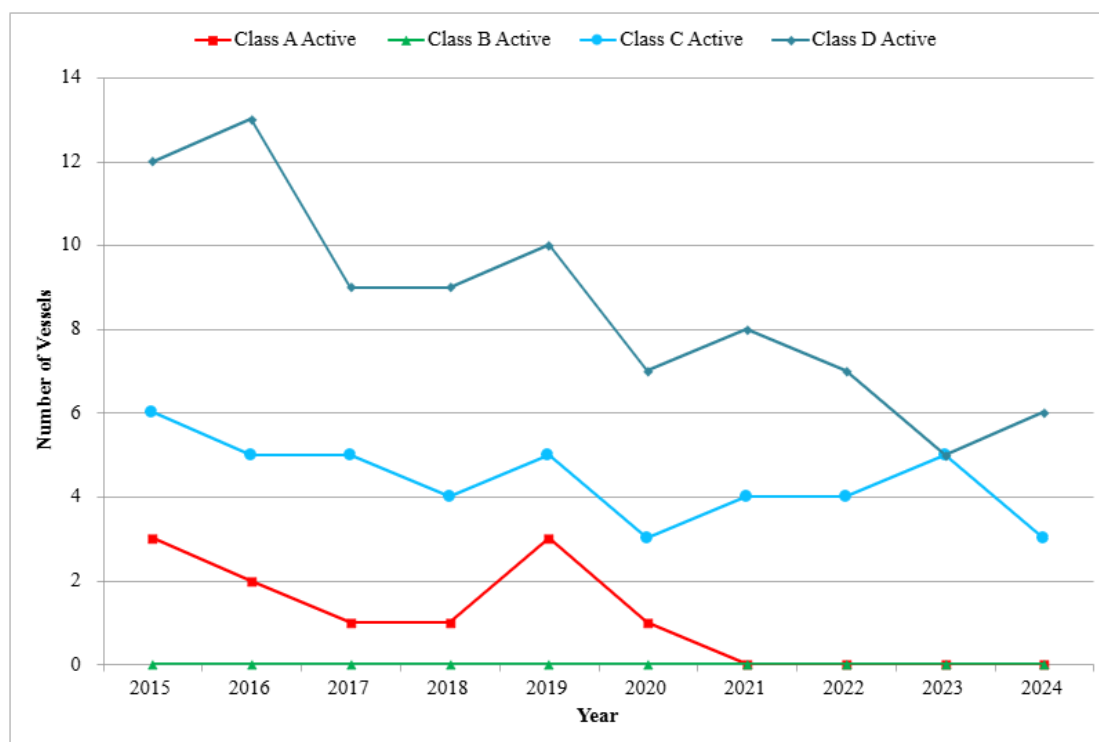


Figure 12. Number of active longline fishing vessels in American Samoa by size classes: Small (0-50 ft) and Large (> 51 ft)

Table 5. Longline effort by American Samoa vessels in 2024

Effort Type	Amount
Boats	9
Trips	47
Sets	1,359
Hooks (Thousands)	4,063
Lightsticks	0

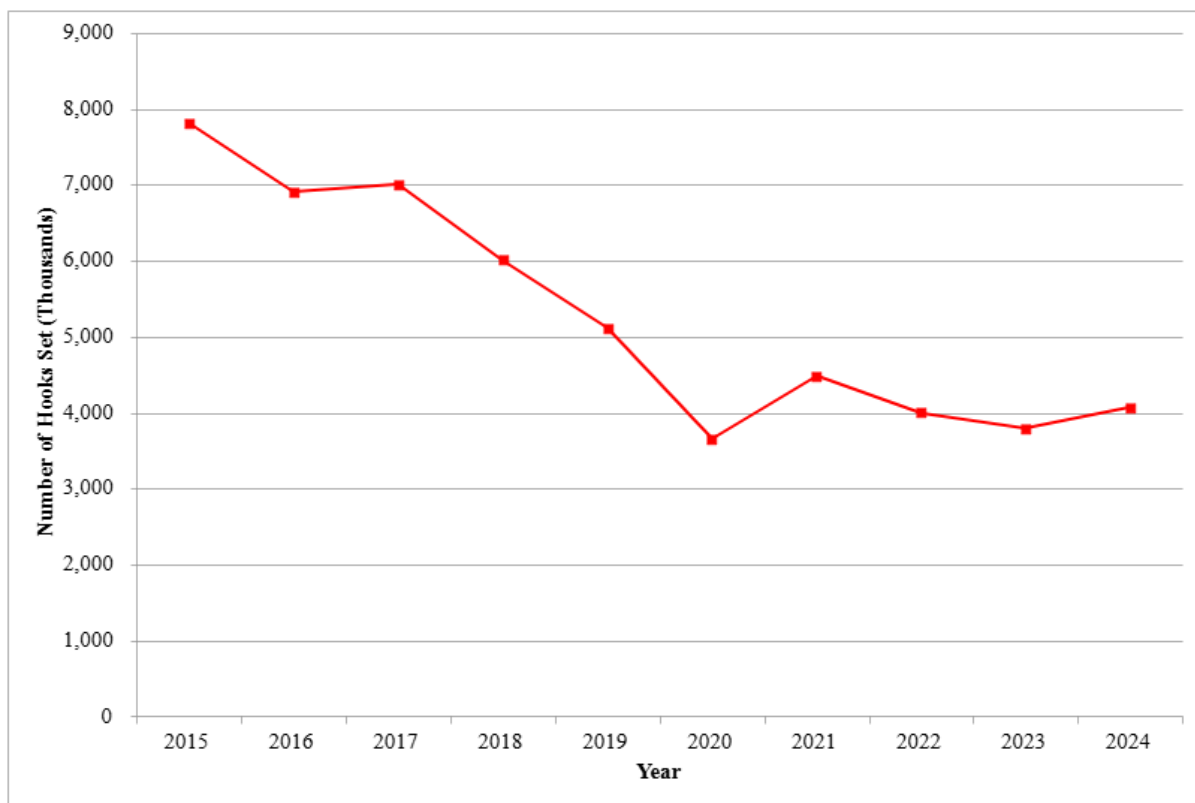


Figure 13. Number of longline hooks set from federal logbook data in American Samoa
Supporting data shown in Table A-12.

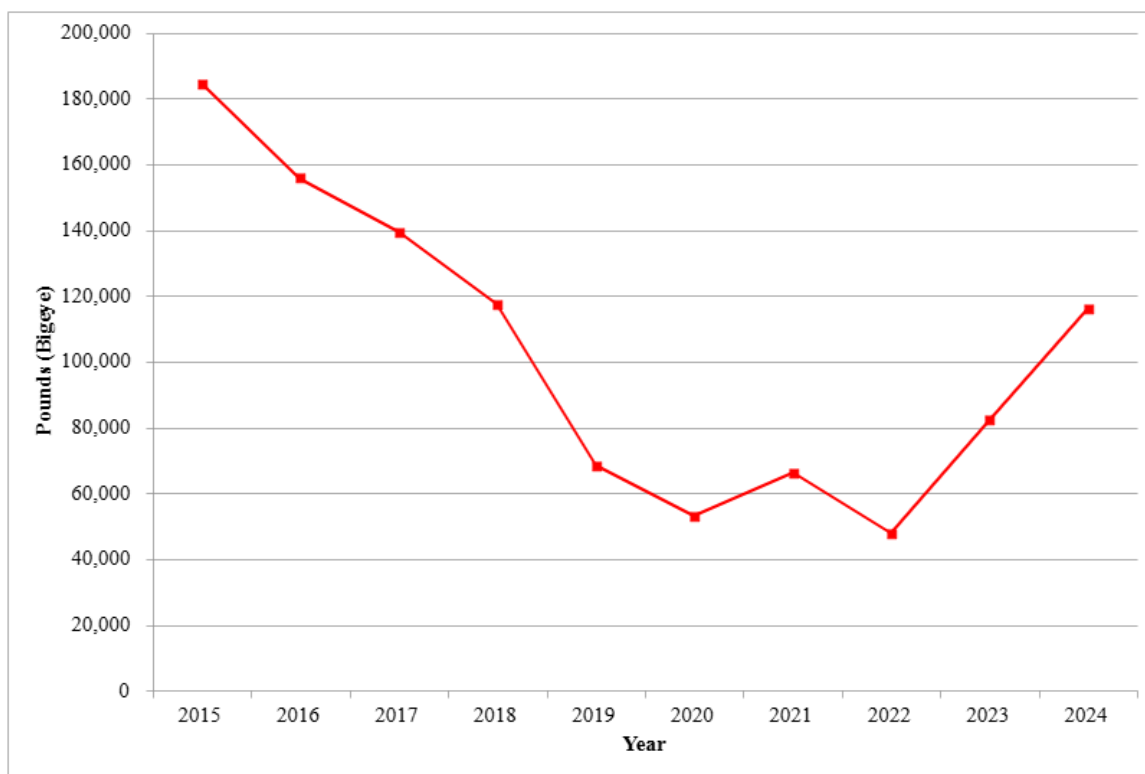


Figure 14. Total estimated landings of bigeye tuna by longlining in American Samoa
Supporting data shown in Table A-13.

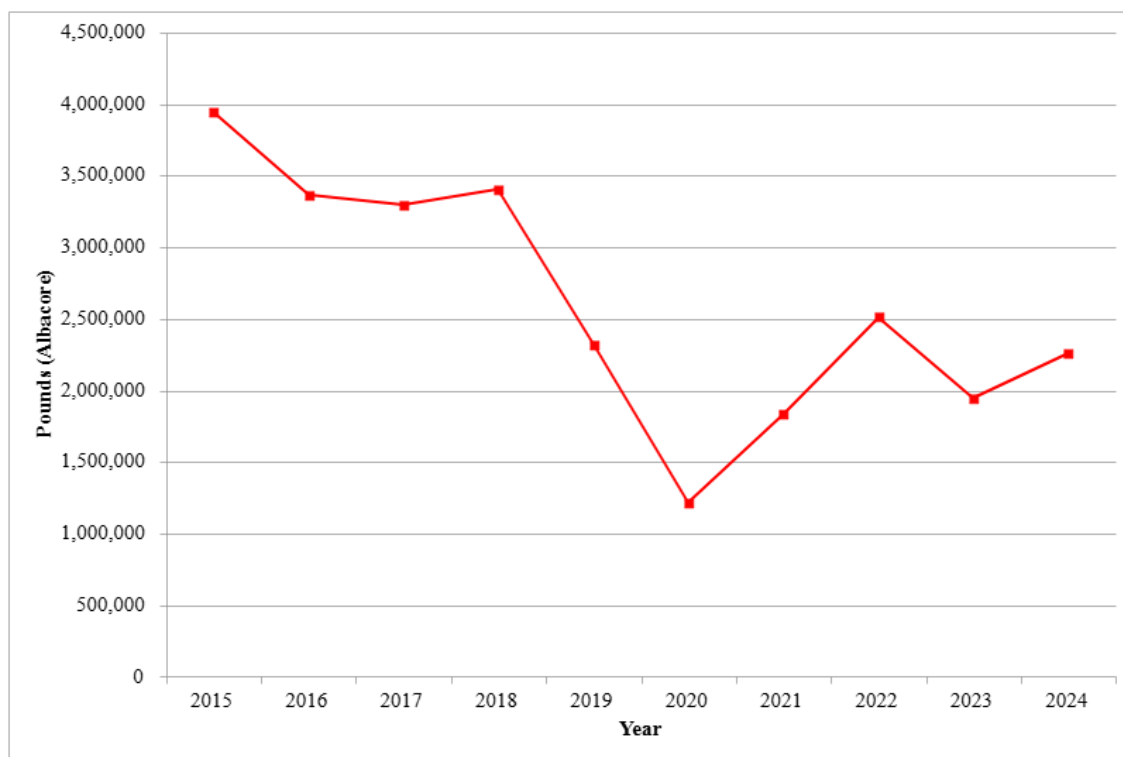


Figure 15. Total estimated landings of albacore by longlining in American Samoa
Supporting data shown in Table A-14.

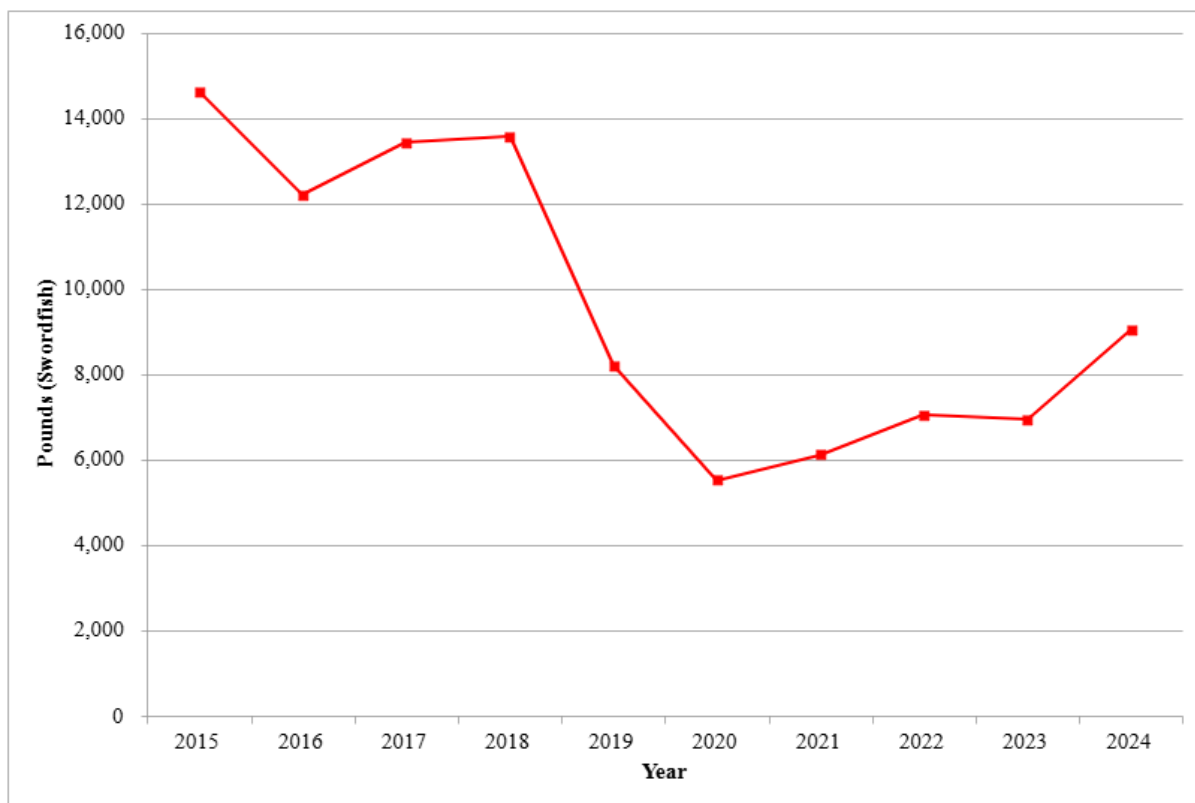


Figure 16. Total estimated landings of swordfish by longlining in American Samoa
Supporting data shown in Table A-15.

Table 6. Number of fish kept, released, and percent released for all American Samoa longline vessels from federal logbook data in 2024

Species	Number Kept	Number Released	Total Caught	Percent Released
Skipjack tuna	22,850	504	23,354	2.2
Albacore tuna	52,048	853	52,901	1.6
Yellowfin tuna	9,295	495	9,790	5.1
Kawakawa	0	0	0	0.0
Bigeye tuna	2,298	135	2,433	5.5
Bluefin tuna	0	0	0	0.0
Tunas (unknown)	0	0	0	0.0
TUNAS TOTAL	86,491	1,987	88,478	2.2
Mahimahi	119	7	126	5.6
Black marlin	0	0	0	0.0
Blue marlin	1,149	64	1,213	5.3
Striped marlin	61	2	63	3.2
Wahoo	1,504	29	1,533	1.9
Swordfish	90	95	185	51.4

Species	Number Kept	Number Released	Total Caught	Percent Released
Sailfish	106	95	201	47.3
Spearfish	21	114	135	84.4
Moonfish	8	9	17	52.9
Oilfish	4	1,535	1,539	99.7
Pomfret	18	140	158	88.6
Pelagic thresher shark	0	0	0	0.0
Thresher shark	0	64	64	100.0
Shark (unknown pelagic)	2	0	2	0.0
Snake mackerel	0	123	123	100.0
Bigeye thresher shark	0	0	0	0.0
Silky shark	0	997	997	100.0
White tip oceanic shark	0	541	541	100.0
Blue shark	0	927	927	100.0
Shortfin mako shark	1	56	57	98.2
Longfin mako shark	0	0	0	0.0
Billfishes (unknown)	0	2	2	100.0
NON-TUNA PMUS TOTAL	3,083	4,800	7,883	60.9
Pelagic fishes (unknown)	0	6	6	100.0
Double-lined mackerel	0	0	0	0.0
Mackerel	0	0	0	0.0
Long-jawed Mackerel	0	0	0	0.0
Barracudas	186	251	437	57.4
Great barracuda	0	0	0	0.0
Small barracudas	0	0	0	0.0
Rainbow runner	13	0	13	0.0
Dogtooth tuna	0	0	0	0.0
OTHER PELAGICS TOTAL	199	257	456	56.4
TOTAL PELAGICS	89,773	7,044	96,817	7.3

Table 7. Total estimated bycatch in number of fish for the top 10 bycatch species from the Pacific Islands Region Observer Program for the American Samoa longline fishery

Species	2019	2020	2021	2022	2023	Average	SD
Stingray, Pelagic	11,908	8,395	8,259	6,487	13,056	9,621	2,748.16
Lancetfish, Longnose	4,991	4,063	3,913	2,749	6,199	4,383	1,290.42
Escolar, Longfin	6,609	5,037	4,788	3,706	5,859	5,200	1,100.89
Escolar	5,094	5,540	5,517	3,111	3,989	4,650	1,066.11
Tuna, Albacore	1,584	1,136	1,077	1,258	2,131	1,437	434.59
Tuna, Yellowfin	1,180	1,476	1,363	1,755	1,893	1,533	289.67
Shark, Silky	1,840	1,227	1,238	949	1,734	1,398	375.73
Shark, Blue	2,681	2,958	2,721	1,752	1,451	2,313	666.27
Snake Mackerel, Unidentified	0	3	2	1	873	176	389.74
Pomfret, Sickle	535	407	425	515	782	533	149.89

Note: The top 10 species comprised 84% of total bycatch in 2023.

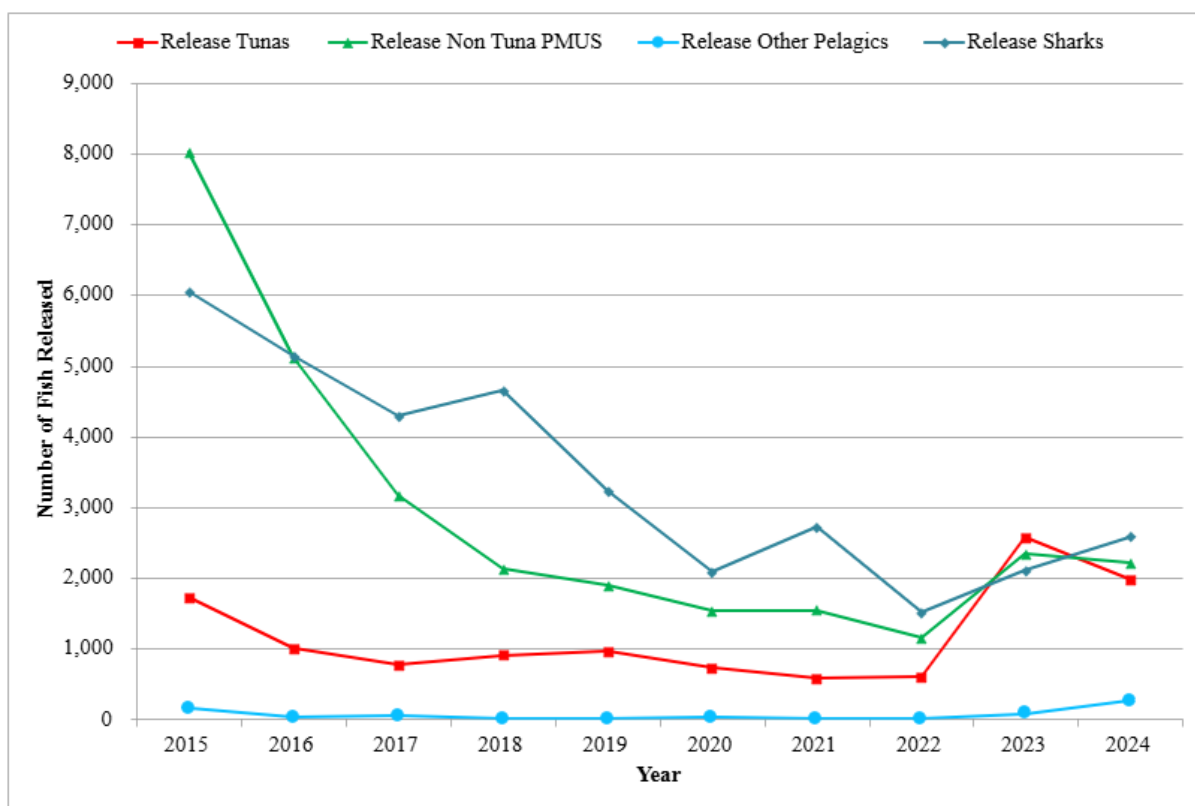


Figure 17. Number of fish released by longline vessels in American Samoa according to federal logbook data

Supporting data shown in Table A-16.

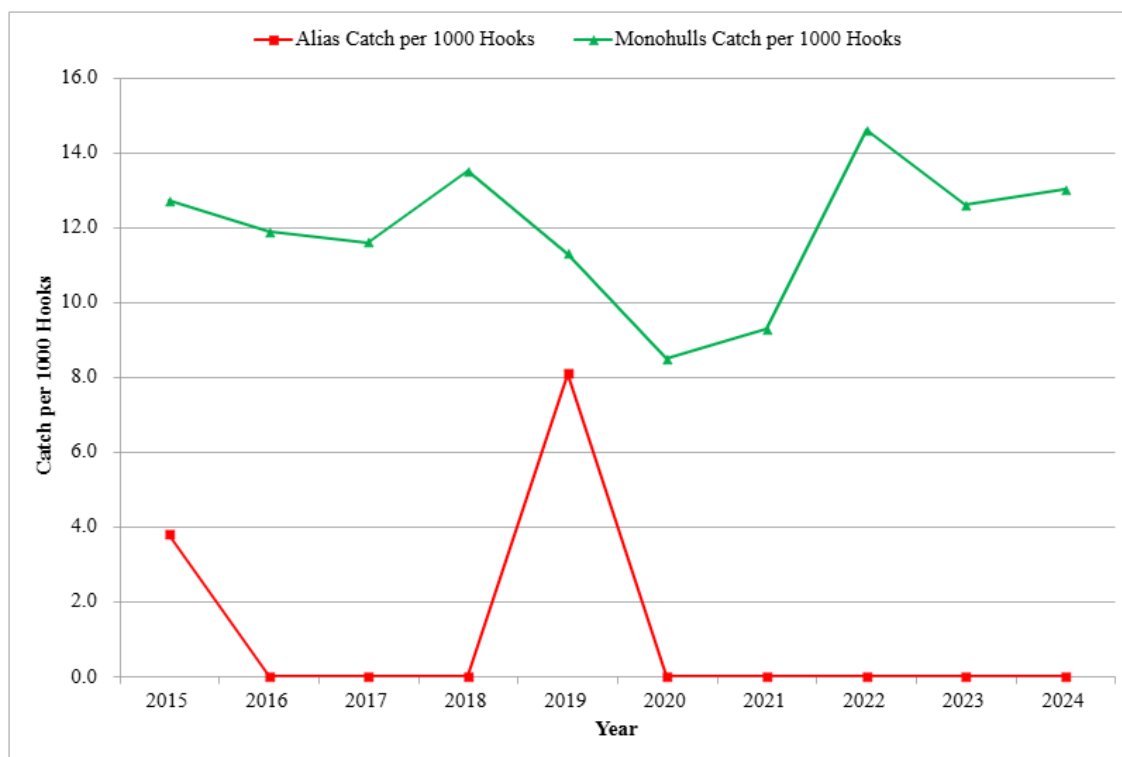


Figure 18. Albacore catch per 1,000 hooks by monohull vessels from longline logbook data in American Samoa

Note: Data for alia vessels are typically non-disclosed due to confidentiality rules. Supporting data shown in Table A-17.

Table 8. Catch per 1,000 hooks for alia vessels in American Samoa from 1996 to 1998

Species	Alia 1996	Alia 1997	Alia 1998
Skipjack tuna	0.1	1.2	3.7
Albacore tuna	40.6	32.8	26.6
Yellowfin tuna	6.5	2.7	2.2
Bigeye tuna	1.3	0.3	0.3
TUNAS TOTAL	48.5	37.0	32.8
Mahimahi	2.3	2.2	1.7
Blue marlin	0.9	0.7	0.5
Wahoo	0.8	0.9	2.2
Swordfish	0.0	0.1	0.0
Sailfish	0.2	0.2	0.1
NON-TUNA PMUS TOTAL	4.2	4.3	4.6
Pelagic fishes (unknown)	0.0	0.0	0.2
OTHER PELAGICS TOTAL	0.0	0.0	0.2
TOTAL PELAGICS	52.7	41.3	37.6

Table 9. Catch per 1,000 hooks for two types of longline vessels in American Samoa from 1999 to 2002

Species	Alia 1999	Monohull 1999	Alia 2000	Monohull 2000	Alia 2001	Monohull 2001	Alia 2002	Monohull 2002
Skipjack tuna	5.0	4.5	2.0	1.7	3.1	2.1	6.0	4.9
Albacore tuna	18.8	14.8	19.8	28.0	27.3	32.9	17.2	25.8
Yellowfin tuna	6.7	2.1	6.2	3.1	3.3	1.4	7.1	1.3
Bigeye tuna	0.7	0.5	0.4	1.0	0.6	1.0	0.6	0.9
TUNAS TOTAL	31.2	21.9	28.4	33.8	34.3	37.4	30.9	32.9
Mahimahi	2.2	0.3	1.7	0.4	3.4	0.5	4.0	0.6
Black marlin	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Blue marlin	0.5	0.1	0.5	0.2	0.4	0.2	0.2	0.3
Striped marlin	0.0	0.2	0.1	0.3	0.0	0.1	0.1	0.0
Wahoo	2.1	1.2	1.2	1.0	1.5	0.6	2.7	1.0
Swordfish	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0
Sailfish	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
Spearfish	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Moonfish	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Oilfish	0.0	0.6	0.0	0.1	0.0	0.2	0.0	0.5
Pomfret	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.1
NON-TUNA PMUS TOTAL	5.1	3.1	3.7	2.5	5.6	1.8	7.3	2.6
Barracudas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
OTHER PELAGICS TOTAL	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.4
TOTAL PELAGICS	36.6	25.2	32.1	36.3	39.9	39.2	38.2	35.9

Table 10. Catch per 1,000 hooks for two types of longline vessels in American Samoa from 2003 to 2005

Species	Alia 2003	Monohull 2003	Alia 2004	Monohull 2004	Alia 2005	Monohull 2005
Skipjack tuna	4.7	2.9	3.0	3.9	1.0	2.7
Albacore tuna	17.3	16.4	13.7	12.9	10.3	17.4
Yellowfin tuna	5.9	2.0	8.8	3.2	7.0	2.6
Bigeye tuna	1.6	1.1	0.8	1.3	1.0	0.9
TUNAS TOTAL	29.5	22.4	26.3	21.3	19.3	23.6
Mahimahi	2.2	0.4	2.1	0.2	2.0	0.3
Blue marlin	0.2	0.2	0.1	0.2	0.2	0.2
Striped marlin	0.0	0.0	0.1	0.0	0.1	0.0

Species	Alia 2003	Monohull 2003	Alia 2004	Monohull 2004	Alia 2005	Monohull 2005
Wahoo	1.8	1.1	3.0	1.6	2.3	1.4
Swordfish	0.1	0.0	0.1	0.0	0.1	0.0
Sailfish	0.1	0.0	0.0	0.1	0.1	0.1
Spearfish	0.1	0.0	0.0	0.1	0.0	0.0
Moonfish	0.1	0.1	0.1	0.1	0.1	0.1
Oilfish	0.3	0.5	0.0	0.7	0.0	0.3
Pomfret	0.1	0.1	0.0	0.1	0.0	0.1
NON-TUNA PMUS TOTAL	5.0	2.4	5.5	3.1	4.9	2.5
Pelagic fishes (unknown)	0.2	0.2	0.0	0.1	0.0	0.1
OTHER PELAGICS TOTAL	0.2	0.2	0.0	0.1	0.0	0.1
TOTAL PELAGICS	34.7	25.0	31.8	24.5	24.2	26.2

Table 11. Catch per 1,000 hooks for all types of longline vessels in American Samoa from 2006 to 2011

Species	All Vessels 2006	All Vessels 2007	All Vessels 2008	All Vessels 2009	All Vessels 2010	All Vessels 2011
Skipjack tuna	3.2	2.3	2.4	2.3	2.4	2.5
Albacore tuna	18.4	18.4	14.2	14.8	17.4	12.1
Yellowfin tuna	1.6	1.9	1.0	1.1	1.8	2.0
Bigeye tuna	0.9	0.9	0.5	0.6	0.8	0.7
TUNAS TOTAL	24.1	23.5	18.1	18.8	22.4	17.3
Mahimahi	0.4	0.1	0.1	0.2	0.1	0.1
Blue marlin	0.2	0.2	0.2	0.2	0.2	0.2
Wahoo	1.5	1.0	0.7	1.0	1.0	0.9
Swordfish	0.1	0.0	0.0	0.0	0.0	0.0
Sailfish	0.1	0.0	0.0	0.0	0.0	0.0
Spearfish	0.1	0.0	0.1	0.1	0.1	0.1
Oilfish	0.5	0.5	0.4	0.5	0.6	0.6
Pomfret	0.0	0.1	0.1	0.1	0.1	0.1
NON-TUNA PMUS TOTAL	2.9	2.2	2.0	2.5	2.5	2.4
Pelagic fishes (unknown)	0.0	0.0	0.0	0.0	0.1	0.0
OTHER PELAGICS TOTAL	0.0	0.0	0.0	0.0	0.1	0.0
TOTAL PELAGICS	27.0	25.7	20.1	21.3	25.0	19.7

Table 12. Catch per 1,000 hooks for all types of longline vessels from 2013 to 2017

Species	All Vessels 2012	All Vessels 2013	All Vessels 2014	All Vessels 2015	All Vessels 2016	All Vessels 2017
Skipjack tuna	4.3	1.1	2.5	2.0	2.0	1.5
Albacore tuna	14.8	11.7	10.6	12.7	11.9	11.5
Yellowfin tuna	1.2	1.9	2.5	2.6	2.6	3.6
Bigeye tuna	0.6	0.4	0.7	0.6	0.5	0.4
TUNAS TOTAL	20.9	15.1	16.3	17.9	17.0	17.0
Mahimahi	0.1	0.2	0.2	0.1	0.1	0.2
Blue marlin	0.1	0.1	0.1	0.1	0.1	0.1
Wahoo	0.7	0.7	0.7	0.7	0.7	0.7
Spearfish	0.1	0.1	0.1	0.1	0.0	0.0
Moonfish	0.1	0.0	0.0	0.0	0.0	0.0
Oilfish	0.8	0.7	0.6	0.8	0.6	0.3
Pomfret	0.1	0.1	0.1	0.1	0.1	0.1
Thresher shark	0.0	0.0	0.0	0.0	0.1	0.1
Silky shark	0.0	0.0	0.1	0.1	0.1	0.1
White tip oceanic shark	0.1	0.1	0.1	0.1	0.1	0.1
Blue shark	0.4	0.2	0.4	0.5	0.5	0.4
Shortfin mako shark	0.0	0.0	0.0	0.1	0.0	0.0
NON-TUNA PMUS TOTAL	2.5	2.2	2.4	2.7	2.4	2.1
Pelagic fishes (unknown)	0.1	0.1	0.0	0.0	0.0	0.0
OTHER PELAGICS TOTAL	0.1	0.1	0.0	0.0	0.0	0.0
TOTAL PELAGICS	23.5	17.4	18.7	20.6	19.4	19.1

Table 13. Catch/1,000 hooks for all types of longline vessels in American Samoa from 2018 to 2024

Species	All Vessels 2018	All Vessels 2019	All Vessels 2020	All Vessels 2021	All Vessels 2022	All Vessels 2023	All Vessels 2024
Skipjack tuna	1.8	2.2	2.7	1.5	1.4	1.6	5.7
Albacore tuna	13.5	11.3	8.4	9.3	14.6	12.6	13.0
Yellowfin tuna	1.7	1.9	2.6	2.3	1.5	2.7	2.4
Bigeye tuna	0.4	0.4	0.3	0.3	0.3	0.5	0.6
TUNAS TOTAL	17.4	15.8	14.0	13.4	17.8	17.4	21.7
Mahimahi	0.1	0.0	0.1	0.0	0.2	0.0	
Blue marlin	0.1	0.1	0.1	0.1	0.2	0.2	0.3

Species	All Vessels 2018	All Vessels 2019	All Vessels 2020	All Vessels 2021	All Vessels 2022	All Vessels 2023	All Vessels 2024
Wahoo	0.5	0.4	0.4	0.3	0.3	0.3	0.4
Oilfish	0.3	0.2	0.3	0.2	0.2	0.4	0.4
Pomfret	0.0	0.1	0.1	0.1	0.1	0.1	
Thresher shark	0.1	0.0	0.0	0.0	0.0	0.0	
Silky shark	0.1	0.1	0.2	0.1	0.1	0.2	0.2
White tip oceanic shark	0.1	0.1	0.1	0.1	0.0	0.1	0.1
Blue shark	0.5	0.3	0.3	0.3	0.2	0.3	0.2
NON-TUNA PMUS TOTAL	1.8	1.3	1.6	1.2	1.3	1.6	1.6
Barracudas	0.0	0.0	0.0	0.0	0.0	0.1	0.1
OTHER PELAGICS TOTAL	0.0	0.0	0.0	0.0	0.0	0.1	0.1
TOTAL PELAGICS	19.2	17.1	15.6	14.6	19.1	19.1	23.4

2.1.7 AMERICAN SAMOA TROLLING BYCATCH AND CPUE

Data for participation, effort, landings, and revenue are found in previous sections of this chapter. Statistics summarizing bycatch for American Samoa trolling are shown in Table 14.

Table 14. American Samoa trolling bycatch summary (released fish)

Year	Number Release	Percent Release	Number Kept	Number Caught	Charter
2015	0	0.0	616	616	F
2016	0	0.0	1,374	1,374	F
2017	0	0.0	915	915	F
2018	0	0.0	743	743	F
2019	0	0.0	640	640	F
2020	0	0.0	465	465	F
2021	0	0.0	607	607	F
2022	0	0.0	132	132	F
2023	0	0.0	49	49	F
2024	0	0.0	64	64	F

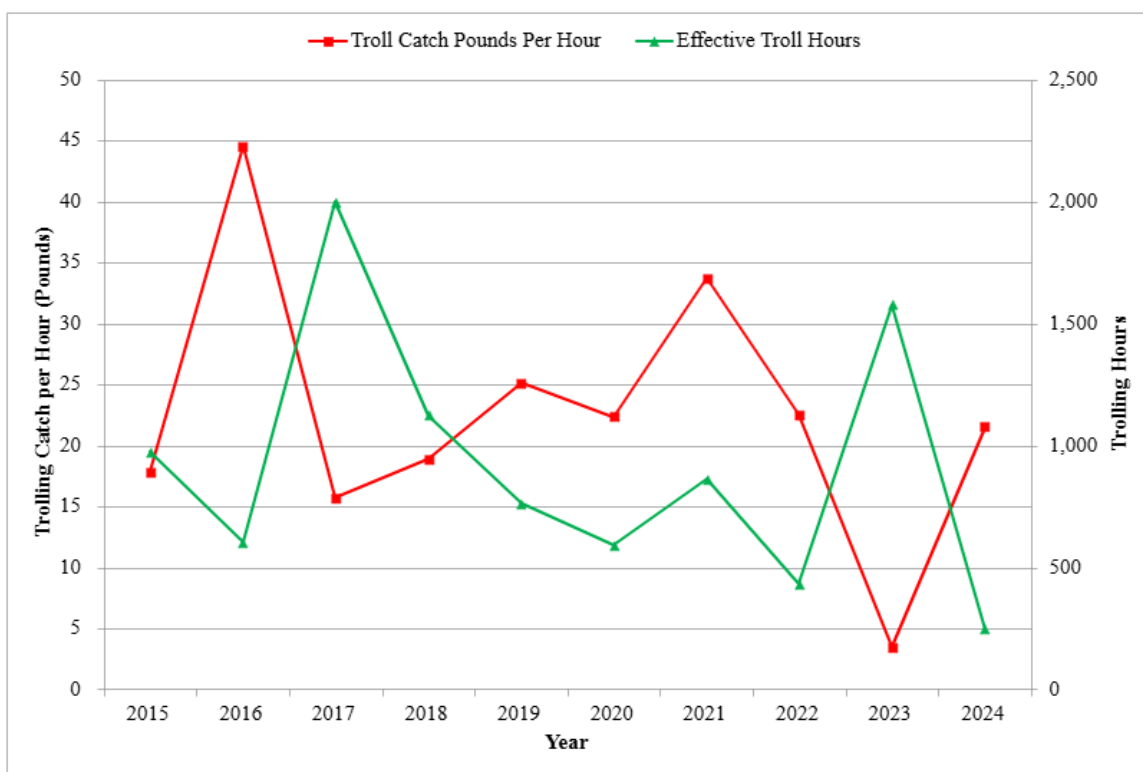


Figure 19. Catch-per-hour for trolling and number of trolling hours in American Samoa
Supporting data shown in Table A-18.

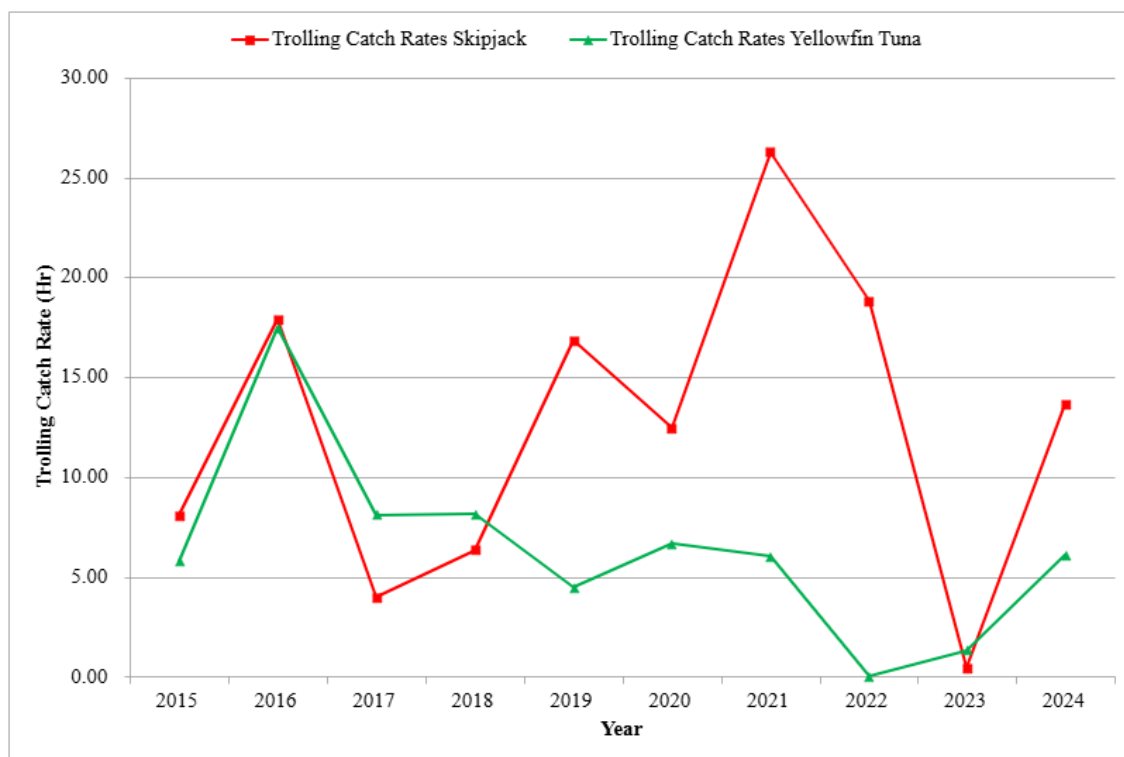


Figure 20. Trolling CPUE for skipjack and yellowfin tuna in American Samoa
Supporting data shown in Table A-19.

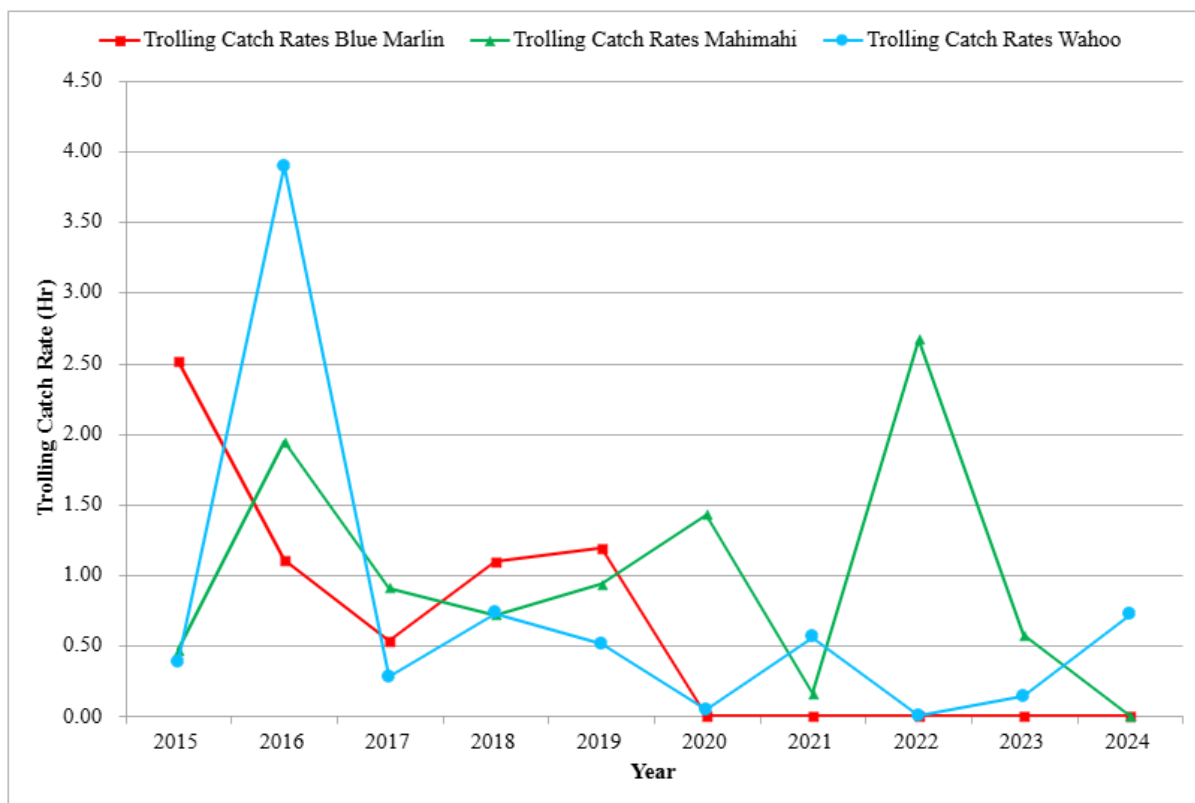


Figure 21. Trolling CPUE for blue marlin, mahimahi, and wahoo in American Samoa
Supporting data shown in Table A-20.

2.2 COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

2.2.1 DATA SOURCES

The CNMI Division of Fish and Wildlife (DFW) monitors this fishery using commercial purchase invoices and boat-based creel surveys. DFW issues paper invoices to all known fish and shellfish buyers, who submit them biweekly or upon request. Nearly all buyers prefer paper reporting, and transitioning to electronic systems would require substantial training due to limited user familiarity.

Currently, commercial invoice and creel data collection occur only in Saipan, though fishing activity around other islands is captured in survey data. While invoices have been collected since the mid-1970s, only data from 1983 onward are considered reliable. Purchase data are estimated to account for 80–90% of commercial pelagic landings in Saipan. In 2024, DFW requested updated business listings from the CNMI Department of Finance to identify unreported buyers using NAICS codes, but no updates had been received at the time of writing.

The boat-based creel survey has operated since April 2000. Although surveys are not conducted on other islands, trips returning to Saipan from those areas are included, with associated fishing locations identified. The survey collects trip-level, interview, catch, size, and economic data.

In 2024, there were 18 survey days, with 18 trips observed and 15 interviews completed. Estimated catch declined from 126,557 pounds in 2023 to 84,333 pounds in 2024 (–33%). Tuna PMUS comprised 41,996 pounds (50%), and non-tuna PMUS 39,950 pounds (50%). A 365-day annual expansion is run for each calendar year of DFW boat-based creel survey data to produce catch and effort estimates for the pelagic fishery, while avoiding over-estimating landings due to seasonal increases in catches of pelagic species.

Percent species composition is calculated by weight for the sampled catch (raw interview data) for each method and applied to the pounds landed to produce catch estimates by species for the expansion period. CPUE data are calculated from the total annual landings of each fishery divided by the total number of hours spent fishing (gear in use), or by trip assuming that a trip is one day in length. Bycatch data are not expanded to the level of estimated annual trips and are reported as a direct summary of raw interview data. Some tables include landings of non-PMUS that may not be included in other tables in this report. This artifact of the reporting method results in a slight difference in the total landings and other values within a single table and between tables in this section.

2.2.2 SUMMARY OF CNMI PELAGIC FISHERIES

Estimated landings declined from 126,557 pounds in 2023 to 84,333 pounds in 2024 (–33%). Tuna PMUS accounted for 41,996 pounds (50%) and non-tuna PMUS for 39,950 pounds (50%). Commercial landings of Skipjack and Yellowfin tuna fell to 65,076 pounds (–33%) and 12,394 pounds (–35%), respectively. Non-tuna PMUS landings declined to 8,585 pounds (–54%).

The overall decline is largely attributed to reduced sampling effort, with only 18 surveys conducted from June to October 2024 (–57%). This reduction was due to administrative and

logistical delays in processing fuel payments and securing vehicle maintenance and repairs. The economic downturn in the CNMI also contributed to decreased fishing activity, though to a lesser extent.

Landings. Skipjack tuna had the highest estimated landings at 39,853 pounds (–48%), followed by blue marlin at 39,075 pounds (increase from zero). Estimated landings for yellowfin tuna were 2,143 pounds (–89%) and for wahoo, 875 pounds (–94%).

Commercial landings for skipjack and yellowfin tunas were 65,076 pounds (–33%) and 12,394 pounds (–35%), respectively. Landings for mahimahi were 7,566 pounds (–46%), wahoo 573 pounds (–85%), and blue marlin 446 pounds (–42%).

Effort. In 2024, estimated trolling trips declined to 1,668 (–30%). Reported trips and the number of fishers decreased to 873 (–40%) and 34 (–61%), respectively.

Boat Ramps. The CNMI has eight boat ramps: five in Saipan, two in Rota, and one in Tinian. Saipan’s facilities include Sugar Dock, Fishing Base, Smiling Cove Marina, Lower Base, and the Tanapag ramp. Smiling Cove Marina provides berth parking for tenants and floating docks for passenger and cargo loading. It serves privately-owned fishing vessels, charter fishing vessels, and non-fishing vessels. The other access points in Saipan are used by both fishing and non-fishing vessels but do not offer tenant berthing.

Rota has two boat ramps: Rota West Harbor Marina, which includes berth parking for tenants, and East Harbor without tenant berthing. Tinian Marina Facility has a ramp and tenant berthing.

From 2022 through October 2024, Sugar Dock was inaccessible and replaced by Lower Base for access point surveys. Following dredging in late 2024, survey operations resumed at Sugar Dock.

Weather. Typical high surf and small-craft advisories were issued throughout the year when wind speed increased seasonally.

Fish Aggregating Devices (FADs). Two FADs, KK and LL were deployed on March 28, 2024 by DFW.

CPUE. Estimated average pounds per hour for trolling increased to 12.3 (+19%).

Revenue. Revenue for pelagic fish was \$267,191 while weighted price was \$2.69/pound.

Bycatch. Bycatch was not measured in 2024.

2.2.3 PLAN TEAM RECOMMENDATIONS

There were no Plan Team recommendations to the Council relevant to the CNMI pelagic fisheries data module.

2.2.4 OVERVIEW OF PARTICIPATION AND EFFORT

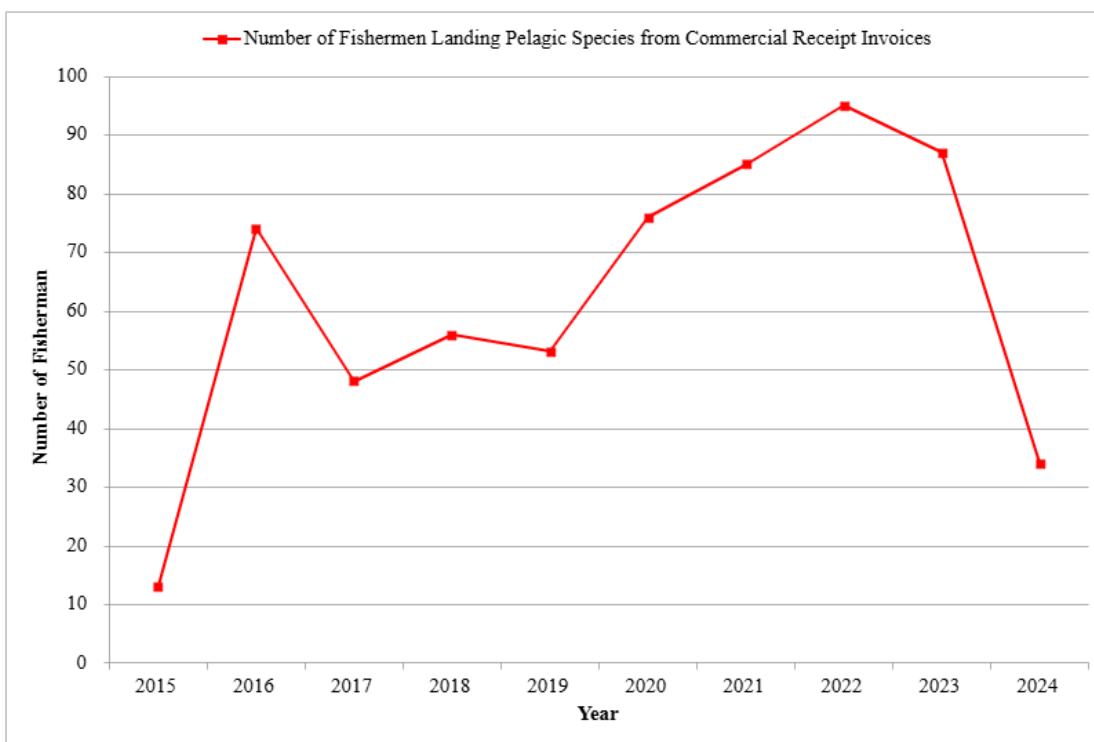


Figure 22. Number of fishers with commercial pelagic landings in the CNMI

Note: Due to reporting methods, this number includes duplicate counts. Supporting data shown in Table A-22.

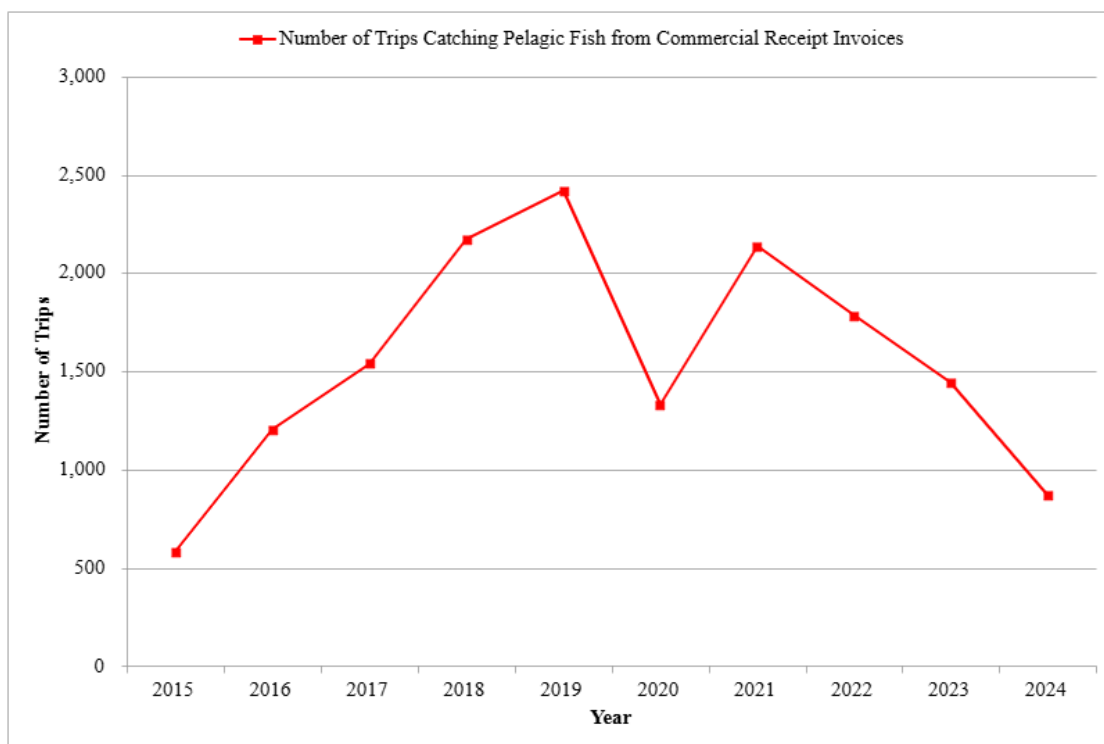


Figure 23. Number of trips with commercial pelagic landings in the CNMI

Supporting data shown in Table A-23.

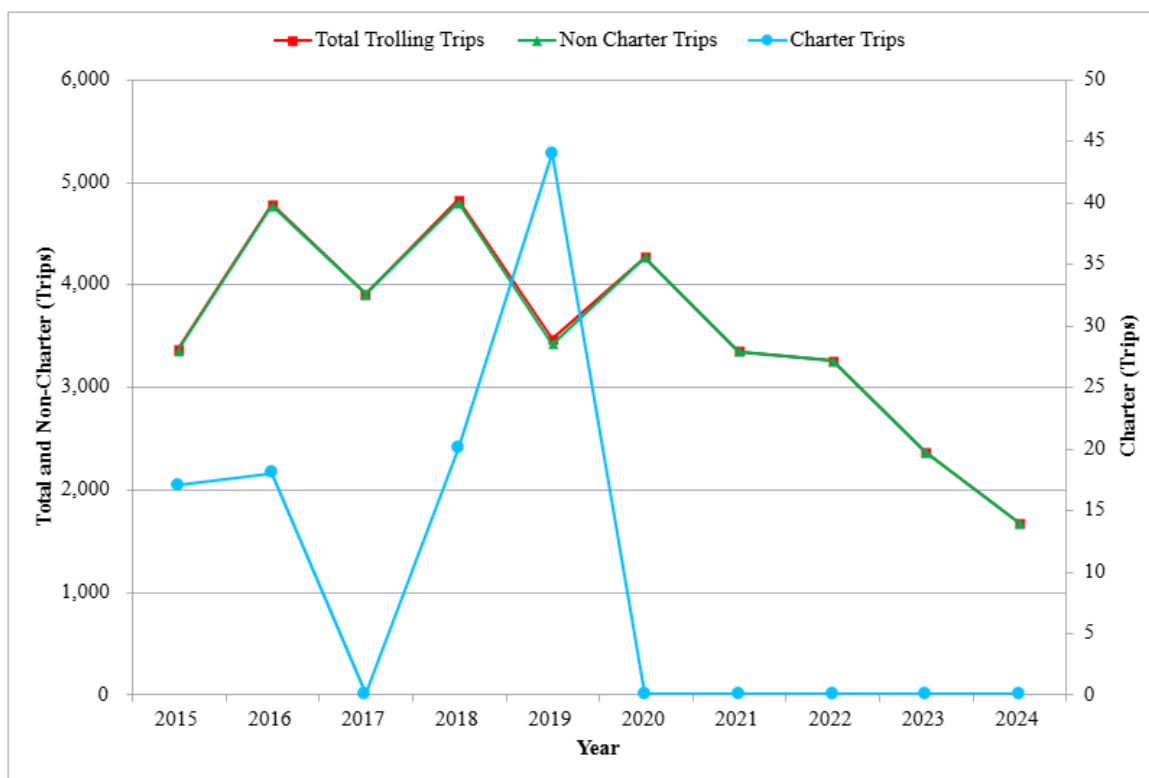


Figure 24. Estimated number of trolling trips from boat-based creel surveys in the CNMI Supporting data shown in Table A-24.

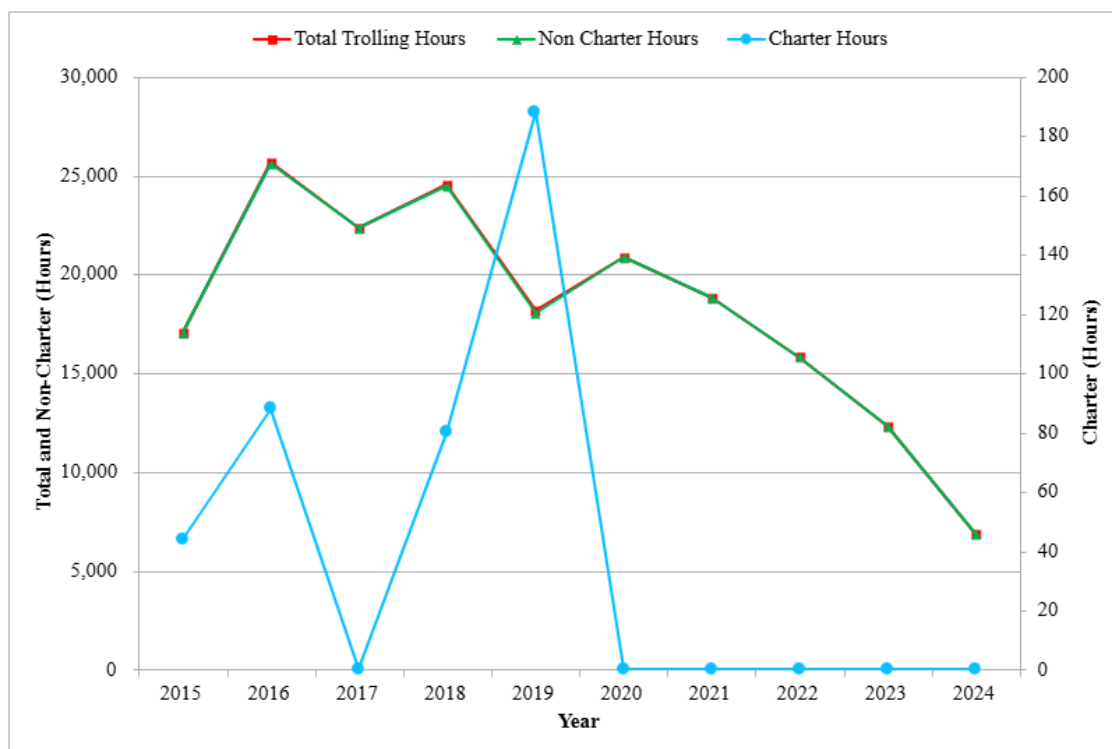


Figure 25. Estimated number of trolling hours from boat-based creel surveys in the CNMI Supporting data shown in Table A-25.

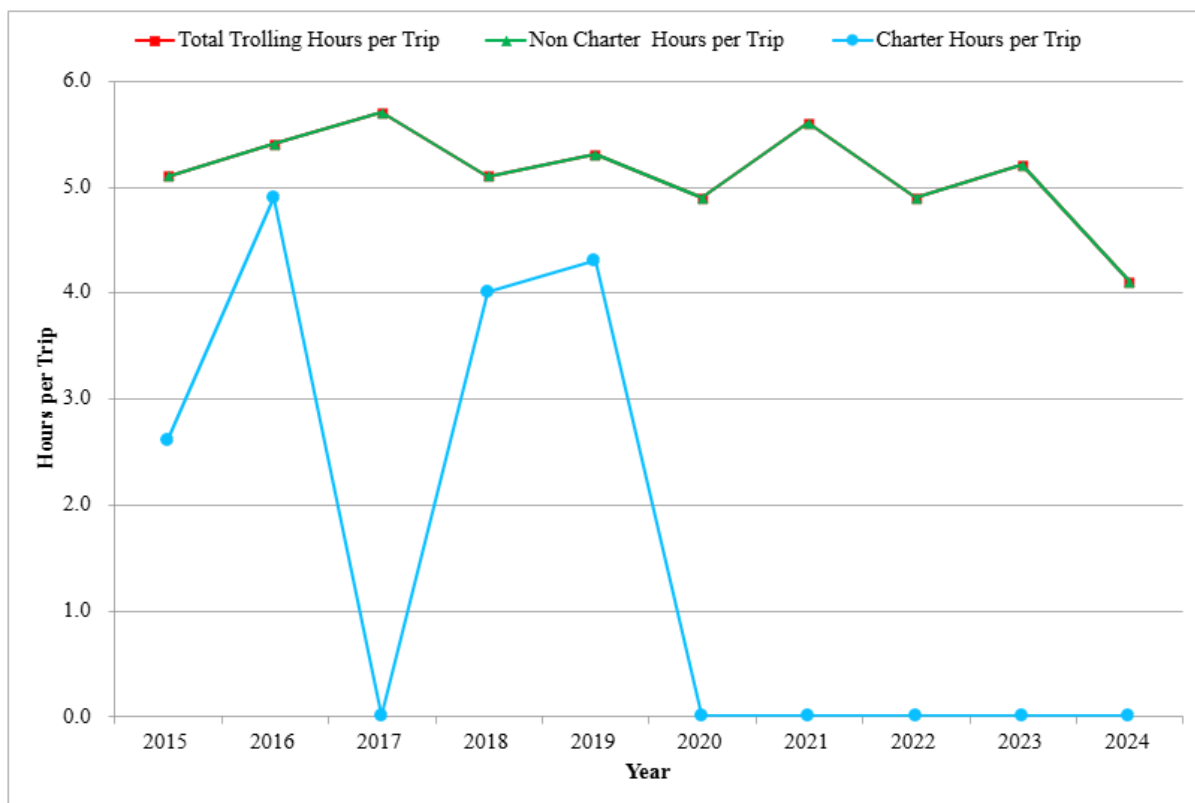


Figure 26. Estimated average troll trip length from boat-based creel surveys in the CNMI Supporting data shown in Table A-26.

2.2.5 OVERVIEW OF LANDINGS

Table 15. Pelagic species composition of boat-based creel survey total estimated catch (lb) in the CNMI in 2024

Species	Total Landings	Non-Charter	Charter
Skipjack Tuna	39,853	39,853	0
Yellowfin Tuna	2,143	2,143	0
Saba (Kawakawa)	0	0	0
Tunas (Misc.)	0	0	0
Tunas Total	41,996	41,996	0
Mahimahi	0	0	0
Wahoo	875	875	0
Blue Marlin	39,075	39,075	0
Sailfish	0	0	0
Spearfish	0	0	0
Sharks	0	0	0
Sickle Pomfret	0	0	0
Non-Tuna PMUS Total	39,950	39,950	0

Species	Total Landings	Non-Charter	Charter
Dogtooth Tuna	1,634	1,634	0
Rainbow Runner	753	753	0
Barracuda	0	0	0
Troll Fish (Misc.)	0	0	0
Other Pelagics Total	2,387	2,387	0
Total Pelagics	84,333	84,333	0

Note: Total pelagic landings may be greater than the sum of the individual species due to an artifact in reporting process, where the difference accounts for non-PMUS reported as part of the creel surveys.

Table 16. Commercial pelagic landings (lb), value (\$), and average price (\$) in the CNMI in 2024

Species	Pounds	Value	Average Price
Skipjack Tuna	65,075.7	172,308.3	2.65
Yellowfin Tuna	12,393.8	38,597.6	3.11
Saba (Kawakawa)	497.5	1,492.5	3.00
Tunas Total and Average Price	77,967.0	212,398.4	2.72
Mahimahi	7,565.9	21,015.5	2.78
Wahoo	572.5	1,957.2	3.42
Blue Marlin	446.3	1,337.5	3.00
Sickle Pomfret	138.8	531.5	3.83
Non-Tuna PMUS Total and Average Price	8,723.5	24,841.6	2.85
Dogtooth Tuna	11,650.3	26,427.4	2.27
Rainbow Runner	878.8	2,941.9	3.35
Barracuda	195.0	581.3	2.98
Other Pelagics Total and Average Price	12,724.0	29,950.6	2.35
Pelagics Total and Average Price	99,414.6	267,190.6	2.69

Note: Total pelagic landings may be greater than the sum of the individual species due to an artifact in reporting process, where the difference accounts for non-PMUS reported as part of the creel survey.

Table 17. Bycatch summary for pelagic fisheries in the CNMI

Year	Number Release	Percent Release	Number Kept	Number Caught	Charter
2015	0	0.0	2,567	2,567	F
2016	0	0.0	1,667	1,667	F
2017	0	0.0	2,199	2,199	F
2018	0	0.0	1,761	1,761	F
2019	0	0.0	1,270	1,270	F
2020	2	0.1	1,929	1,931	F

Year	Number Release	Percent Release	Number Kept	Number Caught	Charter
2021	0	0.0	2,655	2,655	F
2022	0	0.0	1,021	1,021	F
2023	0	0.0	797	797	F
2024	0	0.0	83	83	F
2015	0	0.0	23	23	T
2016	0	0.0	59	59	T
2017	0	0.0	8	8	T
2018	0	0.0	67	67	T
2019	0	0.0	74	74	T
2020	0	0.0	112	112	T

* Both individuals released were mahimahi.

Note: Bycatch information is calculated from raw interview creel survey data and represents the percent of fish caught or percent of interviews with bycatch.

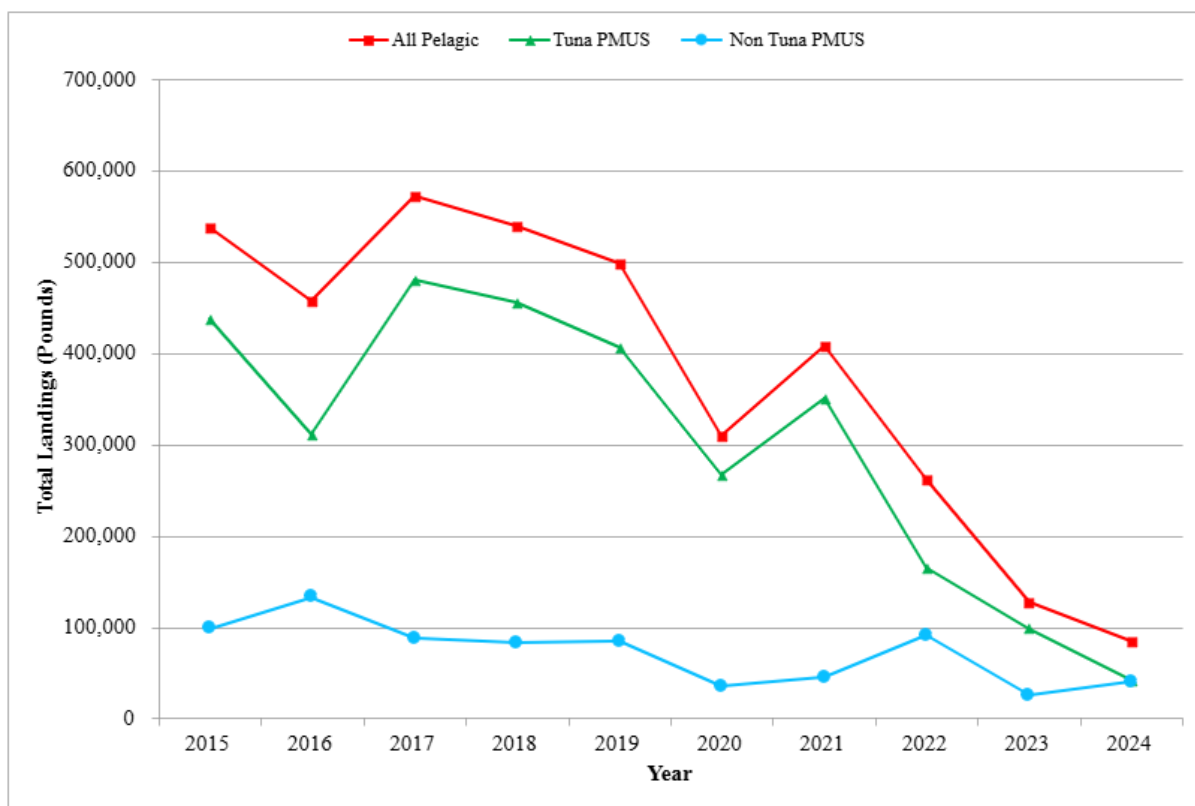


Figure 27. Total estimated catch for all pelagics, tuna PMUS, and non-tuna PMUS from boat-based creel surveys in the CNMI

Supporting data shown in Table A-27.

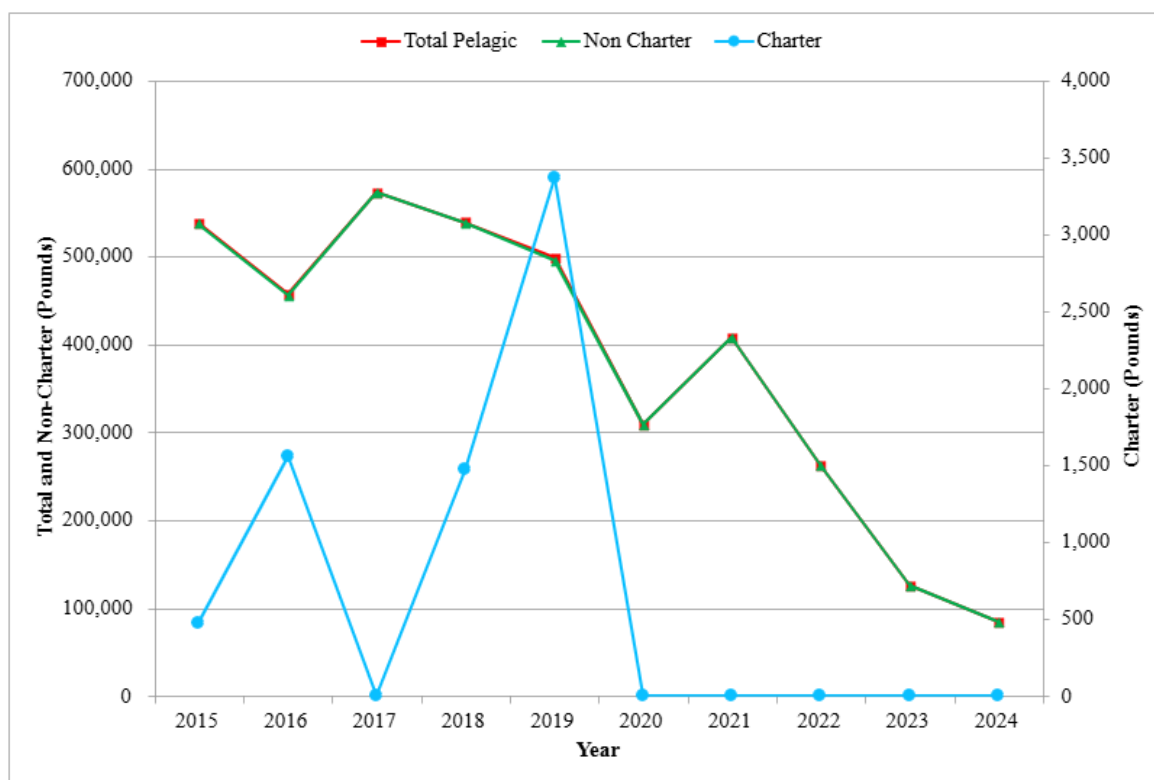


Figure 28. Total estimated catch for all pelagics in the CNMI
Supporting data shown in Table A-28.

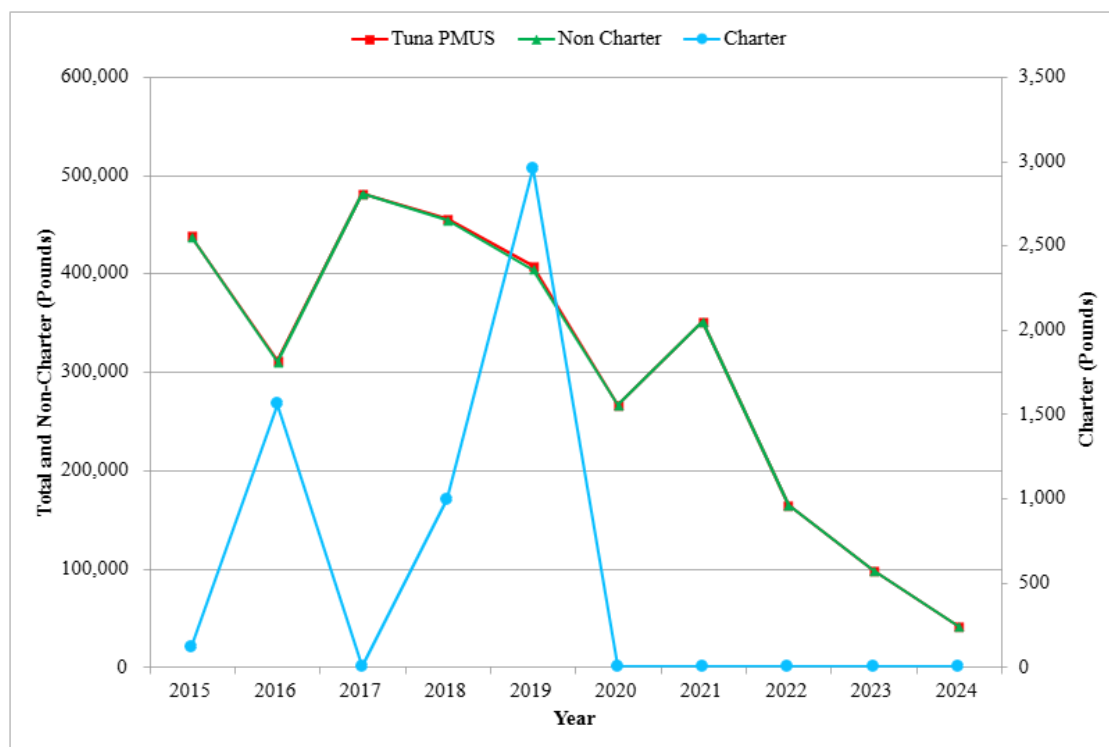


Figure 29. Total estimated catch for tuna PMUS in the CNMI
Supporting data shown in Table A-29.

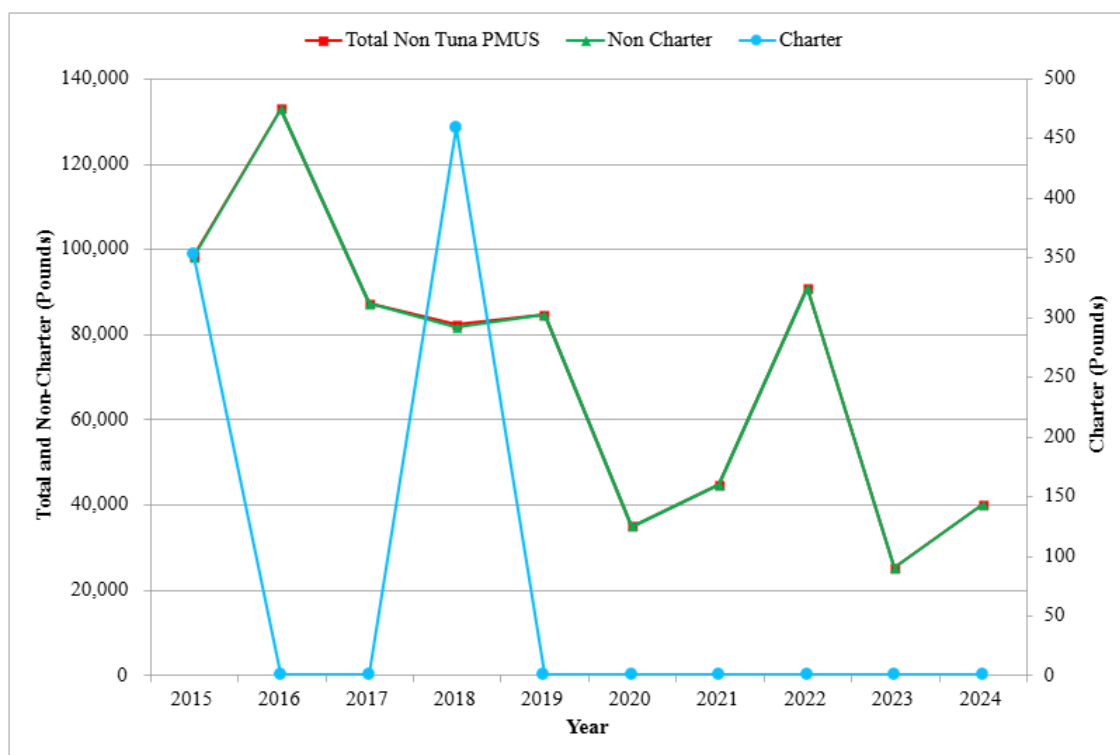


Figure 30. Total estimated catch for non-tuna PMUS in the CNMI
Supporting data shown in Table A-30.

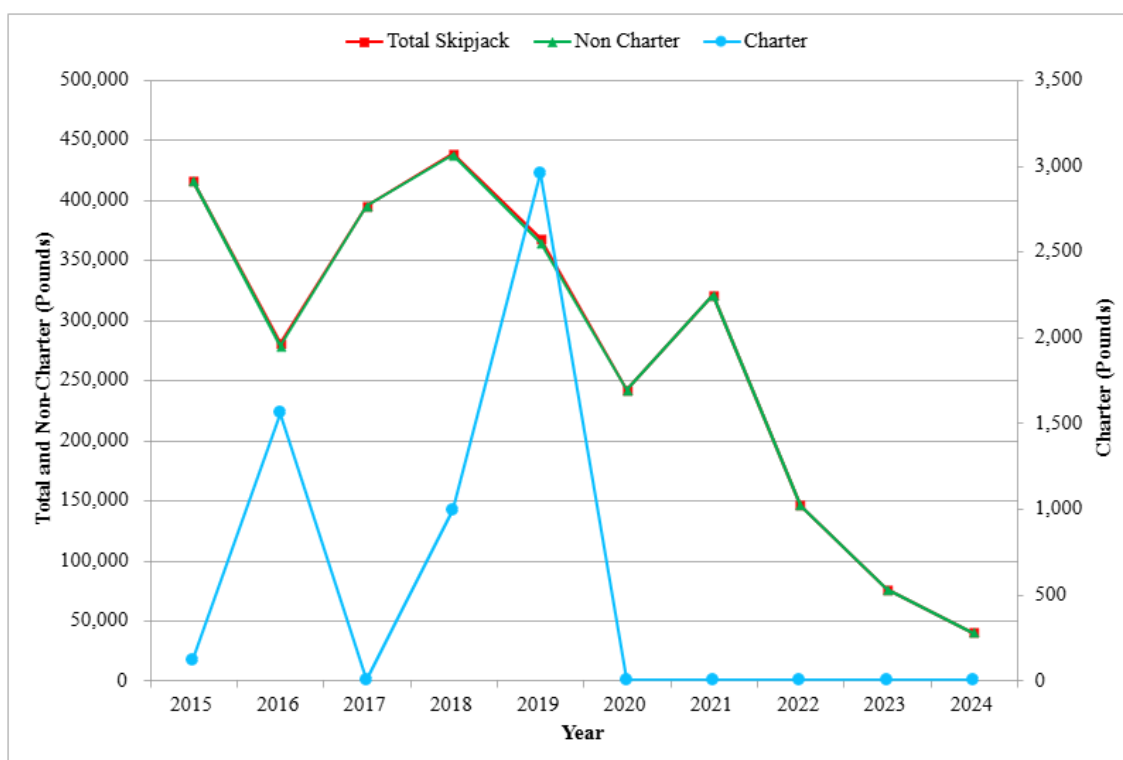


Figure 31. Total estimated catch for skipjack tuna in the CNMI
Supporting data shown in Table A-31.

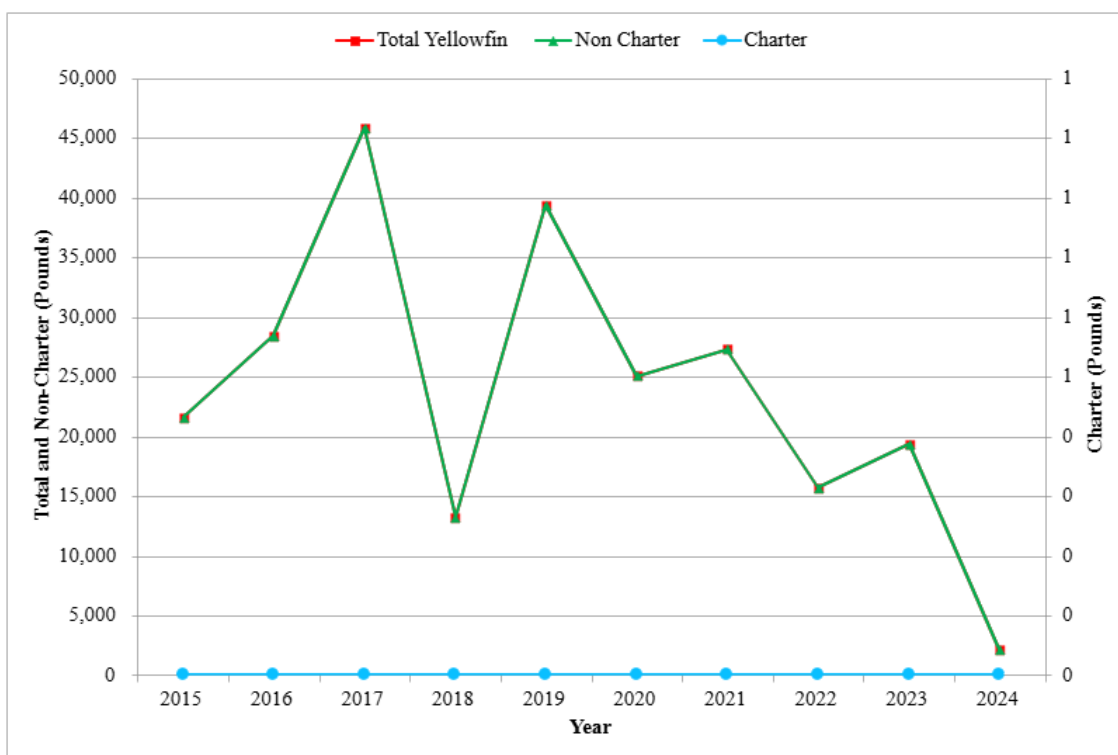


Figure 32. Total estimated catch for yellowfin tuna in the CNMI
Supporting data shown in Table A-32.

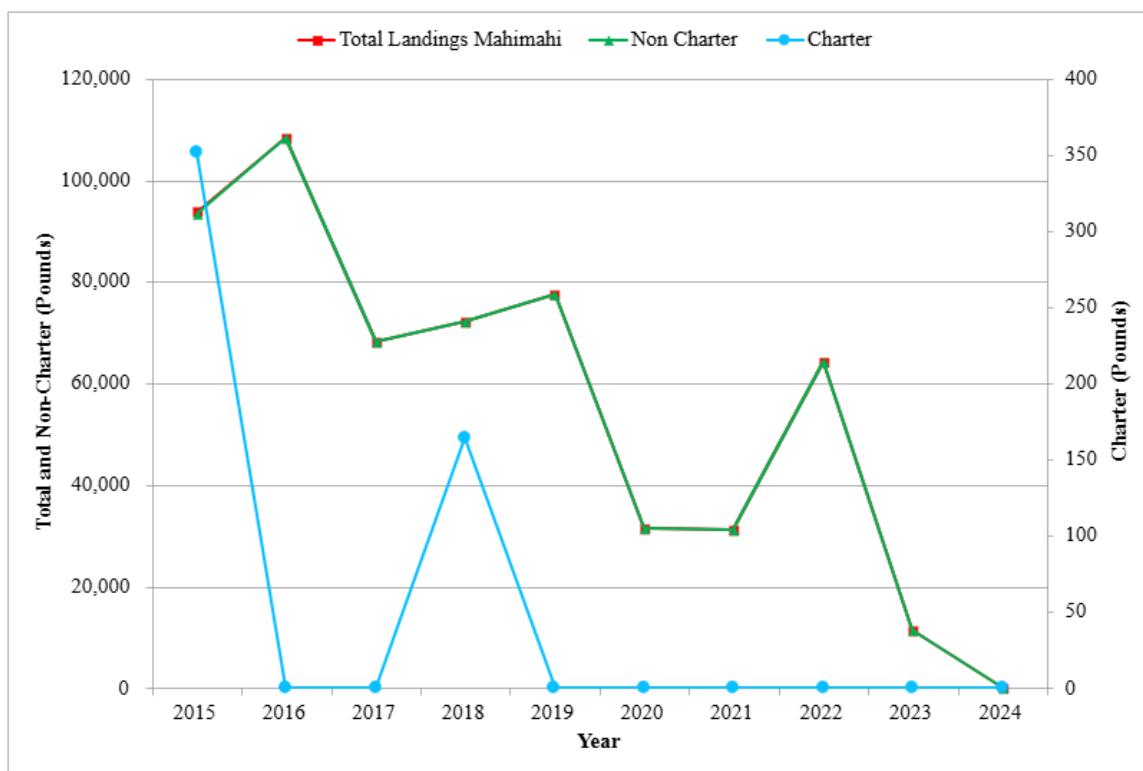


Figure 33. Total estimated catch for mahimahi in the CNMI
Supporting data shown in Table A-33.

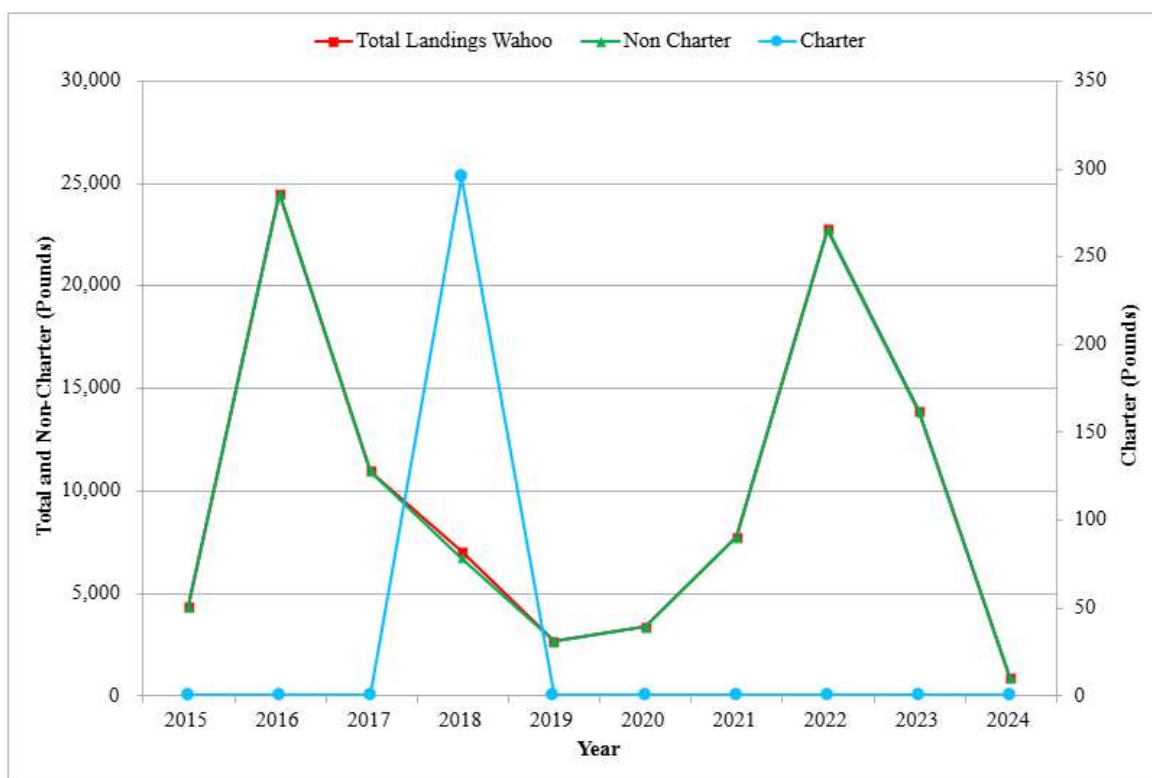


Figure 34. Total estimated catch for wahoo in the CNMI

Supporting data shown in Table A-34.

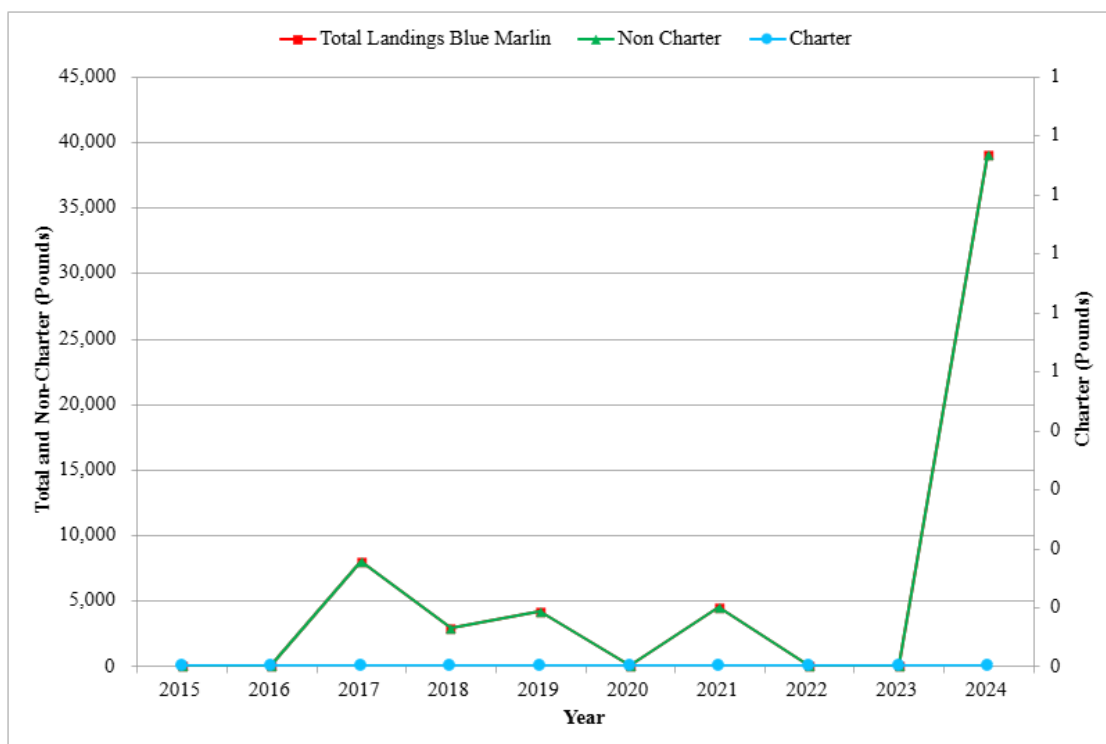


Figure 35. Total estimated catch for blue marlin in the CNMI

Supporting data shown in Table A-35.

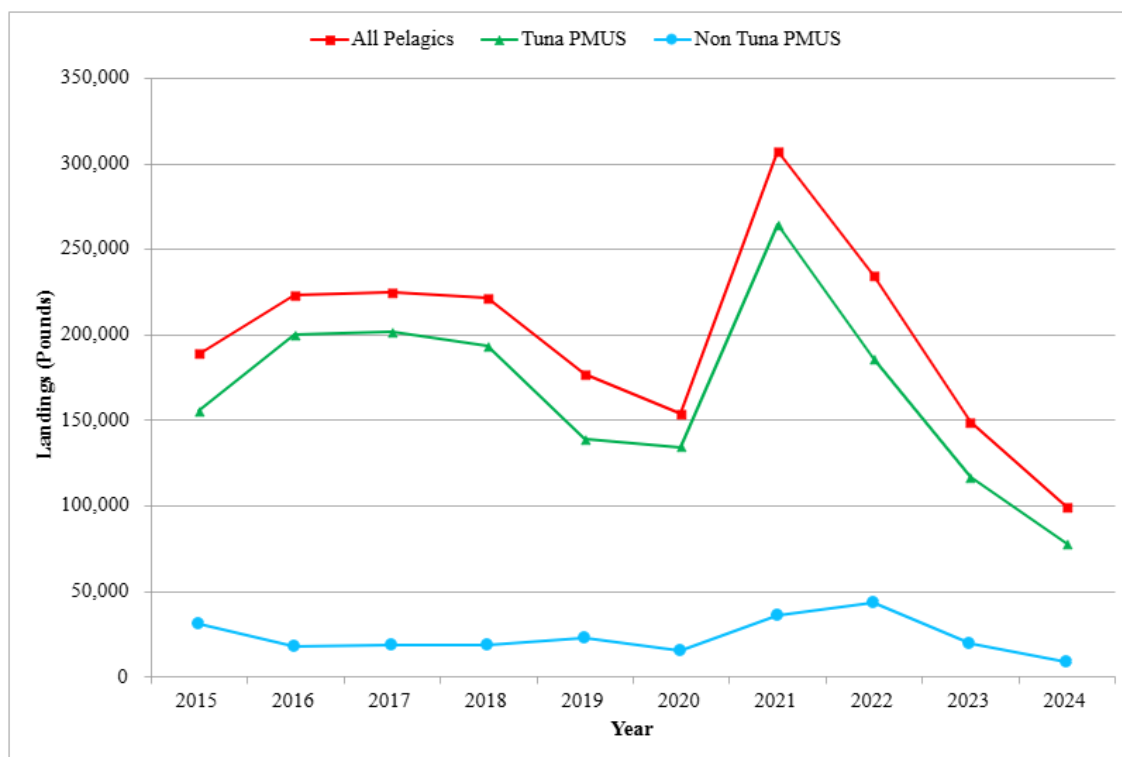


Figure 36. Commercial purchase landings for all pelagics, tuna PMUS, and non-tuna PMUS in the CNMI

Supporting data shown in Table A-36.

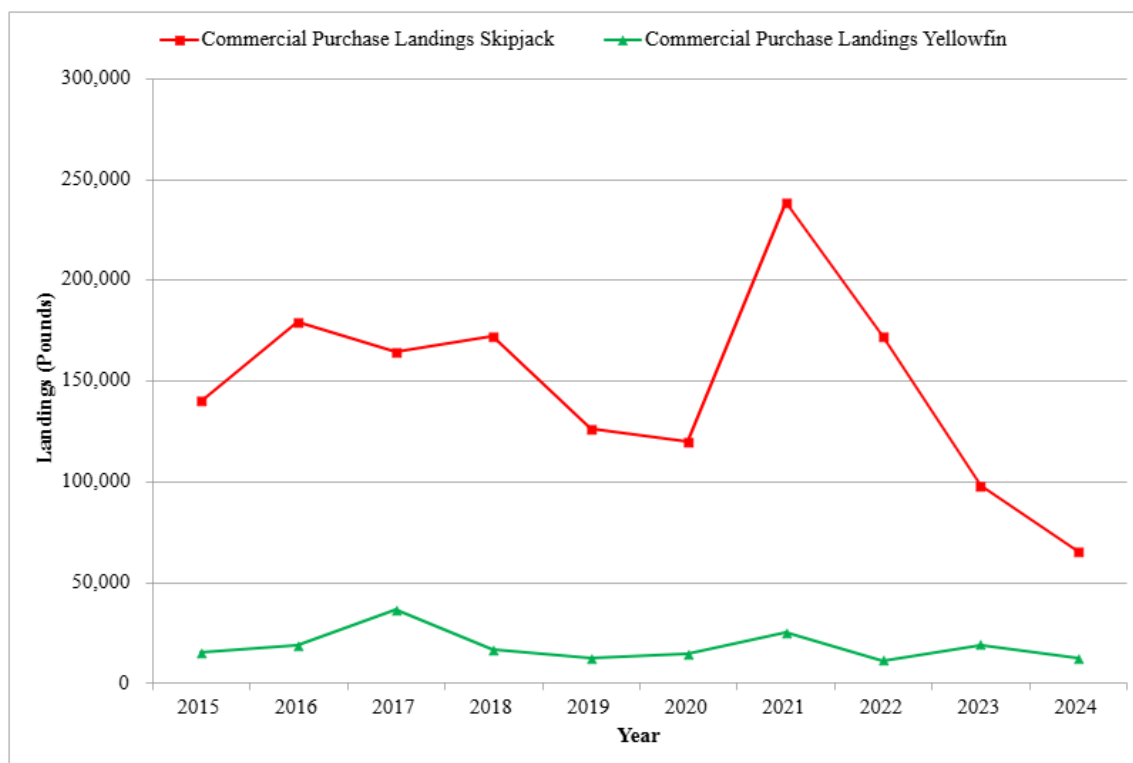


Figure 37. Commercial purchase landings for skipjack and yellowfin tunas in the CNMI
Supporting data shown in Table A-37.

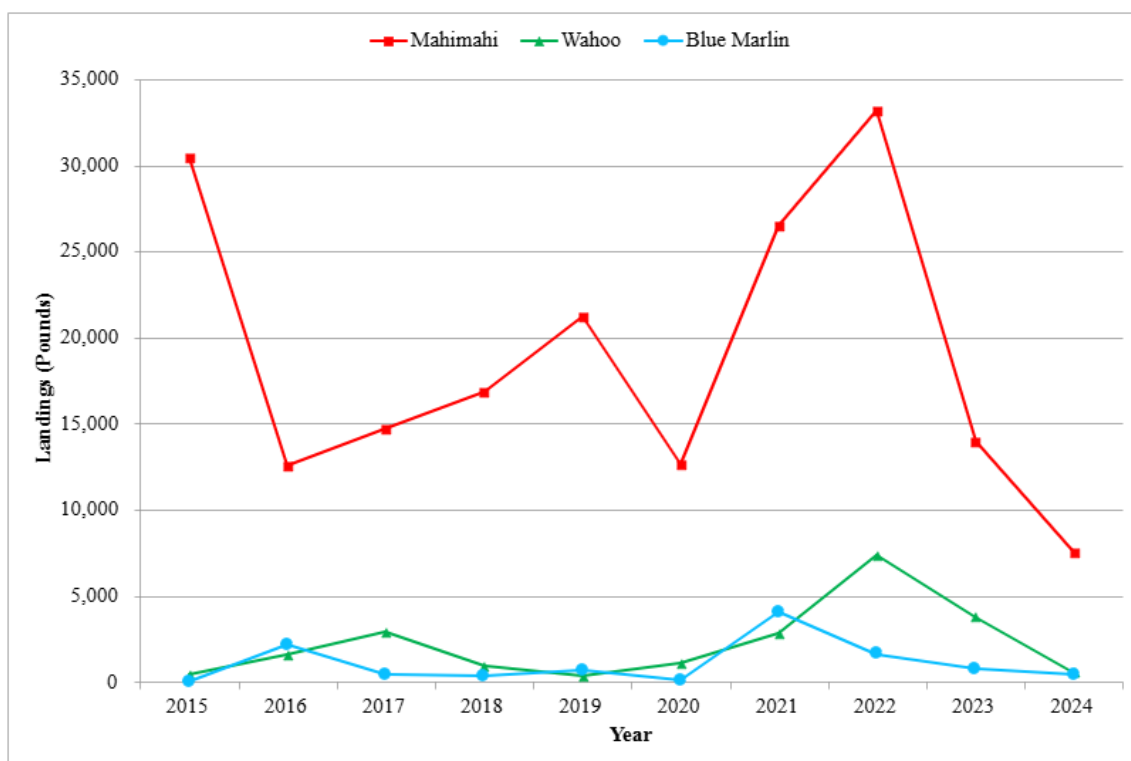


Figure 38. Commercial purchase landings for mahimahi, wahoo, and blue marlin in the CNMI

Supporting data shown in Table A-38.

2.2.6 OVERVIEW OF CATCH PER UNIT EFFORT - ALL FISHERIES

This section provides catch rates for the five main species landed by trolling. “Pounds per hour trolled” is determined from creel survey interviews and includes charter and non-charter sectors, while “pounds per trip” is determined from commercial invoice receipts.

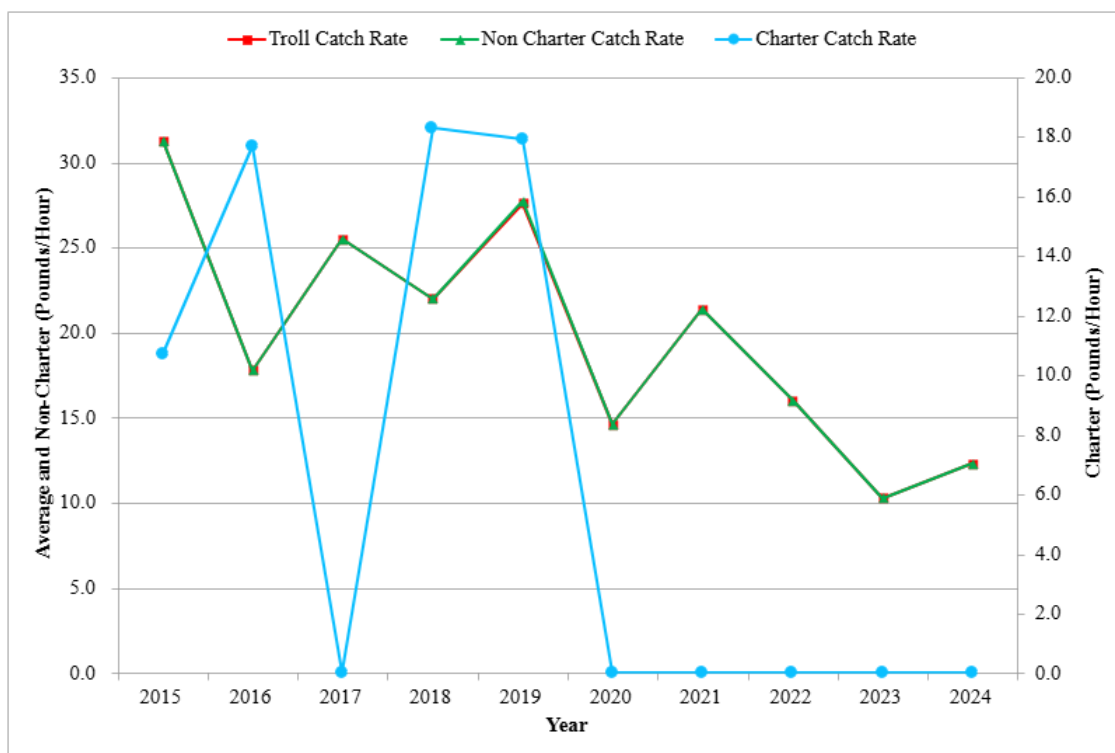


Figure 39. Estimated total trolling catch rates (lb/hr) in the CNMI
Supporting data shown in Table A-39.

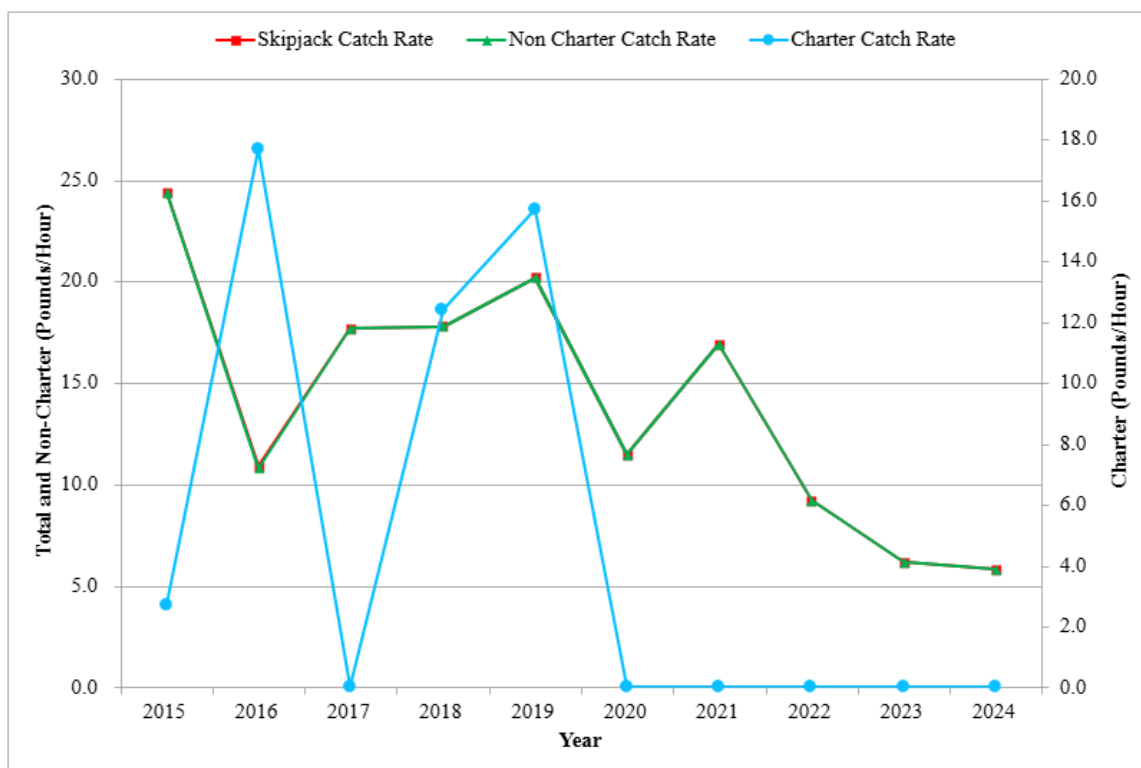


Figure 40. Estimated trolling catch rates (lb/hr) for skipjack tuna in the CNMI
Supporting data shown in Table A-40.

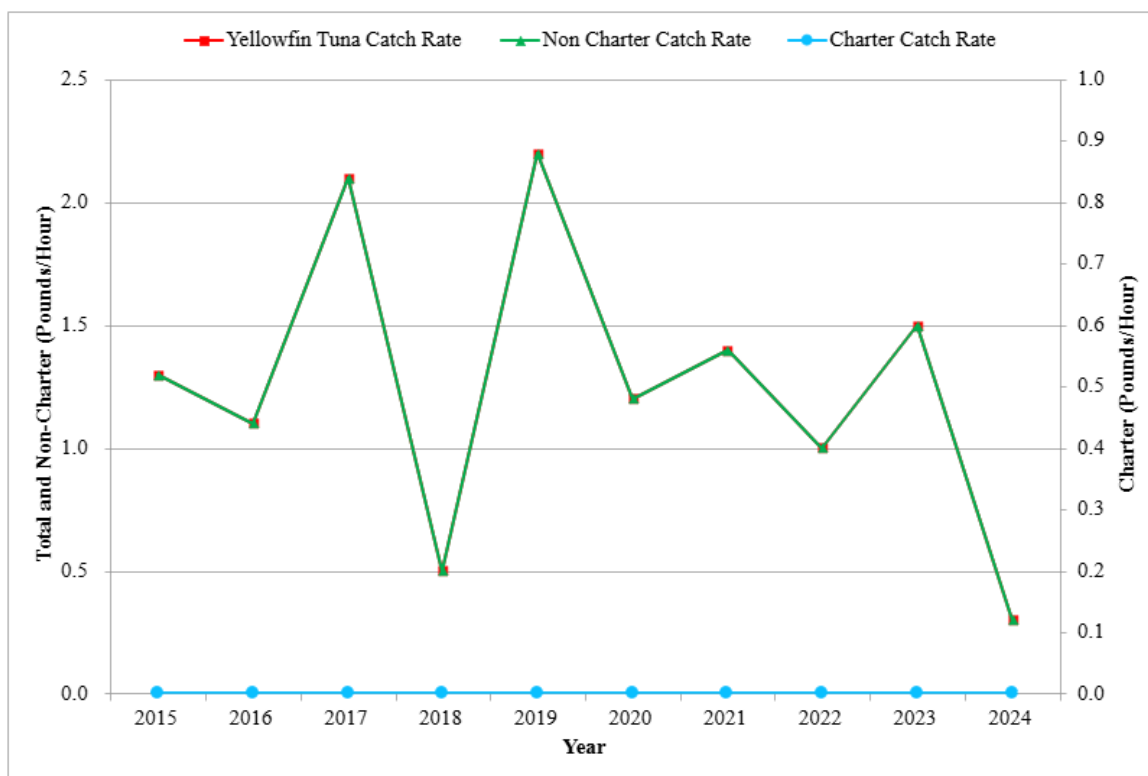


Figure 41. Estimated trolling catch rates (lb/hr) for yellowfin tuna in the CNMI
Supporting data shown in Table A-41.

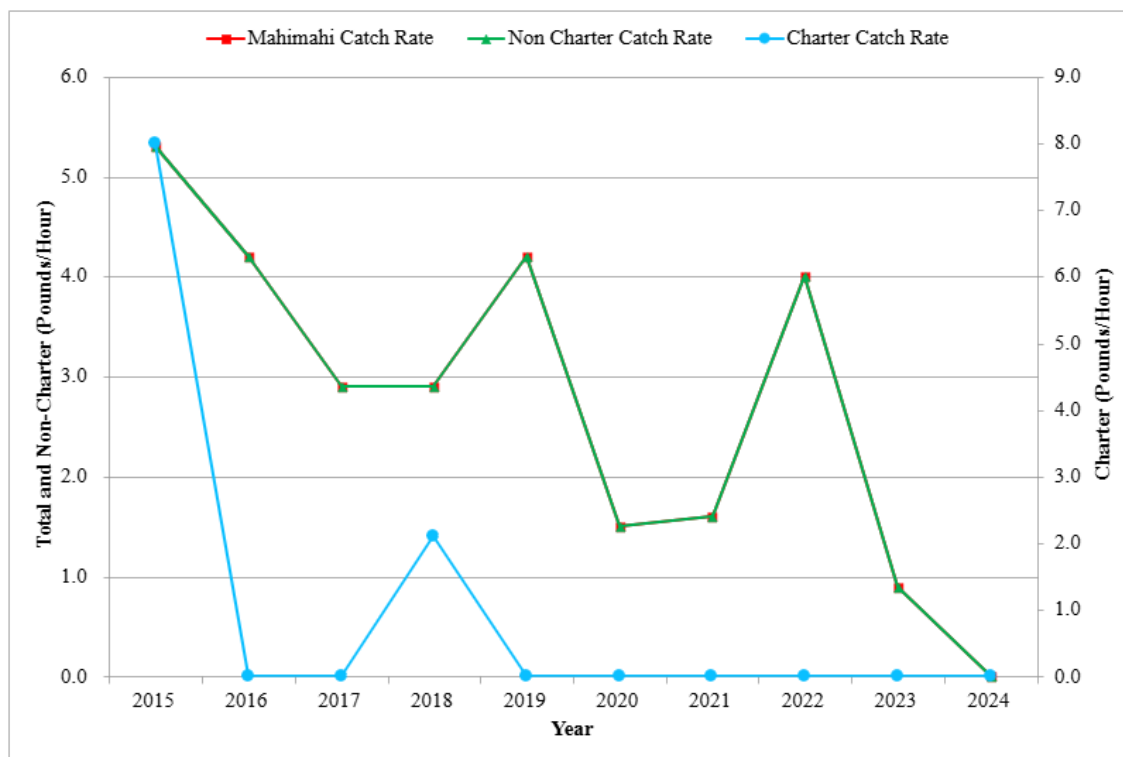


Figure 42. Estimated trolling catch rates (lb/hr) for mahimahi in the CNMI
Supporting data shown in Table A-42.

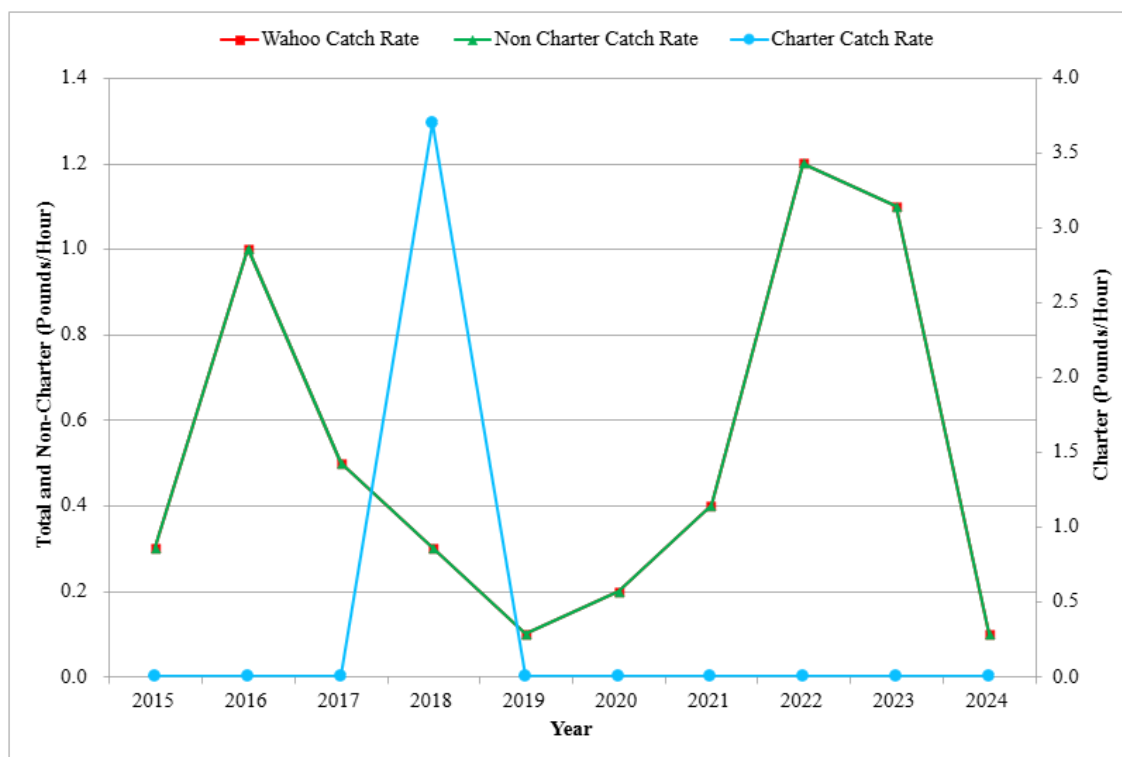


Figure 43. Estimated trolling catch rates (lb/hr) for wahoo in the CNMI
Supporting data shown in Table A-43.

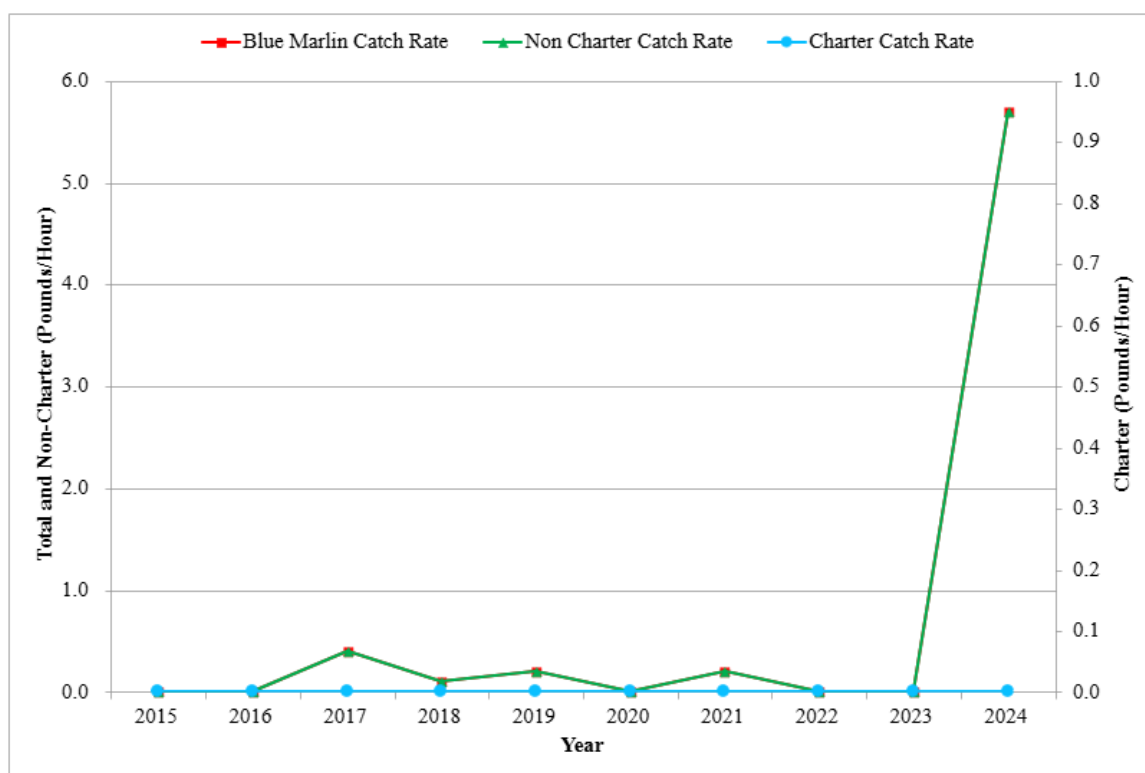


Figure 44. Estimated trolling catch rates (lb/hr) for blue marlin in the CNMI
Supporting data shown in Table A-44.

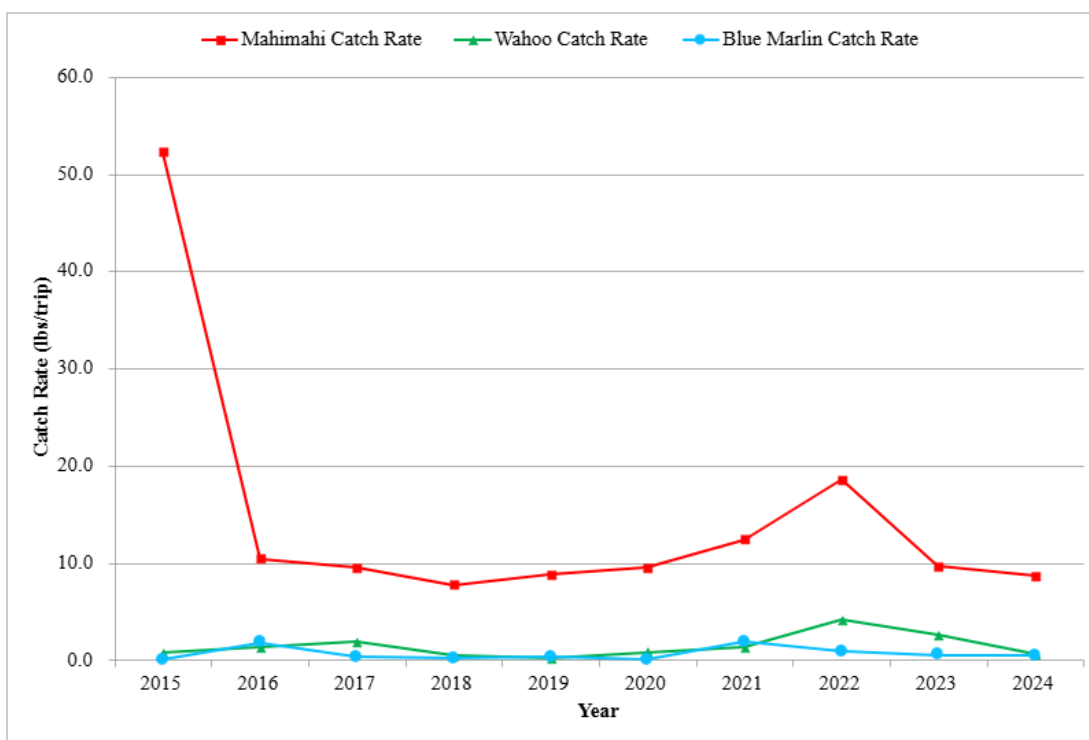


Figure 45. Estimated trolling catch rates (lb/trip) for mahimahi, wahoo, and blue marlin in the CNMI

Supporting data shown in Table A-45.

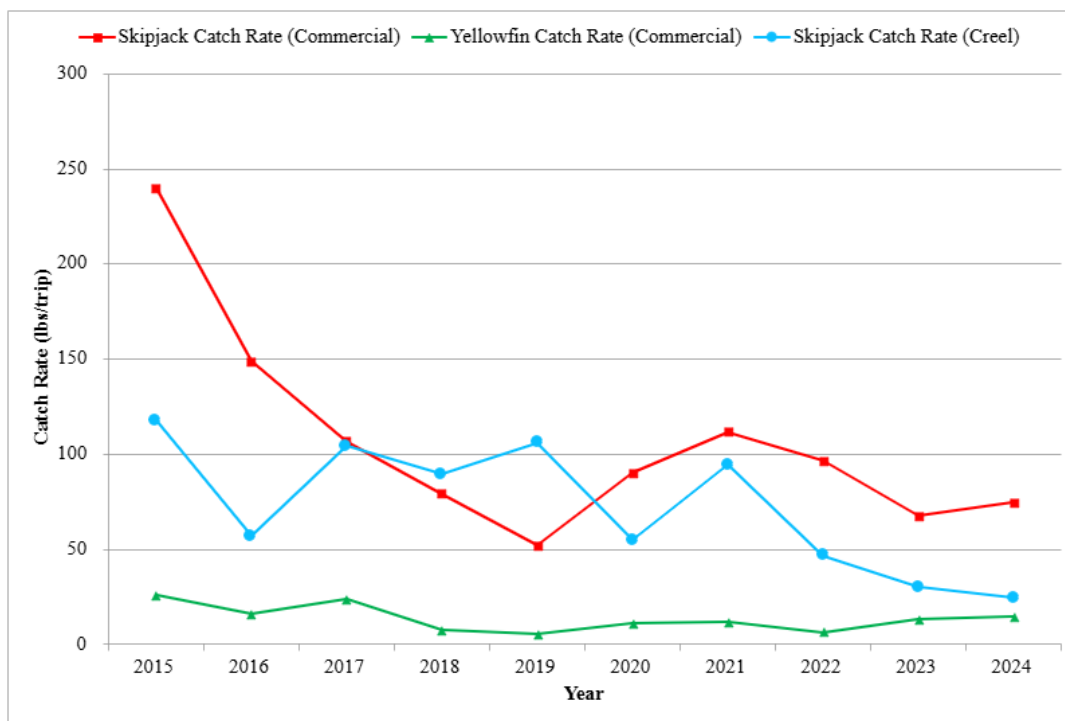


Figure 46. Estimated trolling catch rates (lb/trip) for skipjack and yellowfin in the CNMI
Supporting data shown in Table A-46.

2.3 GUAM

2.3.1 DATA SOURCES

This report contains the most recently available information on Guam's pelagic fisheries, as compiled from data generated by the Division of Aquatic and Wildlife Resources (DAWR) through a program established in conjunction with PIFSC and the WPFMC. Data are gathered through the offshore creel survey data program. In the past 10 years, DAWR staff have logged between 89 and 97 survey days annually (see Table A-47). The number of trips logged in boat logs has varied from 837 to 1,147 during that period, with the number of interviews slightly greater than half of that year's total trips. In 2024, DAWR completed 95 of 95 scheduled survey days, documented 1,287 trips and conducted 664 interviews. Participation, total landings, effort, CPUE, and bycatch are generated from the creel survey. Using the DAWR computerized data expansion system files (with the assistance of NMFS to avoid over-estimating seasonal pelagic species), a 365-day quarterly expansion of survey data is run for each calendar year to produce catch and effort estimates for the pelagic fishery. Commercial landings, revenue, and price per pound data are obtained from the PIFSC-sponsored commercial landings system through the commercial receipt book. Transshipment landings data are obtained from the Bureau of Statistics and Plans. All transshipment through Guam ceased as of December 31, 2020.

DAWR has added one biologist in the past 12 months, which should help address chronic manpower shortages of the past. The one biologist is still employed under DAWR. DAWR staff biologists continue to oversee several projects simultaneously, while providing on-going training to ensure the high quality of data being collected by all staff. All fisheries staff are trained to identify the most commonly caught fish to the species level. New staff are mentored by biologists and senior technicians in the field before conducting creel surveys on their own.

Total commercial landings are estimated by summing the weight fields in the commercial landings database from the principal fish wholesalers in Guam and then multiplying by an estimated percent coverage expansion factor. The annual expansion factor (described above) is subjectively created based on the available information in a given year including: an analysis of the "disposition of catch" data available from the DAWR offshore creel survey, an evaluation of the fishermen in the fishery and their entry/exit patterns, general "dock side" knowledge of the fishery and the status of the marketing conditions and structure, the overall number of records in the database, and a certain measure of best guesses.

2.3.2 SUMMARY OF GUAM PELAGIC FISHERIES

Landings. The estimated annual pelagic landings vary widely in the 43-year time series, ranging between 383,000 and 958,000 lb. The average total catch has shown a slowly increasing trend over the reporting period. The 2024 total expanded pelagic landings were 699,120 lb., a decrease of 2.67% when compared with the catch from 2023. Tuna PMUS landings in 2024 were 456,156 lb., a decrease of 22.62%, while non-tuna PMUS increased 105.3% to 237,040 lb. in 2024. Landings consisted primarily of five major species: mahimahi, wahoo, bonita or skipjack tuna, yellowfin tuna, and Pacific blue marlin, with skipjack comprising over 58.25% of total landings. Other minor species caught include rainbow runner, barracudas, and pomfrets. Sharks were also caught during 2024, with sharks noted in specific fishermen interviews conducted in 2024 regarding shark encounters (see

bycatch below). However, these species were not encountered during offshore creel surveys and were not available for expansion for this year's report. Sharks are often discarded as bycatch. In addition to the above pelagic species, approximately half a dozen other species was landed incidentally this year.

There are wide year-to-year fluctuations in the estimated landings of the five major pelagic species. Landings for three of the five common species decreased in 2024 from the previous year's levels. Skipjack decreased by 17.15%, and yellowfin decreased by 15.01%. Wahoo catch decreased 43.53%, mahimahi catch increased by 220.0%, and blue marlin increased by 183.6%.

Effort. The number of boats involved in Guam's pelagic fishery gradually increased from 193 in 1983 to a high of 546 in 2021. There were 447 boats involved in Guam's pelagic fishery in 2024, a decrease of 3.66% from 2023. The majority of the fishing boats are less than 10 m (33 ft) in length and are usually owner-operated by fishers who earn a living outside of fishing. Most fishers sell a portion of their catch, and it is difficult to make a distinction between recreational, subsistence, and commercial fishers. A small but economically significant segment (~5%) of the pelagic fishery is made up of marina-berthed charter boats that are operated primarily by full-time captains and crews. Data and figures for non-charter fishing, charter operations, and bycatch are represented in this report.

In early 2010, the U.S. military began exercises in an area south and southeast of Guam designated W-517. W-517 is a special use airspace (approximately 14,000 nm²) that overlays deep open ocean approximately 50 miles south-southwest of Guam. Exercises in W-517 generally involve live fire and/or pyrotechnics. When W-517 is in use, a notice to mariners is issued, and vessels attempting to use the area are advised to be cautious of objects in the water and other small vessels. This discourages access to virtually all banks south of Guam, including Galvez, Santa Rosa, White Tuna, and other popular fishing areas. From 1995 to 2009, DAWR surveys recorded an annual average of 13.5 weekday trips to the south, and 31 weekend trips to the south, for a total of 44.5 trips per year. Since 2010, DAWR surveys have recorded an annual average of 6.7 weekday trips to the south, and 19.8 weekend trips to the south, for an average of 26.5 trips per year, a decrease of 40.5% per year. As the majority of NTMs for W-517 cover weekdays, the decrease in weekday trips is greater at 50.4%.

According to the NTM announcements for 2024, there were 55 days closed in W-517, 171 days closed in Orote Point Firing Range, and 33 days closed at Camp Blaz, due to military exercises.

Also in 2024, there were 66 small-craft advisory days, 96 high-surf advisory/warning days, and 5 typhoon warning days (i.e., seven in May and seven in October).

The small-boat bottomfish and trolling fisheries in Guam relies on boat ramp access and FADs. Recent activities to support the Guam fishery follow.

On Guam, the makeshift ramp at Ylig Bay was eliminated in 2010. Widening of the main road on the southeast coast of Guam will cause removal of the ramp. In December 2006, a new launch ramp and facility was opened in Acfayan Bay, located in the village on Inarajan on the southeast coast of Guam. Monitoring of this ramp for pelagic fishing activity began at the start of 2007. In early 2007, this facility was damaged by heavy surf and has yet to be repaired. Monitoring of this ramp is currently on hold until the ramp is repaired. The current

financial situation in Guam makes it unlikely this ramp will be repaired in the near future. DAWR staff are meeting with landowners and Department of Public Works officials to develop a new boat launching facility in Talo'fo'fo' Bay on the east side of Guam, and land ownership may determine final placement.

CPUE. Trolling catch rates (lb./per hour fished) for 2024 were 18.0 lb./hr., a decrease from 2023. Total CPUE decreased by 2.70% in 2024. Skipjack tuna showed a decrease in CPUE, while yellowfin tuna showed a decrease in CPUE from 2023 to 2024. Marlin showed an increase in CPUE from 2023 to 2024. Mahi showed an increase in CPUE and wahoo CPUE decreased from 2023 to 2024. The fluctuations in CPUE are possibly due to variability in the year-to-year abundance and availability of the stocks.

Revenues. Commercial data for Guam pelagic fisheries are non-disclosed due to confidentiality rules that prevent data derived from fewer than three sources to be reported. Because there were fewer than three vendors that reported sales of pelagic fish on Guam in 2024, the data are not able to be presented in this report.

A majority of troll fishers do not rely on the catch or selling of fish as their primary source of income. Previously, Guam law required the Government of Guam to provide locally caught fish to food services in government agencies, such as Department of Education and Department of Corrections. In 2002, the Government of Guam began implementing cost-saving measures, including privatization of food services. The requirement that locally-caught fish be used for food services, while still a part of private contracts, is not being enforced. This has allowed private contractors to import cheaper foreign fish and reduced the sales of vendors selling locally caught fish. This represented a substantial portion of sales of locally caught pelagic fish. The decrease in commercial sales seen following 2002 may be, in part, due to this change.

Bycatch. There is low bycatch in the charter fishery. In 2024, interview data indicated there was again a low bycatch rate; there were 1011 fish reported as bycatch in 6,692 tallied fish caught, for a 15.10% rate. Bycatch occasionally occurs in the troll fishery including sharks, shark-bitten and undersized fish.

In 2024, fishers were asked if they experienced a shark interaction. There was a total of 664 interviews for boat-based fishing in 2024, with 198 of these inappropriate for determining shark interaction. Of the remaining 466 interviews, 195 reported interactions with sharks and 271 reported no interactions with sharks for a 41.84% positive rate, a decrease from 2023, for interviews where fishers were asked about shark interactions.

2.3.3 PLAN TEAM RECOMMENDATIONS

While there were no Plan Team recommendations to the Council relevant to the Guam pelagic fisheries data module, the Pelagic Plan Team developed several associated work items, including:

- In the 2025 SAFE report and beyond, authors should consider separating out the troll handline fishery from the small boat troll sector of the fishery, due to a recent effort increase in that specific sector of the small boat fishery, and in order to more accurately represent the catch and effort between the two distinct sectors.

2.3.4 OVERVIEW OF PARTICIPATION

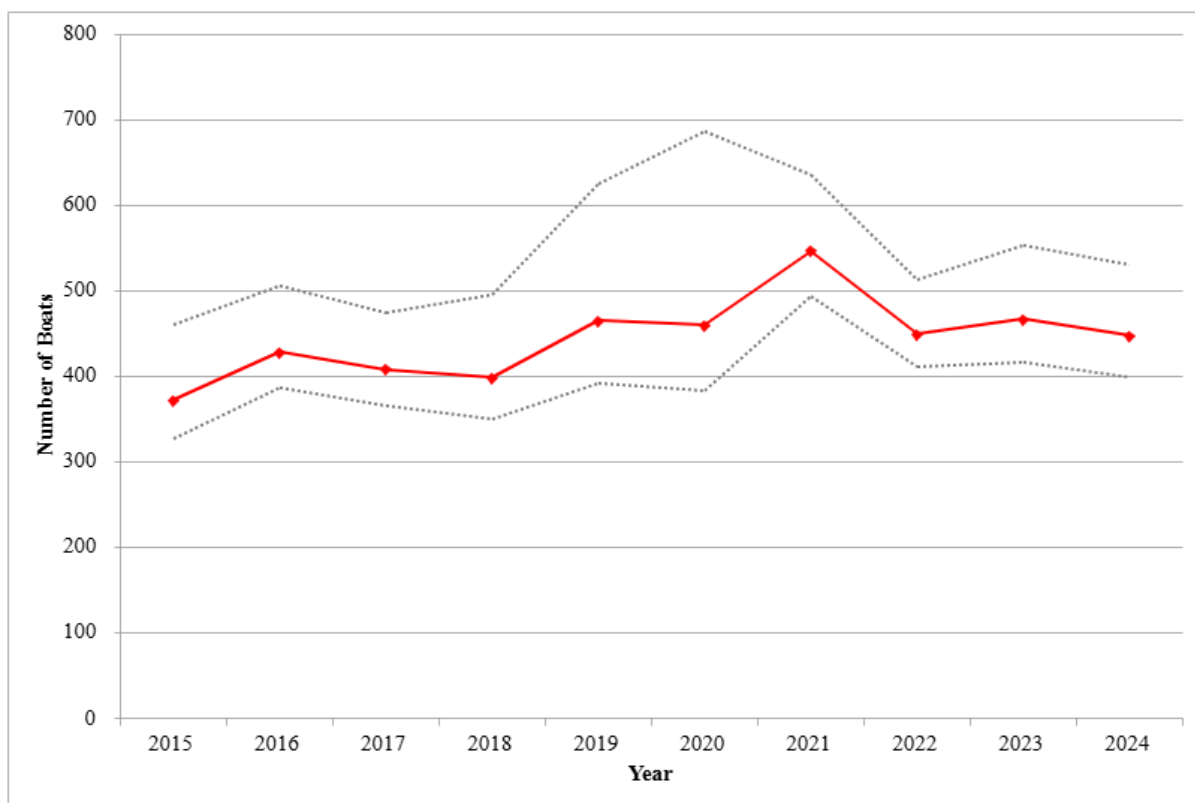


Figure 47. Total estimated number of vessels in Guam pelagic fisheries with upper and lower 95% confidence intervals (grey dashed lines)

Supporting data shown in Table A-48.

2.3.5 OVERVIEW OF TOTAL AND REPORTED COMMERCIAL LANDINGS

Table 18. Total estimated, non-charter, and charter landings (lb) for Guam in 2024

Species	Total	Non-Charter	Charter
Skipjack Tuna	407,346	404,785	2,560
Yellowfin Tuna	48,700	48,598	102
Kawakawa	110	110	0
Albacore	0	0	0
Bigeye Tuna	0	0	0
Other Tuna PMUS	0	0	0
TUNAS Total	456,156	453,493	2,662
Mahimahi	168,668	150,631	18,037
Wahoo	25,794	20,831	4,963
Blue Marlin	40,279	38,671	1,608
Black Marlin	1,383	1,383	0

Species	Total	Non-Charter	Charter
Striped Marlin	0	0	0
Sailfish	635	635	0
Shortbill Spearfish	0	0	0
Swordfish	0	0	0
Oceanic Sharks	0	0	0
Pomfrets	289	289	0
Oilfish	0	0	0
NON-TUNA PMUS Total	237,048	212,440	24,608
Dogtooth Tuna	3,943	3,939	4
Rainbow Runner	1,407	1,303	104
Barracudas	566	566	0
Double-lined Mackerel	0	0	0
Misc. Troll Fish	0	0	0
OTHER PELAGICS Total	5,916	5,808	108
TOTAL PELAGICS	699,120	671,741	27,378

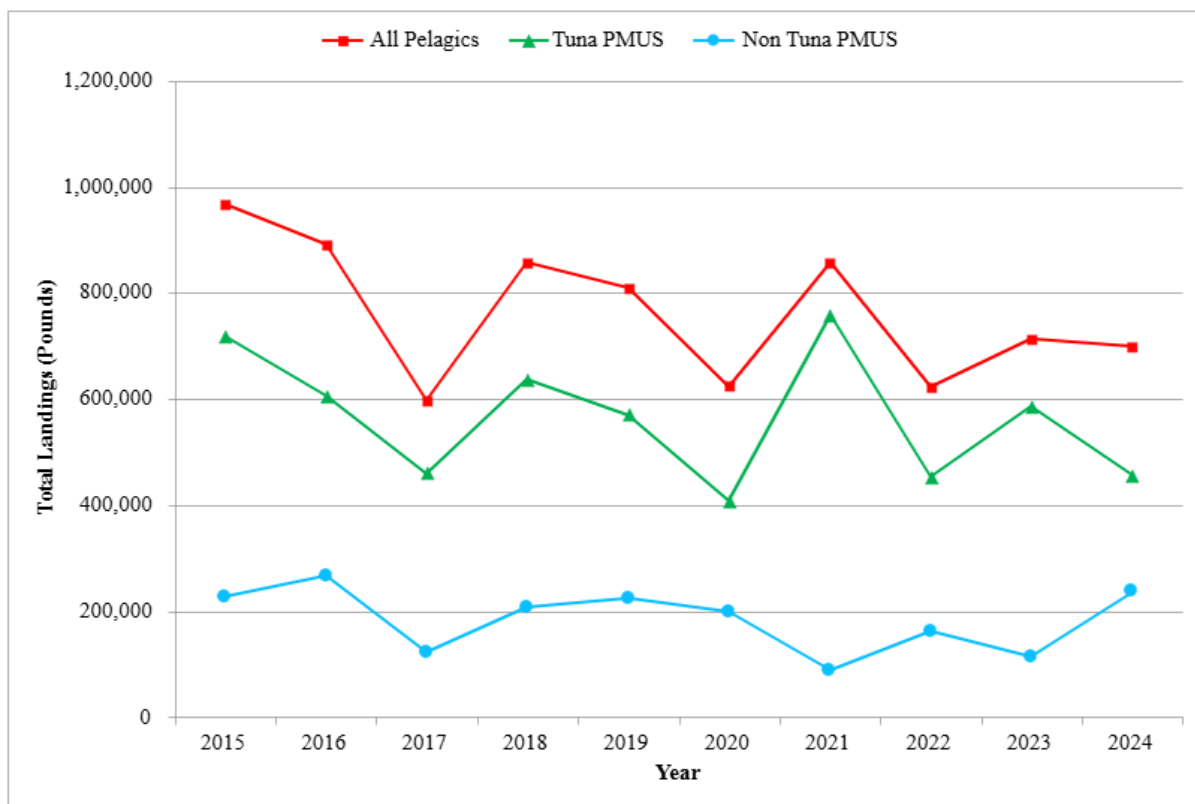


Figure 48. Total estimated landings for all pelagics, tuna PMUS, and non-tuna PMUS from boat-based creel surveys in Guam
Supporting data shown in Table A-49.

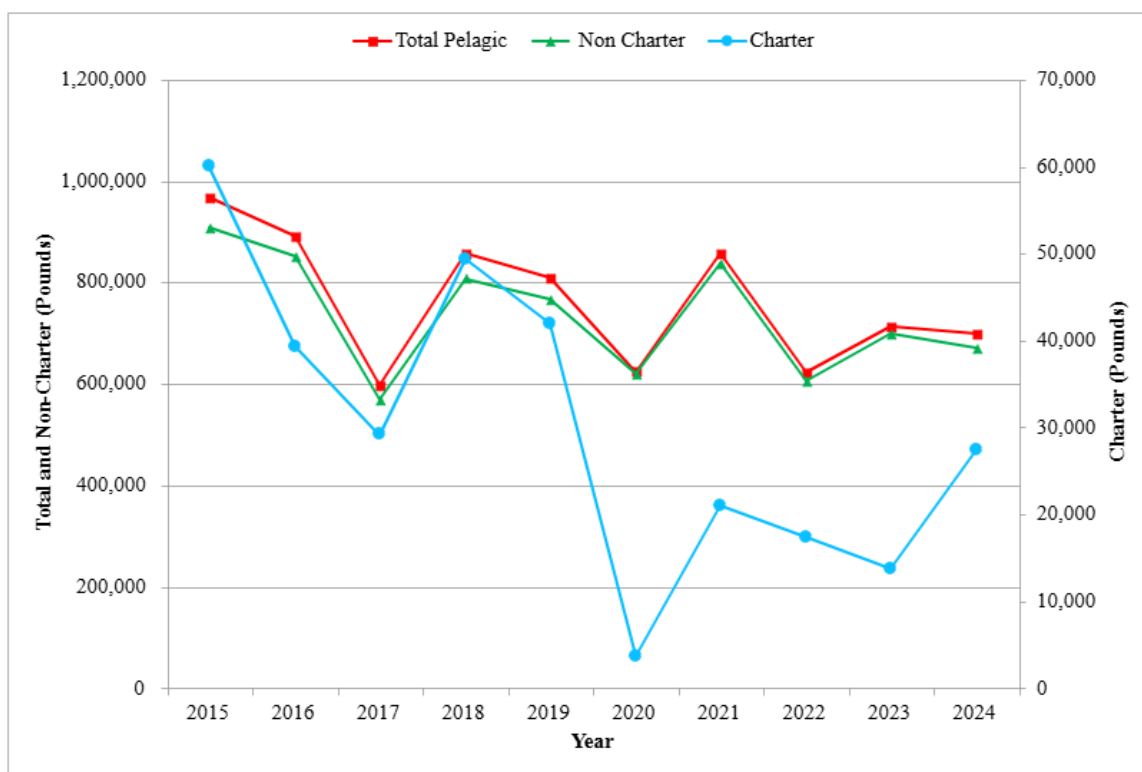


Figure 49. Total estimated landings for all pelagics in Guam
Supporting data shown in Table A-50.

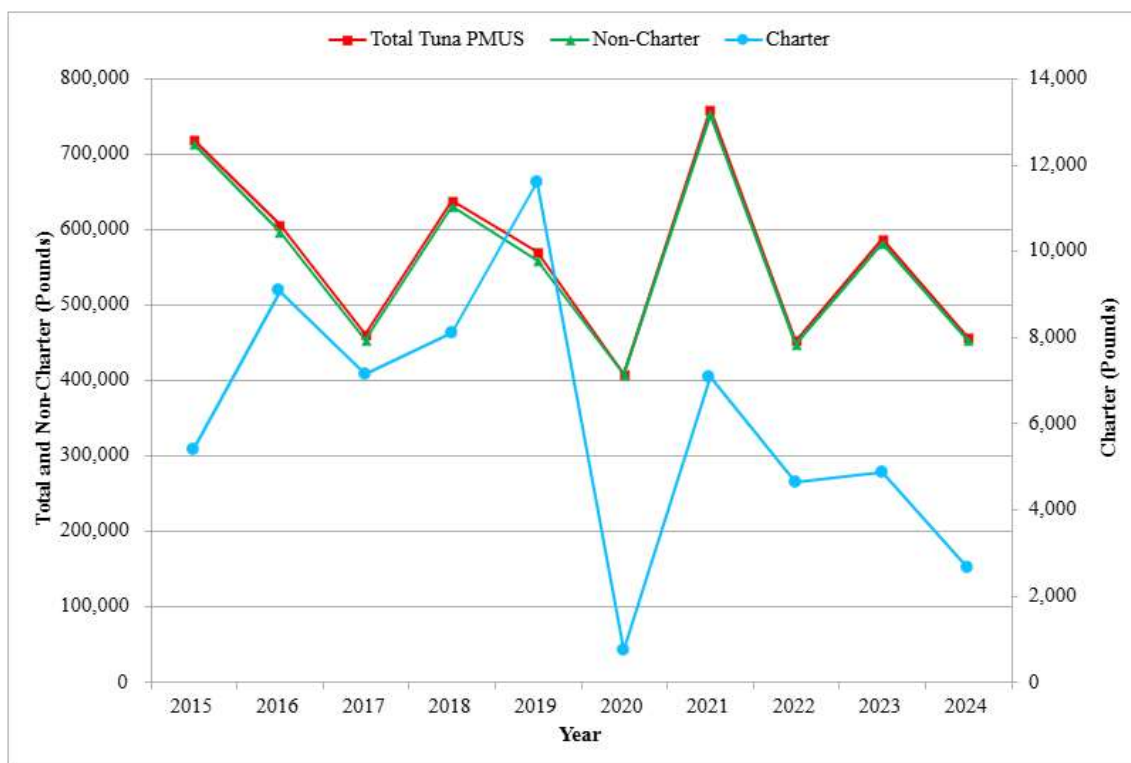


Figure 50. Total estimated landings for tuna PMUS in Guam
Supporting data shown in Table A-51.

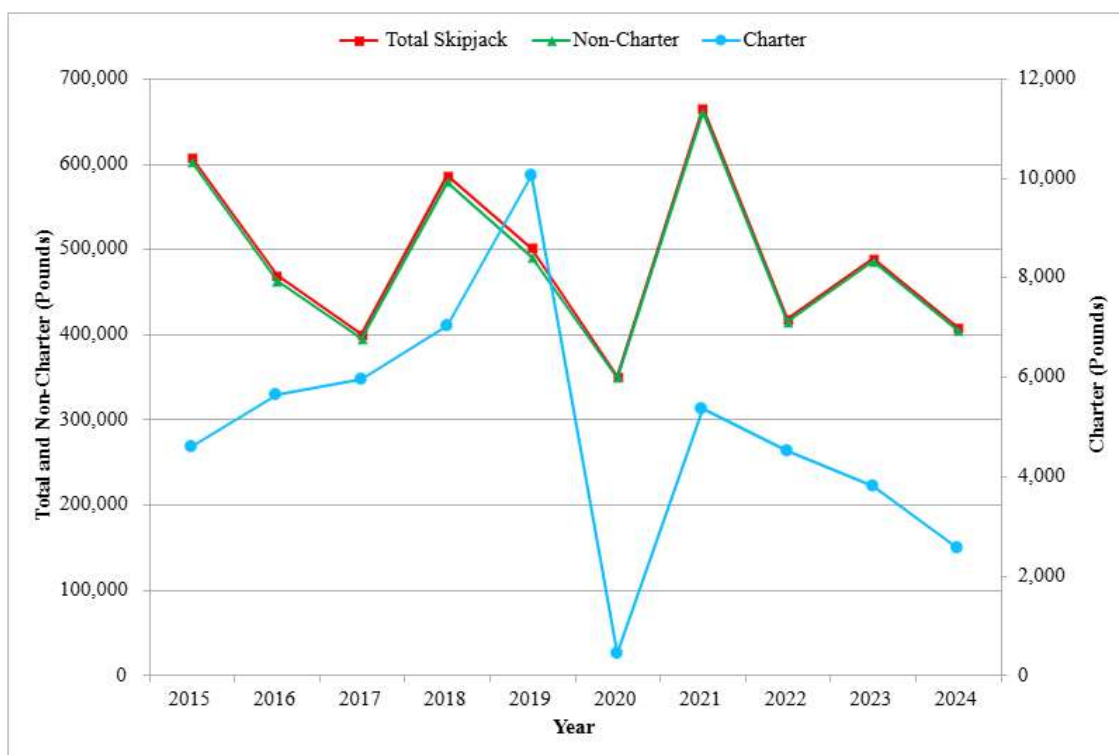


Figure 51. Total estimated landings for skipjack tuna in Guam
Supporting data shown in Table A-52.

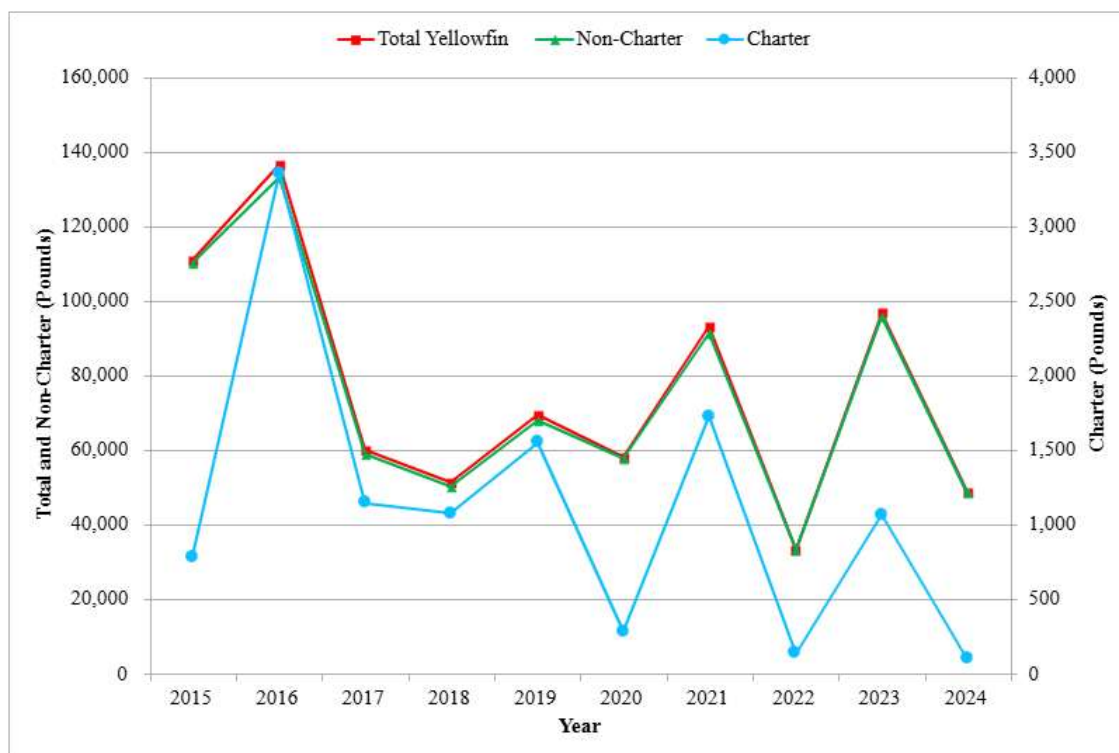


Figure 52. Total estimated landings for yellowfin tuna in Guam
Supporting data shown in Table A-53.



Figure 53. Total estimated landings for non-tuna PMUS in Guam
Supporting data shown in Table A-54.

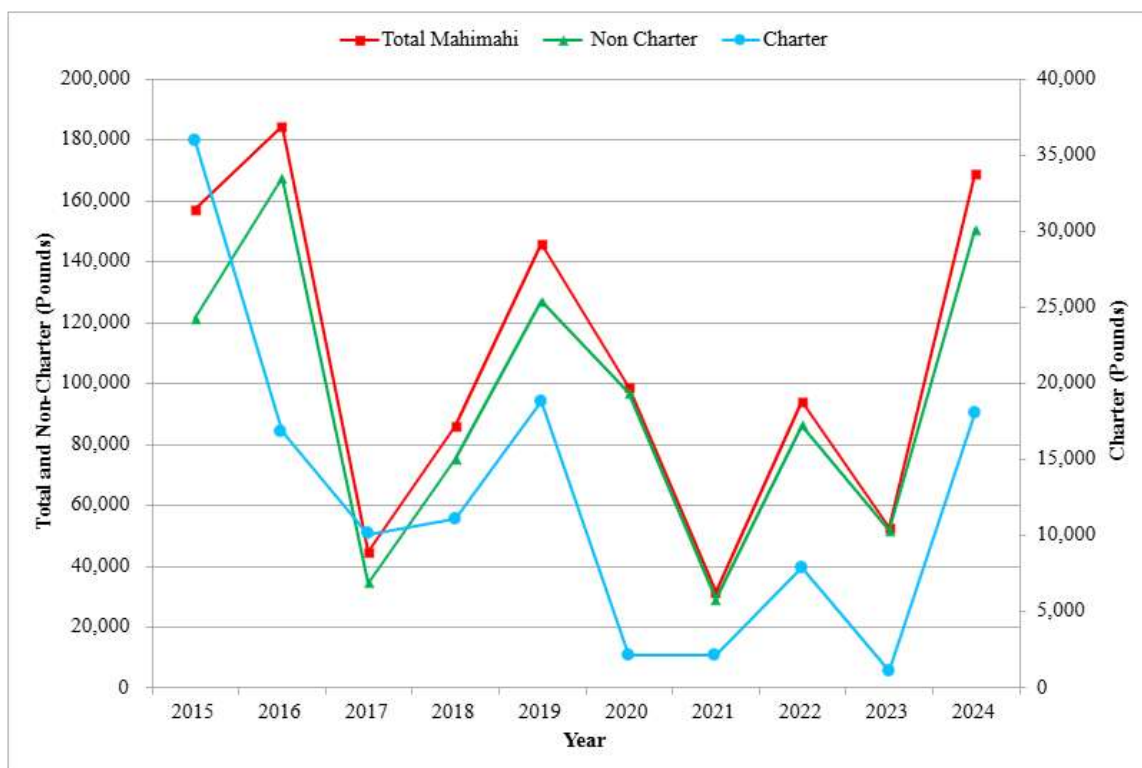


Figure 54. Total estimated landings for mahimahi in Guam
Supporting data shown in Table A-55.

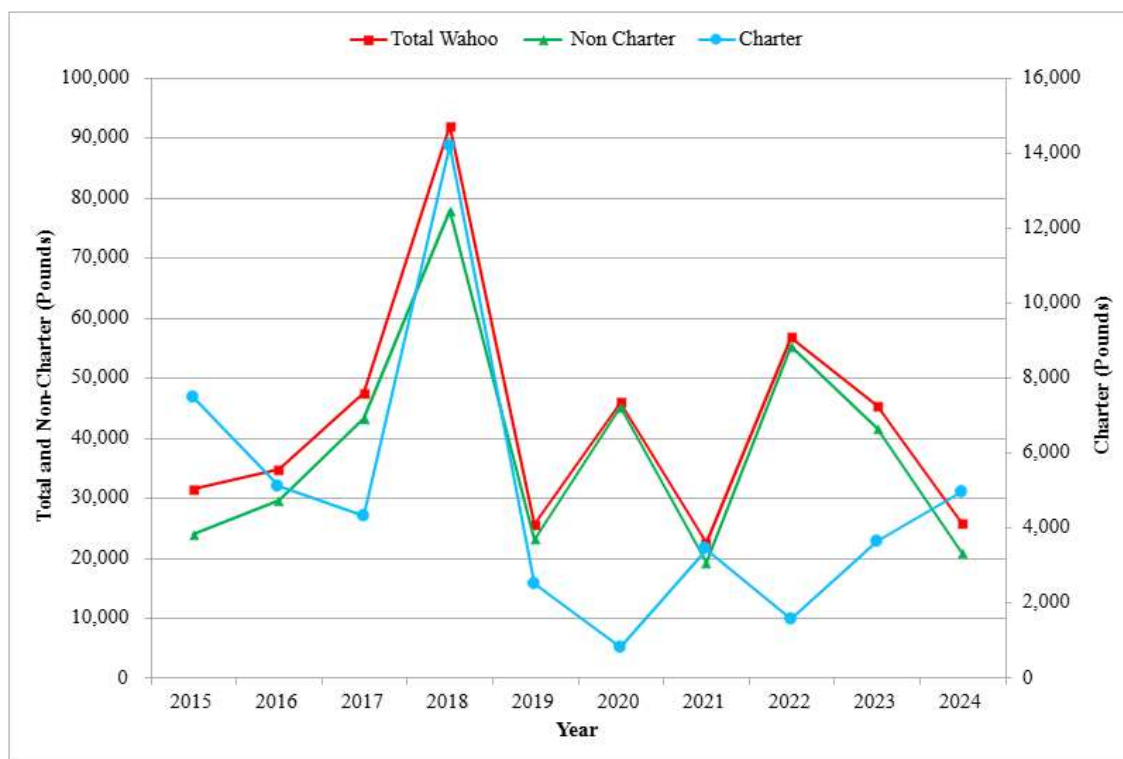


Figure 55. Total estimated landings for wahoo in Guam
Supporting data shown in Table A-56.

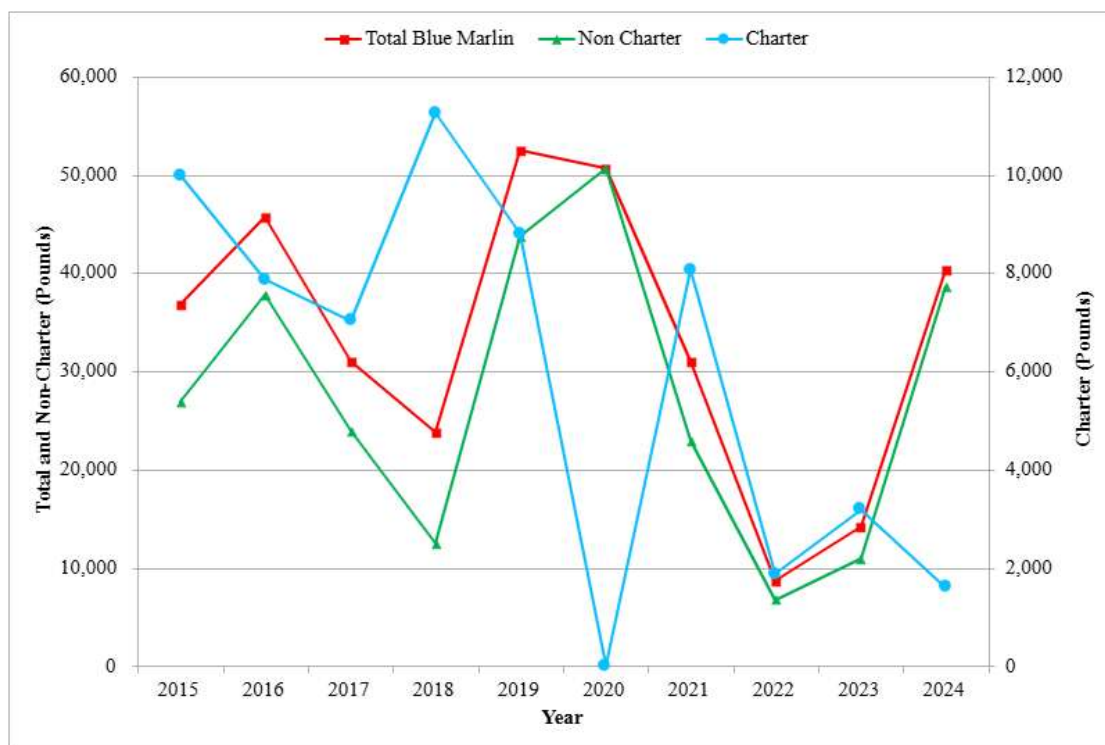


Figure 56. Total estimated landings for blue marlin in Guam
Supporting data shown in Table A-57.

Table 19. Bycatch summary for pelagic trolling fisheries in Guam

Year	Number Release	Percent Release	Number Kept	Number Caught	Charter
2015	0	0.0	6,864	6,864	F
2016	0	0.0	8,897	8,897	F
2017	0	0.0	6,371	6,371	F
2018	2	0.0	7,994	7,996	F
2019	150	2.0	7,335	7,485	F
2020	4	0.1	3,247	3,251	F
2021	14	0.2	7,785	7,799	F
2022	72	1.2	5,772	5,844	F
2023	94	1.4	6,607	6,701	F
2024	1,006	15.1	5,658	6,664	F
2015	0	0.0	445	445	T
2016	6	1.6	369	375	T
2017	0	0.0	235	235	T
2018	0	0.0	284	284	T
2019	0	0.0	315	315	T
2020	0	0.0	40	40	T
2021	0	0.0	174	174	T
2022	0	0.0	130	130	T
2023	1	0.7	143	144	T
2024	5	4.7	101	106	T

Table 20. Bycatch species summary for pelagic trolling fisheries in Guam

Year	Species	Number Release	Percent Release	Number Kept	Number Caught	Charter
2018	Wahoo	1	0.2	568	569	F
2018	Yellowfin Tuna	1	0.3	344	345	F
2019	Skipjack Tuna	148	2.5	5,864	6,012	F
2019	Yellowfin Tuna	2	0.4	531	533	F
2020	Mahimahi	4	1.9	204	208	F
2021	Skipjack Tuna	10	0.2	6,724	6,734	F
2021	Yellowfin Tuna	4	0.5	775	779	F
2022	Blue Marlin	1	11.1	8	9	F
2022	Mahimahi	6	2.9	200	206	F
2022	Skipjack Tuna	65	1.3	5,062	5,127	F
2023	Mahimahi	1	0.4	256	257	F
2023	Skipjack Tuna	67	1.3	5,268	5,335	F
2023	Wahoo	4	1.4	290	294	F

Year	Species	Number Release	Percent Release	Number Kept	Number Caught	Charter
2023	Yellowfin Tuna	22	3.1	694	716	F
2024	Blue Marlin	9	34.6	17	26	F
2024	Mahimahi	13	1.7	746	759	F
2024	Other Tuna PMUS	47	100.0	0	47	F
2024	Skipjack Tuna	859	16.6	4,315	5,174	F
2024	Wahoo	3	3.1	93	96	F
2024	Yellowfin Tuna	75	14.3	450	525	F
2016	Mahimahi	3	2.1	141	144	T
2016	Skipjack Tuna	3	2.5	116	119	T
2023	Skipjack Tuna	1	1.1	92	93	T
2024	Blue Marlin	4	80.0	1	5	T
2024	Mahimahi	1	1.8	55	56	T

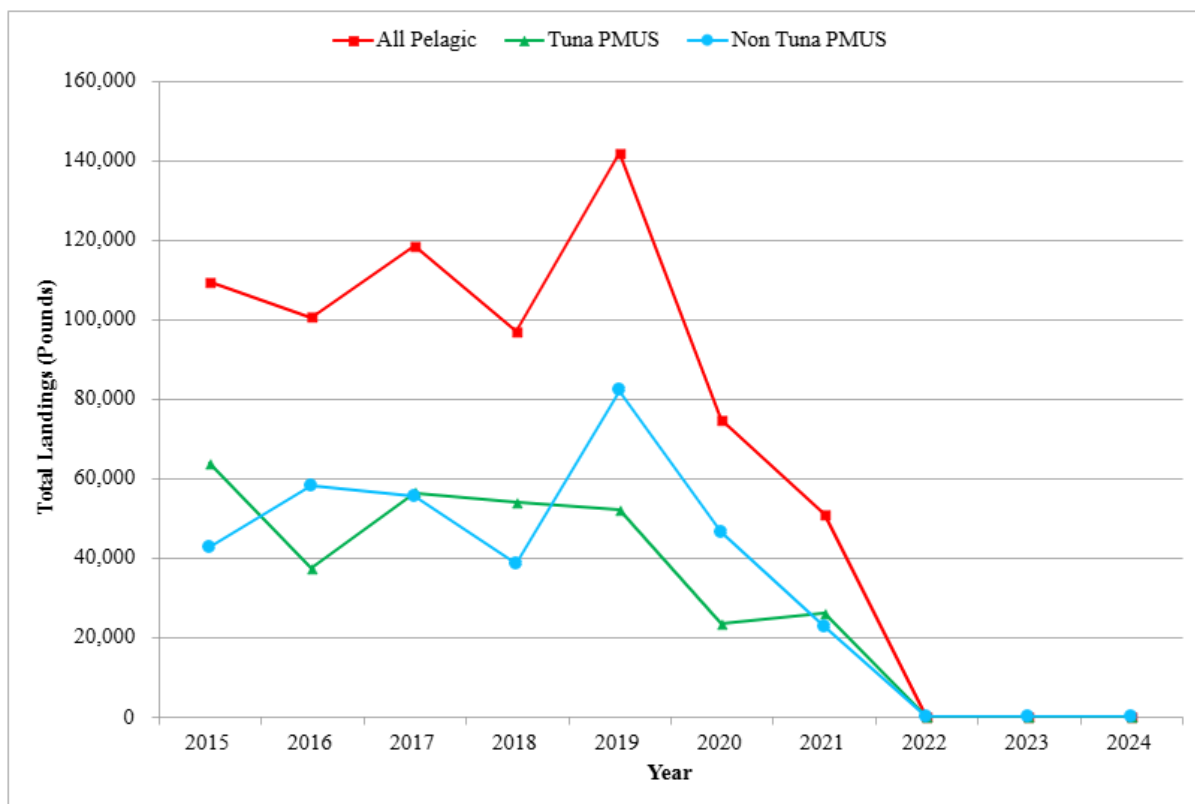


Figure 57. Commercial purchase landings for all pelagics, tuna PMUS, and non-tuna PMUS in Guam

Supporting data shown in Table A-58.

2.3.6 OVERVIEW OF EFFORT AND CPUE

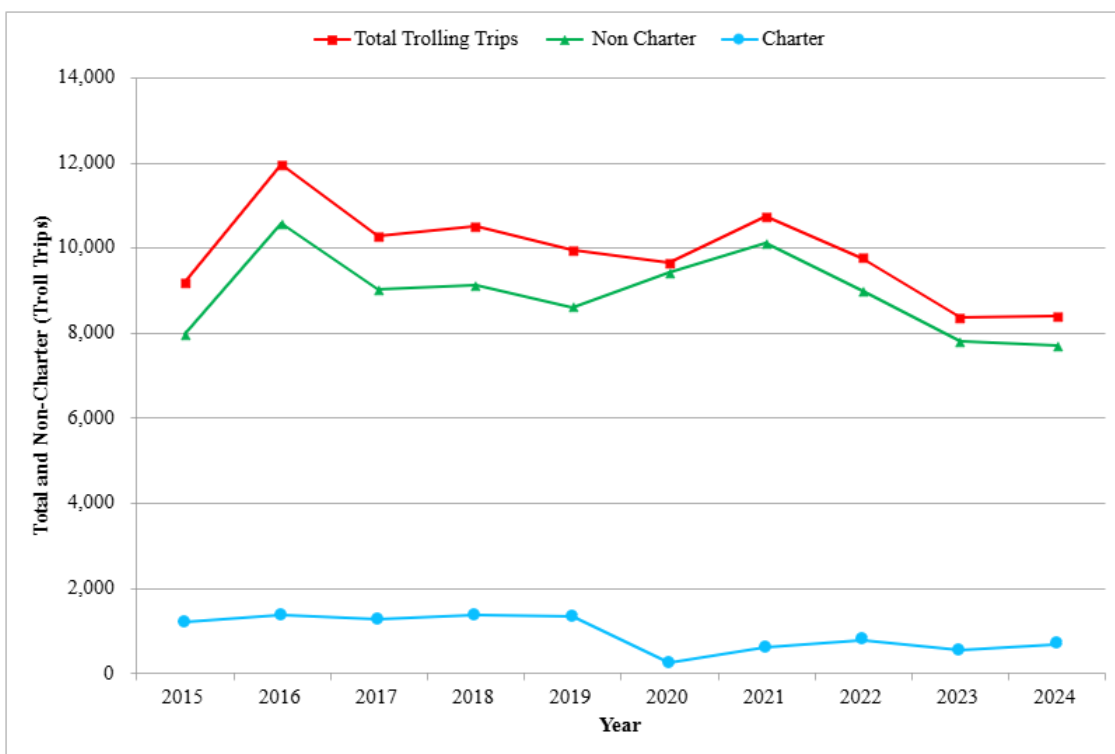


Figure 58. Estimated number of trolling trips from boat-based creel surveys in Guam Supporting data shown in Table A-59.

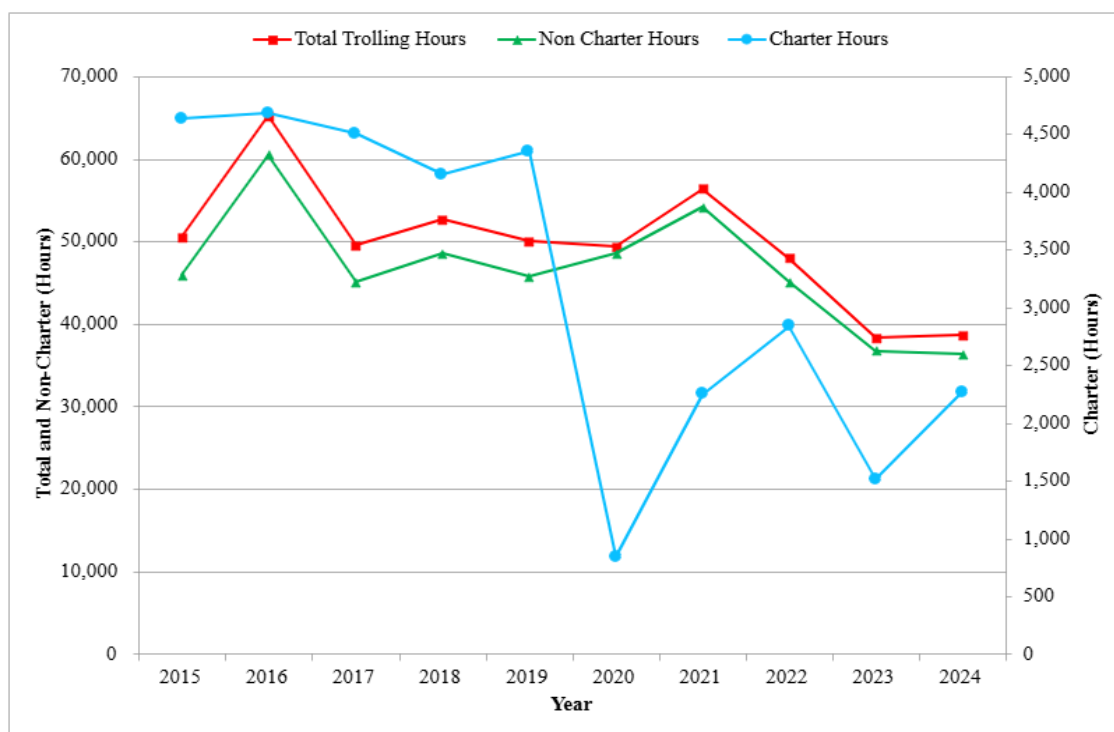


Figure 59. Estimated number of trolling hours from boat-based creel surveys in Guam Supporting data shown in Table A-60.

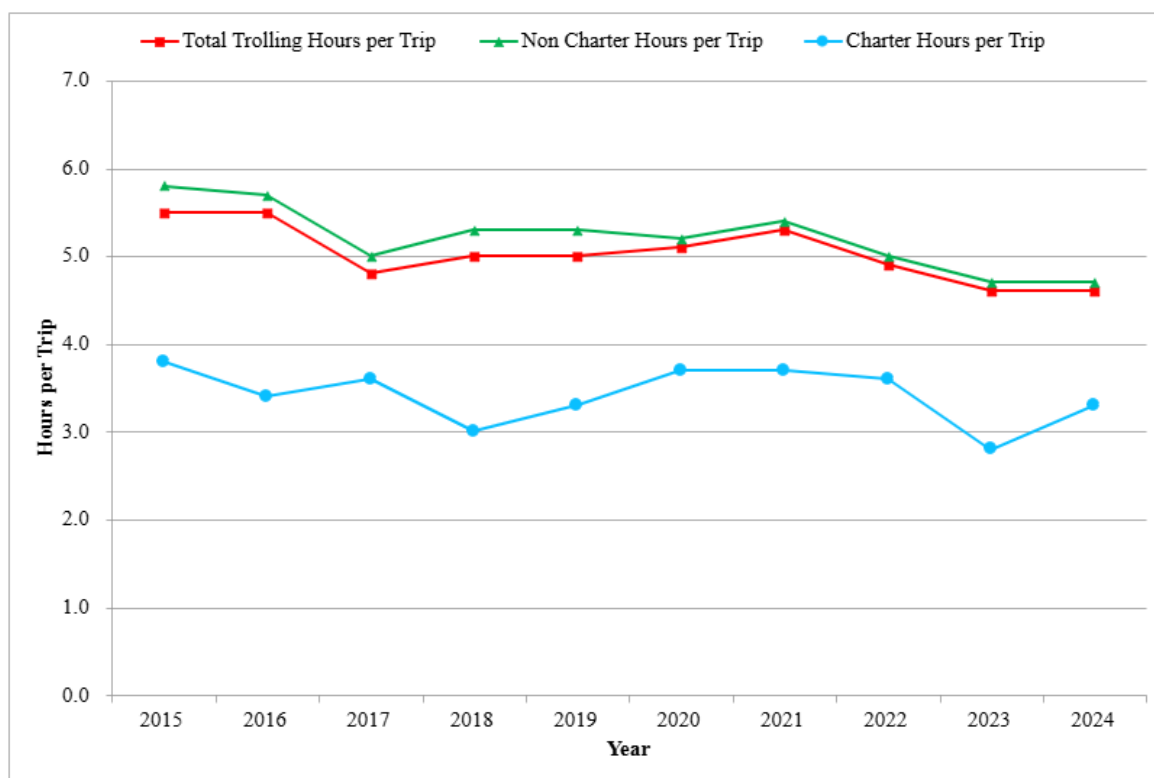


Figure 60. Estimated fishing trip length (hr/trip) from boat-based creel surveys in Guam
Supporting data shown in Table A-61.

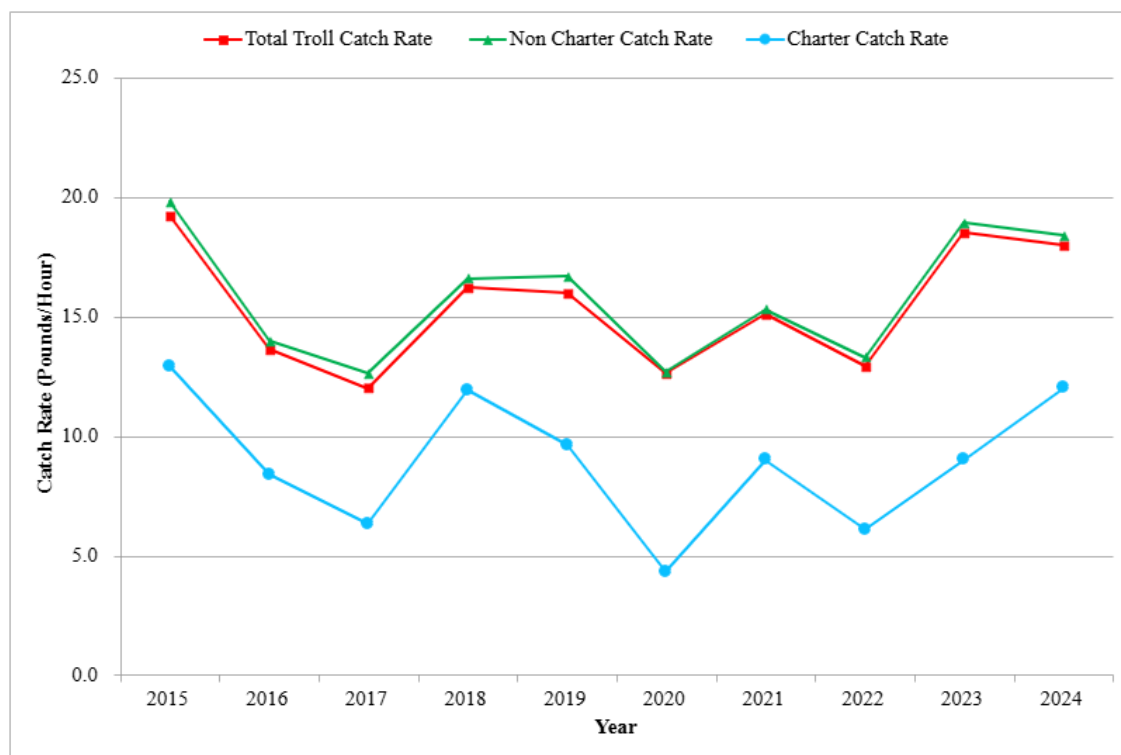


Figure 61. Estimated total trolling catch rates (lb/hr) in Guam
Supporting data shown in Table A-62.

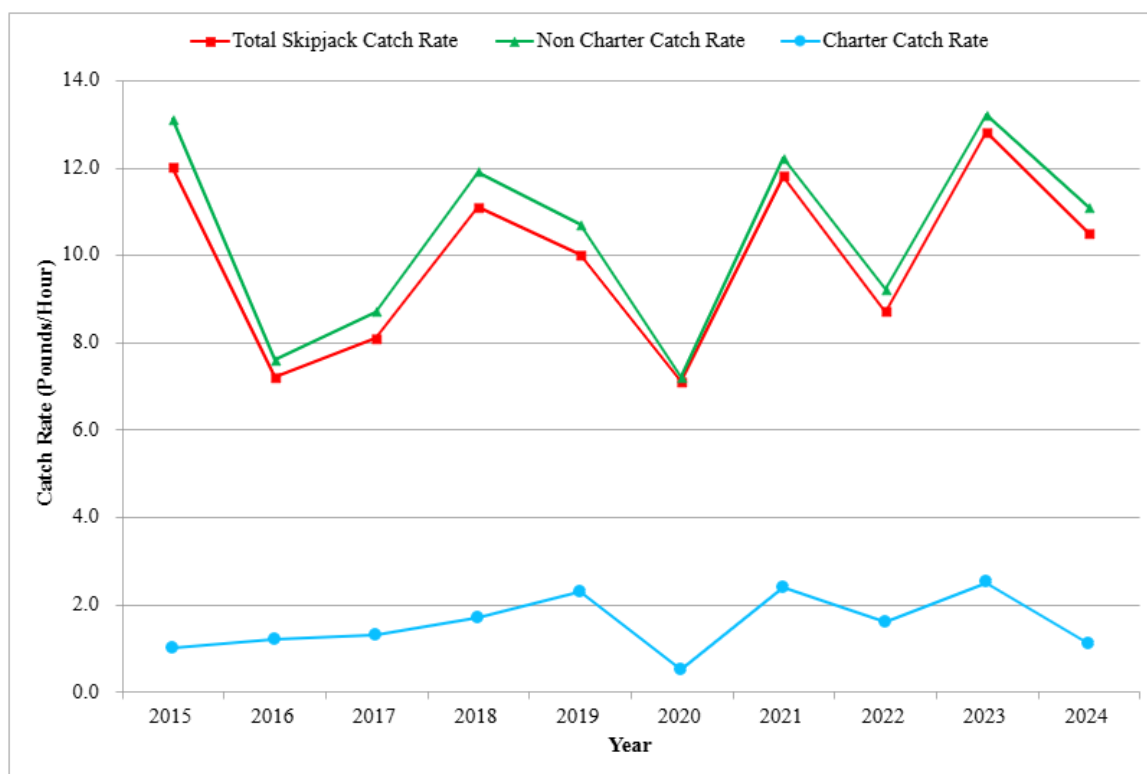


Figure 62. Estimated trolling catch rates (lb/hr) for skipjack tuna in Guam
Supporting data shown in Table A-63.

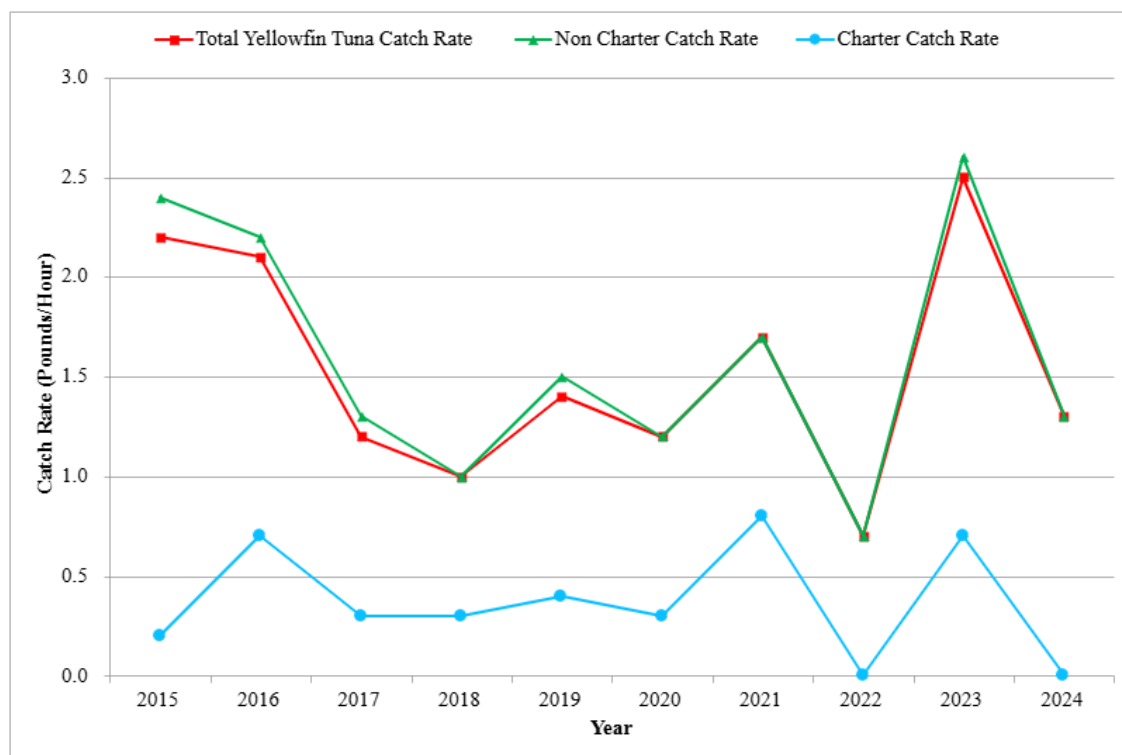


Figure 63. Estimated trolling catch rates (lb/hr) for yellowfin tuna in Guam
Supporting data shown in Table A-64.

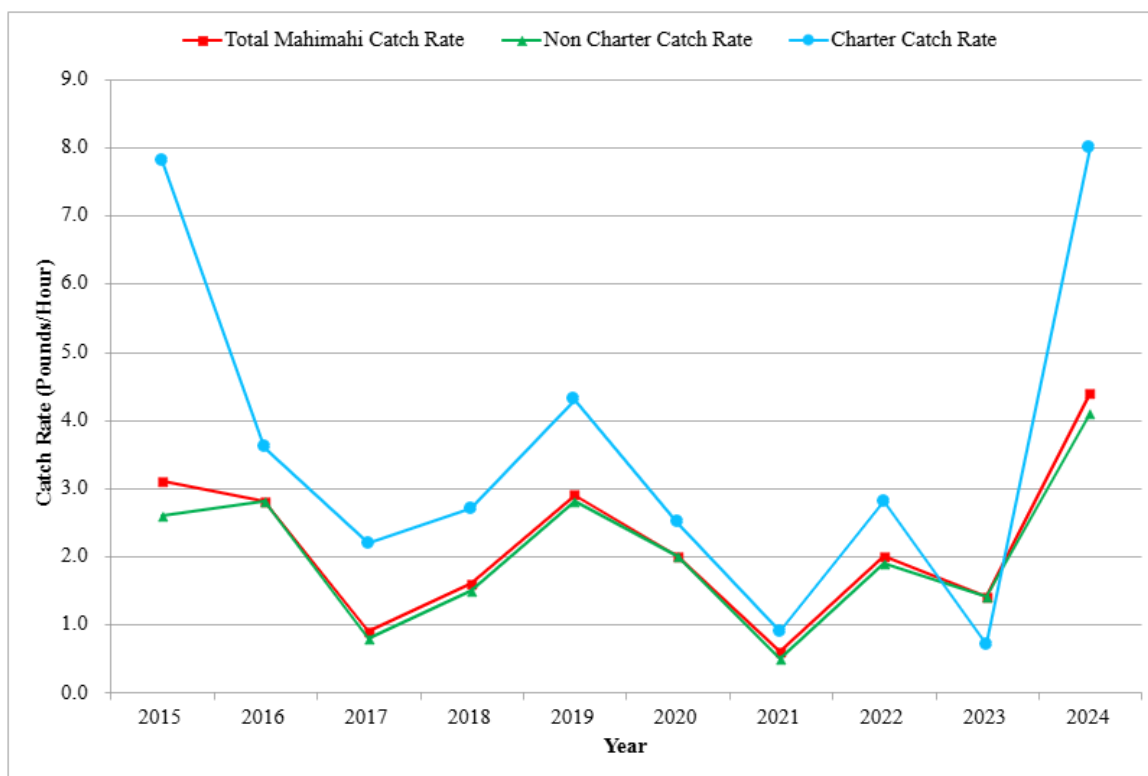


Figure 64. Estimated trolling catch rates (lb/hr) for mahimahi in Guam
Supporting data shown in Table A-65.

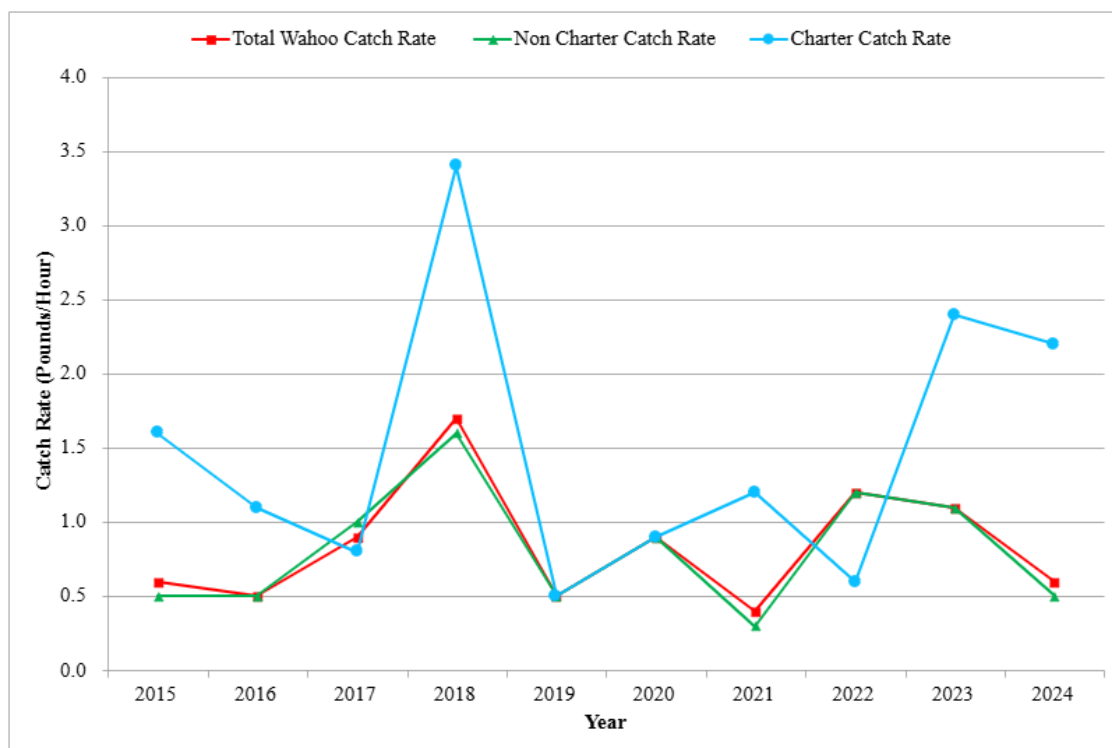


Figure 65. Estimated trolling catch rates (lb/hr) for wahoo in Guam
Supporting data shown in Table A-66.

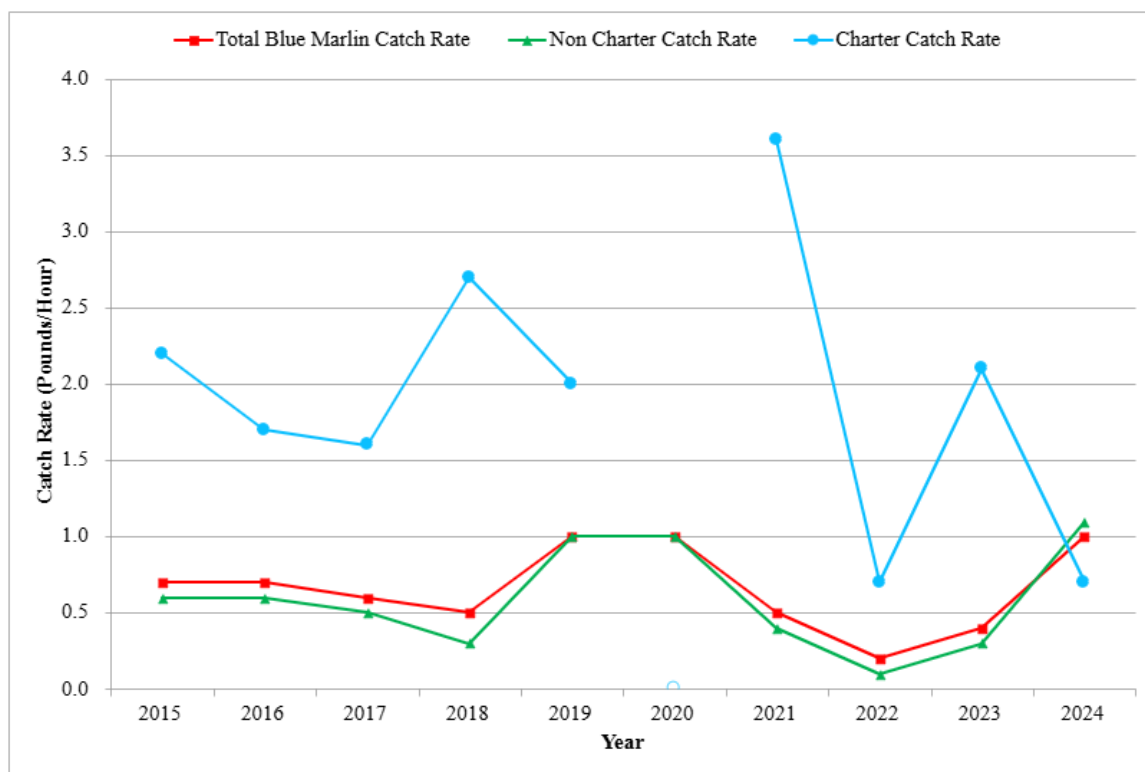


Figure 66. Estimated trolling catch rates (lb/hr) for blue marlin in Guam
Supporting data shown in Table A-67.

2.4 HAWAII

2.4.1 DATA SOURCES

This report summarizes catch, effort, size composition, and revenue data for recent years for Hawaii's commercial pelagic fisheries. Any fisherman who takes marine species in Hawaii for commercial purposes are required to have an HDAR Commercial Marine License (CML). Hawaii fishery data are compiled from the following NOAA fisheries and State of Hawaii sources:

- a. Hawaii small boat fisheries:
 - State of Hawaii Division of Aquatic Resources (DAR) Commercial Fisherman's Catch Reports (catch and effort).
 - State of Hawaii DAR Commercial Marine Dealer Reports (landings, revenue, and size composition).
 - HDAR Commercial Marine License (licenses).
- b. Hawaii longline fisheries:
 - State of Hawaii DAR Commercial Marine Dealer Reports (landings, revenue, and size composition).
 - NMFS federal longline paper and electronic logbooks (catch and effort).
 - Pacific Islands Region Observer Program data (bycatch estimates).
 - HDAR Commercial Marine License (licenses).

Pelagic species are caught in Hawaii by large-scale longline fisheries targeting tunas (*Thunnus* spp.) and swordfish (*Xiphias gladius*) and small boat fisheries targeting various tunas, marlins (striped marlin-*Kajikia audax*, black marlin-*Istiompax indica*, Indo-Pacific blue marlin-*Makaira mazara*), and other pelagic species (mahimahi-*Coryphaena hippurus*, wahoo-*Acanthocybium solandri*, shortbill spearfish-*Tetrapturus angustirostris*). These fisheries are described in more detail below.

Hawaii Longline Fisheries. The Hawaii longline fishery has two fishery sectors: a deep-set defined by >15 hooks set between floats that targets bigeye tuna and a shallow-set sector with <15 hooks set between floats that targets swordfish. Prior to departure, longline vessel operators are required to declare whether they will be participating in a deep-set or shallow-set trip. Generally, Hawaii-permitted vessels operate out of Honolulu; however, some vessels operate from California for some trips. In addition, a few longline vessels are California-permitted and operate solely out of California. Typically there are fewer than three vessels in a given year that are California-permitted, as such, these data are often confidential and are aggregated with Hawaii-permitted vessel data. For simplicity the aggregated California- and Hawaii-permitted longline fisheries are referred to as Hawaii longline fisheries thus forward.

Historically, longline catch and effort statistics include bigeye tuna catch attributed to U.S. territories of CNMI, Guam, or American Samoa. As of 2024, the WCPFC CMM 2023-01 removed the authority to approve territorial allocations of bigeye tuna and the U.S. catch limits of bigeye tuna were increased from 3,554 t to 6,554 t.

Revenue and average price are derived by integrating State of Hawaii DAR Commercial Marine Dealer Reports and NMFS federal longline logbooks.

Catch when reported by weight (lb) is estimated from the product of the number of fish retained as reported on fishers logbooks and the mean whole fish weight estimated from size composition data, primarily derived from landing data from Hawaii DAR Commercial Marine Dealer Reports. Dealers report weights (in pounds to nearest tenth of a weight) for landed whole and processed fish (e.g., gilled and gutted) by species for individual fish or aggregated with multiple fish per record; a conversion factor is applied to estimate whole weights for processed fish. In 2024, methodology for estimating weights was updated for dealer reports and these updates applied retroactively for affected years. Weight records (for certain species at particular size thresholds) with no associated processing condition now correctly have conversion factors applied to estimate round weights. These changes have resulted in higher average weights and thus higher total catch estimates for some species (e.g., billfish species) for previous years data.

For each species where size data are available by trip, a trip-specific mean weight is used to convert the number of fish caught to weight. For species where size data are not available by trip, mean weights are estimated from trip data aggregated by area, month of landing, and fishery sector (deep- or shallow-set) for species with weight data available for at least 20 fish within the area-month-sector category. If fewer than 20 fish are available for a species in an area-month-sector category, then average weights are estimated quarterly, annually, or across area-sectors, or using other reference weights. For California-based trips, size composition data may be derived from Pacific Islands Region or West Coast Region observer data or Hawaii DAR landings.

To estimate annual average weights by species for the deep- and shallow-set longline fisheries, the total estimated kept catch weight (lb) for the year was divided by the total number of fish recorded as kept in the logbooks for that year.

Hawaii Small Boat Fisheries. Hawaii small boat catch, effort, and size composition data are derived from the State of Hawaii DAR Commercial Fisherman's Catch Reports, which are required for all fishing trips for fishers that are commercially permitted, including charter fishers, no matter if fish are being sold on a trip. However, if small boat fishing trips are performed solely for subsistence, personal use, or recreational purposes and a fisher is not commercially permitted, then no catch reports are required. Catch (kept) is reported in weight (lb) by fishers and is used for reporting for the Hawaii small boat fishery in this document. Revenue and average price are derived by integrating State of Hawaii DAR Commercial Marine Dealer Reports with State of Hawaii DAR Commercial Fisherman's Catch Reports.

Hawaii small boat fishers catch pelagic species around the main Hawaiian Islands or offshore using various methods, often using multiple gear types on the same trip. Data are aggregated for reporting into the categories of: **Main Hawaiian Islands (MHI) Troll, MHI Handline, Offshore Handline, and Other Gear**. These broad categories were created to account for all landings of pelagic species, including those occasionally caught or misreported by fishers using gear not typically targeting pelagic fish (e.g., the deep-sea handline, a gear used primarily to target bottomfish is included in the MHI troll fishery category). The MHI troll fishery typically targets tuna, marlins and other PMUS, the MHI handline fishery targets yellowfin tuna, and the offshore handline fishery targets bigeye tuna. Catch and effort data

for a fishing trip that catch PMUS are summarized into a particular category based on the specific fishing method and HDAR statistical area defined below

- **Main Hawaiian Islands (MHI) Troll Fishery:**
 - *Gears:* Miscellaneous Trolling Methods (6), Lure Trolling (61), Bait Trolling (62), Stick Trolling (63), Casting, Light Tackle, Spinners or Whipping (10) and Hybrid Methods (97).
 - *HDAR statistical areas:* 100 through 642. These areas cover the ocean from the shoreline out to the 20-minute latitude and longitude grid squares around the islands of Hawai‘i, Maui, Kaho‘olawe, Lana‘i, Moloka‘i, O‘ahu, Kaua‘i, and Ni‘ihau.
- **MHI Handline Fishery:**
 - *Gears:* Deep Sea or Bottom Handline Methods (3), Inshore Handline or Cowrie Shell (Tako) Methods (4), Kaka line (5), Ika-Shibi (8), Palu-Ahi, Drop Stone or Make Dog Methods (9), Drifting Pelagic Handline Methods (35) and Floatline Methods (91).
 - *HDAR statistical areas:* 100 to 642 except areas 175, 176, and 181.
- **Offshore Handline Fishery:**
 - *Gears:* Ika-Shibi (8), Palu-Ahi, Drop Stone or Make Dog Methods (9), Drifting Pelagic Handline Methods (35), Miscellaneous Trolling Methods (6), Lure Trolling (61), Hybrid Methods (97), and Deep Sea or Bottom Handline Methods (3).
 - *HDAR statistical areas:* 15217 (NOAA Weather Buoy W4), 15717 (NOAA Weather Buoy W2), 15815, 15818 (Cross Seamount) , 16019 (NOAA Weather Buoy W3), 16223 (NOAA Weather Buoy W1), 175, 176, 181, 804, 807, 816, 817, 825, 839, 842, 892, 893, 894, 898, 900, 901, 15416, 15417, 15423, 15523, 15718, 15918, 15819, and 16221, and 16223.
- **Other Gear:**
 - PMUS caught by methods or in HDAR statistical areas not specified within another category, including: Aku boat fishing; trolling in areas outside of the MHI (e.g., distant water albacore troll fishery); shortline fishing; fishing close to shore by diving, spearfishing, squidding; or netting inside of the MHI.

2.4.2 SUMMARY OF HAWAII PELAGIC FISHERIES

Effort, catch, catch per unit effort (CPUE), size composition, revenue, and bycatch data are summarized for the main pelagic fisheries (deep-set and shallow-set longline, MHI troll, MHI handline, and offshore handline).

Participation:

A total of 2,997 fishermen were licensed in 2024 by HDAR, including 59% (1,775) who indicated that their primary fishing method and gear were intended to catch pelagic fish (Table 21). There was a 4% decrease in total fishing licenses issued from the previous year, but <2% decrease in fishing licenses with the primary method intended to target pelagic fish. The primary licenses issued were for longline (52%), trolling (28%), and handline methods (ika shibi and palu ahi, 11%).

Effort:

Longline: In 2024, the Hawai'i-permitted deep-set longline fishery had 150 active vessels, 1,635 trips, and 65.9 million hooks set with effort similar to 2023 but with a slight overall increase in the last 10 years (Figure 87). The Hawai'i-permitted shallow-set longline fishery had 21 vessels, 54 trips, and 1.1 million hooks set with a decline in trips and vessels in 2024 (Figure 93). The shallow-set fishery mainly operates in the first half of the year.

For the deep-set longline fishery, there was not much change in 2024 in total hooks set. However, there was a decline in fishing outside the EEZ, where the majority of fishing occurs and an increase in fishing in the Hawaii EEZ. (Figure 88). For the shallow-set longline fishery, there was an increase in total hooks set and hooks set outside the EEZ, which is where almost all hooks are set. This continues the trend of an increase in total and hooks set outside the EEZ since 2019 for the shallow-set fishery (Figure 94).

Hawaii Small Boat Fisheries: In 2024, 1,042 fishers participated in the MHI troll fishery with 12,396 days fished, 327 fishers participated in the MHI handline fishery with 2,632 days fished, and 5 fishers participated in the offshore handline fishery with 140 number of days fished.

Catch:

Hawaii pelagic catch (kept) is shown for each PMUS or group by the gear or catch composition (Figure 67 – Figure 86). Hawaii commercial fisheries caught and landed 33.6 million pounds of pelagic species in 2024, an 8.5% increase from the previous year (Table 22). The large majority of Hawaii pelagic catch is tuna, followed by billfish and then other PMUS with catch of all three of these species groups increasing in 2024 (Figure 67). The vast majority of the pelagic catch is from the deep-set longline fishery (87%) with an increase in 2024 to 29.4 million pounds (Table 23; Figure 68) driving the increasing trends in overall Hawaii pelagic catch. The shallow-set longline fishery and MHI troll fisheries catch similar proportions of the total Hawaii pelagic catch with the smallest proportions composed of the MHI and offshore handline and other gear fisheries (Figure 68). In 2024, the shallow-set longline fishery caught (5%) 2.0 million pounds, the MHI troll fishery (4%) 1.3 million pounds, and the MHI and offshore handline and other fisheries (3.4%) 1.1 million pounds of pelagic catch (Table 23).

Tuna: The largest component of the pelagic catch was tunas, comprising 75% of catch in 2024 with an increase from 2023 (Table 22). The deep-set longline fishery dominated the tuna catch with small proportions of tuna catch from the MHI troll and handline fisheries (Figure 69). The largest proportion of tuna catch was bigeye tuna accounting for 41% of all pelagic catch followed by yellowfin tuna with much smaller proportions of albacore and skipjack tuna (Table 22; Figure 70). In 2024, there was an increase in total tuna catch driven by increases in yellowfin tuna (Figure 70). Almost all the bigeye tuna catch was from the deep-set longline fishery with a small proportion from the offshore handline fishery with an overall decline in bigeye tuna catch in 2024 (Figure 71). The vast majority of yellowfin tuna catch is from the deep-set longline fishery, which has been increasing since 2020 (Figure 72). Similar proportions of yellowfin tuna are caught by MHI troll and MHI handline fisheries. In 2024, there were differing trends in skipjack tuna catch in the two dominant fisheries with increases in the deep-set longline fishery and decreases in the MHI troll fishery (Figure 73).

The deep-set longline fishery dominates the Hawaii catch of albacore and had a sharp increase in 2023 followed by a decline in 2024 but with the catch still above the 10-year average (Figure 74). A small proportion of albacore catch is from the MHI troll fishery with an increase in 2024 (Figure 74).

Billfish: Billfish catch comprised 18% of total catch in 2024 (Table 22). The proportion of total billfish catch from the shallow- and deep-set longline fisheries was generally similar in the last 10 years. In 2024, the deep-set longline fishery outperformed the shallow-set fishery with increased billfish catch while the shallow-set billfish catch decreased (Figure 75). A small proportion of total billfish catch was from the MHI troll fishery (Figure 75). Swordfish catch dominates the billfish catch composition comprising 7% of total pelagic catch; in 2024 swordfish catch declined (Figure 76; Table 22). Blue marlin, then striped marlin compose the next highest proportions of billfish catch with both increasing in 2024. Spearfish catch remained steady in 2024 (Figure 76). The majority of swordfish catch is from the shallow-set longline fishery followed by the deep-set longline fishery with declines in catch for both fisheries (Figure 77). Blue marlin catch is dominated by the deep-set longline fishery with a steep increase in 2024 with some catch from the MHI troll fishery with a slight increase in 2024 (Figure 78). Striped marlin catch, mostly by the deep-set longline fishery, increased in 2024 to the highest level in ten years (Figure 79).

Other PMUS: Catches of Other PMUS represented 8% of the total pelagic catch in 2024 (Table 22). The majority of Other PMUS catch is from the deep-set longline fishery with the MHI troll fishery also catching a notable proportion of PMUS (Figure 80). All Other PMUS had an overall decline in catch in the last 10 years (Figure 81). The largest proportion of Other PMUS catch was composed of ono (wahoo) with 8% of total pelagic catch (Table 22) and an increase in catch in the last 2 years, followed by mahimahi with a slight decline in 2024 (Figure 81). Opah and pomfrets composed similar proportions of overall Other PMUS catch (Figure 81). All opah catch was from the deep-set longline fishery with a dramatic decline in catch in the last 10 years (Figure 82). Similar proportions of mahimahi are caught from the deep-set and MHI troll fisheries with a decline in 2024 (Figure 83). The majority of ono catch is from the deep-set longline fishery with a steep increase since 2022 and a notable proportion of catch by the MHI troll fishery (Figure 84). Almost all pomfret catch is from the deep-set longline fishery with a slight decline in 2024 (Figure 85). For retained PMUS sharks (shortfin mako and thresher sharks) there was a steep decline from 2015 to 2021. Since then comparatively small numbers have been retained in the deep-set fishery with almost no sharks retained in the shallow-set fishery (Figure 86).

Longline catch by area: Catch by species and area are shown for the deep-set and shallow-set longline fisheries for fishing locations within the Hawaii and Pacific Remote Islands Area (PRIA) EEZs, outside these EEZs, and for all areas (Table 24; Table 28). The majority of the deep-set longline catch occurred outside the EEZs (Table 24) with almost all of the shallow-set longline fishery catch outside the EEZs (Table 28).

Revenue (nominal):

The total nominal revenue from Hawai'i's pelagic fisheries was \$110.8 million in 2024 a 7% decline from 2023 (\$119.4 million) (Table 22). The average price per pound continued to drop with a 19% decline in 2024 with an average of \$2.81 compared to \$3.47 in 2023. In

2024, nominal revenue from tuna was \$93.9 million or 85% of the total pelagic nominal revenue with bigeye tuna (\$56.3 million) and yellowfin tuna (\$36.2 million) representing 51% and 33%. In 2024, billfish contributed \$8.4 million, 8% of the total pelagic revenue with swordfish accounting for \$5,550, 5% of the total pelagic revenue.

In 2024, the deep-set longline generated the vast majority (88%) of the pelagic revenue with \$98.4 million while the shallow-set longline fishery generated \$4.5 million, 4% of the total pelagic revenue. The Hawaii small boat fisheries generated \$8.7 million, 8% of total pelagic revenue with the MHI troll at \$6.0 million (4% of the total pelagic revenue) and the gear types of MHI and offshore handline and other gears generating \$4.4 million (4% of the total pelagic revenue).

For the deep-set longline fishery, revenue followed trends with catch from 2015 to 2020 but after that differed. As catch increased in the last 2 years, revenue continued to decline due to the reduction in average price (Figure 89). For the shallow-set longline fishery, the revenue and catch have followed similar trends over time with a decline in both catch and revenue in 2024 (Figure 95).

Bycatch:

Longline Bycatch: Bycatch information is documented by observers in the Pacific Islands Region Observer Program (PIROP) and from fishers on NMFS federal longline logbooks. Fisheries observers provide information for fish species that are discarded, protected species interactions, length data for retained and discarded catch, and other data on vessel operations. Information on the number of fish retained and released and vessel operations are recorded by fishers on federal logbooks with 100% coverage. However, reporting may differ across fishers and species. The PIROP has historically had about 20% observer coverage for deep-set longline fishing trips; however, coverage of fishing trips dropped to 17% in 2023 and to 13% in 2024. The shallow-set longline fishery has maintained coverage rates of 100%.

Bycatch is estimated annually from PIROP data from trips with observer coverage. The top ten species discarded in the deep-set longline fishery derived from observer data can be found in Table 25 and can be divided into three main categories: nonmarketable fish, elasmobranch, and marketable fish. Seven of the top ten discards in the deep-set fishery also occurred in the shallow-set fishery with additional marketable fish species (Table 29). Variation in discards between deep-set and shallow-set longline fisheries may be due to differences in catch due to fishing locations, gear depth, and other operational factors. In both deep-set and shallow-set longline, fishers may prioritize hold space for the more valuable species and release small or damaged (e.g. shark or marine mammal damage) marketable fish.

In 2024, fishers reported on logbooks catching 553,804 fish in the deep-set longline fishery with 81% of catch retained and 19% released (Table 26) and 26,320 fish in the shallow-set longline fishery with 54% retained and 46% released (Table 30). The shallow-set longline fishery likely had a higher discard rate due to releasing more marketable fish with a prioritization of hold space for large swordfish and not retaining fish with a shorter shelf life, as this fishery typically has longer trips. The majority of releases were blue sharks with 74% of total catch in deep-set and 36% in shallow-set longline fishery. Note that on fisher

logbooks, oilfish and escolar are reported together as “oilfish” as some fishers may have difficulty differentiating between species. Both species may be retained or discarded depending on priorities. However, escolar, the species caught at higher catch rates, is more frequently retained.

CPUE:

Historically, the nominal CPUE was presented to show trends through time. However, changes to fishery operations (e.g. fishing location and time; hook depth, spacing, and soak time; bait; environmental factors; and particular fisher behaviors) may affect the CPUE and not reflect true changes in stock abundance.

Deep-set longline: The deep-set longline fishery CPUE for bigeye tuna continued an overall declining trend since 2015 with a slight decline in 2024 (2.3 fish/1000 hooks) compared to 2023 (2.5 fish/1000 hooks) (Figure 90). The 2024 yellowfin tuna CPUE (1.9 fish/1000 hooks) increased slightly from 2023 (1.3 fish/1000 hooks). While the 2024 albacore CPUE (0.2 fish/1000 hooks) declined slightly from 2023 (0.5 fish/1000 hooks). In 2024, there were sharp increases in blue and striped marlin CPUE (0.2 fish/1000 hooks for blue marlin and 0.4 fish/1000 hooks) from 2023 (0.1 fish/1000 hooks for blue marlin and 0.1 fish/1000 hooks for striped marlin) (Figure 91).

A substantial decline occurred with blue shark CPUE from 2020 to 2023 (Figure 92). In 2022, wire leaders were prohibited in the fleet, with some of the fleet voluntarily switching to monofilament leaders prior to the prohibition. The prohibition was implemented to reduce shark mortality as researchers observed sharks could bite through monofilament gear and free themselves more quickly and easily than if they were caught on wire leaders (Scott et al. 2022). However, there was a slight increase in blue shark CPUE from 2023 to 2024. All blue sharks recorded on logbooks in 2024 were reported by fishers as released.

Shallow-set longline: In 2024, the shallow-set longline fishery had an increase in bigeye tuna CPUE (Figure 96), differing from the decrease in the deep-set fishery (Figure 90). However, there was an increase in yellowfin tuna and albacore CPUE as seen with deep-set longline fishery. The shallow-set fishery CPUE for swordfish continued to follow the declining trend occurring since 2022 (Figure 97) with a 2024 CPUE of 7.1 fish/1000 hooks compared to the 2023 CPUE of 7.9 fish/1000 hooks. For blue sharks (all reported as released) the 2024 CPUE (8.0 fish/1000 hooks) was higher than the 2023 CPUE (6.3 fish/1000 hooks). Overall, the blue shark CPUE is higher in the shallow-set fishery compared to the deep-set longline fishery but has had a general decline in the last 10 years (Figure 98). However the blue shark CPUE increased in 2024 compared to 2023.

Hawaii small boat fisheries: The 2024 MHI troll fishery CPUE for yellowfin tuna was lower (27.9 fish/days fished) than 2023 (39.2 fish/days fished). While the skipjack tuna CPUE was similar in 2023 (16.6 fish/days fished) and 2024 (17.1 fish/days fished). The 2024 CPUE for blue marlin was higher (20.3 fish/days fished) compared to 2023 (13.2 fish/days fished). The mahimahi CPUE (25.4 fish/days fished in 2023 and 18.5 fish/days fished in 2024) was lower and the wahoo (ono) CPUE (12.4 fish/days fished in 2023 and 16.3 fish/days fished in 2024) was higher in 2024.

In 2024, the MHI handline fishery CPUE for yellowfin tuna (144.0 fish/days fished) was lower compared to 2023 (172.3 fish/days fished); however, was still relatively high compared to the CPUE for other species and fisheries. The 2024 albacore CPUE (24.2 fish/days fished) was much higher compared to 2023 (3.8 fish/days fished). The 2024 bigeye tuna CPUE was higher (8.9 fish/days fished) compared to 2023 (6.3 fish/days fished).

Fish Size:

The 2024 deep-set longline fishery average weights for all tuna species, with the exception of Pacific bluefin tuna, were above 10 year averages; all billfish species below, with the exception of sailfish; other PMUS of opah below, mahimahi above, and ono, pomfrets, and oilfish similar to the 10 year averages (Table 27).

The 2024 shallow-set longline fishery average weights for bigeye, skipjack, and bluefin tuna were above the 10 year averages, yellowfin tuna below, and albacore similar; swordfish above; striped and blue marlin and spearfish below; with Other PMUS species of mahimahi below, pomfrets above, and ono, opah, and oilfish above 10 year averages (Table 31).

The 2024 Hawaii troll and handline fisheries average weights were above the 10 year averages for bigeye, skipjack, and yellowfin tuna with the albacore average weight below. All billfish (blue and striped marlin and swordfish) were below 10 year average weights, and the Other PMUS of mahimahi and ono were above the 10 year average weights (Table 32).

2.4.3 PLAN TEAM RECOMMENDATIONS

While there were no Plan Team recommendations to the Council relevant to the Hawaii pelagic fisheries data module, the Pelagic Plan Team developed several associated work items, including:

- In 2025 and beyond, authors should consider removing presentation and discussion of CPUE for the Hawaii small boat pelagic fishery. Due to operations of the fisheries and the confounding catch and effort of different gear types, it is likely not a good representation for these fisheries.
- Regarding CPUE time series in the Annual SAFE Reports, Fishery Performance Section Authors will work with the PIFSC Stock Assessment Program to include standardized CPUE time series in the Annual SAFE Reports where possible alongside nominal CPUE. Nominal CPUE time series should come with narratives expressing the caveats with those data. Authors are to operate in conjunction with the existing Pelagic Plan Team Working Group on Bigeye Tuna CPUE. This work item is intended to develop guidelines on priority management unit species, timelines, the periodicity of CPUE standardization updates (i.e., with assessment cycles), defining metrics of effort, and contents of narratives that accompany standardized CPUE time series. Products are to be shareable within open science tools.

2.4.4 OVERVIEW OF PARTICIPATION – ALL FISHERIES

Table 21. Number of HDAR Commercial Marine Licenses

Primary Fishing Method	Number of licenses	
	2023	2024
Trolling	532	502
Longline	912	924
Ika Shibi & Palu Ahi	353	341
Aku Boat (Pole and Line)	6	8
Total Pelagic	1803	1775
Total All Methods	3132	2997

2.4.5 OVERVIEW OF LANDINGS AND ECONOMIC DATA

Table 22. Hawaii commercial pelagic catch, revenue, and price by species

Species	2023			2024		
	Catch (1,000 lbs)	Revenue (\$1,000)	Price (\$/lb)	Catch (1,000 lbs)	Revenue (\$1,000)	Price (\$/lb)
Tuna PMUS						
Skippack tuna	396	\$718	\$2.96	548	\$503	\$1.82
Albacore	1,127	\$868	\$1.30	608	\$907	\$1.66
Yellowfin tuna	7,358	\$28,921	\$4.48	10,117	\$36,193	\$4.20
Bigeye tuna	14,526	\$67,558	\$5.75	13,776	\$56,261	\$4.88
Bluefin tuna	4	\$42	\$10.91	6	\$29	\$7.37
Other tunas	4	\$32	\$5.03	4	\$14	\$4.03
SubTotal	23,415	\$98,139	\$5.07	25,059	\$93,907	\$4.01
Billfish PMUS						
Blue marlin	1,069	\$2,018	\$2.68	1,839	\$1,410	\$1.33
Striped marlin	503	\$1,275	\$2.78	1,420	\$1,056	\$0.99
Swordfish	2,691	\$8,087	\$4.19	2,248	\$5,550	\$3.59
Spearfish	445	\$625	\$1.48	400	\$393	\$1.18
Other marlins	50	\$56	\$1.88	58	\$22	\$0.63
SubTotal	4,759	\$12,060	\$2.60	5,965	\$8,430	\$1.55
Other PMUS						
Species	2023			2024		
	Catch (1,000 lbs)	Revenue (\$1,000)	Price (\$/lb)	Catch (1,000 lbs)	Revenue (\$1,000)	Price (\$/lb)
Opah (moonfish)	505	\$1,273	\$3.83	290	\$773	\$3.54
Pomfrets (monchong)	366	\$1,959	\$4.67	346	\$2,042	\$5.02
Ono (wahoo)	903	\$2,646	\$3.26	1,276	\$3,039	\$2.76
Oilfish	131	\$228	\$1.72	104	\$189	\$1.53
Mahimahi	897	\$3,079	\$3.88	571	\$2,369	\$4.67
PMUS Sharks	8	\$0	\$0.00	5	\$0	\$0.00
SubTotal	2,810	\$9,185	\$2.89	2,593	\$8,411	\$2.92
Other Pelagics						
Other Pelagics	3	\$8	\$1.67	3	\$2	\$1.33
Total	30,988	\$119,392	\$3.47	33,621	\$110,750	\$2.81

Table 23. Hawaii commercial pelagic catch, revenue, and price by fishery

	2023			2024		
	Catch (1,000 lbs)	Revenue (\$1,000)	Price (\$/lb)	Catch (1,000 lbs)	Revenue (\$1,000)	Price (\$/lb)
Deep-set longline	26,057	\$101,310	\$4.85	29,400	\$98,379	\$4.09
Shallow-set longline	2,215	\$6,834	\$4.19	1,979	\$4,536	\$3.44
MHI trolling	1,603	\$6,093	\$4.32	1,323	\$4,263	\$3.91
MHI handline	573	\$2,712	\$4.60	508	\$2,186	\$4.15
Offshore handline	348	\$1,573	\$3.62	180	\$517	\$3.21
Other gear	383	\$1,739	\$3.86	461	\$1,739	\$3.94
Total	31,179	\$120,262	\$4.24	33,852	\$111,619	\$3.79

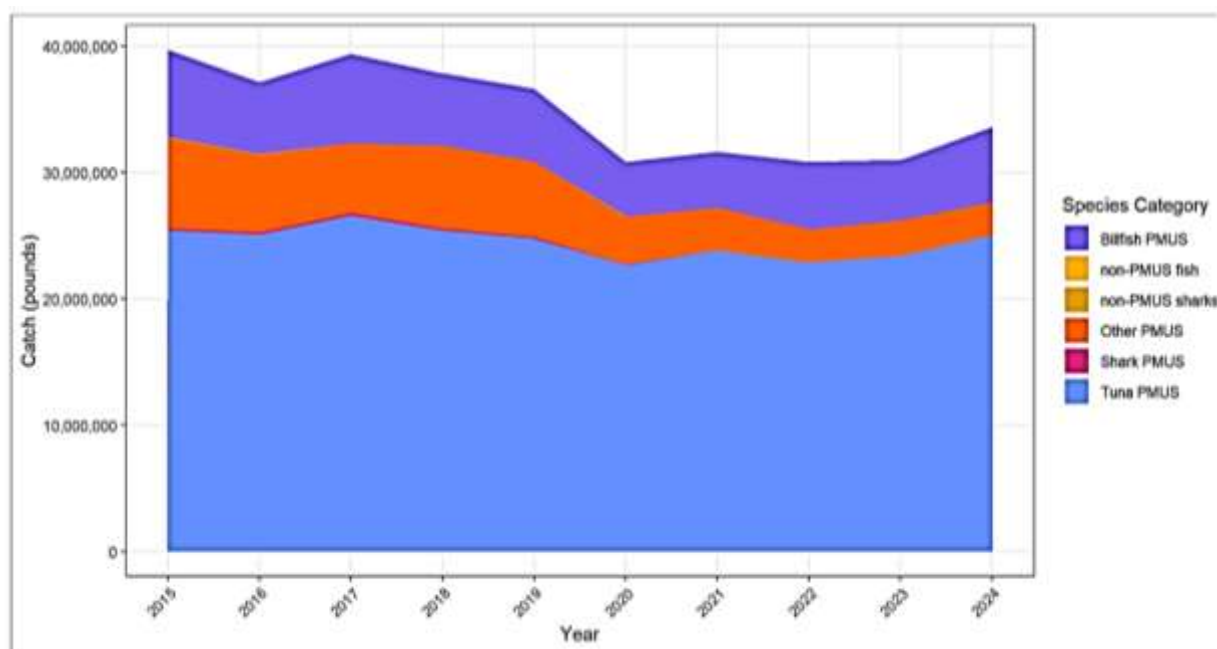


Figure 67. Hawaii commercial tuna, billfish, other PMUS and PMUS shark catch
Supporting data shown in Table A-68.

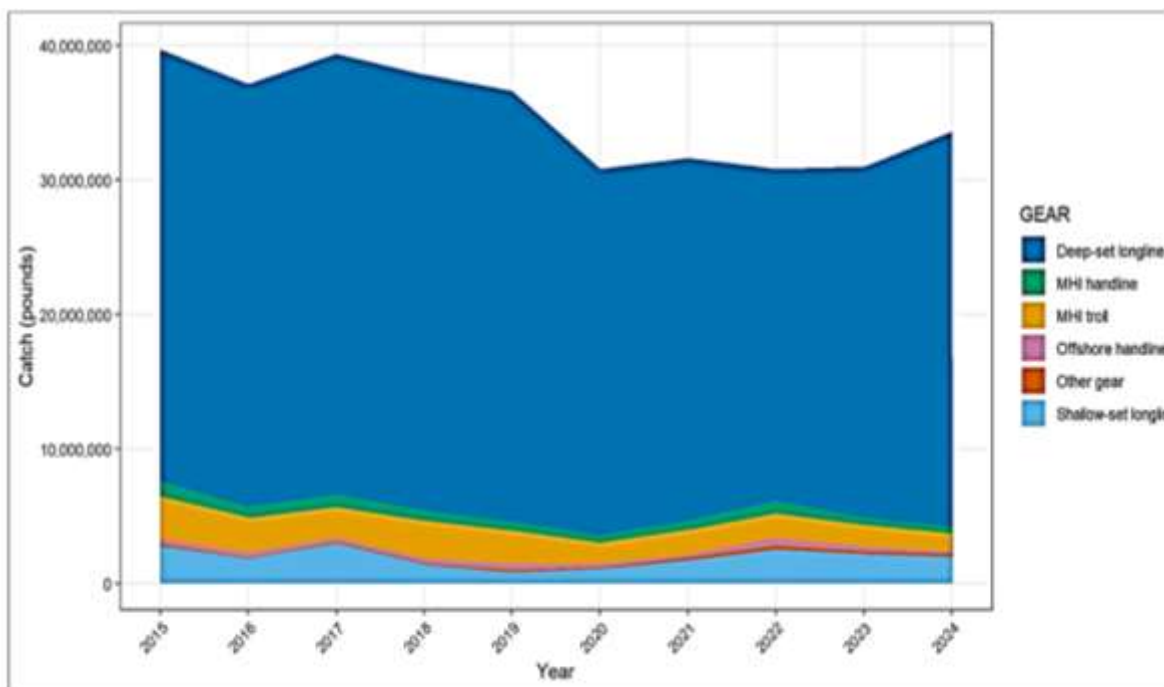


Figure 68. Total commercial pelagic catch by gear type
Supporting data shown in Table A-69.

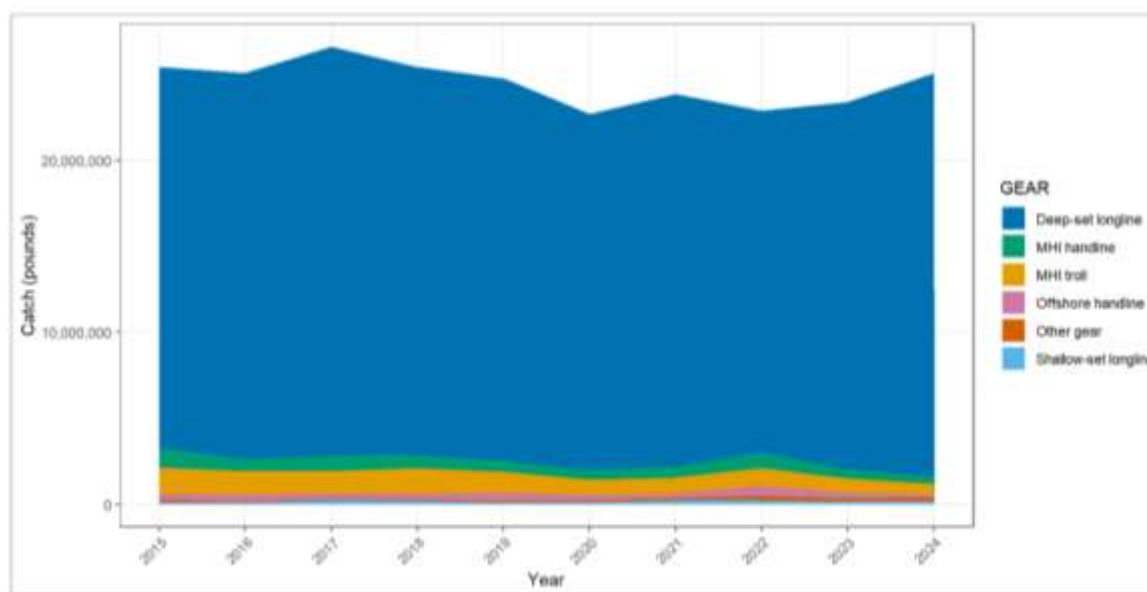


Figure 69. Hawaii commercial tuna catch by gear type
Supporting data shown in Table A-70.

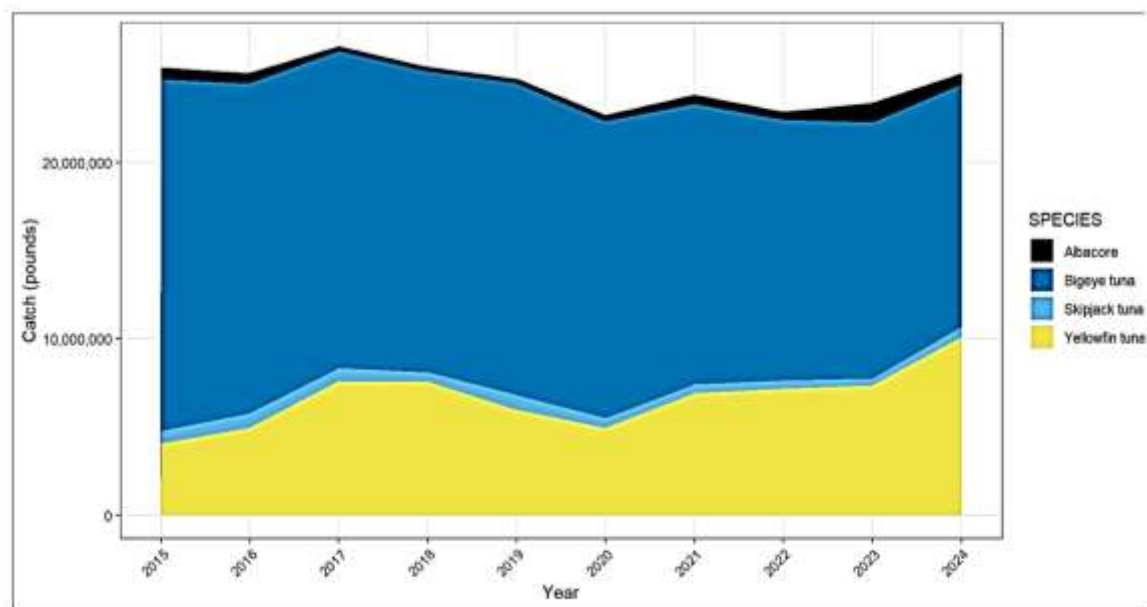


Figure 70. Species composition of tuna catch
Supporting data shown in Table A-71.

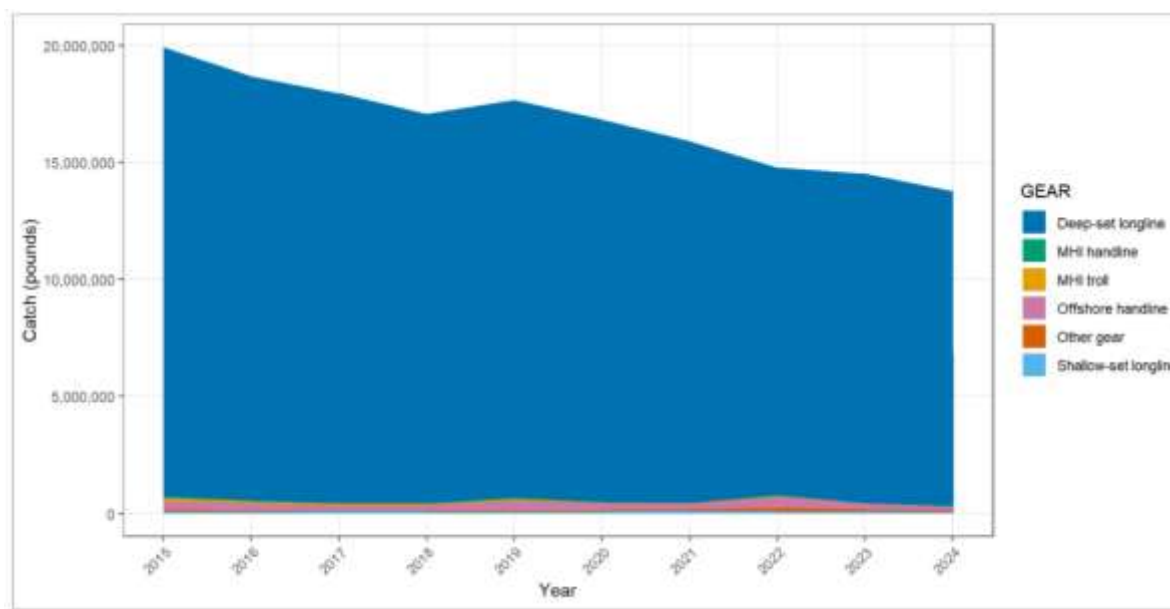


Figure 71. Hawaii bigeye tuna catch by gear type
Supporting data shown in Table A-72.

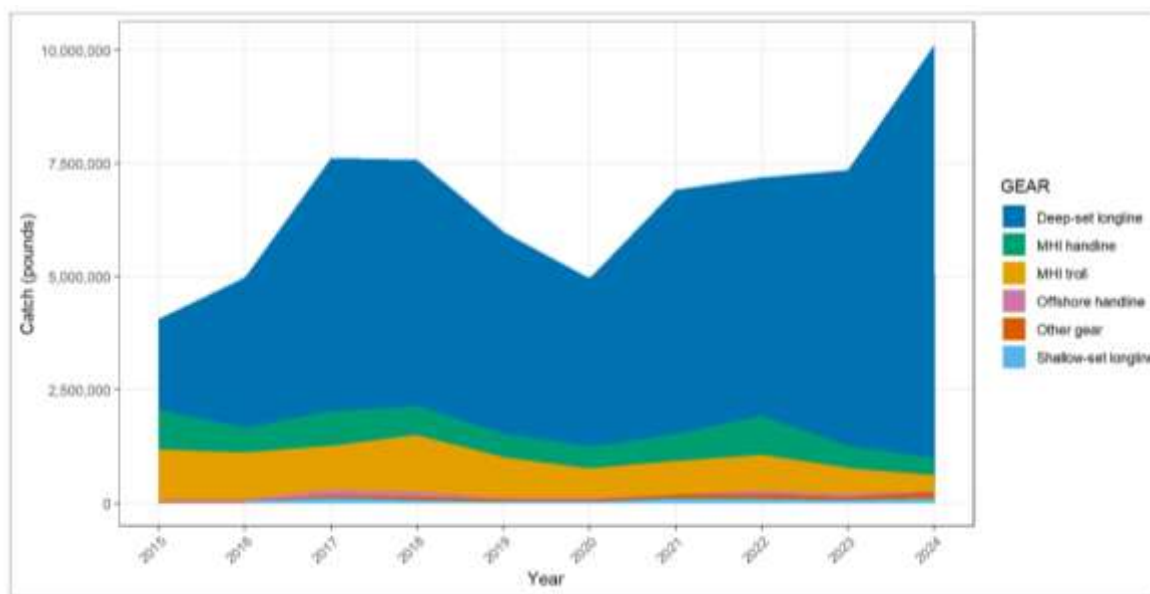


Figure 72. Hawaii yellowfin tuna catch by gear type
Supporting data shown in Table A-73.

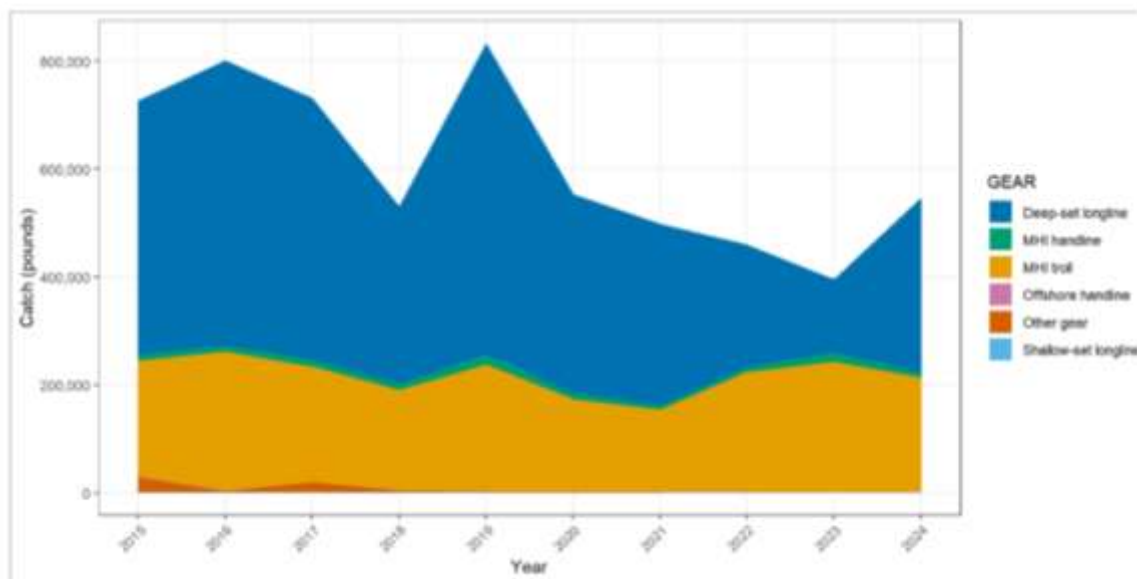


Figure 73. Hawaii skipjack tuna catch by gear type
Supporting data shown in Table A-74.

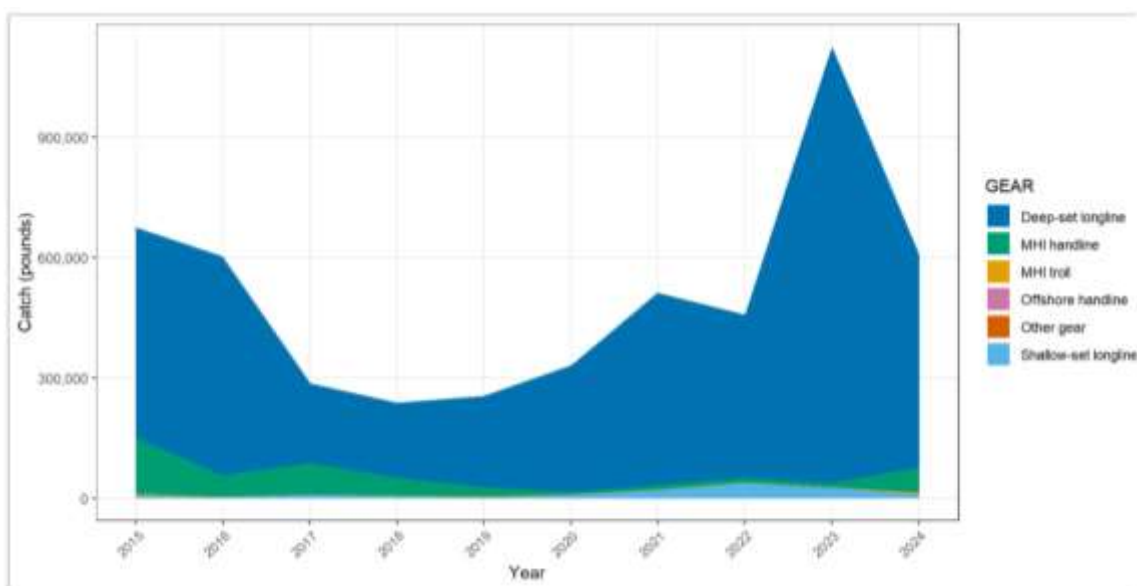


Figure 74. Hawaii albacore catch by gear type
Supporting data shown in Table A-75.

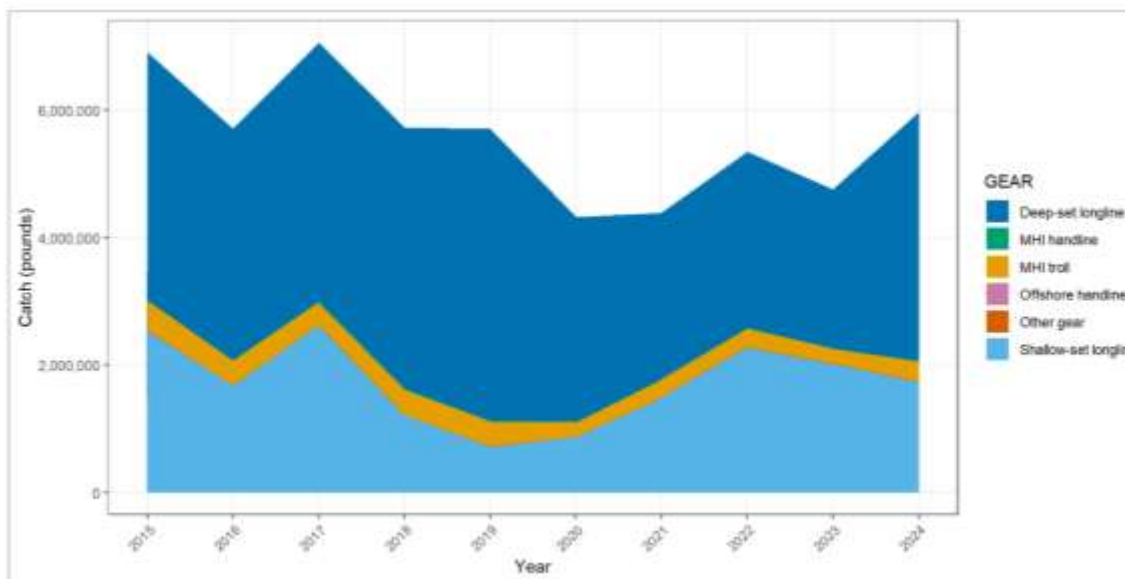


Figure 75. Hawaii commercial billfish catch by gear type
Supporting data shown in Table A-76.

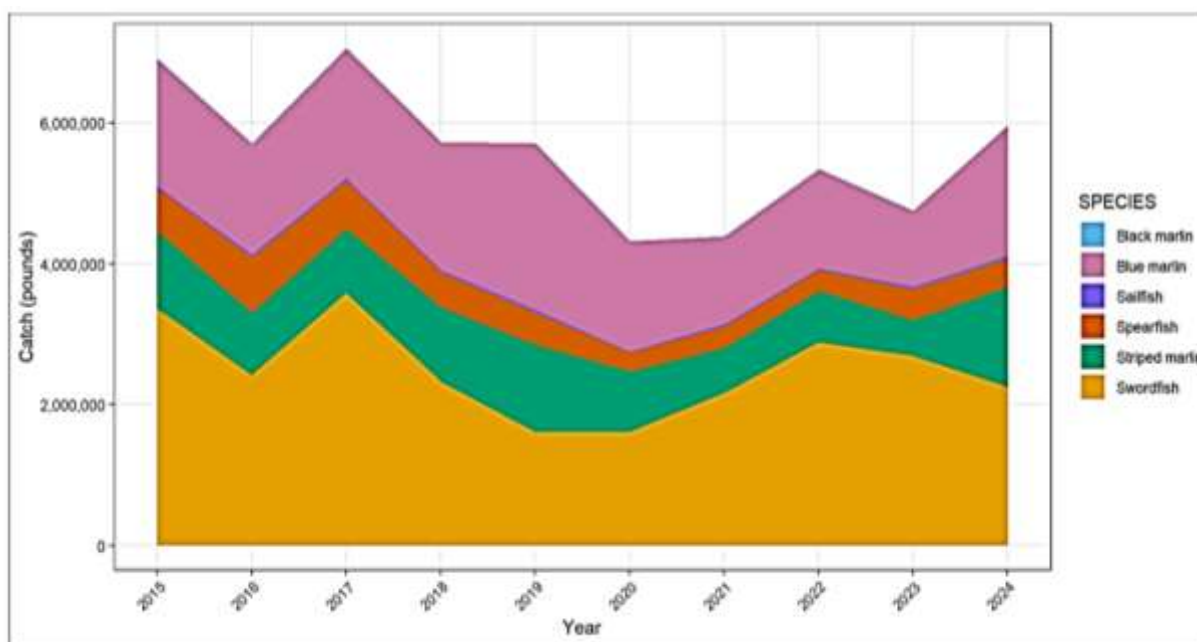


Figure 76. Species composition of billfish catch
Supporting data shown in Table A-77.

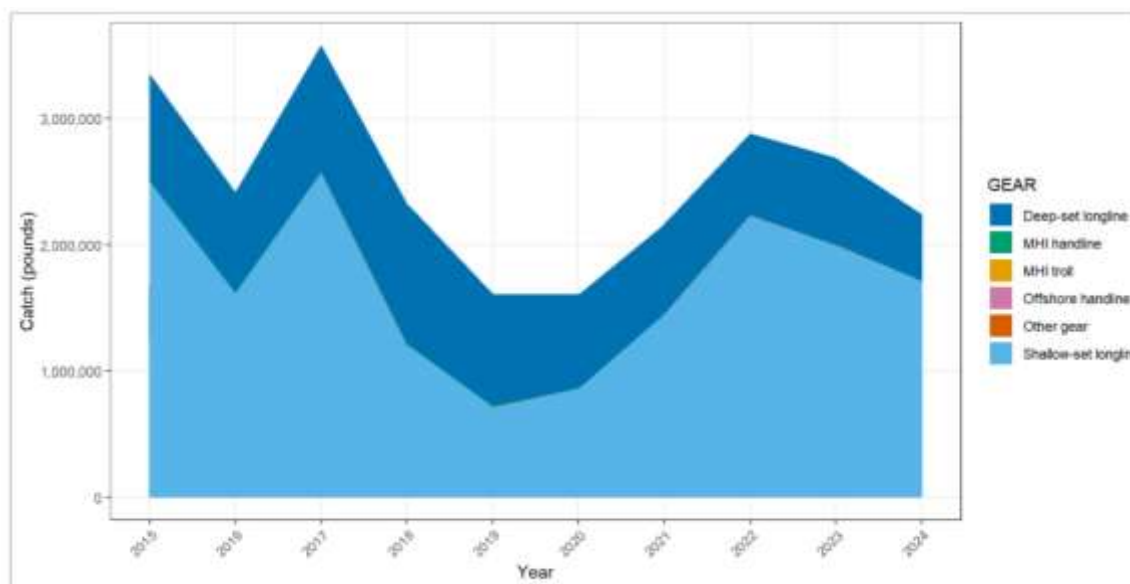


Figure 77. Hawaii swordfish catch by gear type
Supporting data shown in Table A-78.

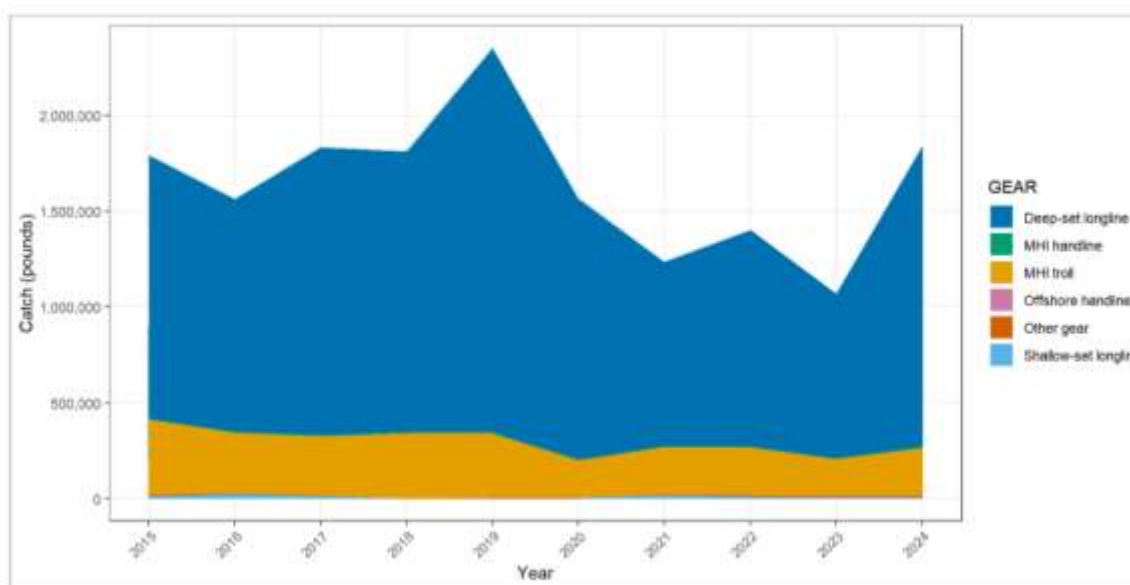


Figure 78. Hawaii blue marlin catch by gear type
Supporting data shown in Table A-79.

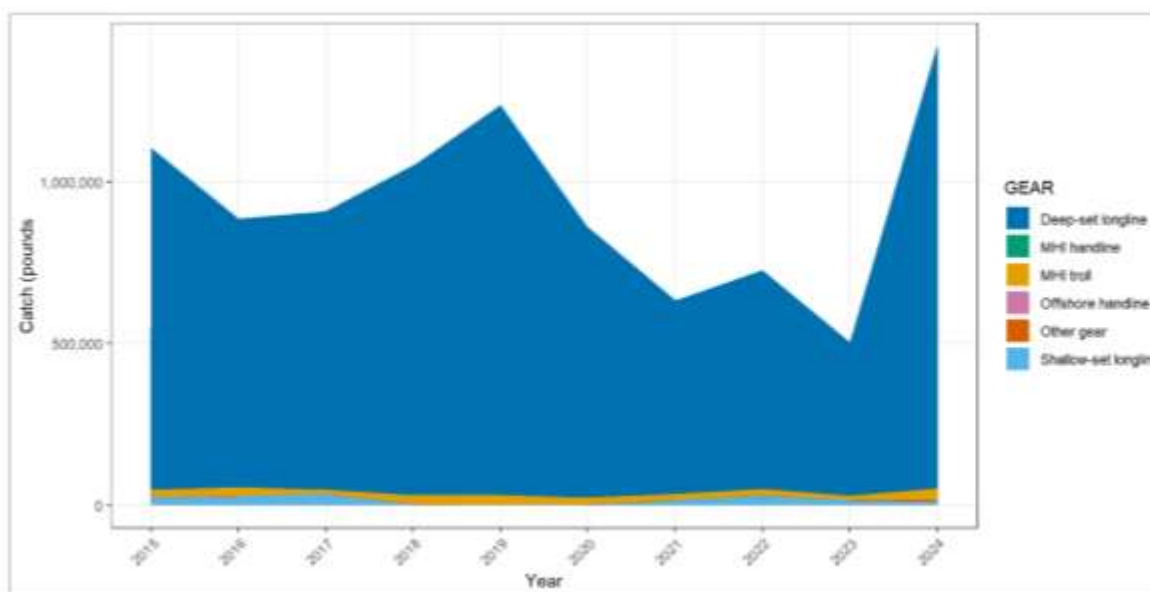


Figure 79. Hawaii striped marlin catch by gear type
Supporting data shown in Table A-80.

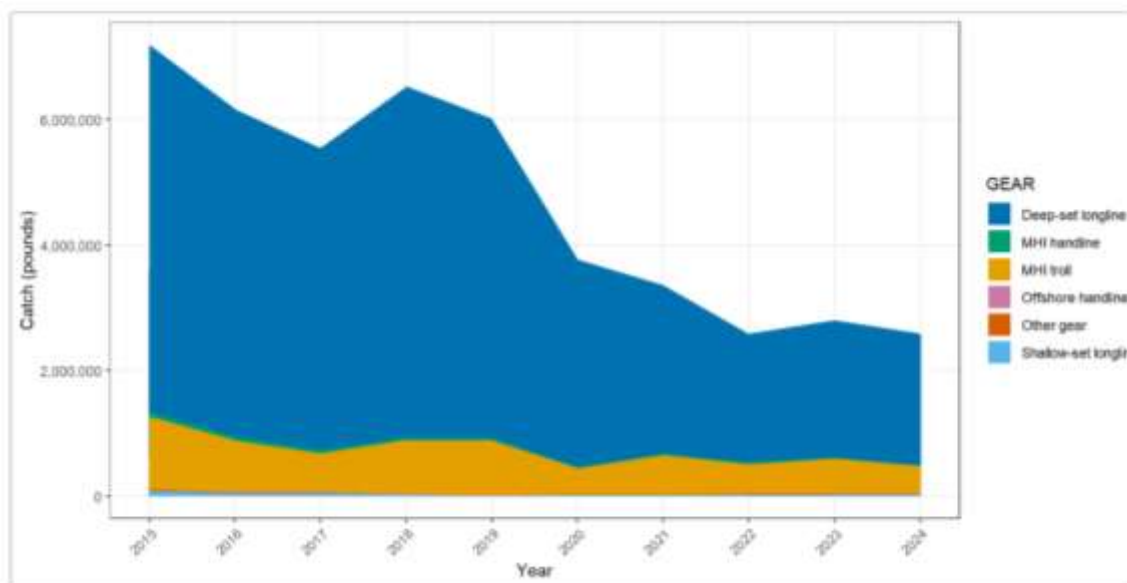


Figure 80. Hawaii commercial catch of other PMUS by gear type
Supporting data shown in Table A-81.

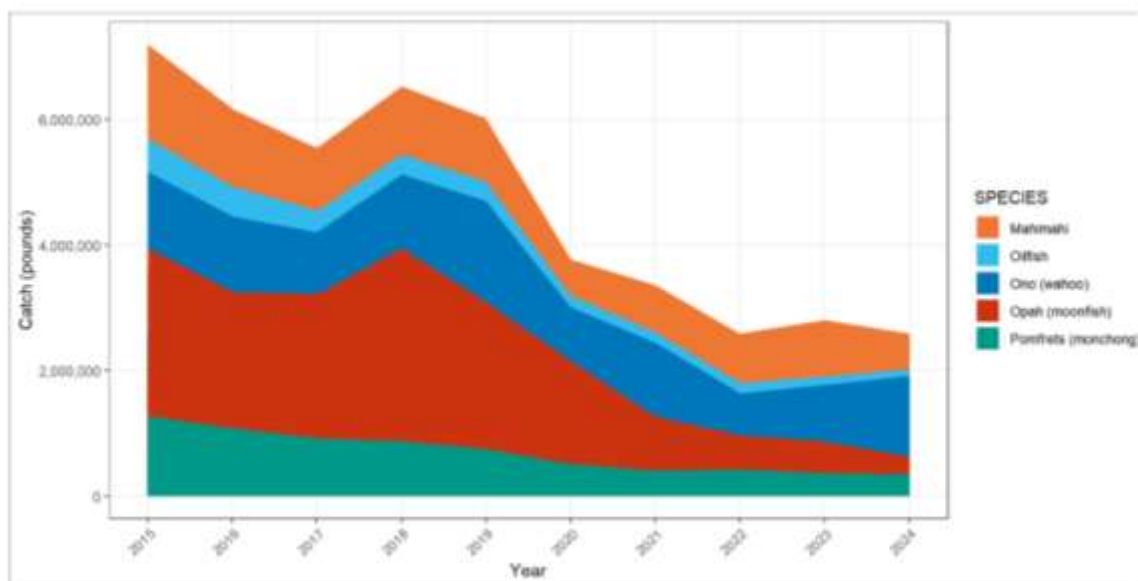
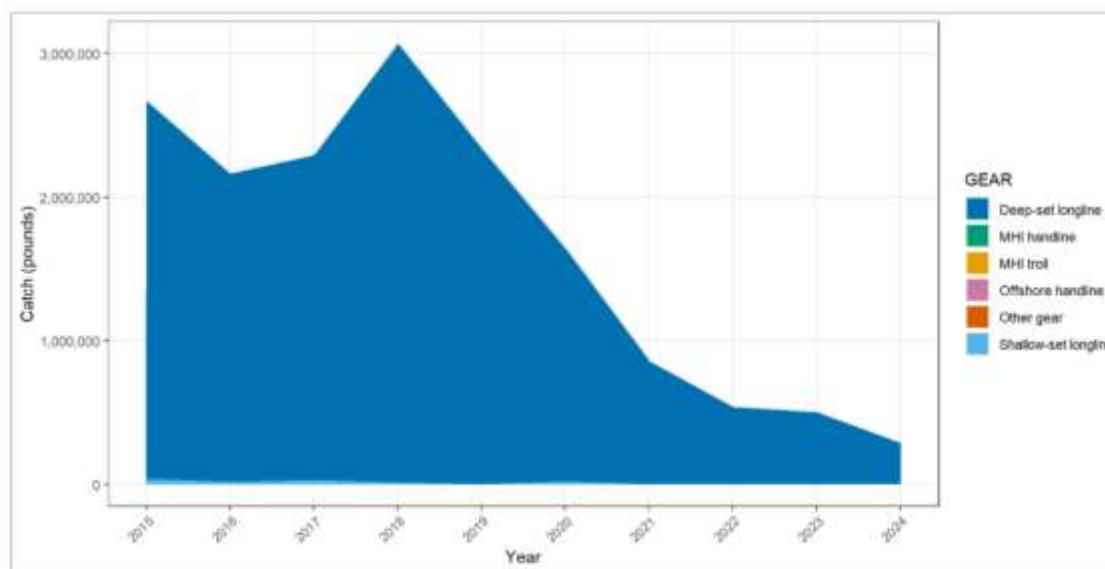


Figure 81. Species composition of other PMUS catch



Supporting data shown in Table A-82.

Figure 82. Hawaii moonfish catch by gear type

Supporting data shown in Table A-83.

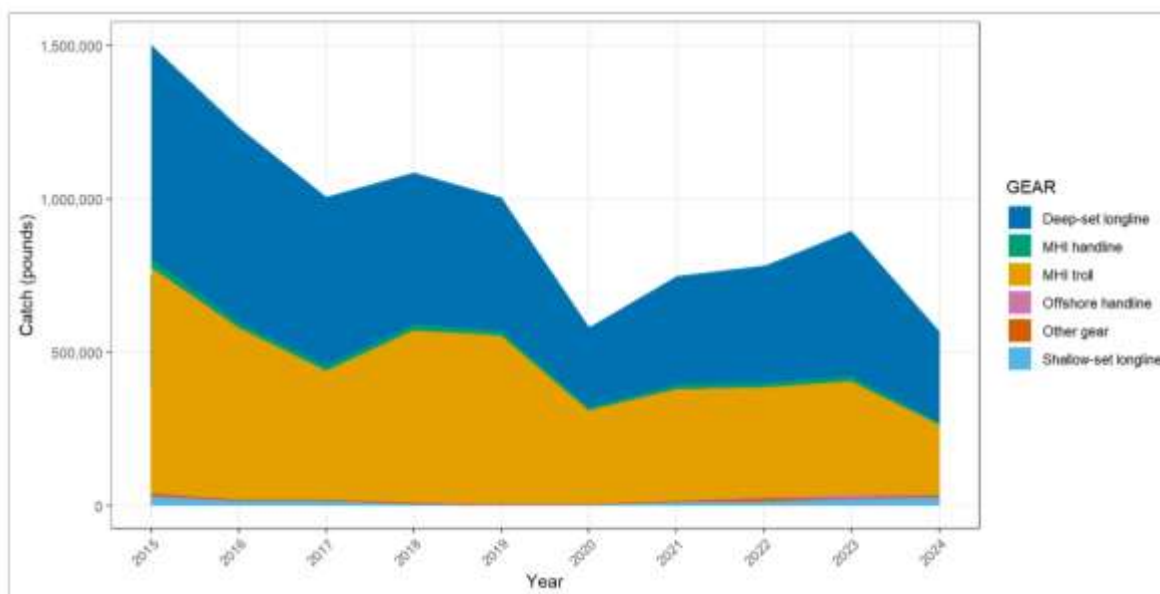


Figure 83. Hawaii mahimahi catch by gear type
Supporting data shown in Table A-84.

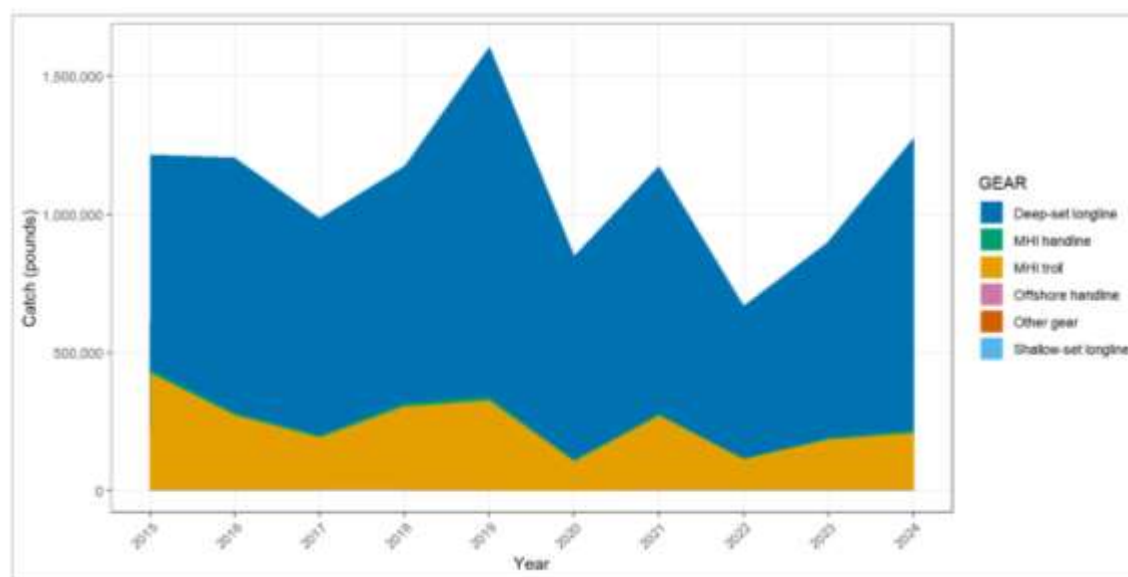


Figure 84. Hawaii ono (wahoo) catch by gear type
Supporting data shown in Table A-85.

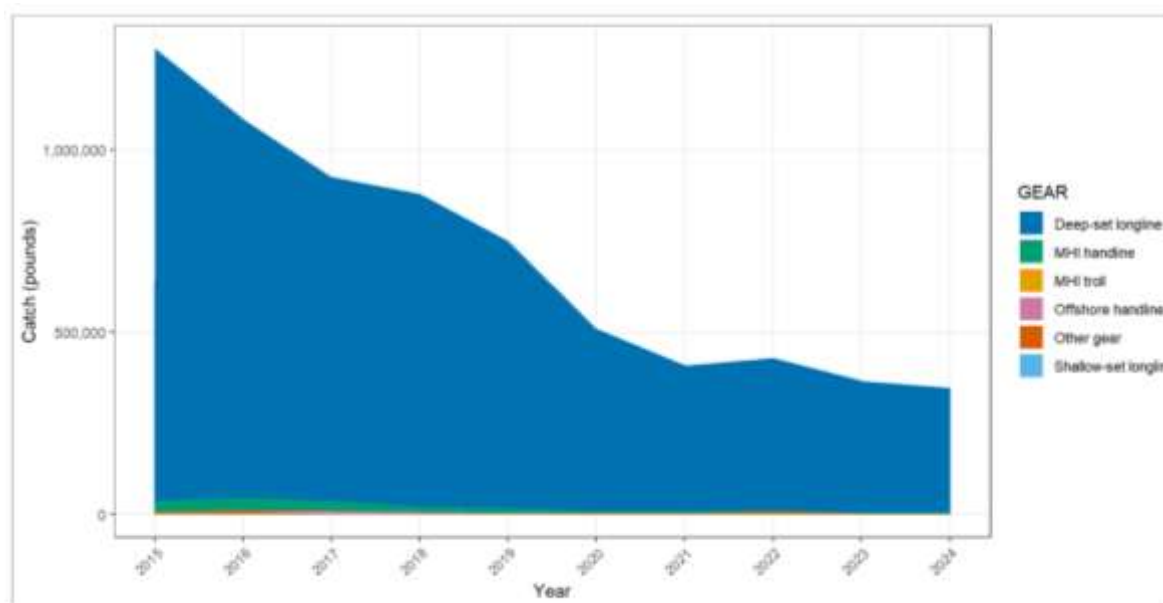


Figure 85. Hawaii pomfret catch by gear type
Supporting data shown in Table A-86.

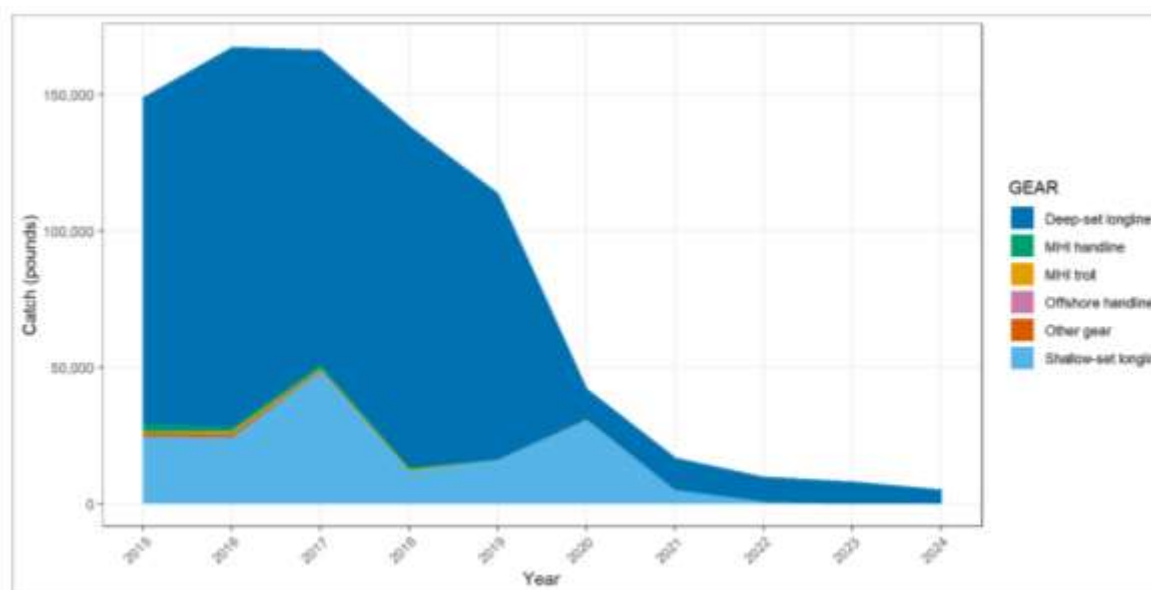


Figure 86. Hawaii PMUS shark catch by gear type
Supporting data shown in Table A-87.

2.4.6 HAWAII DEEP-SET LONGLINE FISHERY EFFORT, LANDINGS, REVENUE, AND CPUE

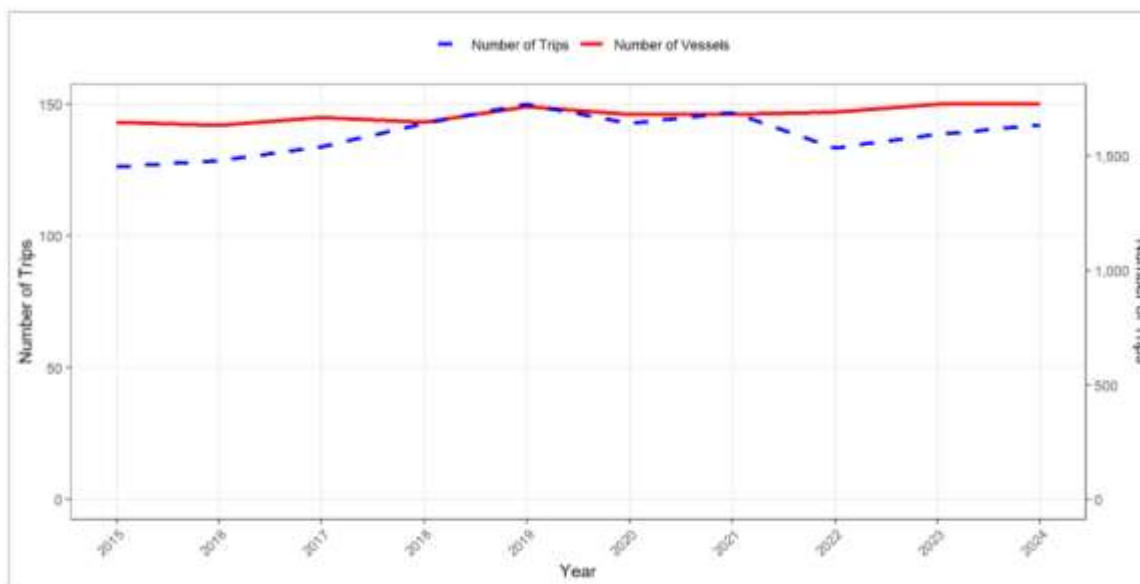


Figure 87. Number of Hawaii-permitted deep-set longline vessels and trips
Supporting data shown in Table A-88.

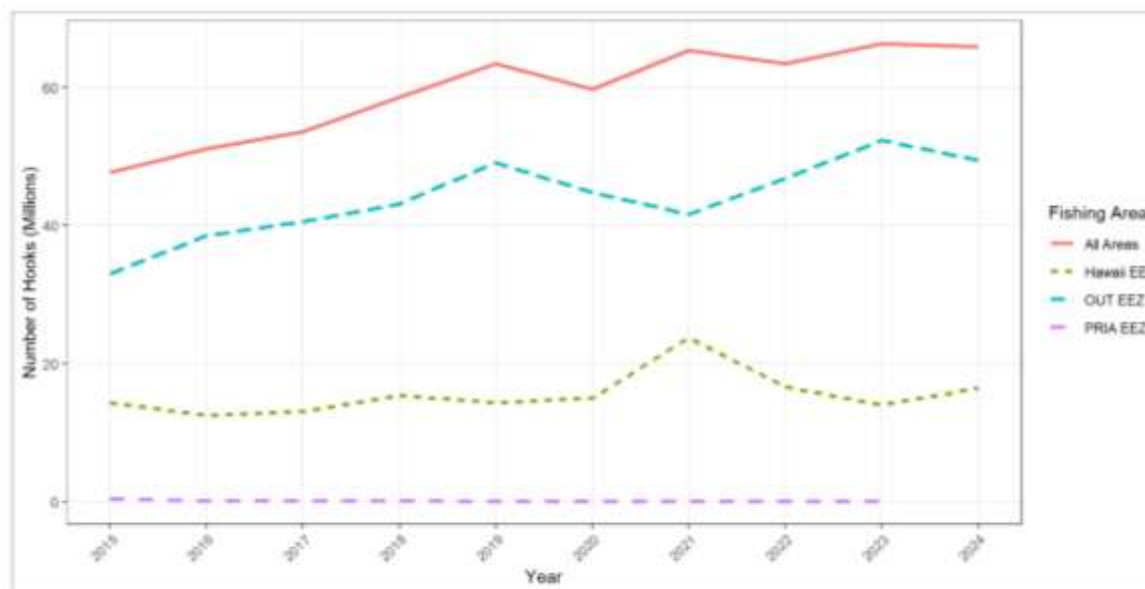


Figure 88. Number of hooks set by the Hawaii-permitted deep-set longline fishery
Supporting data shown in Table A-89.

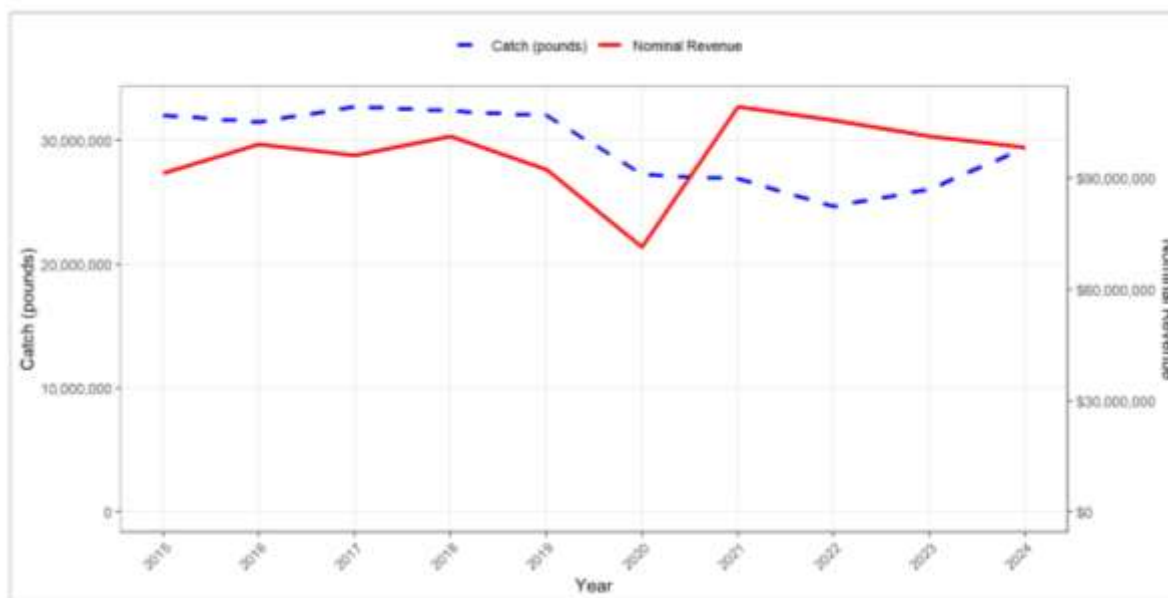


Figure 89. Catch and revenue for the Hawaii-permitted deep-set longline fishery
Supporting data shown in Table A-90.

PELAGIC SAFE REPORT

DATA MODULES

Table 24. Hawaii-permitted deep-set longline catch (number of fish) by area

	Tunas			Billfish				Other PMUS				PMUS Sharks
	Bigeye tuna	Yellowfin tuna	Albacore	Swordfish	Blue marlin	Striped marlin	Spearfish	Mahimahi	Ono (Wahoo)	Moonfish	Pomfrets	
Hawaii + PRIAs EEZ												
2015	62,393	11,939	3,135	1,349	2,647	5,966	7,146	15,434	6,562	2,756	22,092	26,550
2016	45,282	13,650	1,656	1,248	1,817	3,888	7,199	9,097	5,777	2,323	15,826	23,954
2017	52,352	24,337	277	825	2,298	4,314	5,507	8,849	5,147	1,795	12,731	28,022
2018	46,410	19,652	292	1,622	2,918	5,387	5,034	10,226	7,213	2,637	13,079	26,753
2019	39,590	12,178	167	1,126	3,860	5,735	3,748	6,079	8,235	2,142	13,211	30,358
2020	41,850	13,807	75	761	2,387	3,179	2,603	4,691	5,243	1,234	9,548	30,504
2021	58,694	26,613	516	1,267	2,522	4,087	5,068	6,449	11,010	777	9,488	37,561
2022	35,414	20,500	650	761	1,725	3,292	3,483	5,751	3,783	478	6,016	22,437
2023	26,271	15,125	1,440	735	1,179	2,826	4,589	4,594	4,043	326	4,464	19,382
2024	29,956	25,215	1,475	916	3,504	9,220	5,299	4,017	8,052	413	4,409	21,285
Outside EEZ												
2015	167,550	15,745	7,072	4,048	4,868	7,155	10,707	44,946	18,337	26,593	75,363	59,994
2016	175,867	32,820	8,197	3,870	4,444	7,700	16,828	39,397	24,440	22,029	65,864	66,044
2017	172,039	55,283	3,831	4,751	5,720	8,705	15,161	37,297	20,279	22,999	55,005	71,687
2018	172,662	42,106	3,363	4,492	4,642	10,340	10,443	33,912	24,090	30,548	42,870	76,408
2019	181,754	49,999	4,177	3,775	9,066	14,734	12,548	31,700	36,311	22,844	39,891	95,725
2020	165,165	40,594	8,461	3,102	5,790	9,600	7,372	17,258	19,118	15,372	26,529	88,041
2021	128,268	54,688	12,031	2,846	3,725	5,559	6,505	23,376	21,740	7,564	24,637	76,691
2022	136,184	63,543	10,888	2,868	5,384	7,849	7,474	30,004	13,723	4,477	25,686	66,936
2023	140,436	68,295	30,544	3,295	4,537	4,220	11,244	37,503	19,801	4,488	24,686	64,042
2024	124,195	97,270	8,710	3,233	9,015	16,835	10,323	16,558	29,067	2,825	21,401	70,828
All areas												
2015	229,943	27,684	10,207	5,397	7,515	13,121	17,853	60,380	24,899	29,349	97,455	86,544
2016	221,149	46,470	9,853	5,118	6,261	11,588	24,027	48,494	30,217	24,352	81,690	89,998
2017	224,391	79,620	4,108	5,576	8,018	13,019	20,668	46,146	25,426	24,794	67,736	99,709
2018	219,072	61,758	3,655	6,114	7,560	15,727	15,477	44,138	31,303	33,185	55,949	103,161
2019	221,344	62,177	4,344	4,901	12,926	20,469	16,296	37,779	44,546	24,986	53,102	126,083
2020	207,015	54,401	8,536	3,863	8,177	12,779	9,975	21,949	24,361	16,606	36,077	118,545
2021	186,962	81,301	12,547	4,113	6,247	9,646	11,573	29,825	32,750	8,341	34,125	114,252
2022	171,598	84,043	11,538	3,629	7,109	11,141	10,957	35,755	17,506	4,955	31,702	89,373
2023	166,707	83,420	31,984	4,030	5,716	7,046	15,833	42,097	23,844	4,814	29,150	83,424
2024	154,151	122,485	10,185	4,149	12,519	26,055	15,622	20,575	37,119	3,238	25,810	92,113

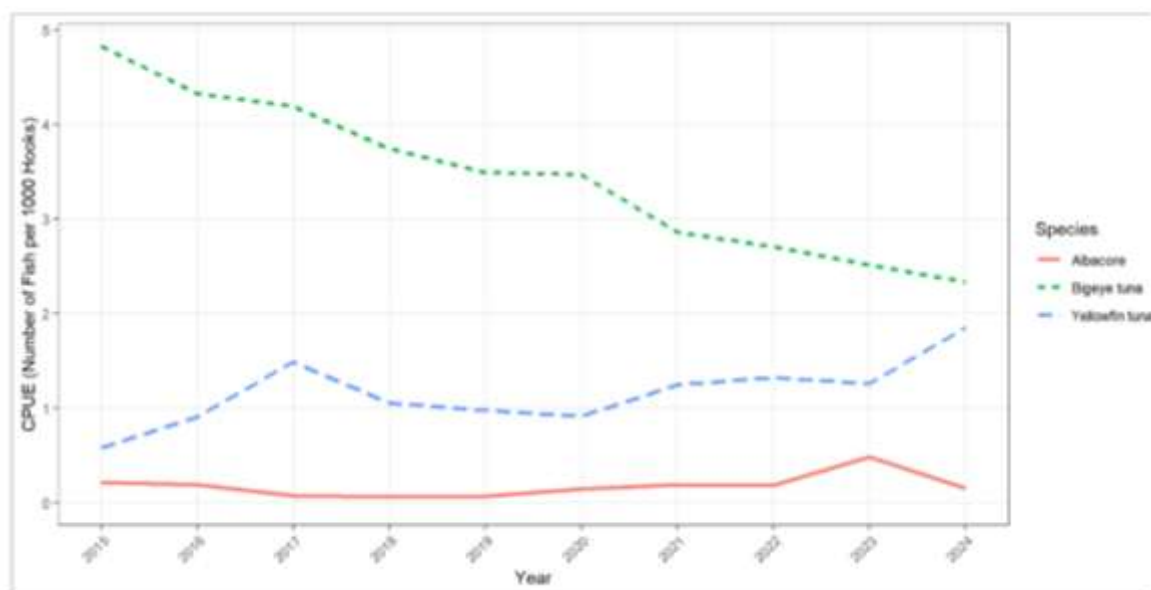


Figure 90. Tuna CPUE for the Hawaii-permitted deep-set longline fishery
Supporting data shown in Table A-91.

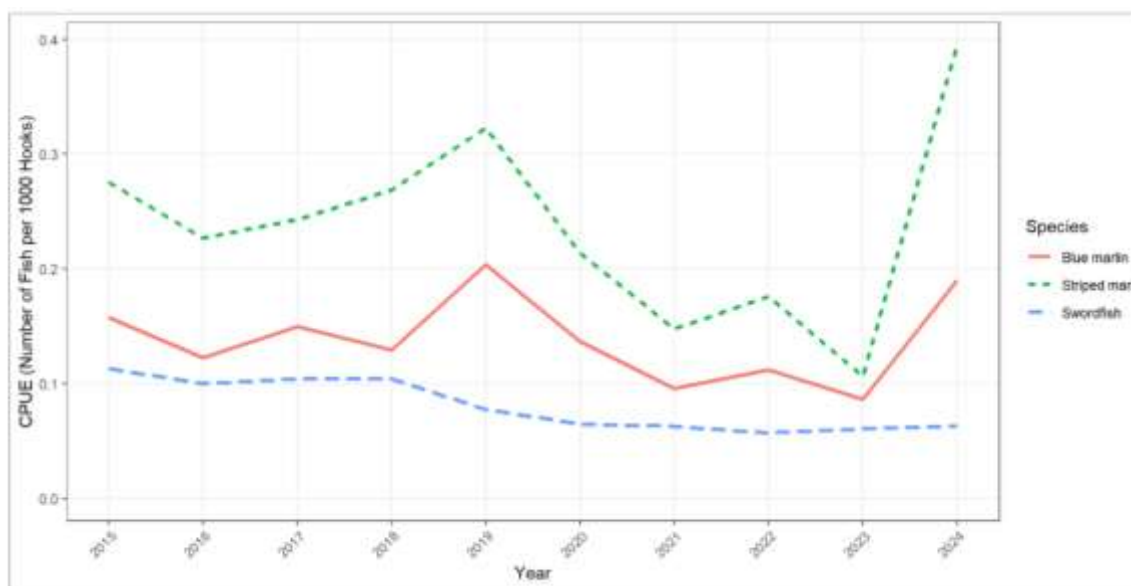


Figure 91. Billfish CPUE for the Hawaii-permitted deep-set longline fishery
Supporting data shown in Table A-92.

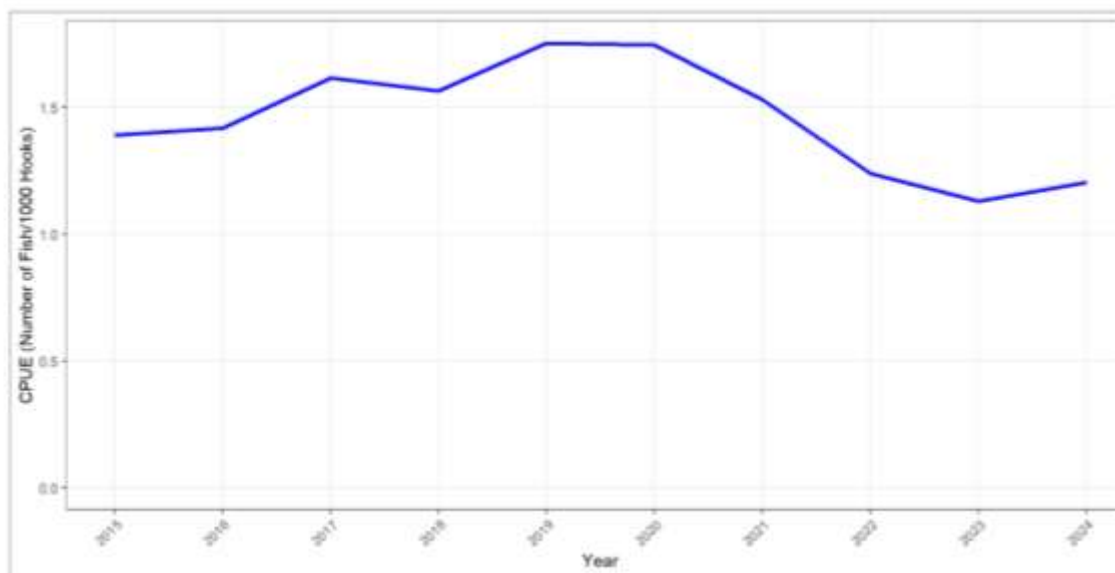


Figure 92. Blue shark CPUE for the Hawaii-permitted deep-set longline fishery
Supporting data shown in Table A-93.

Table 25. Total estimated bycatch in number of fish for the top 10 bycatch species from the Pacific Islands Region Observer Program for the Hawaii deep-set longline fishery

Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Average	SD
Lancetfish, Longnose	204,042	229,791	230,048	309,551	275,802	288,339	217,244	153,865	199,574	165,052	227,331	51,138
Shark, Blue	93,260	102,250	123,166	119,306	134,067	139,284	124,209	87,911	88,965	108,592	112,101	18,640
Snake Mackerel	128,022	110,655	120,432	79,308	49,481	43,862	67,877	59,556	98,779	62,200	82,017	30,390
Escolar	21,762	37,860	35,052	44,873	47,973	50,556	53,089	45,225	45,246	61,159	44,280	10,807
Tuna, Bigeye	14,536	20,723	20,800	24,053	19,481	20,596	12,360	5,773	5,913	11,884	15,612	6,503
Shark, Bigeye Thresher	18,630	11,639	9,551	6,519	10,399	9,754	13,313	11,746	9,219	20,674	12,144	4,375
Stingray, Pelagic	4,191	6,958	6,608	7,234	10,949	9,357	8,526	9,533	10,646	9,970	8,397	2,124
Pomfret, Dagger	6,292	6,464	7,443	8,188	8,929	5,667	9,450	5,936	4,948	5,143	6,846	1,579
Tuna, Yellowfin	3,836	5,615	9,455	5,201	7,434	6,138	10,804	5,064	3,904	8,853	6,630	2,404
Shark, Shortfin Mako	4,490	6,205	8,184	8,834	7,362	7,052	4,678	2,597	2,364	2,334	5,410	2,463

Note: Note marketable fish may be released by fishers when not as valuable (e.g., small size or damage from sharks or marine mammals) or for other reasons such as prioritization due to fish hold space.

Table 26. Released catch, retained catch, and total catch for the Hawaii-permitted deep-set longline fishery in 2024

Deep-set longline fishery				
	Released catch	Percent released	Retained catch	Total Catch
Tuna PMUS				
Skipjack tuna	230	1.4%	15,918	16,148
Bigeye tuna	2,432	1.6%	151,719	154,151
Yellowfin tuna	1,943	1.6%	120,542	122,485
Bluefin tuna	0	0.0%	11	11
Albacore	469	4.6%	9,716	10,185
Other tunas	0	0.0%	6	6
SubTotal	5,074	1.7%	297,912	302,986
Billfish PMUS				
Striped marlin	749	2.9%	25,306	26,055
Blue marlin	116	0.9%	12,403	12,519
Swordfish	114	2.7%	4,035	4,149
Spearfish	728	4.7%	14,894	15,622
Other marlins	34	4.6%	707	741
SubTotal	1,741	2.9%	57,345	59,086
Other PMUS				
Opah (moonfish)	21	0.6%	3,217	3,238
Oilfish	1,741	26.2%	4,899	6,640
Mahimahi	140	0.7%	20,435	20,575
Ono (wahoo)	187	0.5%	36,932	37,119
Pomfrets (monchong)	214	0.8%	25,596	25,810
SubTotal	2,303	2.5%	91,079	93,382
Non-PMUS fish				
Non-PMUS fish	6,114	98.0%	123	6,237
PMUS Sharks				
Thresher shark	9,593	99.9%	10	9,603
Blue shark	79,426	100.0%	0	79,426
Oceanic whitetip shark	702	100.0%	0	702
Mako sharks	1,644	98.9%	19	1,663
Silky shark	448	100.0%	0	448
SubTotal	91,813	100.0%	29	91,842
Non-PMUS Sharks				
Non-PMUS Sharks	270	99.6%	1	271
SubTotal	107,315	19.4%	446,489	553,804

Table 27. Average weight (lb) of the catch by the Hawaii-permitted deep-set longline fishery. Calculated by taking the total weight of all landings and dividing by the total number of pieces.

Year	Hawaii-permitted deep-set longline fishery																	
	Tunas					Billfish						Other PMUS					Sharks	
	Bigeye tuna	Yellowfin tuna	Albacore	Skipjack tuna	Bluefin tuna	Swordfish	Striped marlin	Blue marlin	Spearfish	Sailfish	Black marlin	Mahimahi	Ono (wahoo)	Opah (moonfish)	Pomfrets (monchong)	Oilfish	Mako sharks	Thresher shark
2015	85	74	52	18	237	165	81	185	33	59	219	12	31	91	13	18	195	219
2016	83	73	55	17	252	165	73	196	31	51	242	13	31	88	13	19	179	183
2017	79	72	49	19	252	190	67	188	32	63	286	12	31	92	13	20	181	200
2018	78	89	51	19	276	189	66	197	32	64	185	11	28	93	15	22	182	184
2019	79	74	53	18	269	187	61	157	28	31	182	12	29	94	14	22	190	190
2020	81	70	39	18	243	199	66	167	27	46	294	12	30	100	14	23	184	183
2021	84	68	39	19	232	176	63	155	26	54	177	12	27	104	12	21	184	183
2022	83	64	37	18	245	181	62	160	27	60	155	11	32	109	13	20	184	183
2023	85	74	37	20	254	179	67	151	28	64	143	11	30	105	12	21	184	183
2024	89	76	55	20	237	132	54	126	25	58	174	15	29	90	13	21	184	183
Average	82.5	73.4	46.8	18.5	249.9	176.4	66.0	168.3	28.7	55.0	205.7	12.0	29.7	96.6	13.3	20.8	184.7	189.1
SD	3.4	6.6	7.7	0.9	14.1	19.1	7.3	22.8	2.9	10.2	52.7	1.1	1.5	7.3	1.0	1.5	4.6	11.9

2.4.7 MHI TROLL FISHERY EFFORT, LANDINGS, REVENUE, AND CPUE

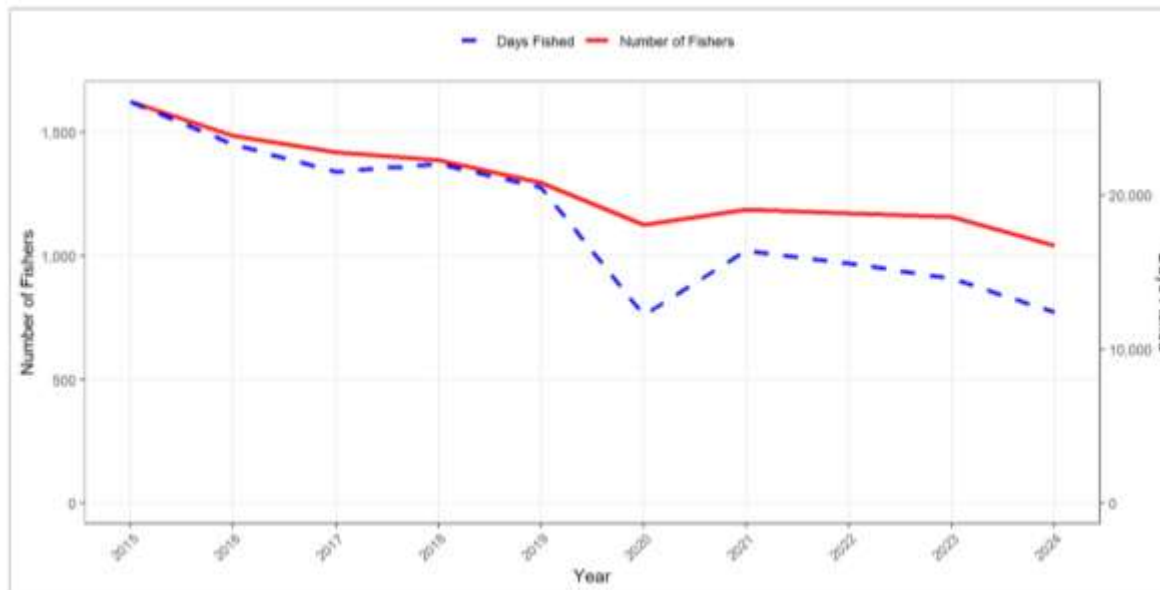


Figure 99. Number of MHI troll fishers and days fished
Supporting data shown in Table A-100.

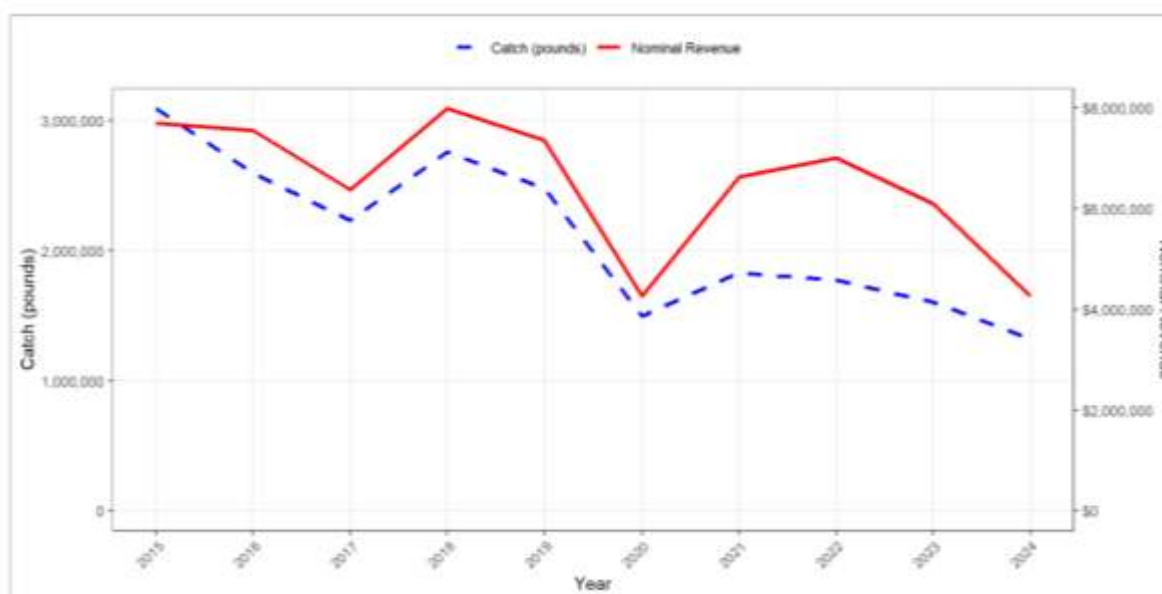


Figure 100. Catch and revenue for the MHI troll fishery
Supporting data shown in Table A-101.

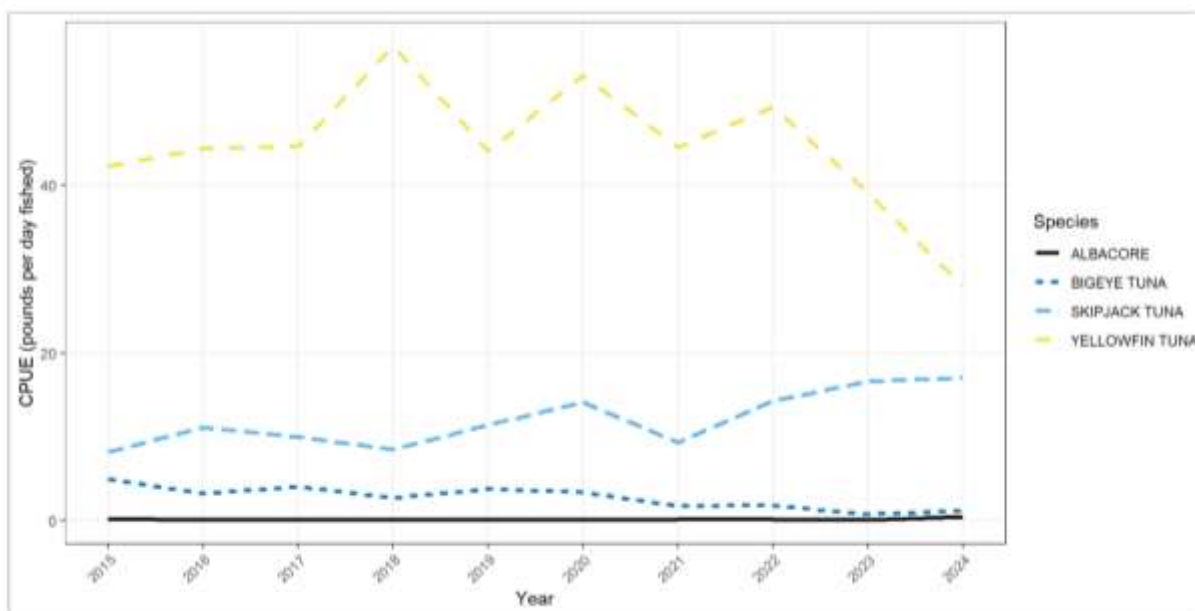


Figure 101. Tuna CPUE for the MHI troll fishery
Supporting data shown in Table A-102.

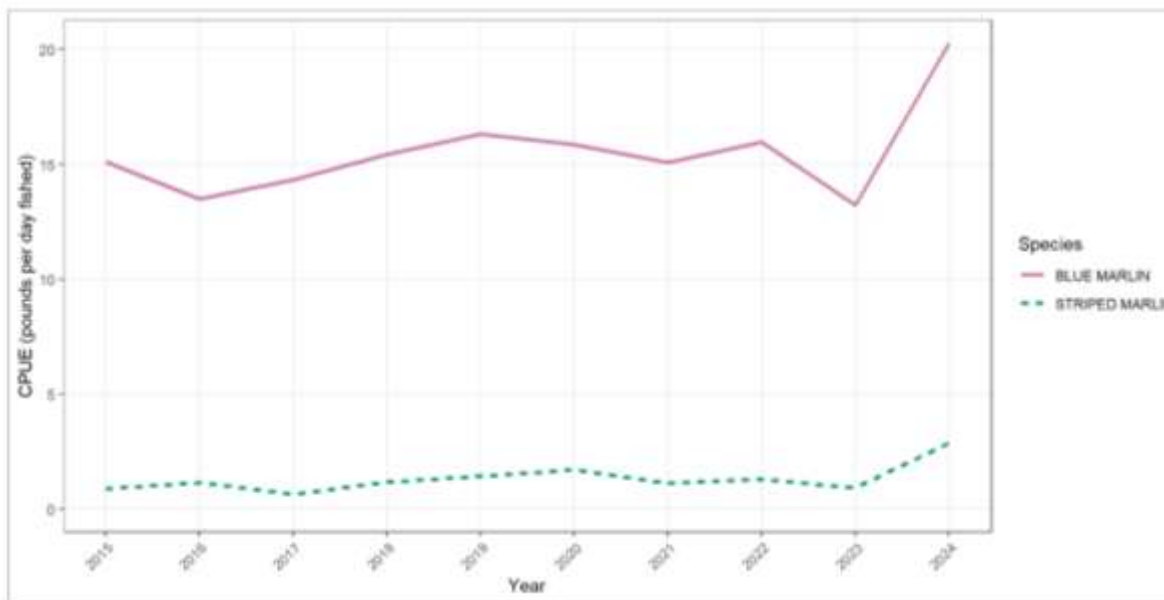


Figure 102. Marlin CPUE for the MHI troll fishery
Supporting data shown in Table A-103.

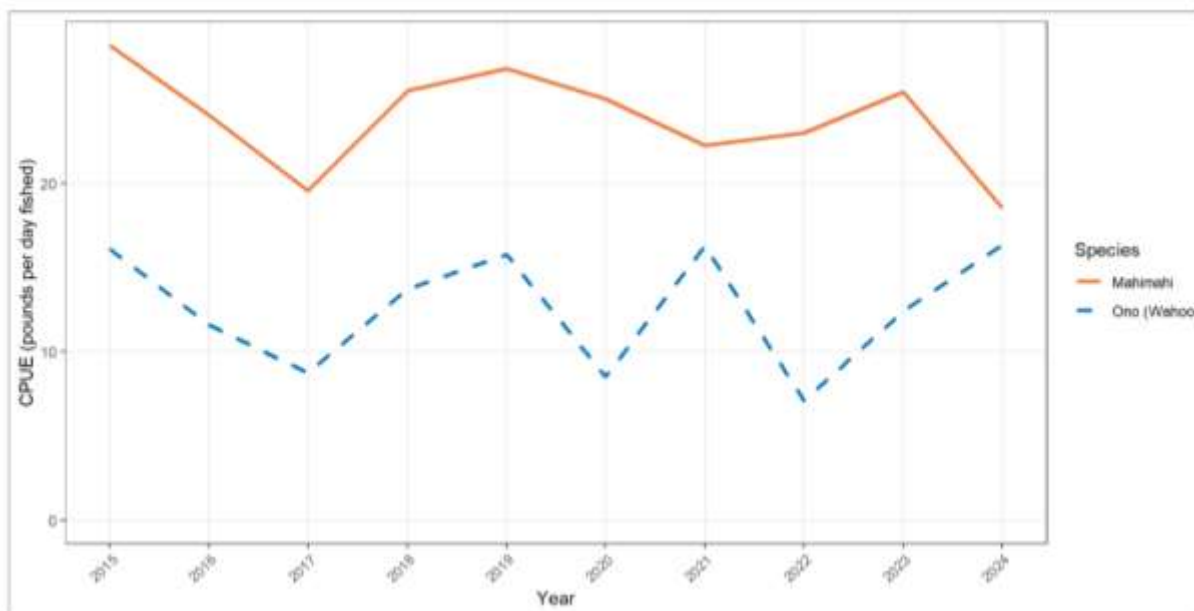


Figure 103. Mahimahi and Ono CPUE for the MHI troll fishery
Supporting data shown in Table A-104.

2.4.8 HAWAII SHALLOW-SET LONGLINE FISHERY EFFORT, LANDINGS, REVENUE, AND CPUE

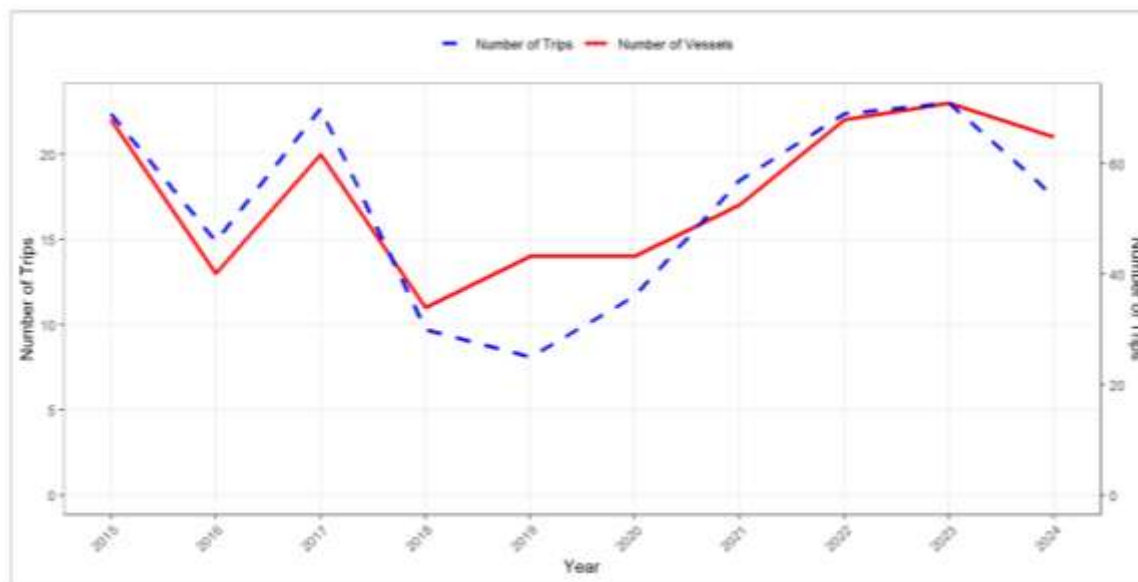


Figure 93. Number of Hawaii-permitted shallow-set longline vessels and trips
Supporting data shown in Table A-94.

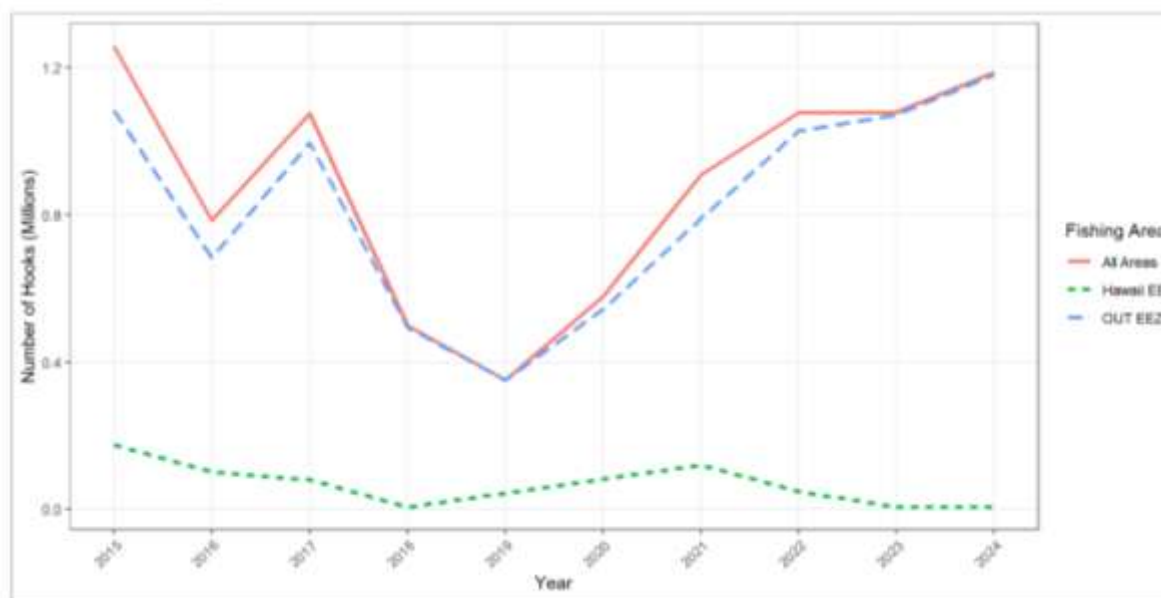


Figure 94. Number of hooks set by the Hawaii-permitted shallow-set longline fishery
Supporting data shown in Table A-95.

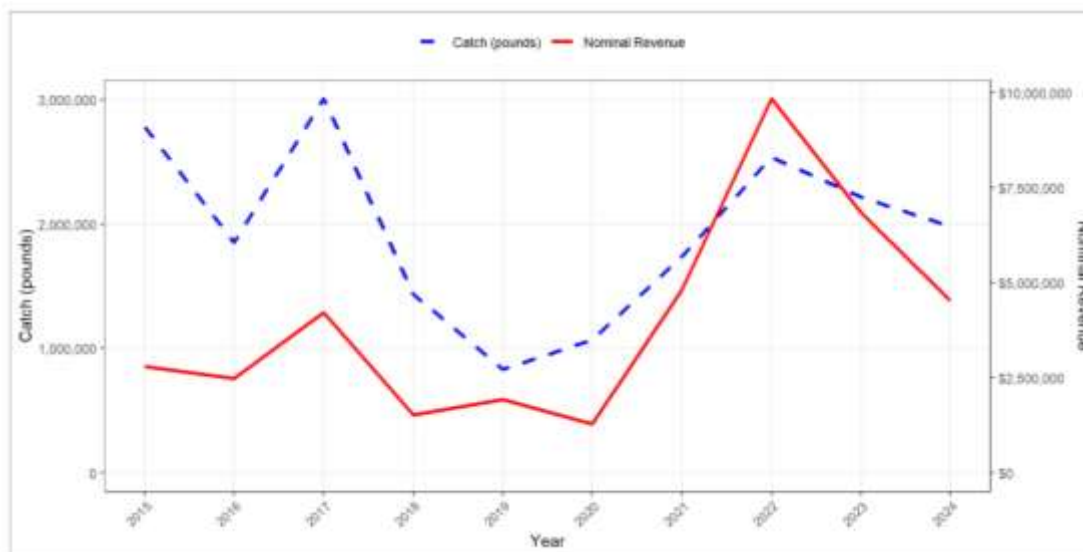


Figure 95. Catch and revenue for the Hawaii-permitted shallow-set longline fishery
Supporting data shown in Table A-96.

Table 28. Hawaii-permitted shallow-set longline catch (number of fish) by area

	Tunas			Billfish				Other PMUS				PMUS Sharks
	Bigeye tuna	Yellowfin tuna	Albacore	Swordfish	Blue marlin	Striped marlin	Spearfish	Mahimahi	One (Wahoo)	Moonfish	Pomfrets	
Hawaii + PRIAs EEZ												
2015	40	36	1	2,001	23	111	40	804	5	0	3	1,537
2016	20	47	5	1,157	68	104	45	69	19	0	2	1,142
2017	12	31	1	787	32	88	38	38	10	0	2	586
2018	12	11	0	58	1	1	0	12	1	0	0	22
2021	100	94	0	424	41	69	65	34	23	4	36	485
2022	7	51	0	185	13	33	10	13	3	1	0	249
2023	1	4	0	13	0	8	0	2	1	0	1	32
2024	1	1	0	19	2	7	15	31	1	0	0	37
Outside EEZ												
2015	1,305	103	305	12,988	26	155	66	1,822	11	645	121	12,544
2016	921	254	54	8,573	27	225	115	1,065	20	271	16	10,794
2017	1,518	1,522	286	13,141	26	323	122	1,263	64	431	37	10,271
2018	1,279	767	137	6,052	4	61	44	627	25	172	24	2,888
2019	874	331	81	3,435	0	12	18	247	3	31	5	3,195
2020	1,099	456	356	4,374	7	23	24	229	9	300	12	6,607
2021	873	1,067	626	6,074	50	123	38	1,218	38	20	1	5,735
2022	947	1,016	1,395	9,426	36	355	52	1,488	32	28	6	6,899
2023	670	905	841	8,554	23	165	35	2,355	51	12	6	7,534
2024	854	1,728	382	8,481	22	143	122	3,532	37	27	18	10,460
All areas												
2015	1,345	139	306	14,989	49	266	106	2,626	16	645	124	14,081
2016	941	301	59	9,730	95	329	160	1,134	39	271	18	11,936
2017	1,530	1,553	287	13,928	58	411	160	1,301	74	431	39	10,857
2018	1,291	778	137	6,110	5	62	44	639	26	172	24	2,910
2019	874	331	81	3,435	0	12	18	247	3	31	5	3,195
2020	1,114	497	356	4,594	23	30	26	241	12	302	12	7,014
2021	973	1,161	626	6,498	91	192	103	1,252	61	24	37	6,220
2022	954	1,067	1,395	9,611	49	388	62	1,501	35	29	6	7,148
2023	671	909	841	8,567	23	173	35	2,357	52	12	7	7,566
2024	855	1,729	382	8,500	24	150	137	3,563	38	27	18	10,497

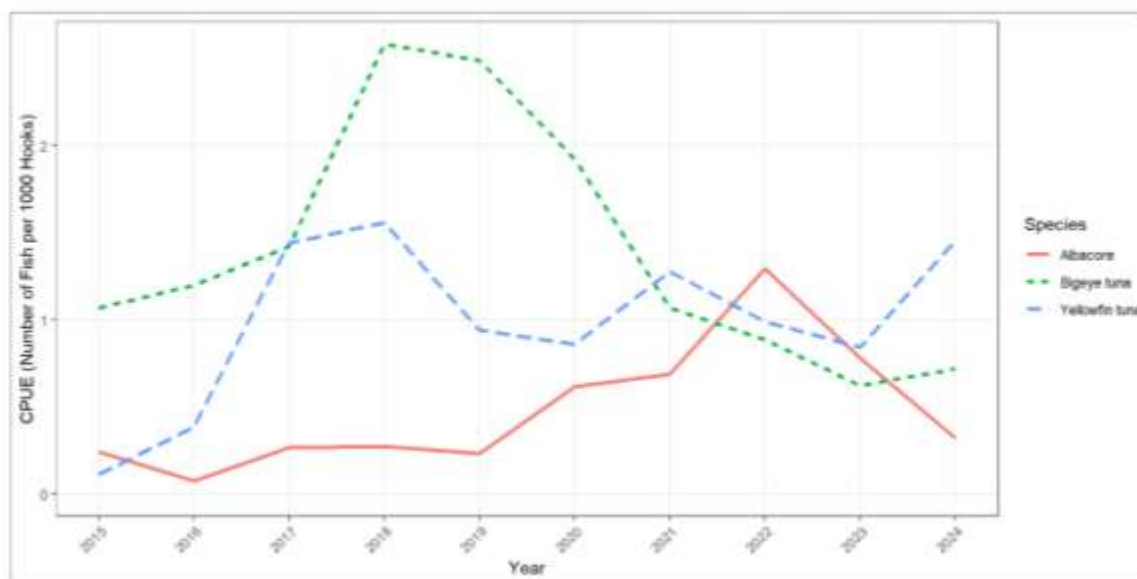


Figure 96. Tuna CPUE for the Hawaii-permitted shallow-set longline fishery
Supporting data shown in Table A-97.

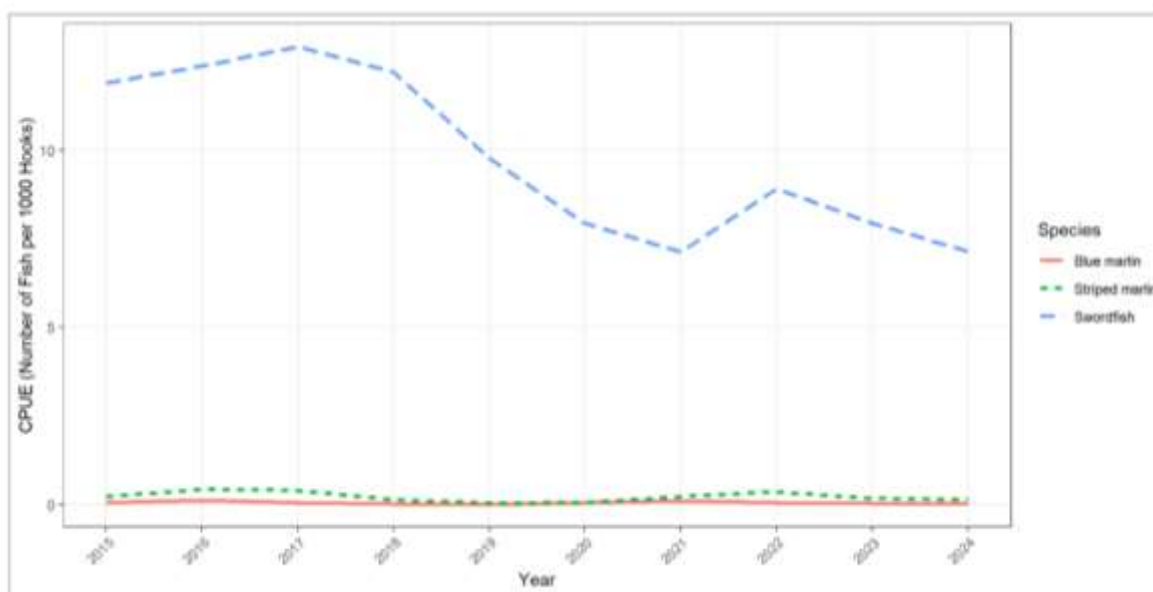


Figure 97. Billfish CPUE for the Hawaii-permitted shallow-set longline fishery
Supporting data shown in Table A-98.

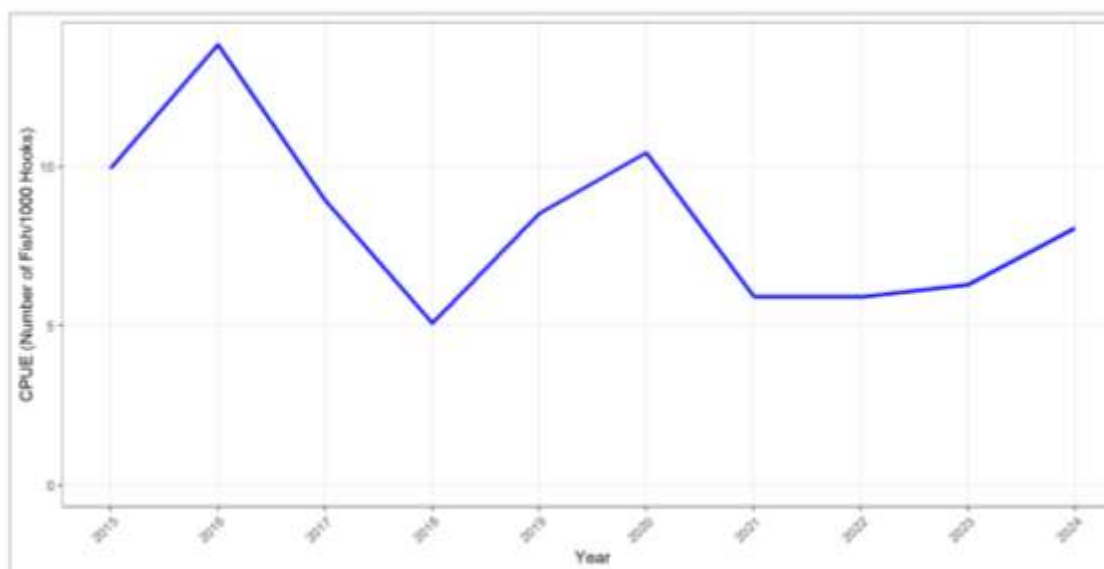


Figure 98. Blue shark CPUE for the Hawaii-permitted shallow-set longline fishery
Supporting data shown in Table A-99.

Table 29. Total estimated bycatch in number of fish for the top 10 bycatch species from the Pacific Islands Region Observer Program for the Hawaii shallow-set longline fishery

Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Average	SD
Shark, Blue	13,453.0	11,853.0	10,102.0	4,115.0	4,225.0	6,949.0	6,446.0	8,252.0	7,214.0	10,544.0	8,315.3	3,127.3
Lancetfish, Longnose	2,597.0	1,784.0	2,728.0	1,211.0	1,232.0	1,268.0	2,480.0	3,150.0	3,121.0	3,940.0	2,351.1	944.1
Shark, Shortfin Mako	1,347.0	968.0	1,085.0	537.0	298.0	1,151.0	808.0	1,224.0	1,007.0	1,121.0	954.6	323.1
Swordfish	1,735.0	1,049.0	1,419.0	735.0	254.0	251.0	499.0	541.0	646.0	1,523.0	865.2	535.9
Escolar	481.0	459.0	765.0	150.0	122.0	152.0	521.0	557.0	686.0	498.0	439.1	226.1
Stingray, Pelagic	499.0	245.0	284.0	440.0	82.0	328.0	171.0	123.0	143.0	286.0	260.1	136.5
Oilfish	418.0	171.0	327.0	114.0	57.0	248.0	219.0	359.0	217.0	317.0	244.7	112.7
Snake Mackerel	313.0	315.0	638.0	62.0	16.0	31.0	98.0	151.0	104.0	85.0	181.3	191.8
Dolphinfish	222.0	83.0	107.0	34.0	18.0	20.0	75.0	69.0	86.0	500.0	121.4	145.3
Tuna, Bigeye	74.0	121.0	278.0	153.0	55.0	77.0	79.0	35.0	50.0	103.0	102.5	70.9

Note marketable fish may be released by fishers when not as valuable (e.g., small size or damage from sharks or marine mammals) or for other reasons such as prioritization due to fish hold space.

Table 30. Released catch, retained catch, and total catch for the Hawaii-permitted shallow-set longline fishery in 2024

Shallow-set longline fishery				
	Released catch	Percent released	Retained catch	Total Catch
Tuna PMUS				
Skipjack tuna	0	0.0%	68	68
Bigeye tuna	54	6.3%	801	855
Yellowfin tuna	136	7.9%	1,593	1,729
Bluefin tuna	0	0.0%	17	17
Albacore	117	30.6%	265	382
Other tunas	0	NaN	0	0
SubTotal	307	10.1%	2,744	3,051
Billfish PMUS				
Striped marlin	8	5.3%	142	150
Blue marlin	0	0.0%	24	24
Swordfish	856	10.1%	7,644	8,500
Spearfish	17	12.4%	120	137
Other marlins	0	NaN	0	0
SubTotal	881	10.0%	7,930	8,811
Other PMUS				
Opah (moonfish)	4	14.8%	23	27
Oilfish	163	63.4%	94	257
Mahimahi	301	8.4%	3,262	3,563
Ono (wahoo)	0	0.0%	38	38
Pomfrets (monchong)	0	0.0%	18	18
SubTotal	468	12.0%	3,435	3,903
Non-PMUS fish				
Non-PMUS fish	30	51.7%	28	58
PMUS Sharks				
Thresher shark	19	100.0%	0	19
Blue shark	9,583	100.0%	0	9,583
Oceanic whitetip shark	3	100.0%	0	3
Mako sharks	889	100.0%	0	889
Silky shark	0	NaN	0	0
SubTotal	10,494	100.0%	0	10,494
Non-PMUS Sharks				
Non-PMUS Sharks	3	100.0%	0	3
SubTotal	12,183	46.3%	14,137	26,320

Table 31. Average weight (lb) of the catch by the Hawaii-permitted shallow-set longline fisheries

Year	Hawaii-permitted shallow-set longline fishery																	
	Tunas					Billfish					Other PMUS					Sharks		
	Bigeye tuna	Yellowfin tuna	Albacore	Skipjack tuna	Bluefin tuna	Swordfish	Striped marlin	Blue marlin	Spearfish	Sailfish	Black marlin	Mahimahi	Ono (wahoo)	Opah (moonfish)	Pomfrets (monchong)	Oilfish	Mako sharks	Thresher sharks
2015	79	120	22	16	-	184	97	292	37	52	-	12	39	76	13	22	150	243
2016	86	103	34	16	-	179	97	304	39	52	-	14	33	83	13	21	215	243
2017	98	94	35	18	201	200	102	259	39	52	-	12	36	83	14	20	179	243
2018	89	98	36	16	201	214	94	413	36	-	-	10	39	84	14	25	184	243
2019	72	92	35	19	-	216	126	-	35	52	-	9	39	83	16	22	165	-
2020	90	76	28	18	201	193	97	176	34	-	-	12	36	83	17	19	175	243
2021	95	101	34	20	245	231	84	199	25	52	-	10	32	85	17	20	175	243
2022	106	92	28	18	214	239	77	225	26	43	-	9	36	80	12	29	175	-
2023	97	92	34	17	236	242	91	252	28	52	-	9	39	81	15	21	-	-
2024	94	77	31	21	220	224	81	200	25	-	-	9	36	83	13	22	-	-
Average	90.5	94.6	31.7	18.0	217.0	212.4	94.6	257.7	32.3	50.9	—	10.6	36.5	82.2	14.5	22.0	177.2	243.1
SD	9.8	12.7	4.4	1.8	17.7	22.4	13.7	72.3	5.8	3.7	—	1.9	2.6	2.5	1.6	2.9	18.6	0.0

2.4.9 MHI HANDLINE FISHERY EFFORT, LANDINGS, REVENUE, AND CPUE

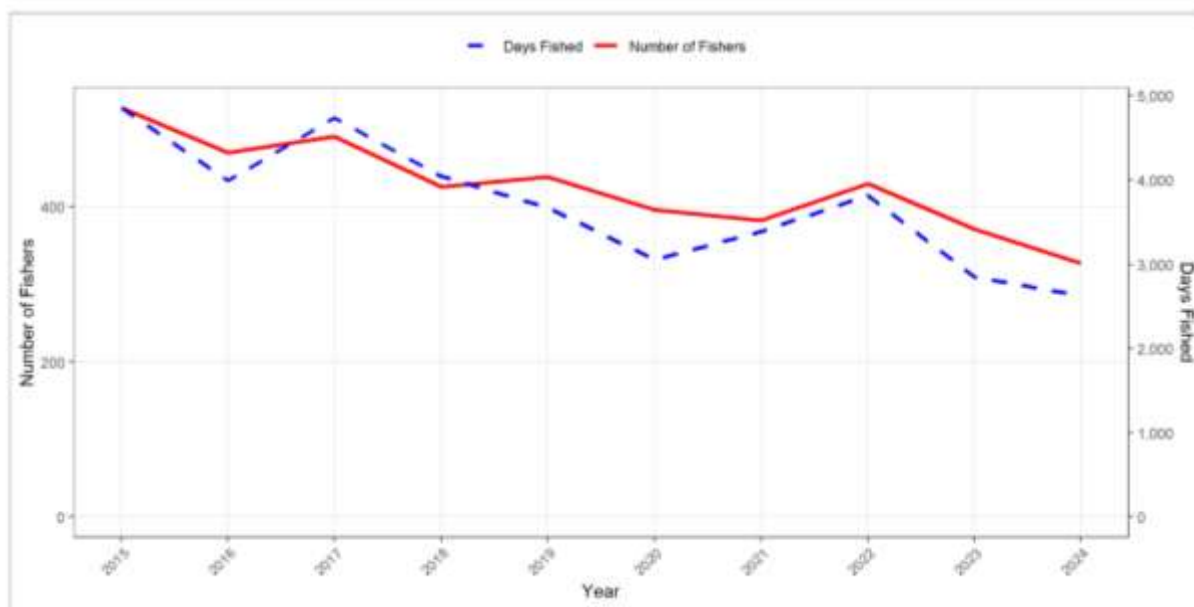


Figure 104. Number of MHI handline fishers and days fished
Supporting data shown in Table A-105.

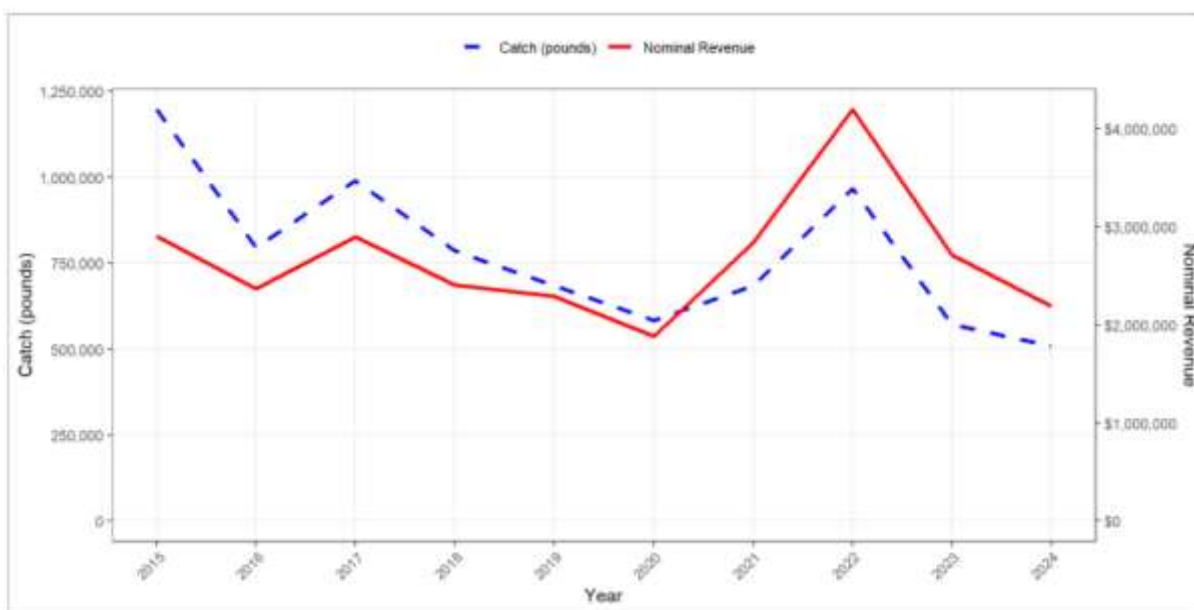


Figure 105. Catch and revenue for the MHI handline fishery
Supporting data shown in Table A-106.

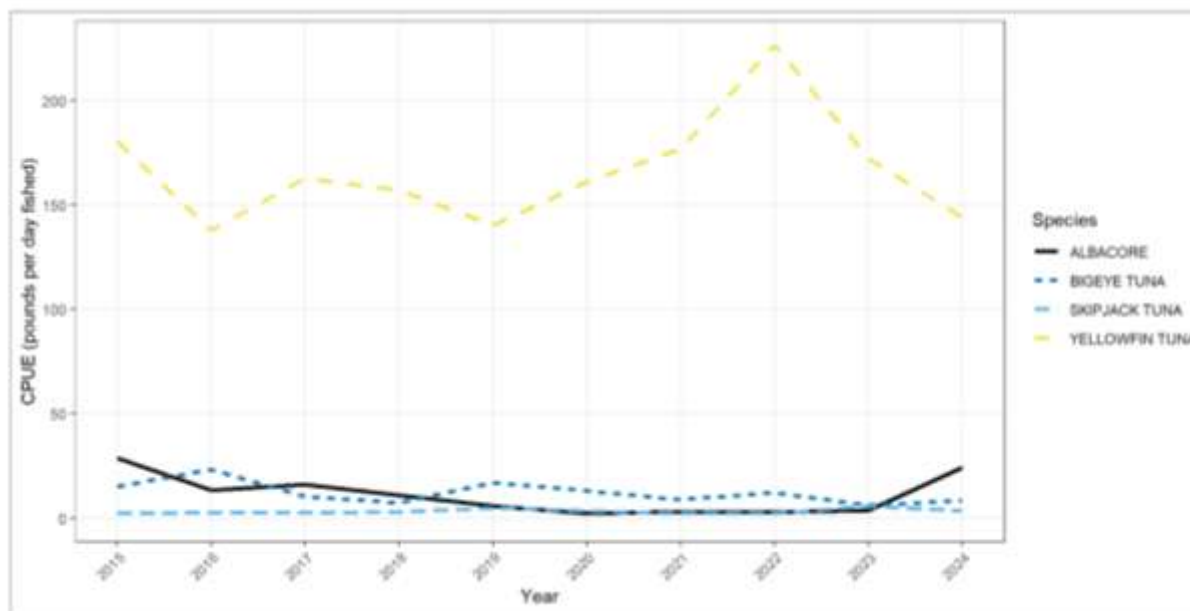


Figure 106. Tuna CPUE for the MHI handline fishery
Supporting data shown in Table A-107.

2.4.10 OFFSHORE HANDLINE FISHERY EFFORT, LANDINGS, REVENUE, AND CPUE

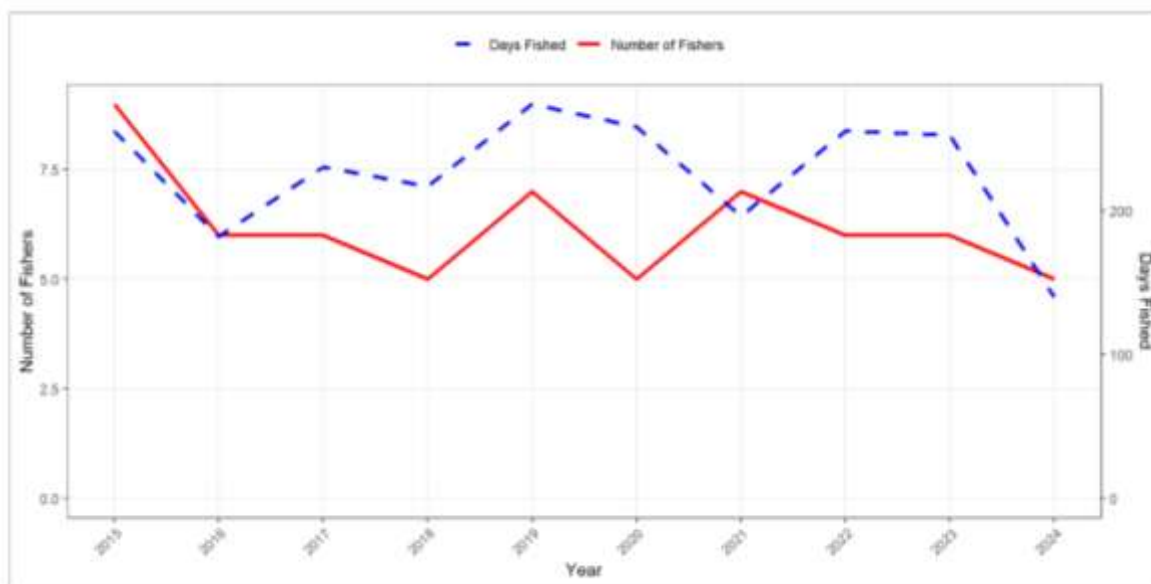


Figure 107. Number of offshore handline fishers and days fished
Supporting data shown in Table A-108.

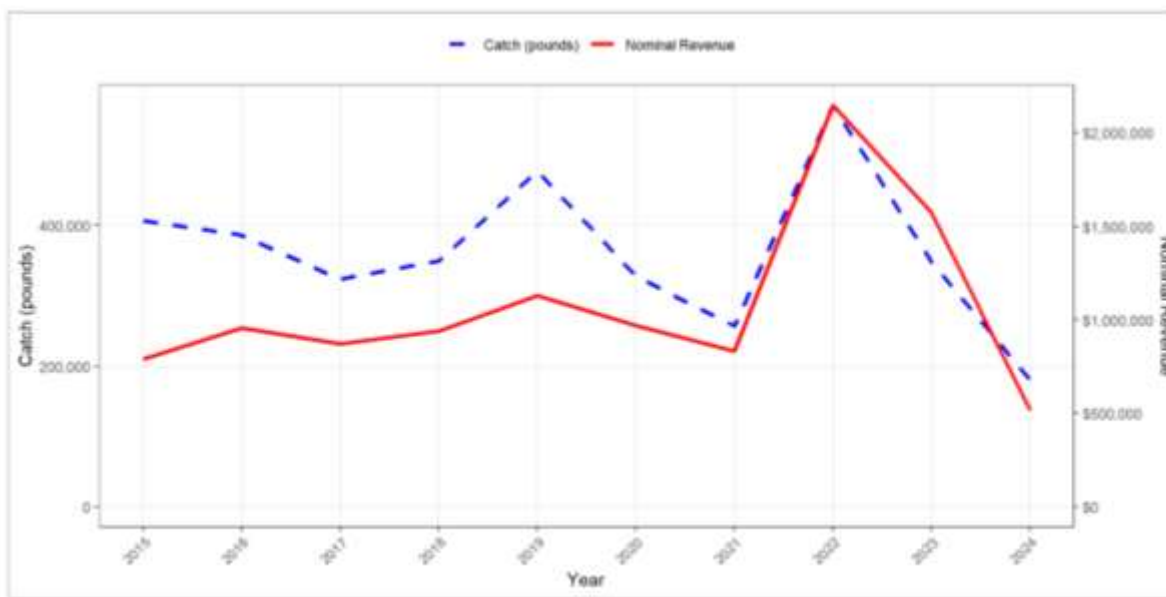


Figure 108. Catch and revenue for the offshore tuna handline fishery
Supporting data shown in Table A-109.

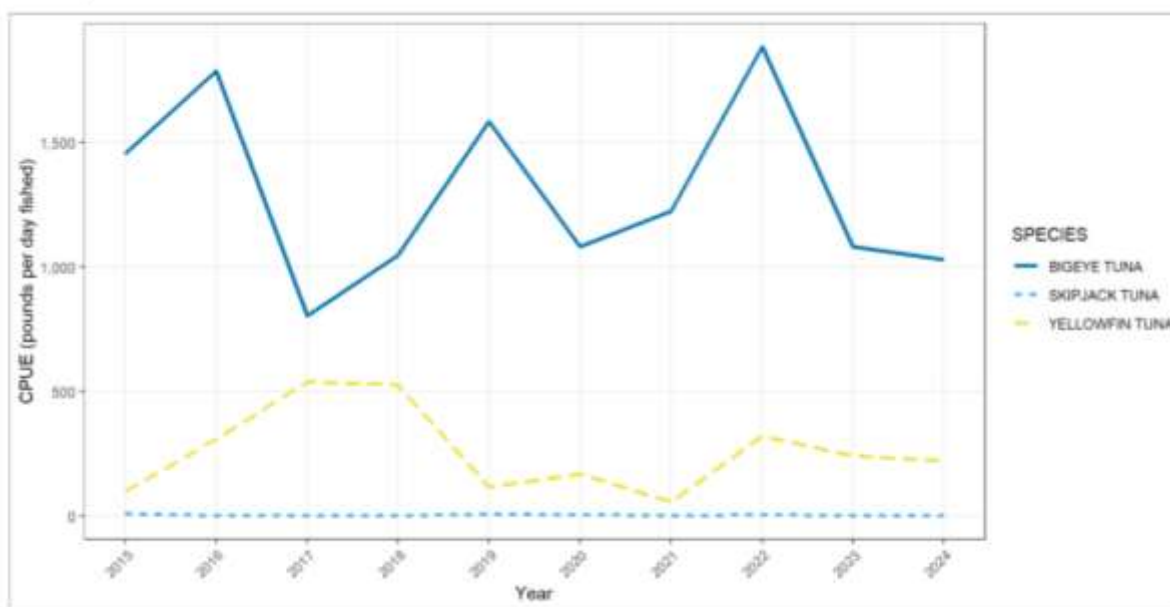


Figure 109. Tuna CPUE for the offshore tuna handline fishery
Supporting data shown in Table A-110.

Table 32. Average weight (lb) of the catch by the Hawaii troll and handline fisheries

Year	Tunas				Billfish			Other PMUS	
	Albacore	Bigeye tuna	Skipjack tuna	Yellowfin tuna	Blue marlin	Striped marlin	Swordfish	Mahimahi	Ono (Wahoo)
2015	44.1	19.8	7.4	28.9	180.7	75.6	93.2	13.4	21.7
2016	45.2	18.2	7.2	28.9	172.6	57.6	114.6	12.4	22.7
2017	51.5	20.5	9.2	40.0	187.3	70.2	116.3	11.3	22.7
2018	52.1	21.2	9.1	41.6	177.7	69.7	110.8	12.1	20.6
2019	53.4	19.5	8.6	31.5	157.1	66.0	128.1	12.8	20.6
2020	59.6	20.0	11.8	32.8	178.7	73.6	137.7	12.3	21.7
2021	51.6	22.0	9.5	29.9	167.6	81.0	93.4	13.0	22.2
2022	55.0	27.1	10.5	43.2	177.8	68.6	94.0	12.1	24.2
2023	47.4	31.8	7.8	38.6	199.5	70.8	123.3	12.5	23.5
2024	44.2	23.9	11.0	37.9	121.8	57.2	81.3	13.8	22.9
Average	50.4	22.4	9.2	35.3	172.1	69.0	109.3	12.6	22.3
SD	5.1	4.2	1.5	5.5	20.9	7.4	18.1	0.7	1.2

2.4.11 PELAGIC SMALL BOAT FISHERY BYCATCH SUMMARIES

CML holders are required to report all fishing activity regardless of whether the marine life is ultimately kept. Bycatch is reported at the species or species group level along with count (pieces), gear, reporting location grid number and other trip details. Fishers are not required to report bycatch in weight.

2.4.11.1 FISHERY DEFINITIONS

To best represent bycatch of fisheries targeting pelagic fish, the troll and handline fishery categories were modified for bycatch estimation to exclude gear types that may catch pelagic fish (and thus included in the broad fishery definition to account for all pelagic catch) but do not typically target pelagics. Gears that were excluded for MHI troll include: casting, light tackle, spinners or whipping, and for MHI handline include: deep sea or bottom handline methods, inshore handline or cowrie shell, and kaka line.

2.4.11.2 BYCATCH SUMMARIES

In 2024, 60% of the bycatch for the MHI troll fishery was blue marlin and yellowfin tuna (Table 33). High releases of blue marlin and other billfish are due in part to releases by sport charter fishers, which often target billfish, especially those fishing off West Hawai'i Island. While high bycatch of yellowfin tuna is likely due to the State of Hawaii three-pound minimum size limit on the commercial sale of ahi (yellowfin and bigeye tuna). The MHI troll fishery also typically has bycatch of high-value species such as mahimahi, skipjack (aku), and ono that may be released because they are not at a marketable size, as well as, other species that have low market value. Small inshore species such as menpachi, 'āweoweo, and halālū are likely misreported by fishers for mixed-gear trips (e.g., trolling and inshore handline).

Reported bycatch for the MHI handline fishery was mostly yellowfin tuna and skipjack (aku) (Table 34). The majority of bycatch data are confidential and can not be reported if less than three fishers reported catch of a particular species in a given year. Bycatch in this fishery is believed to be relatively low compared to overall catch, but underreporting may occur.

Bycatch for other pelagic fisheries including the offshore handline and offshore troll fisheries are not reported here due to data confidentiality rules. Both of these fisheries are extremely small in terms of participation compared with the MHI troll and handline fisheries.

Table 33. Total reported commercial bycatch (number of individuals) from the MHI troll fishery for fishing years 2014-2024

Species	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015
<i>Makaira mazara</i> or <i>Makaira nigricans</i> ; Blue Marlin	759	430	518	497	386	1167	949	651	681	1269
<i>Thunnus albacares</i> ; Yellowfin Tuna	464	969	332	586	615	780	551	497	835	1240
<i>Katsuwonus pelamis</i> ; Aku	285	457	248	224	187	124	151	193	417	411
<i>Tetrapturus angustirostris</i> ; Shortbill Spearfish	200	39	30	30		77	146	181	280	180
<i>Coryphaena hippurus</i> ; Mahimahi	190	263	155	146	197	213	216	282	248	427
<i>Kajikia audax</i> ; Striped Marlin	81		48	21	38	101	54		64	75
<i>Selar crumenophthalmus</i> ; Akule	n.d.									
<i>Acanthocybium solanum</i> ; Ono	43	59		49		56	66	60		
<i>Decapterus macarellus</i> ; 'Opelu	n.d.									
<i>Thunnus obesus</i> ; Bigeye Tuna	28	23		28	36	110			148	170
<i>Euthynnus affinis</i> ; Kawakawa		57	30							202
<i>Seriola lalandi</i> ; Kāhala		37	91	87	53	94	100	92	59	
<i>Selachii</i> (infraclass); Shark (Msc.)		30	29	21	26	53				
<i>Sphyrna barracuda</i> ; Kāku			36		26					58
<i>Caranx ignobilis</i> ; White Pāpio/Ulua					27				59	55
<i>Myripristis</i> spp.; Mempachi							n.d.	n.d.	n.d.	
<i>Heteropriacanthus cruentatus</i> ; 'Āweoweo							n.d.	n.d.		
<i>Selar crumenophthalmus</i> (juvenile); Halakū								n.d.		
Percent of all Bycatch	92	97	96	97	95	95	66	57	87	96

Note: Confidential bycatch are indicated by not disclosed (n.d.). Species presented represent the ten most frequently caught and released each year.

**Table 34. Total reported commercial bycatch (number of individuals) from the MHI
handline fishery for fishing years 2014-2024**

Species	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015
<i>Thunnus albacares</i> ; Yellowfin Tuna	193	258	160	246	118	183	261	168	283	434
<i>Katsuwonus pelamis</i> ; Aku	65	73	31	n.d.	n.d.	n.d.	n.d.	13	20	44
<i>Myripristis</i> spp.; Menpachi	n.d.									
<i>Thunnus obesus</i> ; Bigeye Tuna	19	n.d.	n.d.	13	n.d.	46	n.d.	92	34	40
<i>Eloagatis bipinnulata</i> ; Kamanu	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	26	n.d.
<i>Selachii</i> (infraclass); Shark (Misc.)	n.d.		n.d.	n.d.				n.d.		
<i>Thunnus alalunga</i> ; Tombo	n.d.	n.d.						15		
<i>Pristipomoides filamentosus</i> ; 'Opakapaka	n.d.	n.d.			n.d.					
<i>Corax ignobilis</i> ; White Pāpio/Ulua	n.d.		n.d.							
<i>Coryphaena hippurus</i> ; Mahimahi		n.d.	12	n.d.	n.d.	44	13	23	n.d.	n.d.
<i>Acanthocybium solandri</i> ; Ono		n.d.		n.d.	n.d.	n.d.	21	n.d.	28	n.d.
<i>Etelis carbunculus</i> ; Ehu		n.d.								
<i>Aphareus rutilans</i> ; Lehi		n.d.								
<i>Belontiidae</i> (family); 'Aha			n.d.	n.d.			n.d.			
<i>Seriola dumerilii</i> ; Kahala			n.d.		12	n.d.	20		7	n.d.
<i>Isurus paucus</i> ; Mako Shark			n.d.							
<i>Sphyrna tiburo</i> ; Kāki				n.d.						
<i>Alopias vulpinus</i> ; Thresher Shark				n.d.						
<i>Decapterus macanellus</i> ; 'Ōpehu					n.d.					
<i>Euthynnus affinis</i> ; Kawakawa						n.d.	n.d.	n.d.	n.d.	n.d.
<i>Carcharhinus longimanus</i> (Use Code 326) or <i>Trachinodon obesus</i> (Use Code 325); <i>Carcharhinus longimanus</i> (Use Code 326) or <i>Trachinodon obesus</i> (Use Code 325)						n.d.			5	
<i>Ballistidae</i> (family); Humuhumu						n.d.				
<i>Corax melampygus</i> ; 'Ōmīlu							n.d.			
<i>Prionace glauca</i> ; Blue Shark								n.d.		
<i>Selar crumenophthalmus</i> ; Akule									n.d.	n.d.
<i>Carangidae</i> (family); Pāpio, Ulua (Misc.)									n.d.	
Percent of all Bycatch	81	83	70	66	65	59	65	78	88	75

Note: Confidential bycatch are indicated by not disclosed (n.d.). Species presented represent the ten most frequently caught and released each year.

2.5 NON-COMMERCIAL PELAGIC FISHERIES

2.5.1 OVERVIEW OF NON-COMMERCIAL PELAGIC FISHERIES

Fishing, either for subsistence, sustenance, or recreation continues to be an important activity throughout the Western Pacific region in its four major populated island areas: Hawaii, American Samoa, Guam, and the CNMI. These non-commercial fisheries are important in island communities that depend on fish and other marine organisms as one of its few local sources of protein. This section was not updated in the 2021 or 2022 report in preparation of a revised section in the 2023 annual SAFE report, consistent with recommendations by the Council's Pelagic Plan Team.

In Hawaii, non-commercial shoreline fishing was more popular than boat-based fishing up to and after World War 2. Boat-based fishing during this period referred primarily to fishing from traditional canoes (Glazier 1999). All fishing was greatly constrained during World War 2 through time and area restrictions, which effectively stopped commercial fishing and confined non-commercial fishing to inshore areas (Brock 1947). Following World War 2, the advent of better fishing equipment, new small boat hulls, and marine inboard and outboard engines led to a growth in small vessel-based non-commercial fishing.

A major period of expansion of small vessel non-commercial fishing occurred between the late 1950s and early 1970s through the introduction of fiberglass technology to Hawaii and the further refinement of marine inboard and outboard engines. By the early 1960s there were an estimated 5,300 small boats in the State being used for non-commercial fishing. By the 1980s, the number of non-commercial craft had risen to almost 13,000 vessels, and this number increased further to about 15,000 vessels in the 1990s. There are many fishing clubs in Hawaii, and a variety of different recreational fishing tournaments organized by both clubs and independent tournament organizers. Hawaii also hosts between 150 and 200 boat-based fishing tournaments, about 30 of which are considered major international competitions. This level of interest in recreational fishing is sufficient to support local fishing magazines, *Hawaii Fishing News* and *Lawai'a*, with articles about local recreational fishing, as well as several recreational fishing television programs.

Elsewhere in the Western Pacific region, non-commercial fishing is less structured. In Guam, fishing clubs have been founded along ethnic lines by Japanese and Korean residents. These clubs had memberships of 10 to 15 people along with their families. Four such clubs were founded in Guam over the past 20 years, but none lasted for more than a 2 to 3 years (Gerry Davis, NMFS PIRO, pers. comm.). There was also a Guam Boating Association, comprised of mostly fishermen, with several hundred members. This organization functioned as a fishing club for about 10 years before disbanding. Some school groups and the boy scouts have formed fishing clubs focused on rod and reel fishing, and there is still one spearfishing club (Marianas Underwater Fishing Federation) that is active. There are also some limited fishing tournaments in Guam, including a fishing derby for children organized by the DAWR.

Every summer in Guam, the fishing community gathers to partake in several fishing derbies and the *Gupot Y Peskadot* (i.e., Fishermen's Festival). This includes several fishing competitions such as the Kid's Fishing Derby, In-Shore Tournament (rod and reel), Spearfishing Challenge and Guam Marianas International Fishing Derby (trolling).

There are a few fishing clubs in the Northern Mariana Islands. The Saipan Fishermen's Association (SFA) has been in existence since 1985 and is the sponsor of the annual Saipan International Fishing Tournament usually held in August or September. The SFA also developed a "Tasi to Table" Youth Fishing Club, which provides fishing experiences and training to high school students. One spearfishing club, the Marianas Apnea Spearfishing Club, was founded in 2007 and continues to instill traditional cultural fishing skills among the people of the CNMI to encourage sustainable fishing.

Levine and Allen (2009) provided an overview of fisheries in American Samoa, including subsistence and recreational fisheries. Citing a survey conducted in American Samoa by Kilarski et al. (2006), Levine and Allen (2009) noted that approximately half of the respondents stated that they fished for recreation, with 71 percent of these individuals fishing once a week or less. Fishermen also fished infrequently for cultural purposes, although cultural, subsistence, and recreational fishing categories were difficult to discern as one fishing outing could be motivated by any combination of the three reasons.

Boat-based recreational fishing in American Samoa has been influenced primarily by fishing clubs and fishing tournaments. Tournament fishing for pelagic species began in American Samoa in the 1970s, and between 1974 and 1998, a total of 64 fishing tournaments were held (Tulafono 2001). Most of the boats that participated were *alia* catamarans and small skiffs. Catches from tournaments were often sold, as most of the entrants were local small-scale commercial fishermen. In 1996, three days of tournament fishing contributed about one percent of the total domestic landings. Typically, seven to 14 local boats carrying a total of 55 to 70 fishermen participated in each tournament, which were held two to five times per year (Craig et al. 1993).

Most tournament participants operated 28-foot *alia* vessels, the same vessels that engage in the small-scale longline fishery. With more emphasis on commercial longline fishing since 1996, interest in the tournaments waned (Tulafono 2001) and pelagic fishing effort shifted markedly from trolling to longlining. Catch-and-release recreational fishing is virtually non-existent in American Samoa. Landing fish to meet cultural obligations is of such high importance such that releasing fish would generally be considered a failure to meet these responsibilities (Tulafono 2001). Nevertheless, some pelagic fishermen who fish for subsistence release fish that are in excess of their subsistence needs.

Most of the non-commercial boat-based fishing is done by the Pago Pago Game Fishing Association (PPGFA), which was founded in 2003 to host regular fishing competitions. The PPGFA has annually hosted international tournaments with fishermen from neighboring Samoa and Cook Islands attending. The non-commercial vessels extensively use anchored FADs, and venture to the various outer banks such as the South Bank (35 miles), North East Bank (40 miles NE), South East bank (37 miles SE), Two Percent Bank (40 miles), and East Bank (24 miles East) during tournaments. The PPGFA plays host to the Steinlager *I'a Lapo'a* Game Fishing Tournament, which is a qualifying event for the International Game Fish Association's Offshore World Championship. There is no full-time regular charter fishery in American Samoa similar to those in Hawaii, CNMI, or Guam. However, Pago Pago Marine Charters does include fishing charters among the services it offers.

There is also some non-commercial fishing activity within portions of the PRIA, namely at Midway, Wake Island, and Palmyra Atoll. There are no resident populations at Howland

Island, Baker Island, Johnston Atoll, or Jarvis Island, and fishing activity at these locations is likely minimal. There was a tourist facility at Midway until 2002, which operated a charter boat fishery targeting primarily pelagic fish. The company operated five vessels for charter fishing, consisting of three 22 to 26 foot catamarans for lagoon and nearshore fishing operations and two 38 foot sportfishing vessels used for blue water trolling. In addition, there were approximately seven small vessels maintained and used by Midway residents for non-commercial fishing. Of these seven, three vessels engaged primarily in offshore trolling for PMUS including yellowfin tuna, wahoo, and marlin. All vessels fishing at Midway were required to file a float plan prior to a fishing trip and complete the “Midway Sports Fishing Boat Trip Log” upon completion of each trip. The U.S. Fish and Wildlife Service was responsible for compiling these catch data.

At Palmyra Atoll, an island privately owned by The Nature Conservancy, small boats are operated within the lagoon for trolling. There are several craft used for non-commercial fishing at the military base on Wake Island, including two landing craft and two small vessels.

2.6 INTERNATIONAL

2.6.1 INTRODUCTION

The U.S Pacific Island EEZs managed by the Council are surrounded by large and diverse fisheries targeting pelagic species. The International Module contains reported catches of pelagic species in the entire Pacific Ocean by fleets of Pacific Island nations and distant water fishing nations and information for a SAFE report that includes the most recent assessment information in relation to status determination criteria. Fishery trends in the entire Pacific Ocean are illustrated for the purse seine, longline and pole-and-line fisheries. The tables of this section show the catches of pelagic MUS by U.S. longline (Hawaii and California-based) and U.S. territorial longline fisheries in the Western and Central Pacific Fisheries Commission (WCPFC) Convention Area from 2018-2023, as reported by NMFS to the WCPFC. The catches for 2023 are preliminary.

Table 41 through Table 43 provide the U.S. longline landings as submitted to the WCPFC and Inter-American Tropical Tuna Commission (IATTC).

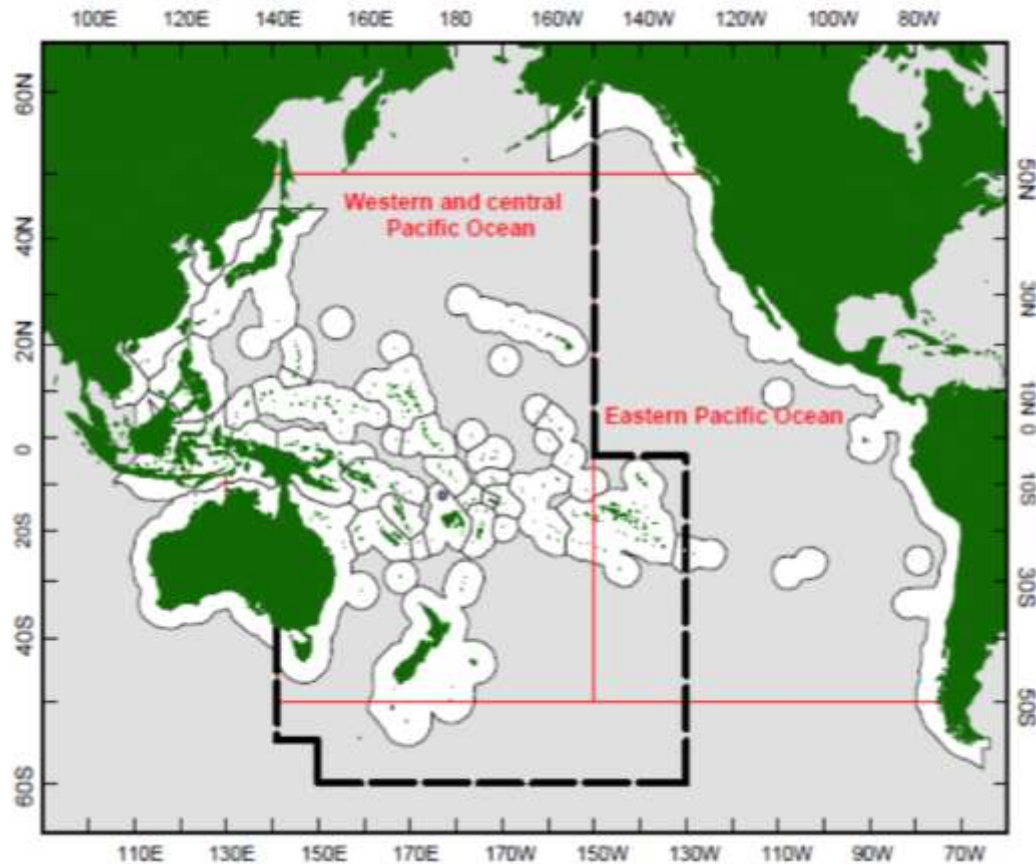


Figure 110. The Western and Central Pacific Ocean, Eastern Pacific Ocean and the WCPFC Convention Area (WCP–CA) [in dashed lines]

2.6.2 DATA SOURCES

The data sources for the international module of the annual SAFE report are obtained from the various literature of the WCPFC, the IATTC, and the International Scientific Committee for Tuna and Tuna-like species (ISC). These references can be found in Section 5. Additional sources of data include the U.S. data submissions to the WCPFC and IATTC documented in this module.

2.6.3 PLAN TEAM RECOMMENDATIONS

There were no recommendations for the International module by the Pelagic Plan Team for the 2024 annual SAFE report to be forwarded to the Council, only work items to Pelagic Plan Team members on improvements to other modules.

2.6.4 SUMMARY OF FISHERIES

This section presents the total catch of tuna species in the Pacific Ocean as reported to the Pacific Community (PC) from all member countries. Table 35 and Figure 111 depict the combined catch of all fisheries, while the following subsections present fishery specific data for the three main fisheries: purse seine, longline, and pole-and-line.

Table 35. Estimated annual catch (mt) of tuna species in the Pacific Ocean

Year	Albacore	Bigeye	Skipjack	Yellowfin	Total
2014	162,336	258,913	2,248,223	869,688	3,539,160
2015	153,528	250,352	2,118,897	849,074	3,371,851
2016	130,209	249,065	2,127,252	915,093	3,421,619
2017	153,187	233,260	1,935,794	934,512	3,256,753
2018	139,613	248,730	2,133,846	949,672	3,471,861
2019	128,290	228,836	2,392,553	924,331	3,674,010
2020	149,388	251,290	2,018,069	957,510	3,376,257
2021	121,428	212,563	2,009,287	1,010,430	3,353,708
2022	136,031	219,202	2,041,164	949,272	3,345,669
2023	121,597	219,037	1,956,552	999,498	3,296,684
Average	139,561	237,125	2,098,164	935,908	3,410,757
SD	14,432	16,543	139,727	50,472	123,183

Source: PC (2023).

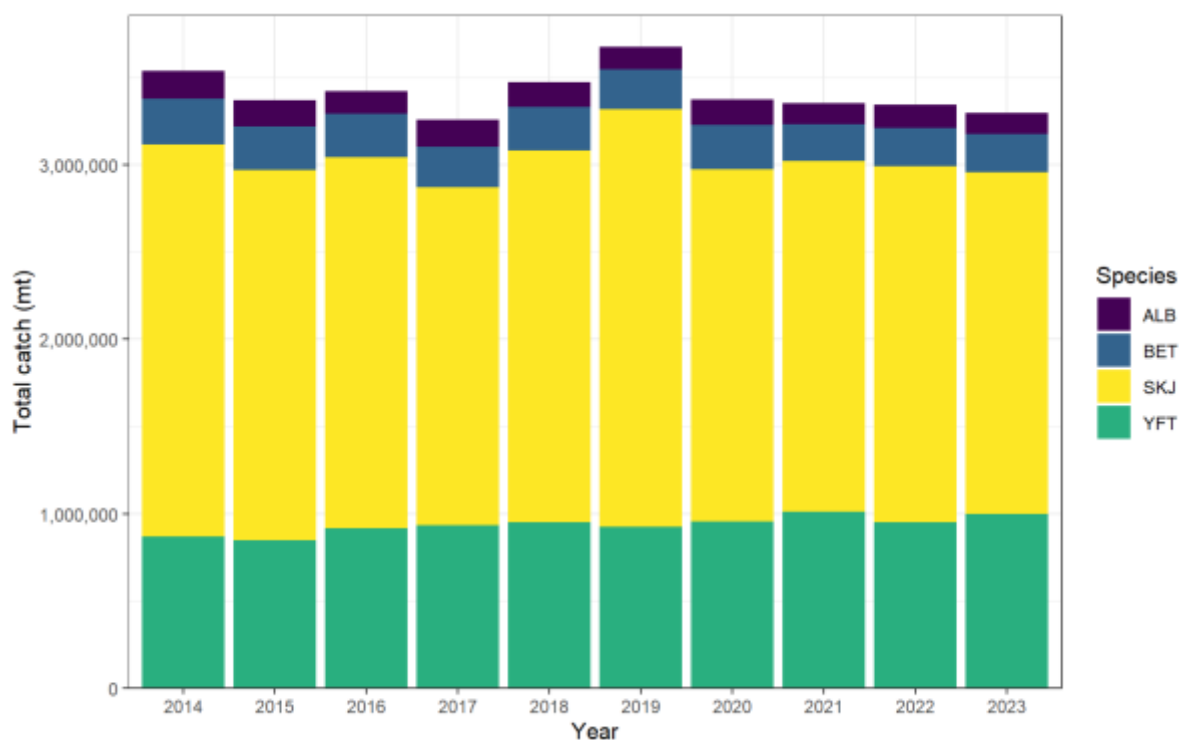


Figure 111. Estimated total annual catch of tuna species in the Pacific Ocean: albacore (ALB), bigeye tuna (BET), skipjack tuna (SKJ), and yellowfin tuna(YFT)

Source: PC (2024).

2.6.4.1 PURSE SEINE FISHERY IN THE WCPFC

Source: [WCPFC- SC20-GN-WP-01](#)

Vessels: The majority of the historic WCPFC Convention Area (WCPFC-CA) purse seine catch has come from the four main Distant Water Fishing Nation (DWFN) fleets – Japan, Korea, Chinese-Taipei and USA, which combined numbered 163 vessels in 1992, but declined to a low of 111 vessels in 2006 (due to reductions in the US fleet), before some rebound in recent years (up to 129 vessels in 2017 and 124 vessels in 2020, and 97 vessels in 2023). The Pacific Islands fleets have gradually increased in numbers over the past two decades to a level of 142 vessels in 2023. The remainder of the purse seine fishery includes several fleets which entered the WCPFC tropical fishery during the 2000s (e.g., China, Ecuador, El Salvador, New Zealand, and Spain).

The total number of purse seine vessels was relatively stable over the period 1990-2006 (in the range of 170–250 vessels), but thence until 2014, the number of vessels gradually increased, attaining a record level of 308 vessels in 2015, before steadily declining since (to 270 vessels in 2023). Further declines have occurred in recent years, with a significant reduction in vessels from one component of the U.S. purse seine fleet.

The provisional 2023 purse seine catch of 1,843,100 mt was around 257,035 mt lower than the record catch in 2019 (2,100,135 mt). The 2023 purse seine skipjack catch (1,377,830 mt; 75% of catch) as slightly below the average catch over the past decade, and around 322,000 mt lower than the catch in 2019 (~1,700,000 mt). The 2023 purse seine catch for yellowfin tuna (408,281 mt; 22% of the total purse seine tuna catch) was the fourth highest on records and around 92,000 mt lower than the record catch in 2017 (500,506 mt). The provisional catch estimate for bigeye tuna for 2023 (56,094 mt; 3% of the total purse seine fishery) was about 8,500 mt lower than the 2022 catch and a only a slight increase over the notably low purse seine bigeye tuna catch in 2019 (52,081 mt). The increased bigeye tuna catches from 2020-2022 appear to be related to a higher number of associated sets in conjunction with La Nina conditions.

Despite the FAD closure for certain periods in each year since 2010, drifting FAD sets remain an important fishing strategy, particularly to the east of 160°E. The purse seine catch/effort distribution in tropical areas of the WCPFC–CA is strongly influenced by El Niño –Southern Oscillation Index (ENSO) events. The relatively high proportion of unassociated sets in the eastern areas (e.g. Gilbert Islands) was a feature of the fishery in 2015–2016 (i.e. corresponding to El Niño conditions). The move to ENSO-neutral conditions, then weak La Niña during 2017 into early 2018 resulted in more effort in the area west of 160°E compared to recent years, and a higher use of drifting FADs in the area east of 160°E. By late 2018, weak El Niño conditions presided over the fishery and relatively high catches were taken in the eastern tropical areas, in and adjacent to the waters of Tokelau and the Phoenix Group. El Niño conditions continued into 2019 with purse seine effort extending further to the east compared to recent years and very good catches were taken in a few concentrated areas of the eastern tropical waters. The La Niña conditions experienced in 2020 to 2022 resulted in a general westward shift of fishing effort compared to 2019. Catch rates in 2023 have remained consistent with the past couple years, possibly reflecting the transition to El Niño conditions.

The US fleet typically fishes in the more eastern areas since 2020 with effort extended into the Gilberts, Phoenix and Line Islands, the Cook Islands, Tokelau and the adjacent eastern high seas areas with increasingly less effort west of 160°E; during 2021, the US fleet fished even further east, in the Line Group and the high seas areas north of the Cook Islands and French Polynesian EEZs. The difference in areas fished by the non-Pacific islands' fleets is related to the areas they have access to and perhaps also related to fishing strategy (e.g., use of traditional fishing grounds, e.g. FSM, PNG and the Solomon Islands by the Japan fleet).

Table 36. Total reported purse seine catch (mt) of skipjack, yellowfin, and bigeye tuna in the Pacific Ocean

Year	Skipjack	Yellowfin	Bigeye	Total
2014	1,879,297	620,473	134,058	2,633,828
2015	1,718,683	559,728	121,323	2,399,734
2016	1,713,013	650,714	130,054	2,493,781
2017	1,588,318	712,265	132,409	2,432,992
2018	1,738,395	618,621	141,276	2,498,292
2019	2,051,003	572,087	120,958	2,744,048
2020	1,703,142	617,023	151,537	2,471,702
2021	1,691,549	656,913	119,932	2,468,394
2022	1,764,462	621,260	121,171	2,506,893
2023	1,680,181	672,772	113,443	2,466,396
Average	1,752,804	630,186	128,616	2,511,606
SD	127,612	45,347	11,569	102,026

Source: SPC (2024) and IATTC (2024).

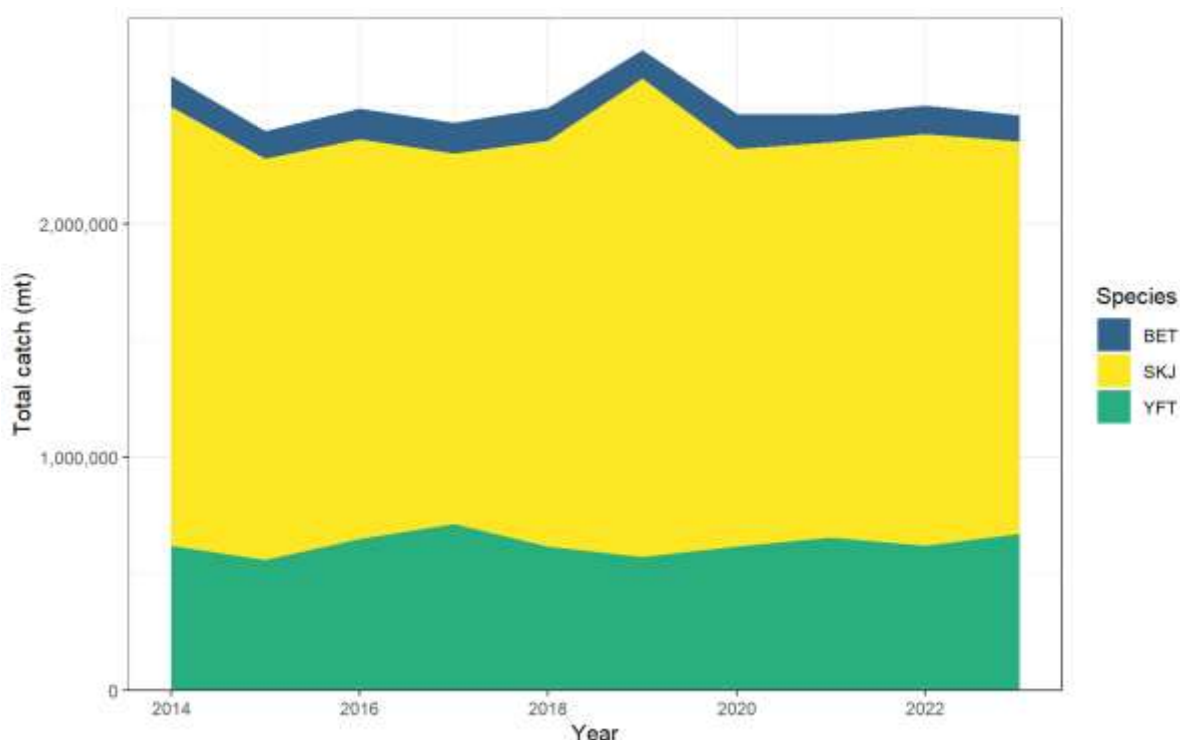


Figure 112. Total purse seine catch of skipjack (SKJ), yellowfin (YFT), and bigeye tuna (BET) in the Pacific Ocean

Source: SPC (2024) and IATTC (2024).

2.6.4.2 LONGLINE FISHERIES IN THE WCPFC

Source: [WCPFC- SC20-GN-WP-01](#)

The longline fishery now accounts for only 8–10% of the total WCPFC–CA catch (OFP, 2024) but approaches the much larger purse seine catch in landed value. It provides the longest time series of catch estimates for the WCP–CA, with estimates available since the early 1950s. The total number of vessels involved in the fishery generally fluctuated between 3,000 and 6,000 for the period 1970–2004, although for some distant-water fleets, vessels operating in areas beyond the WCP–CA could not be separated out and more representative vessel numbers for WCP–CA have only become available in recent years. Total longline vessel numbers have slowly declined over the past 15 years, with the provisional estimate of 1,543 vessels in 2021 showing a 57% drop on vessel numbers in 2005 and a 9% drop on 2019 vessel numbers, mainly due to a decline in the category of non-Pacific Islands domestic fleets, but also no doubt due to the impacts of COVID-19.

The fishery involves two main types of operation:

- Large (typically >250 gross registered tonnes [GRT]) distant-water freezer vessels which undertake long voyages (months) and operate over large areas of the region. These vessels may target either tropical (yellowfin, bigeye tuna) or subtropical (albacore) species. Voluntary reduction in vessel numbers by at least one fleet has occurred in recent years.

- Smaller (typically <100 GRT) offshore vessels which are usually domestically based, undertaking trips less than one month, with ice or chill capacity, and serving fresh or air-freight sashimi markets, or albacore canneries. There are several foreign offshore fleets based in Pacific Island countries.

The following broad categories of longline fishery, based on type of operation, area fished and target species, are currently active in the WCPFC–CA:

- South Pacific offshore albacore fishery comprises Pacific-Islands domestic “offshore” vessels, such as those from American Samoa, Cook Islands, Fiji, French Polynesia, Kiribati, New Caledonia, PNG, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu; these fleets mainly operate in subtropical waters, with albacore the main species taken. Two new entrants, Tuvalu and Wallis & Futuna, joined this category during 2011, although the latter fleet has not fished recently. Vessel numbers have stabilized in recent years, but they may also vary depending on charter arrangements.
- Tropical offshore bigeye/yellowfin-target fishery includes “offshore” sashimi longliners from Chinese-Taipei, based in Micronesia, Guam, Philippines and mainland Chinese vessels based in Micronesia, and domestic fleets based in Indonesia, Micronesian countries, Philippines, PNG, the Solomon Islands and Vietnam.
- Tropical distant-water bigeye/yellowfin-target fishery comprises “distant-water” vessels from Japan, Korea, Chinese-Taipei, mainland China and Vanuatu. These vessels primarily operate in the eastern tropical waters of the WCP–CA (and into the EPO), targeting bigeye and yellowfin tuna for the frozen sashimi market.
- South Pacific distant-water albacore fishery comprises “distant-water” vessels from Chinese-Taipei, mainland China and Vanuatu operating in the south Pacific, generally below 20°S, targeting albacore tuna destined for canneries.
- Domestic fisheries in the sub-tropical and temperate WCP–CA comprise vessels targeting different species within the same fleet depending on market, season and/or area. These fleets include the domestic fisheries of Australia, Japan, New Zealand and Hawai’i. For example, the Hawaiian longline fleet has a component that targets swordfish and another that targets bigeye tuna.
- South Pacific distant-water swordfish fishery is a relatively new fishery and comprises “distant-water” vessels from Spain and Portugal (one vessel started fishing in 2011).
- North Pacific distant-water albacore and swordfish fisheries mainly comprise “distant-water” vessels from Japan (swordfish and albacore), Chinese-Taipei (albacore only) and Vanuatu (albacore only).

The provisional WCPFC–CA longline catch (234,894 mt) for 2023 remains lower than the recent ten-year average but a slight increase from 2022 (243,115 mt). The COVID-19 restrictions played a role in the distribution of 2021 effort in the longline fishery, with clear declines in effort in both the south Pacific Albacore fishery and in the tropical longline fishery. The La Niña conditions in previous may also have contributed to lower catches in

the longline fishery prior to 2023, although further investigation would be required to confirm this hypothesis.

The WCPFC–CA albacore longline catch (86,957 mt – 37%) for 2023 exceeded the catch in 2022 and was the highest since 2019, but about 19,000 mt lower than the record of 106,141 mt attained in 2010. The provisional bigeye catch (56,203 mt – 24%) for 2023 was similar to the 2022 catch level which are some of the lowest catches reported since the mid-1980s, and well below on the bigeye catch levels experienced in the 2000s (e.g., the 2004 longline bigeye catch was 99,709 mt). The yellowfin catch for 2023 (89,975 mt – 38%), was higher than the previous three years, but a significant drop from the high catch level in 2019 (104,426 mt).

A significant change in the WCPFC–CA longline fishery over the past two decades has been the growth of the Pacific Islands domestic albacore fishery, which has risen from taking 33% of the total South Pacific albacore longline catch in 1998 to accounting for around 50-60% of the catch in recent years. The combined national fleets (including chartered vessels) mainly active in the Pacific Islands domestic albacore fishery have numbered more than 500 (mainly small ‘offshore’) vessels in some years over the past decade with catches at a similar level to the distant-water longline vessels active in the south WCPFC–CA.

The distant-water fleet dynamics have continued to evolve in recent years, with catches down from record levels in the mid-2000s initially due to a reduction in vessel numbers, although vessel numbers for some fleets appear to be on the rise again in recent years, but with variation in areas fished and target species. The Japanese distant-water and offshore longline fleets have experienced a substantial decline in both bigeye catches (from 18,172 mt in 2004 to 3,329 mt in 2023) and vessel numbers (366 in 2004 to 74 in 2023). The Chinese-Taipei distant-water longline fleet had a peak bigeye tuna catch of 22,154 mt in 2004 but has stabilized at a lower level in recent years, with 9,203 mt taken in 2023 (809 vessels). The Korean distant-water longline fleet experienced some decline in bigeye and yellowfin catches since the period of highest catches 15–20 years ago in line with a reduction in vessel numbers – from 184 vessels active in 2002 reduced to 96 vessels in 2023.

In contrast, the China longline fleet catches of albacore tuna have been amongst the highest ever in recent years, with a range of 16,000–29,000 mt of albacore tuna in the south WCPFC–CA area over the past six years; their 2023 albacore tuna catch was 25,732 mt, the second highest catch for this fleet.

With domestic fleet sizes continuing to increase as foreign-offshore and distant-water fleets decrease, this evolution in fleet dynamics no doubt has some effect on the species composition of the catch. For example, the increase in effort by the Pacific Islands domestic fleets has primarily been in albacore fisheries, although this had been balanced to some extent by the switch to targeting bigeye tuna (from albacore) by certain vessels in the distant-water Chinese-Taipei fleet almost a decade ago. More detail on individual fleet activities during recent years is available in the WCPFC–SC20 National Fisheries Reports.

Effort by the large-vessel, distant-water fleets of Japan, China, Korea and Chinese-Taipei account for most effort on the high seas in the eastern WCPFC Area, noting the reduction in vessel numbers for some fleets over the past two decades. Effort is widespread as sectors of

these fleets target bigeye and yellowfin for the frozen sashimi market in central and eastern tropical waters, and albacore for canning in the more temperate waters

Activity by the foreign-offshore fleets from Japan, China, and Chinese-Taipei is restricted to tropical waters, targeting bigeye and yellowfin for the fresh sashimi market; these fleets tend to have limited overlap with the distant-water fleets. The substantial ‘domestic fleet’ effort in the west of the WCPFC-CA is primarily by the Indonesian and Chinese-Taipei domestic fleets targeting yellowfin and bigeye in the lower latitudes, and the Japanese offshore and coastal fleets in their home fishery and adjacent high seas.

Table 37. Total reported longline catch (mt) of PMUS in the Pacific Ocean

Year	Albacore	Bigeye	Yellowfin	Striped Marlin	Swordfish	Blue Marlin	Black Marlin	Total
2014	107,887	104,819	106,660	2,443	5,557	18,186	2,157	347,709
2015	110,037	108,380	111,347	2,717	5,468	17,633	2,429	358,011
2016	93,768	93,509	96,219	1,677	6,037	16,132	1,256	308,599
2017	116,850	87,281	91,469	1,615	5,791	14,319	1,071	318,395
2018	104,259	91,939	105,089	1,361	5,076	13,725	1,189	322,638
2019	100,830	91,513	111,257	1,788	4,410	12,962	1,127	323,887
2020	89,593	76,561	81,636	1,555	3,772	9,893	1,372	264,382
2021	93,292	69,866	79,830	1,292	4,924	8,614	1,045	258,863
2022	107,233	70,516	88,957	1,175	4,941	8,439	948	282,209
2023	105,391	70,633	85,946	1,496	4,474	9,485	746	278,172
Average	102,914	86,502	95,841	1,712	5,045	12,939	1,334	306,287
SD	8,526	14,148	12,034	497	696	3,689	537	32,397

Source: SPC (2024) and IATTC (2024).

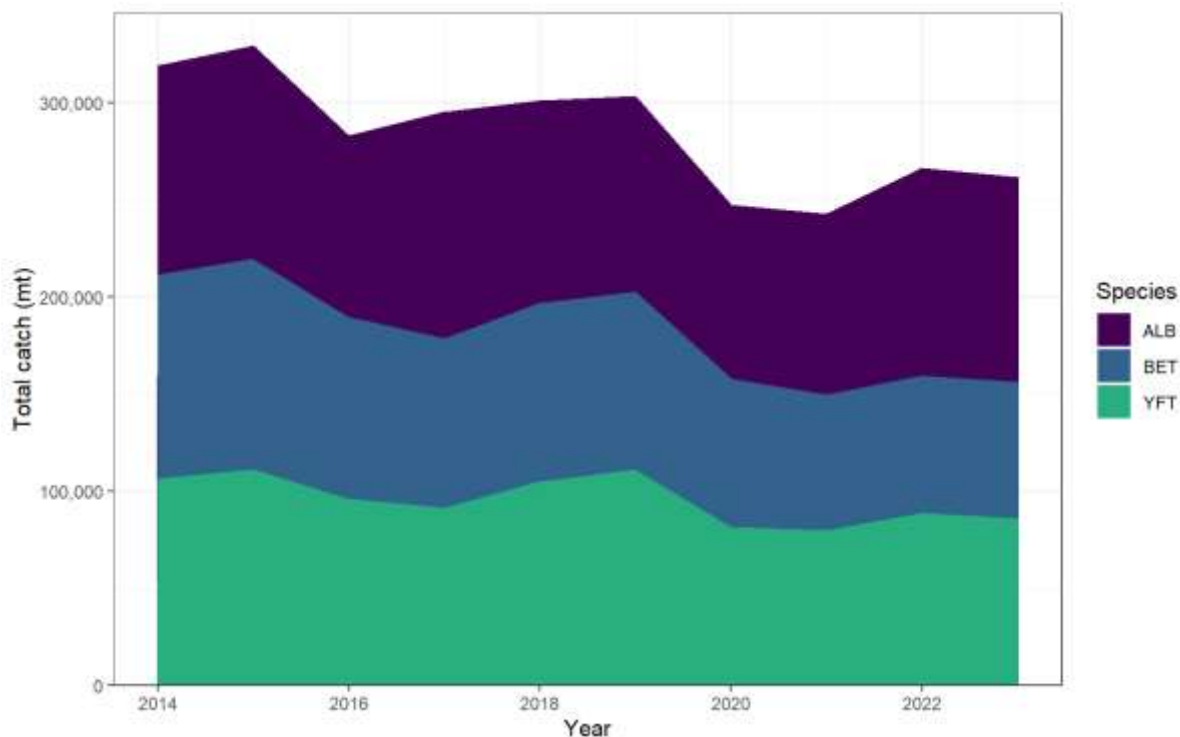


Figure 113. Reported longline tuna catches in the Pacific Ocean (2014-2023): albacore (ALB), bigeye tuna (BET), and yellowfin tuna(YFT)

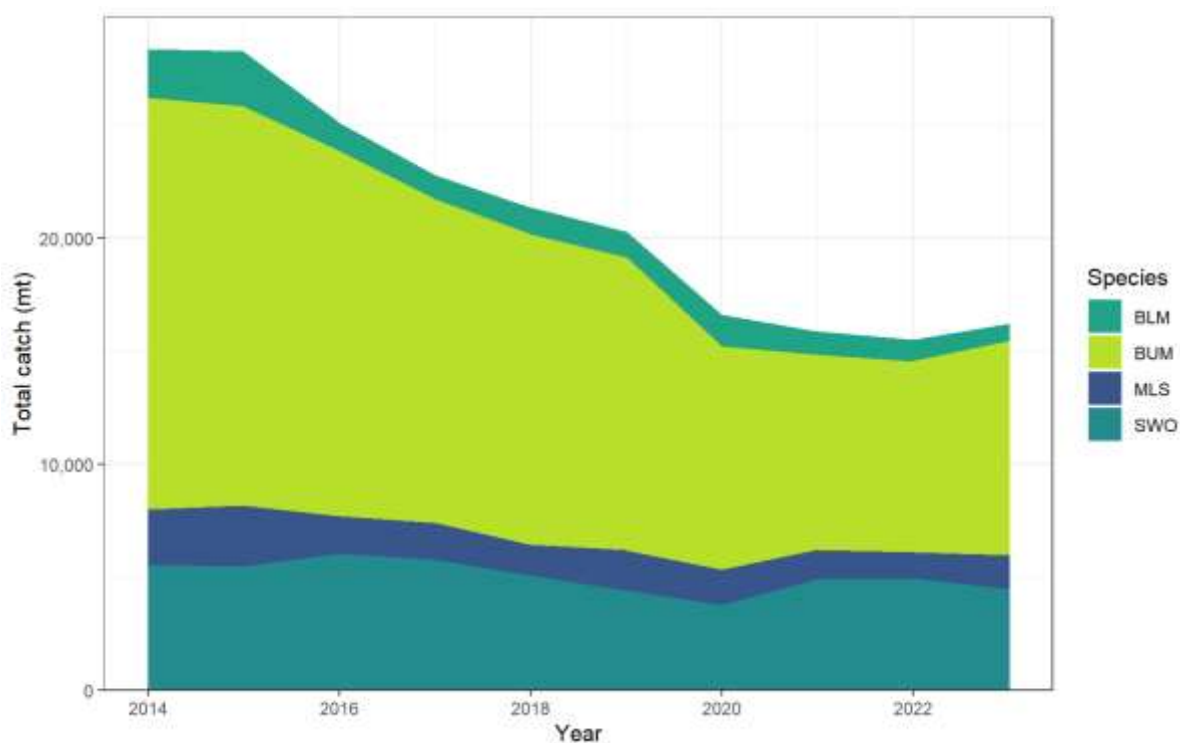


Figure 114. Reported longline billfish catches in the Pacific Ocean (2014-2023): black marlin (BLM), blue marlin (BUM), striped marlin (MLS), swordfish (SWO)

Source: SPC (2024) and IATTC (2024).

2.6.4.3 POLE-AND-LINE FISHERY IN THE WCPFC

Source: [WCPFC- SC20-GN-WP-01](#)

Economic factors and technological advances in the purse seine fishery (primarily targeting the same species, skipjack) have resulted in a gradual decline in the number of vessels in the pole-and-line fishery and in the annual pole-and-line catch during the past 15–20 years. The gradual reduction in numbers of vessels has occurred in all pole-and-line fleets over the past decade. Pacific Island domestic fleets have declined in recent years – fisheries formerly operating in Fiji, Palau and Papua New Guinea are no longer active, only one vessel is now operating (occasionally) in Kiribati, and fishing activity in the Solomon Islands fishery during the 2000s was reduced substantially from the level experienced during the 1990s. Several vessels continue to fish in Hawai'i, and the French Polynesian *bonitier* fleet remains active (30 vessels in 2021), but an increasing number of vessels have turned to longline fishing. Vessel and catches from Indonesian pole-and-line fleet have also declined over recent years. There is continued interest in pole-and-line fish associated with certification/ecolabelling.

The provisional 2023 pole-and-line catch (143,431 mt) is the lowest annual catch since the early-1960s, due to reduced catches in the Japanese fishery, although we note as in previous years the provisional nature of the estimates at this stage Skipjack accounts for the majority of the catch (~70-84% in recent years, but typically more than 85% of the total catch in tropical areas) and albacore (5–10% in recent years, with a reduction to 3% in 2023) is taken by the Japanese coastal and offshore fleets in the temperate waters of the north Pacific. Yellowfin tuna (recently 10–13%) and a small component of bigeye tuna (~1% in recent years) make up the remainder of the catch. There were four pole-and-line fleets active in the WCPO in 2023 (Japan, Indonesia, French Polynesia, and Solomon Islands). Japanese distant-water and offshore fleets (58,057 mt in 2023), and the Indonesian fleets (85,098 mt in 2022, carried over to 2023 at this stage), account for nearly all of the WCPFC–CA pole-and-line catch (98% in 2023). The catches by the Japanese distant-water and offshore fleets in recent years have been the lowest for several decades and this is no doubt related to the continued reduction in vessel numbers (61 vessels in 2023; although the vessel numbers have been stable at around 60-70 over the past 5 years). The Solomon Islands, resumed activity in this fishery in 2011 and participated until 2022, and have continued to participate in the fishery since then with a catch of 533 mt in 2023.

Fleet distribution: The WCPFC–CA pole-and-line fishery has several components:

- the year-round tropical skipjack fishery, mainly involving the domestic fleets of Indonesia, Solomon Islands and French Polynesia, and the distant water fleet of Japan
- seasonal sub-tropical skipjack fisheries in the domestic (home) waters of Japan, Australia, Hawaii, and Fiji
- a seasonal albacore/skipjack fishery east of Japan (largely an extension of the Japan home-water fishery).

Table 38. Total reported pole-and-line catch (mt) of skipjack in the Pacific Ocean

Year	Catch
2014	148,619
2015	151,157
2016	156,503
2017	123,308
2018	183,851
2019	158,161
2020	159,400
2021	165,435
2022	130,147
2023	88,936
Average	146,551.7
St Dev	26,459.9

Source: PC (2024).

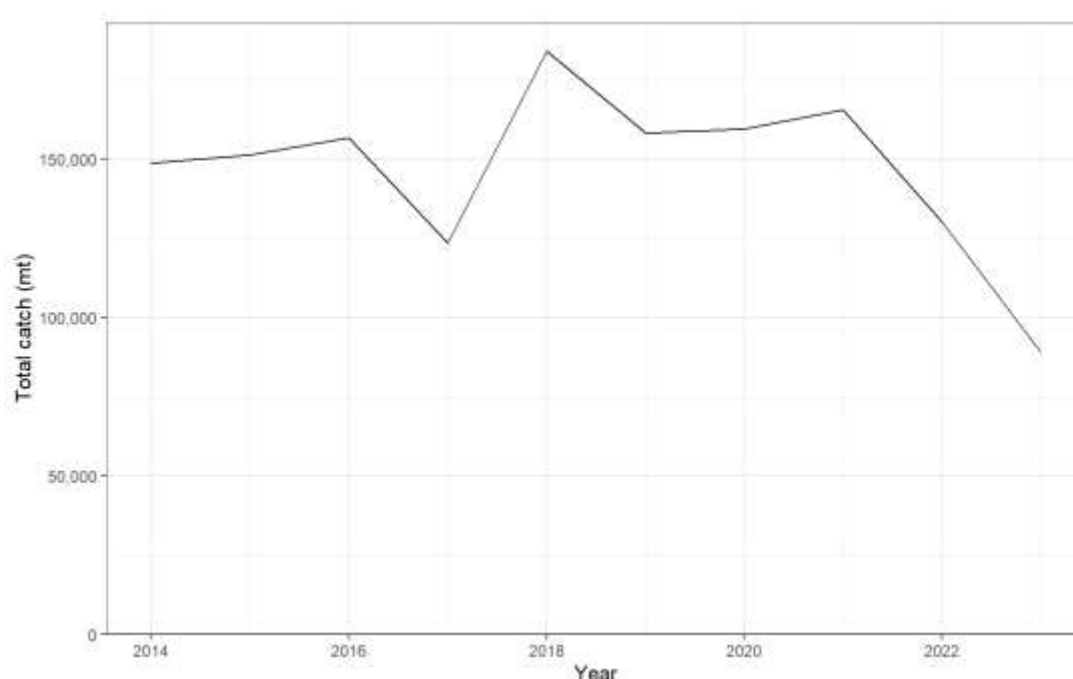


Figure 115. Reported pole-and-line catch (mt) in the Pacific Ocean

Source: PC (2024).

2.6.5 STATUS OF THE STOCKS

National Standard 1 of the MSA requires that conservation and management measures prevent overfishing while achieving, on a continual basis, the optimum yield from each fishery for the U.S. fishing industry. NMFS advisory guidelines for National Standard 1 require the Council to evaluate and describe in their fishery management plans, the criteria for determining if a stock is subject to overfishing, and when a stock is overfished, or

approaching a condition of becoming overfished. This section briefly summarizes the status determination criteria (SDC) for pelagic MUS described in the Pelagic FEP, the stock status relative to the SDC, and lists the stock assessments completed since the last SAFE report.

2.6.5.1 DESCRIPTION OF OVERFISHED STATUS DETERMINATION CRITERIA

For all PMUS, the Council adopted a maximum sustainable yield (MSY) control rule shown in Figure 116. The Pelagic FEP uses minimum stock size threshold (MSST) as the SDC for an overfished determination, and a stock is considered overfished when its biomass (B) has declined below the MSST. The MSST is determined based on the natural mortality (M) of the stock and the biomass at MSY (B_{MSY}). Specifically, $MSST = cB_{MSY}$, where c is the greater of 0.5, or 1 minus the natural mortality rate (M). Expressed as a ratio, a stock is overfished when $B_{year}/B_{MSY} < 1-M$ or 0.50, whichever is greater. To illustrate these specifications of the MSST, for a stock with a natural mortality rate of 0.2, MSST would be set at $0.8B_{MSY}$, and the stock would be overfished if $B_{year}/B_{MSY} < 0.8$. For a stock with a natural mortality rate greater than 0.5, MSST cannot be set below $0.5B_{MSY}$, and the stock would be overfished if $B_{year}/B_{MSY} < 0.5$.

The Council has also adopted a warning reference point, B_{FLAG} , set equal to B_{MSY} to provide a trigger for consideration of management action before a stock's biomass reaches the MSST. A stock is approaching an overfished condition when there is more than a 50 percent chance that the biomass will decline below the MSST within two years.

It is important to note that NMFS National Standard 1 guidelines at 50 CFR 665.310(e)(1)(i)(C) defines B_{MSY} as the long-term average size of the stock measured in terms of spawning biomass (SB) or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at B_{MSY} . Thus, whenever available, NMFS will use estimates of SB in determining the status of a stock. When estimates of SB are not available, NMFS may use estimates of total biomass (B), or other reasonable proxies for determining stock status.

2.6.5.2 OVERFISHING SDC

The Pelagic FEP uses maximum fishing mortality threshold (MFMT) as the SDC for overfishing. Specifically, overfishing occurs when fishing mortality (F) is greater than the fishing mortality rate that results in MSY (F_{MSY}). Expressed as a ratio, the MFMT is exceeded and a stock is subject to overfishing when $F/F_{MSY} > 1.0$. However, for a stock where biomass has declined below MSST, the default MSY control rule requires the MFMT to be reduced linearly below F_{MSY} to allow for rebuilding of the stock.

It is also important to note that all finfish managed under the Pelagic FEP are also managed under the international agreements governing the WCPFC and/or the IATTC to which the U.S. is a party. Additionally, both the WCPFC and IATTC have adopted criteria for overfishing and overfished for certain species that differ from those described above. Pursuant to Section 304(e)(1), for those fisheries managed under a fishery management plan or international agreement, NMFS shall determine the status of a stock using the criteria specified in the plan, or the agreement. For the purpose of stock status determinations, NMFS will determine stock status of Pelagic MUS using the SDC described in the Pelagic FEP.

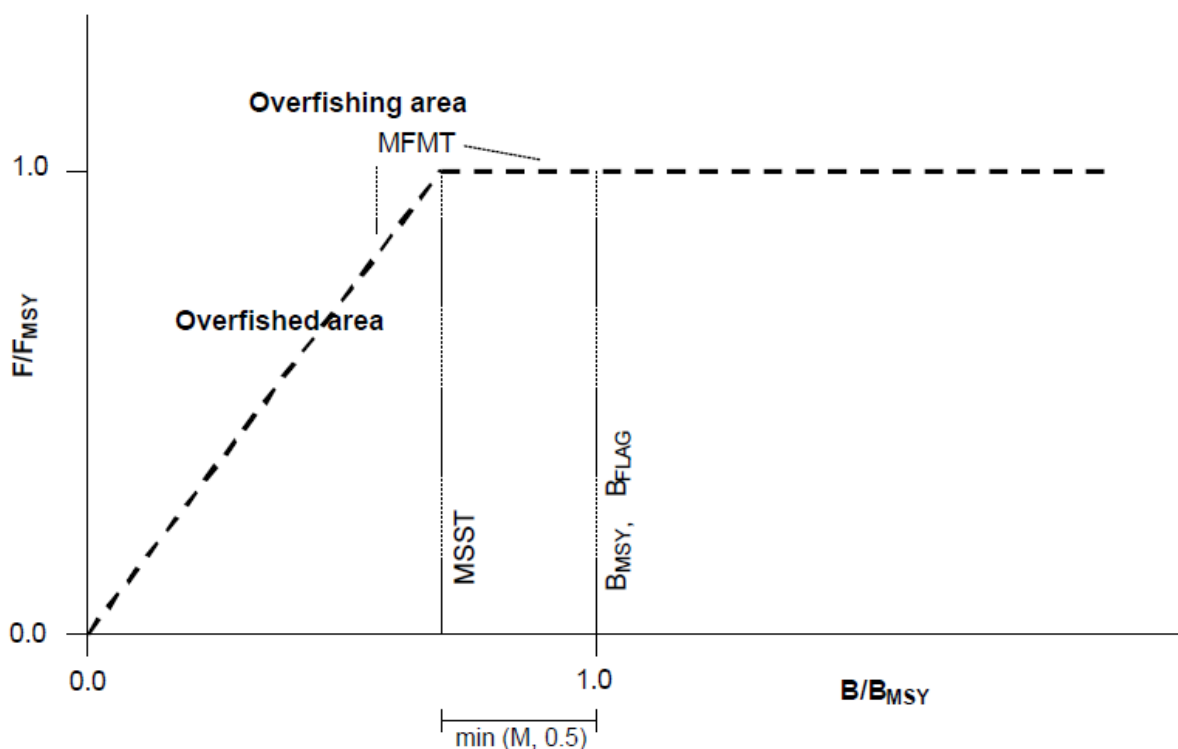


Figure 116. MSY control rule and reference points for pelagic MUS

2.6.6 INFORMATION ON OFL, ABC, AND ACL

Because pelagic squid have an annual life cycle, and all pelagic finfish are subject to management under the international agreements governing the WCPFC and/or the IATTC, all pelagic MUS are excepted from annual catch limit (ACL) and accountability measure requirements of section 303(a)(15) of the MSA, and related reference points. However, this statutory exception does not preclude the Council from specifying ACLs and related reference points for pelagic MUS using the ACL process described in the Pelagic FEP, if the Council deems such specifications are necessary to meet the objectives of the plan.

2.6.7 STOCK ASSESSMENTS COMPLETED SINCE THE LAST PELAGIC SAFE REPORT

Stock status is most reliably determined from stock assessments that integrate fishery and life history information across the range of the stock. For Pelagic MUS, most stock assessments are conducted by several international organizations. In the EPO, IATTC staff conduct stock assessments mainly for tropical tunas (bigeye and yellowfin) and some billfish (striped marlin, swordfish). These assessments are presented to the Scientific Advisory Committee of the IATTC and then to the full IATTC plenary. Assessments for IATTC managed stocks may be accessed on the [IATTC meeting webpage](#).

In the WCPO, the Pacific Community's Oceanic Fisheries Program (OFP-SPC) conducts stock assessments as the science provider to the WCPFC. Like the IATTC, the PC-OFP generally focuses on the tropical tunas, but also conduct stock assessments for South Pacific albacore and southwest Pacific swordfish and striped marlin. In the North Pacific Ocean, the ISC for Tuna and Tuna-like Species in the North Pacific Ocean conducts stock assessments specifically for the WCPFC Northern Committee. These assessments are presented to the

Scientific Committee of the WCPFC and then to the full WCPFC plenary. Assessments for WCPFC managed stocks may be accessed on the [WCPFC meeting webpage](#).

The following pages include links to the most recent stock assessments and assessment results completed in 2024, including descriptions provided in the [WCPFC Stock Status and Management Advice Reports](#). For more information on stock assessments and assessment results completed in years prior, please see the past [pelagic annual SAFE reports](#).

2.6.7.1 SOUTH PACIFIC ALBACORE

Stock assessment: Tears et al. (2024).

Link: <https://meetings.wcpfc.int/node/23119>

Stock status and management advice: <https://www.wcpfc.int/doc/04/south-pacific-albacore-tuna>

2.6.7.2 SILKY SHARK (WCPO)

Stock assessment: Neubauer et al. (2024).

Link: <https://meetings.wcpfc.int/node/23088>

Stock status and management advice: <https://www.wcpfc.int/doc/13/silky-shark>

This stock assessment did not provide reliable estimates of biomass and fishing mortality relative to MSY, therefore the previous stock assessment ([Clark, 2018](#)) remains as a reference for stock status and management advice.

2.6.7.3 PACIFIC BLUEFIN TUNA

Stock assessment: ISC (2024).

Link: <https://meetings.wcpfc.int/node/23117>

Stock status and management advice: <https://www.wcpfc.int/doc/06/pacific-bluefin-tuna>

2.6.7.4 NORTH PACIFIC SHORTFIN MAKO SHARK

Stock assessment: ISC (2024).

Link: <https://meetings.wcpfc.int/node/22828>

Stock status and management advice: <https://www.wcpfc.int/doc/16/north-pacific-shortfin-mako-shark>

Table 39. Estimates of stock status in relation to overfishing and overfished reference points for WPFMC PMUS

Stock	Overfishing reference point	Is overfishing occurring?	Approaching Overfishing (2 yr)	Overfished reference point	Is the stock overfished?	Approaching Overfished (2 yr)	Assessment results ¹	Natural mortality ²	MSST
Skipjack Tuna (WCPO)	$F_{2017-2020}/F_{MSY}=0.32$	No	No	$SB_{2018-2022}/SB_{MSY}=3.12$, $SB_{2018-2021}/SB_F=0.52$	No	No	Castillo et al. (2022), SC18 report	$>0.5 \text{ yr}^{-1}$	$0.5 SB_{MSY}$
Skipjack Tuna (EPO)	NA	NA	NA	NA	NA	NA	Maunder (2018)	NA	NA
Yellowfin Tuna (WCPO)	$F_{2014-2017}/F_{MSY}=0.37$	No	No	$SB_{2018}/SB_{MSY}=2.43$, $SB_{2018}/SB_F=0.54$	No	No	Magnusson et al. 2023	$0.8-1.6 \text{ yr}^{-1}$	$0.5 SB_{MSY}$
Yellowfin Tuna (EPO)	$F/F_{MSY}=1.01$	Yes, because $F > MFMT$	Not applicable	$SB_{2015-2017}/SB_{MSY}=1.08$, $B_{2015-2017}/B_{MSY}=1.35$	No	No	Minte-Vera et al. (2018)	$0.2-0.7 \text{ yr}^{-1}$	$0.5 B_{MSY}$
Albacore (S. Pacific)	$F_{2015-2018}/F_{MSY}=0.25$	No	No	$SB_{2019}/SB_{MSY}=2.50$ $SB_{2019}/SB_F=0.37$	No	No	Teears, et al. 2024	$0.2-0.4 \text{ yr}^{-1}$	$0.6 SB_{MSY}$
Albacore (N. Pacific)	$F_{2015-2017}/F_{MSY}=0.60$	No	No	$SB_{2015-2017}/SB_F=0.43$	No	No	ISC 2023	0.4 yr^{-1}	$0.6 B_{MSY}$
Bigeye Tuna (WCPO)	$F_{2014-2017}/F_{MSY}=0.74$	No	No	$SB_{2018}/SB_{MSY}=1.70$, $SB_{2018}/SB_F=0.38$	No, because $SSB > MSST$	No	Day et al. 2023	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	$0.1-0.25 \text{ yr}^{-1}$	$\sim 0.75 B_{MSY}$
Pacific Bluefin Tuna	F is 30.7% SPR	No	Not applicable	$SB_{2019}/SB_F=0.102$	Yes, because $SSB < MSST$	Not applicable	(ISC 2022a)	$0.25-1.6 \text{ yr}^{-1}$	$\sim 0.75 B_{MSY}$
Blue Marlin (Pacific)	$F_{2017-2019}/F_{MSY}=0.6$	No	Unknown	$SB_{2017-2019}/SB_{MSY}=1.13$	No	Unknown	(ISC 2021)	$0.22-0.42 \text{ yr}^{-1}$	$\sim 0.7 SB_{MSY}$
Swordfish (WCNPO)	$F_{2013-2015}/F_{MSY}=0.45$	No	Unknown	$SB_{2016}/SB_{MSY}=1.87$	No	Unknown	ISC 2023	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		0.35 yr^{-1}	$0.65 B_{MSY}$
Striped Marlin (WCPO)	$F_{2015-2017}/F_{MSY}=1.07$	Yes, because $F > MFMT$	Not applicable	$SB_{2017}/SB_{MSY}=0.38$	Yes, because $SSB_{2017} < MSST$	Not applicable	ISC 2023	0.4 yr^{-1}	$0.6 SB_{MSY}$

Stock	Overfishing reference point	Is overfishing occurring?	Approaching Overfishing (2 yr)	Overfished reference point	Is the stock overfished?	Approaching Overfished (2 yr)	Assessment results ¹	Natural mortality ²	MSST
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) ²	F ₂₀₁₇₋₂₀₁₉ /F _{MSY} =0.445	No	Unknown	SB ₂₀₂₀ /SB _{MSY} =1.17	No	Unknown	(ISC 2022b)	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} =0.11	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	Neubauer, et al., 2024	0.18 yr ⁻¹	0.82 B _{MSY}
Silky Shark (EPO) ³	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Clarke et al. (2018), SC14 Report	Unknown	Unknown
Longfin mako shark (N. Pacific)	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 2024	0.128 yr ⁻¹	0.872 B _{MSY}
Common thresher shark (N. Pacific)	F/F _{MSY} =0.21	No	Unknown	SB/SB _{MSY} =1.3	No	Unknown		0.04 yr ⁻¹	0.96 B _{MSY}
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	ISC (2018b)	Unknown	Unknown
Salmon shark (N. Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown		Unknown	Unknown
Mahimahi (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Teo et al. (2018)	Unknown	Unknown
Wahoo (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown		Unknown	Unknown
Opah (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Stock	Overfishing reference point	Is overfishing occurring?	Approaching Overfishing (2 yr)	Overfished reference point	Is the stock overfished?	Approaching Overfished (2 yr)	Assessment results¹	Natural mortality²	MSST
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 (<i>Auxis</i> spp., <i>Allothunnus</i> spp., and <i>Scomber</i> spp, Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Squids (Pacific)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

¹For some WCPO stocks, the Scientific Committee of the WCPFC may adjust the weighting of the structural uncertainty grid, based on scientific uncertainty, used to derive median limit reference points. For these stocks, the reference to the SC meeting report at which the weighting decision was made is provided in addition to the stock assessment report reference.

²Estimates based on Boggs et al. (2000) or assumed in the assessments.

³As of this publication, NMFS has not yet determined that this stock assessment is the best scientific information available for the purposes of stock status determination.

2.6.8 U.S. LONGLINE LANDINGS REPORTED TO WCPFC AND IATTC FOR 2022

The tables of this section show the catches of pelagic MUS by U.S. longline (Hawaii and California-based) and U.S. territorial longline fisheries in the WCPFC Convention Area from 2020-2024, as reported by NMFS to the WCPFC in 2025. The catches for 2024 are preliminary.

Table 40. U.S. and territorial longline catch (mt) by species in the WCPFC Statistical Area, 2020-2024

	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				
	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020
Vessels	144	145	142	137	135											15	19	133	24	122	9	10	11	12	11	154	155	153	150	146
Species																														
Albacore, NPO	194	238	108	105	48											25	26	22	30	8						219	264	129	135	57
Albacore, SPO																					1024	881	1139	832	551	1024	881	1139	832	551
Bigeye tuna	5317	3554	3234	3748	3548		1205	549	1500	926						344	371	1547	405	1563	53	37	22	30	24	5714	5167	5352	5683	6061
Pacific bluefin tuna	2	1	1	1	0											0	0	0	0	0	0	0	0	0	0	3	1	1	1	1
Skipjack tuna	128	52	85	130	124											14	5	10	15	16	160	48	45	53	65	301	106	140	198	204
Yellowfin tuna	3704	2329	1972	2022	1201											223	211	184	274	160	208	221	155	213	224	4136	2761	2310	2509	1585
Other tuna	0	0	0	0	0											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL TUNA	9346	6174	5399	6006	4922		1205	549	1500	926						607	613	1763	725	1747	1445	1187	1360	1128	864	11397	9180	9071	9359	8459
Black marlin	1	1	0	0	0											0	0	0	0	0						1	1	0	0	0
Blue marlin	655	333	405	386	512											24	30	62	35	51	67	39	53	34	28	747	403	520	456	591
Sailfish	11	10	10	12	6											0	1	1	1	2	3	1	1	1	1	15	13	12	14	8
Spearfish	155	162	112	110	95											8	11	8	10	11	0	1	1	1	0	164	173	121	121	106
Striped marlin, NPO	554	191	261	222	272											28	15	28	33	53						582	206	288	255	325
Striped marlin, SPO																					2	2	2	3	2	2	2	2	3	2
Other marlins	11	4	0	1	1											0	0	0	0	0	0	0	0	0	0	11	4	0	1	1
Swordfish, NPO	821	1066	1046	749	368											64	22	35	54	56	0					885	1088	1081	803	424
Swordfish, SPO																					4	3	3	3	3	4	3	3	3	3
TOTAL BILLFISH	2209	1767	1835	1481	1254											124	80	133	133	172	77	46	60	42	33	2410	1893	2028	1657	1460
Blue shark	0	0	0	0	0											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mako shark	1	0	1	1	2											0	0	0	0	0	0	0	0	0	0	1	0	1	1	2
Thresher	0	1	2	1	1											0	0	0	1	0	0	0	0	0	0	0	1	2	1	1
Other sharks																														
Oceanic whitetip shark																														
Silky shark																														
Hammerhead shark																														
Tiger shark																														
Porbeagle																														
TOTAL SHARKS	1	2	3	1	3											0	0	0	1	0	0	0	0	0	0	1	2	3	2	3
Mahimahi	127	164	130	109	76											5	19	14	18	11	1	1	6	1	5	134	184	149	128	92
Moonfish	72	79	82	111	201											4	13	12	26	40	0	0	1	1	1	76	92	94	138	242
Oilfish	38	39	57	52	55											3	5	7	6	8	0	0	0	0	0	41	44	64	58	63
Pomfret	125	118	138	132	157											9	9	17	18	23	0	0	0	0	0	134	127	155	150	181
Wahoo	406	240	195	316	240											24	25	25	41	35	17	12	11	16	17	447	277	231	373	293
Other fish	1	1	2	2	2											0	0	0	0	0	1	1	0	1	0	2	1	2	3	2
TOTAL OTHER	769	641	602	721	730											45	70	74	109	118	20	14	19	19	23	834	725	695	849	872
GEAR TOTAL	12324	8584	7838	8210	6909		1205	549	1500	926						777	763	1970	968	2038	1542	1248	1439	1189	921	14642	11800	11797	11866	10794

Table 41. U.S. longline catch (mt) by species in the North Pacific Ocean, 2020-2024

	U.S. (ISC)				
	2024	2023	2022	2021	2020
Vessels	149	150	147	146	147
Species					
Albacore, North Pacific	244	505	201	226	147
Albacore, South Pacific					
Bigeye tuna	6129	6403	6379	7042	7442
Pacific bluefin tuna	3	2	2	1	2
Skipjack tuna	148	62	103	153	168
Yellowfin tuna	4189	2797	2428	2496	1699
Other tuna					
TOTAL TUNA	10713	9770	9113	9918	9457
Black marlin	1	1	0	0	0
Blue marlin	712	392	517	444	618
Sailfish	12	14	12	16	9
Spearfish	172	196	131	133	117
Striped marlin, North Pacific	626	222	320	278	380
Striped marlin, South Pacific					
Other marlins	11	5	0	1	2
Swordfish, North Pacific	1018	1218	1307	971	728
Swordfish, South Pacific					
TOTAL BILLFISH	2552	2048	2288	1844	1854
Blue shark					
Mako shark	2	2	2	5	16
Thresher	1	2	3	3	3
Other sharks					
Oceanic whitetip shark					
Silky shark					
Hammerhead shark					
Tiger shark					
Porbeagle					
TOTAL SHARKS	2	4	5	8	19
Mahimahi	148	224	178	166	119
Moonfish	132	229	245	391	747
Oilfish	47	59	75	74	83
Pomfret	155	164	189	182	228
Wahoo	480	323	251	408	335
Other fish	1	1	2	2	2
TOTAL OTHER	963	1000	940	1223	1514
GEAR TOTAL	14231	12822	12345	12993	12844

Table 42. U.S. longline catch (mt) by species in the Eastern Pacific Ocean, 2020-2024

	All U.S. vessels					U.S. vessels ≥ 24 m					U.S. vessels ≤ 24 m				
	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020
Vessels	98	121	108	112	121	21	25	21	23	26	77	96	87	89	95
Albacore, North Pacific	25	242	72	90	90	4	120	15	20	13	22	122	57	71	77
Albacore, South Pacific															
Bigeye tuna	468	1273	1049	1389	1404	91	258	177	357	329	376	1015	872	1032	1076
Pacific bluefin tuna	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0
Skipjack tuna	6	4	8	8	29	1	1	1	2	4	6	4	7	5	24
Yellowfin tuna	261	257	273	200	338	46	53	40	48	62	215	204	233	152	276
Other tuna															
TOTAL TUNA	761	1777	1402	1688	1863	142	431	233	427	410	619	1346	1169	1260	1453
Black marlin	0														
Blue marlin	33	28	50	23	56	7	6	8	4	6	26	23	43	19	49
Sailfish	0	3	1	3	1	0	0	0	1	0	0	2	1	2	1
Spearfish	9	23	11	13	11	2	4	2	4	2	7	18	9	9	9
Striped marlin, North Pacific	43	16	32	24	55	9	3	4	7	12	34	13	28	17	43
Striped marlin, South Pacific															
Other marlins	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Swordfish, North Pacific	134	131	226	168	303	70	49	123	130	241	64	82	103	38	62
Swordfish, South Pacific															
TOTAL BILLFISH	219	201	320	230	427	88	62	136	145	262	132	139	184	85	165
Blue shark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mako shark	1	1	1	5	14	1	1	1	4	13	0	0	0	1	1
Thresher	1	1	1	1	2	0	1	1	1	1	0	0	0	0	0
Other sharks															
Oceanic whitetip shark															
Silky shark															
Hammerhead shark															
Tiger shark															
Porbeagle															
TOTAL SHARKS	1	2	2	6	16	1	2	2	5	14	0	0	0	1	2
Mahimahi	15	41	35	39	32	4	9	6	9	6	11	33	29	29	26
Moonfish	55	138	152	254	506	12	39	26	55	117	44	98	126	199	389
Oilfish	6	15	11	16	20	3	8	2	4	6	2	7	8	12	15
Pomfret	22	38	34	32	47	5	9	5	8	8	17	29	29	24	39
Wahoo	50	58	31	51	60	8	12	4	12	12	42	46	28	39	49
Other fish	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
TOTAL OTHER	149	290	264	392	666	32	77	43	89	149	116	212	221	304	517
GEAR TOTAL	1130	2270	1987	2316	2971	263	572	414	666	835	867	1698	1574	1649	2137

3 FISHERY ECOSYSTEMS

3.1 FISHER OBSERVATIONS

Hawai'i fishermen Clay Tam and Roy Morioka started the fisher observations initiative in 2020 to add traditional and local ecological knowledge, and on-the-water observations that can complement fisheries dependent data sources in the Annual SAFE reports. Fisher observations from 2020-2023 can be found in the pelagic and the respective archipelagic reports. Since 2021, the Council has collected fisher observations for pelagic fisheries during quarterly advisory panel meetings for Hawai'i, American Samoa, Guam, and the CNMI. Data collected during these meetings is limited to Advisory Panel members and were published in the 2021-2023 Pelagic SAFE reports. In 2023 Pelagic fisher observations were summarized in annual fisher observations data reports for American Samoa, Guam and the CNMI, and Hawai'i (Ayers et al. 2024a, 2024b, 2024c).

Pelagic fisher observations from 2024 will begin with a summary quarterly advisory panel meetings, separated by island area/jurisdiction, then followed by a summary of pelagic management unit species data collected from the fisher observations meetings.

3.1.1 INFORMATION FROM ADVISORY PANEL MEETINGS

3.1.1.1 AMERICAN SAMOA

Second Quarter (April-June)

The AP reported that foreign vessels have not been following regulations and selling their bycatch fish in local markets, undercutting local fish prices. They also mentioned a social media video of the foreign vessels offloading their bycatch fish right in front of an American Samoa Customs van. The AP contacted NOAA OLE and were informed that it is an American Samoa government customs issue. The sale of fish by foreign vessels was described as a "bycatch" issue, whereby Korean, Chinese, and Taiwanese flag vessels sell non-target species for \$1.50/lb, while the going rate for these fish caught on American Samoa flag vessels is typically \$2.50/lb. The AP asked if there might be any government assistance available for local fishers to help them be more competitive in markets. There was talk of an upcoming meeting with the U.S. Trade representative and the U.S. International Trade Commission in Honolulu in June to discuss these trade and import issues, but mainly issues related to the Hawai'i longline fleet. American Samoa-based purse seine vessels have shifted effort to French Polynesia due to changes in seasonal fishing conditions. Some of these vessels unload their catch in South America. The fish supply at Starkist has remained good despite the shift in Purse Seine effort. American Samoa longliners are also having issues sourcing fishing bait with one of two suppliers deciding not to sell bait. This may further disadvantage American Samoa longliners relative to foreign vessels. There is talk that some American Samoa longline vessels might be for sale if there is interest. Costs are up, wages are down, and business is difficult. There is also a sportfishing boat that is bringing in spearfishers and sportfishers in to target dogtooth tuna and other species in American Samoa waters.

Third Quarter (July-September)

The AP noted high winds with some good days for sportfishing. They also highlighted infrastructure issues such as docks in disrepair and unusable with some ramps blocked by trash and broken pallets. The AP reported that foreign boats are dropping off albacore caught by

foreign longline vessels. Apparently, customs charged foreign vessels a fee to unload their miscellaneous catch in Pago Pago before being exported internationally. This could have influenced foreign vessels to sell this catch locally in American Samoa markets at reduced prices to avoid paying the customs fee. Despite this, market prices have returned to normal. The drop in prices may have been influenced by social media posts documenting vans purchasing lower priced fish from foreign vessels, as mentioned in the second quarter meeting. Fish supply remains good at the [Starkist] cannery. For purse seine vessels, FAD closures were reduced by one half, from 3 months to 1.5 months and the high seas FAD closure from 2 months to 1 month. The additional time enables purse seiners to better plan their operations and trips, and was viewed positively by American Samoa purse seiners. The AP were pleased that the DMWR has FADs back up after an extended period of time offline.

Fourth Quarter (July-September)

The AP noted the recent Akule run with fishers out targeting them. Windy conditions persisted through the quarter. The Buds and Suds tournament had a good turnout, with good conditions for trolling. A number of vessels (8 or 9) entered from Apia and there was a total catch of 2000-3000 pounds. A vessel from Apia won the tournament and all of the fish were donated to the tournament sponsor who sold them for cash prizes for the charity. The Buds and Suds was one of 3 tournaments held in 2024, including the Manu'a Flag tournament. This is the first time in several years that all tournaments were held in the same year. There are now about 10 U.S. flagged purse seine vessels fishing out of American Samoa, but there has not been much effort in the American Samoa EEZ. Purse seine fishing in the American Samoa EEZ generally favors larger vessels and the American Samoa-based fleet mostly fishes the high seas outside the EEZ. But the size of the fleet is good to support the cannery in terms of offloading fish and capacity. American Samoa commercial fishing fleets may soon advocate for government help to address unfair fishing competition and subsidies of foreign fleets.

3.1.1.2 CNMI

Second Quarter (April-June)

The AP observed good fishing conditions, but few large schools of fish with strong currents and birds attacking their lures. AP members thought that the larger schools might be further offshore than normal. Fishers have been catching small marlin, most around or less than 100lb. Only 5 wahoo were caught in the Tasi to Table Derby. The AP attributed this to warmer water temperatures, which may cause fish to seek and inhabit deeper depths. The AP also reported that the tunas that they have caught have been large, but are scattered all over with the bird aggregations. The AP also noted that lu'aos (Brown boobys) have been following boats around and attacking lures. The channel at Smiling Cove Marina is becoming less navigable, with the potential that larger boats may soon be unable to navigate it.

Third Quarter (July-September)

The AP reported calmer ocean conditions around Saipan, Tinian and Rota with more people trolling. The AP reported that some trolling is going on, but catches are not great; fishing has been hit or miss. Despite this, the AP noted some nice runs of yellowfin tuna. Marlins they have caught are small, all under 150lb, but there have been lots observed outside the international shelf. Several earthquakes occurred in late August into early September, which may have triggered fish to feed. Weather has fluctuated between hot and small storms with high winds and rain. Fuel prices remain high. The cross light between Saipan and Tinian is also not working.

Shark depredation continues to be an issue around Rota and lights on the buoys need to be replaced. The AP also discussed a 2019 law that was passed to allow the DLNR to collect a small fee from commercial fishers that has not been enforced. The AP felt that if this law was enforced, it would be a way to identify commercial fishers and good revenue stream for the Department. The AP are still waiting for updates from the DLNR on FADs, the Tinian marina, and Smiling Cove. Tinian fishers have wanted to run a fishing derby for 4 years.

Fourth Quarter (October-December)

The AP reported that weather has been unfavorable for fishing and there is a possible algal bloom at the Tinian port. Ocean conditions have been rough with wind coming from different directions due to passing storms. Earthquake activity has continued from the previous quarter, from north of Maug to south of Guam. The AP reported that shark depredation remains a persistent issue, particularly on Tinian and Saipan. Another AP member reported that shark depredation has increased, perhaps due to seasonality, rough water, and strong currents. As evidence of this, one AP member reported losing a marlin to a shark right at the boat. The AP is pleased at the responsiveness of DFW in replacing a street light out at Fishing Base. The fishing community also donated equipment and labor to replace a broken faucet at the washdown area there. Tunas have been hard to find, but a few mahimahi are being caught. The marina site in Rota is broken, but parts are ordered, and it should be fixed within a month. Fishing has been slow around Rota and Saipan. For commercial fishers selling their catch, market vendors are purchasing fish at lower prices than when hotels and restaurants were buying.

3.1.1.3 GUAM

Second Quarter (April-June)

The AP observed rough ocean conditions during the first quarter with west swell and high seas from the direction of Japan and China. Despite the weather, the fishing was great. Wahoo arrived earlier than expected, but catches were often in the 5-10lb size range until later in the season when larger-sized fish showed up. Some vessels reported catching 40-60 pieces in one trip. The mahimahi run lasted from January-April, with more fish around than last year due to the weather and cooler water temperatures. A lot of fish could be caught closer to shore in February/March. Water temperatures are getting warmer due to the change of seasons with flying fish nearer to shore than other times of the year. Tradewinds have also returned.

Third Quarter (July-September)

Some AP members felt that inshore fishing pressure may be greater than what is being observed. A video of silky sharks in a feeding frenzy eating bonita was circulating through the fishing community. Despite good fishing conditions, AP members reported that trolling has not been productive, with most fishers only catching bonita. Fishers also noted an abundance of small marlin under 100lb. In terms of markets, a few AP members reported fish buyers purchasing lower priced imported fish and felt that local fish buyers preferred buying imported fish to those caught locally. There was also a market-wide recall for imported mahimahi that was spoiled. The improved weather conditions had more local fish in the markets, with some fishers holding more fish than they could offload. The Guam Fishermens Co-op is getting some customers in and are hoping the new facility will be completed by late 2025. They need to finish the seawall and then they can get started on the new building.

Fourth Quarter (October-December)

La Niña may be affecting fishing conditions and altering fish migration patterns. Mahimahi are normally more prevalent during this time of year and wahoo showed up months later than usual. Lots of rats (small wahoo) around as well. FADS continue to be an issue (deployment costs have tripled in the last 10 years), but Guam is trying to improve the deployment and bidding processes to allow smaller outfits an opportunity to bid. Guam deployed two LIDAR systems that the fishing community recommended. There was no mañahak run in the quarter, which may have affected pelagic fishing as there were fewer bait fish available for pelagics to eat. In terms of weather, there have been a lot of tropical weather systems, with 5 systems passing over Guam in November alone. Cooler winds from China and Japan were noted in December, making ocean conditions rough. Fishers finally reported catching some wahoo loads in December and mahimahi were also around. The AP are worried that the presence of mahimahi in December could affect their regular February migration around Guam waters. Overall, fishing was a bit slow in 2024.

3.1.1.3.1 Hawaii Island*Second Quarter (April-June)*

2024 is the 50th anniversary of the Hilo troller club. Bids are due for the Wailoa Small Boat Harbor channel dredging work in Hilo. Due to the dredging work, Hilo Trollers cancelled their 2024 tournaments since the channel prevents larger boats from accessing the channel, but they are planning to celebrate the 50th anniversary in 2025. Good numbers and sizes for all numbers and sizes of pelagic fish have been observed, but Suisan Fish Market is not buying in large quantities due to their limited capacity. Fishers reported that it has been many years since the bite was this good. Small size aku and rats are being caught, ‘ahi (yellowfin) caught in the 90-198lb size range. A few of the troll days were close in, just outside Hilo. The ika shibi bite has been slow. Fuel prices remain high. Just held their first East Hawai‘i meeting, with 10 members. Another fisher reported folks are getting out fishing, but that there’s not much enforcement presence on the Hilo side. There has been steady rain every afternoon in Kona, with a lot of moisture in the air. Fishers noted a lot of otado around in the 25lb range. Honokohau Small Boat Harbor in Kona is turning away fishers that do not have a current registration on their boat trailer. Kona gas prices are in the \$5/gallon range.

Third Quarter (July-September)

In Hilo, dredging continues on the Wailoa Harbor and completion is expected by the end of the year. The dredging operation has picked up a tremendous amount of sand, the channel was really filled in. The rains have slowed down since second quarter (springtime) and the coffee season up mauka is starting. Citrus production is down in Kona, which may be something to note. Orange, lemon, and tangerines all have low numbers on trees. There has been a decent tuna run on the Hilo side, but only the shortliners are catching tuna out of Kona. Shark depredation continues, making buoy fishing nearly impossible. Lots of ‘porpoises’ on the buoys as well. And one of the charter boats caught a grander marlin. Tuna fishing in general has been poor except for Hilo. Fishing “on the bag” or ika shibi have been more productive than trolling. Most of the shibis caught were in the low 100lb range, but a few were 200lb plus. One fisher suggested that tuna might not be as migratory as once thought. Fishers are catching onos around 1000’ depth while trolling for ‘ahi. Fishers reported catching tombos outside when fishing ika shibi and onos on the inside, which is unusual.

Fourth quarter (October-December)

Fishers reported that fishing around Hilo has been “unreal.” There is a big eddy offshore and fish are biting from Pohoiki to Smoke stack, and probably down to South Point. Unfortunately, tombo prices are only \$0.50/lb. On the Kona side, there has been a consistent ono bite up near the [Kailua-Kona] airport. Aku are still being found around Kona. Aku and otarus have been biting off Kona all year. Shark depredation remains an issue on the buoys. One fisher brought up a 900lb marlin with several bites taken out of it. An ice machine at the harbor should help out small boat fishermen. Fishers are reporting more DOCARE enforcement of boats, checking coolers for fish caught, Kona crab, lobsters, and trailers. DLNR [DOCARE] hires have helped increase enforcement. Dredging was completed at the Wailoa boat harbor channel. The project estimate for the dredging project came in at \$4.8 million, but the budget was only \$3.1 million. There are only a few full-time fishermen out of Honokohau harbor in Kona. The Honokohau harbor now charges \$350 to use the scale to weigh and take a picture of a fish. The lack of harbors (for fishing access and safety) on Hawai‘i Island is an important issue. There is no harbor south after Miloli‘i / Honaunau, neither of which require a registration sticker, but your boat has to be small to launch there. Pohoiki boat ramp in the Puna region on the Southeast coast of Hawai‘i Island was filled in by the 2018 lava flows. As of December 12th, a \$9.2 million dollar contract was awarded to dredge Pohoiki Bay to restore ocean access to the ramp. The project is anticipated to begin in February, 2025.

3.1.1.3.2 Kauai*Second Quarter (April-June)*

One fisher reported the best trolling that they’ve ever seen, catching fish with any line out. Ono bite has been “amazing” too. Charter boats are catching 3-20 ono and mahimahi per day. Fishing was really good when the winds were strong. There has been a steady ‘ahi bite in the west, south, and east of the island. The bites are blind strikes, no large aggregations. ‘Ahi are also biting at shallower depths. Strong year for hebi and striped marlin. One ‘ahi was caught with two large egg sacks, one on each side. Fuel prices for non-ethanol fuel are higher than \$6/gallon. Aku in the 20lb size range are around, but not found consistently. The state of Hawai‘i is nearing completion a boat ramp further up the Anini stream. A community member is working with the state to put up no swimming signs by the boat ramp, since swimmers often venture into the boat channel by the reef flat area and interactions with swimmers have increased in recent years. One fisher noted harbors are full of people fishing again, for the first time in years. Kekaha boater’s association started an Instagram account to share information about their small harbor and all of the multiple users there. Near Port Allen, some thrillcraft have been running close to shore near divers/dive spots and there have been some close calls with swimmers/divers. The septic waste machine at the Port Allen boat ramp is not working, which has prevented boaters from disposing of waste. DOCARE officers are turning away boaters with unregistered trailers from boat ramps. One Kaua‘i fisher reported that their island’s fresh fish presentation is poor and that no one wants to buy fish from them when they catch a couple hundred pounds.

Third Quarter (July-September)

Fishing participation is down, with just a few trailers and boats at the boat ramp. Trolling has slowed down. Depredation continues to be an issue on fishing trips, with one shortliner reporting losing their entire catch fishing off both the west and south side of the island, but fishing in general remains above average. Fishers are reporting observations of large amounts of pilot

whales. Fishers are still not seeing large aggregations of ‘ahi. Onos are coming in on the ledge, one fisher caught a 40lb. The marlin run has been strong, but the mahimahi has not started yet.

Fourth quarter (October-December)

A lot of vessels are out trying to catch ‘ahi. Kaua‘i fishers starting to catch some yellowfin tuna on the buoys from 1-70lb, but pelagic dolphins, whether rough-toothed or spotted, have been wreaking havoc around the buoys. Wiliwili harbor has deferred maintenance from bumpers to no dedicated area to wash down boats, big potholes in the parking lot, and docks that need to be replaced. Port Allen fishers drew attention to maintenance needs with floating docks, wash down issues [broken water lines], and lack of parking and bathroom stalls, and dredging needed to make the harbor navigable. DOCARE has been out enforcing trailer and boat registration. The state of Hawai‘i has been working with a local landowner adjacent to Port Allen in an attempt to utilize some of their vacant land for the harbor.

3.1.1.3.3 Maui

Third Quarter (July-September)

Infrastructure and ramp issues persist, with boats clustered in Ma‘alaea following the Lahaina fire.

Fourth quarter (October-December)

Maui is rebuilding after the fire and Lahaina is cleaned up. Thirty additional moorings have been built at Maalaea Harbor. Recreational boating businesses are surrounding humpback whales, which have just arrived from Alaska

3.1.1.3.4 Oahu

Second Quarter (April-June)

A fisher reported that a commercial fisherman caught a grander marlin off the coast of Windward O‘ahu. Lots of small marlin were caught in the beginning of May. A netter caught a 25lb ‘ahi in the net, an indication that fish are coming in closer to shore. Another fisher caught a 170lb ‘ahi, a sign that there are some bigger fish around. Otados are still being seen. ‘Ahis seem to be caught / found at pretty deep depths, perhaps a reason why trolling has not been as productive. Summer longline fishing has been similar to the past 4-5 years, difficult to catch big loads of fish. High quality fish fetch high prices and low-quality fish sell for low prices. Longline vessels are catching more yellowfin tuna than previous years, but in general, the proportion of yellowfin/bigeye catches are around 50/50. Longline fishers expect false killer whale depredation, with fishers motoring away for a couple days to get away from them. Gas prices observed as low as \$4.19/gallon at Costco. A big island fisher visiting O‘ahu noted ono for \$7/lb in a downtown O‘ahu market.

Third Quarter (July-September)

Offshore fishing off of Windward O‘ahu was affected by unusual, erratic summer weather, with rain, high winds, and fewer tourists. Fish catches are down – still catching all sizes – but fewer than previous years. Climate change and the economy have increased uncertainty of fishing trips. Proposed wind energy projects may affect Waimānalo, Kailua, fishing, and traditional uses. O‘ahu fishers started the MOUSS work on the Penguin Banks after completing O‘ahu, Maui, and Big Island.

Fourth quarter (October-December)

Fourth quarter seemed similar to the third quarter for Hawai'i longliners, but production is up overall. Catches are up to 25,000lb loads, yet the fish markets remain challenging. Many vessels are barely breaking even with fishing expenses. Hawai'i longline boats implemented tory lines to reduce seabird interactions. With higher oil prices, shallow-set trips targeting swordfish have a break-even price of \$3-3.50/lb, so Hawai'i longliners targeting swordfish are watch mainland markets intently before they plan trips. O'ahu fishers are pleased to see more DOCARE officers enforcing fishing regulations on boats. There used to be just 1 DOCARE officer on O'ahu's North Shore, but now there 4-5 DOCARE officers on patrol. Illegal/unpermitted moorings for shark tours are a hazard for boats heading out or coming back to Haleiwa Harbor in low light or dark conditions. One fishing boat ran into one of the moorings and got a line tangled in their propellor. Fortunately, another small boat was able to tow them back to port. One fisher reported that there are as many as 20 large aluminum vessels using the Haleiwa boat harbor to take customers on shark tours. Fishers reported that the homeless population is also a problem in the harbor with break-ins and theft. Another fisher noted that sharks remain an issue affecting fishing productivity. Lack of trailer parking can affect safety in Windward O'ahu, particularly during busy times. Windward O'ahu trolling was productive when fishers could make it out, with catches of otados, mahimahi, and 'ahi. Market prices are inconsistent, so it is hard to make money on trips.

3.1.2 ANNUAL FISHER OBSERVATION MEETING AMERICAN SAMOA*Social*

In American Samoa, fishing infrastructure issues were a prominent theme during the annual summit meeting. Foremost of these issues were Fish Aggregating Devices (FADs), and several fishers referenced lower productivity at FAD locations. Others described how FADs might improve fishing on the outer banks and ways to potentially recover FADs that had become unmoored to test in different locations. Another comment dealt with marina repairs that were needed at Pago Pago harbor, and praised the DMWR for fixing piers prior to a fishing tournament.

Economic

In American Samoa, when fishers referenced economic aspects of their fisheries, they primarily discussed costs of fishing and market conditions. For costs of fishing, one fisher explained that they will sometimes sell excess catch to recoup costs. Another fisher described challenges that the American Samoa longline (ASLL) fleet faces with low prices paid for their fish and high prices for bait and fuel. Another comment related to the ASLL fleet referenced a jigging pilot project whereby a vessel was equipped with jigging gear to fish in southern waters, but that the vessel did not find jigging to be effective or profitable when taking into account trip costs and catch rates. On market conditions, one fisher reported a decline of fish for sale in roadside markets and on social media; another decried the lack of labels on seafood available in local markets. They may know if the fish was caught locally or in Independent Samoa, but are unaware of the origin of other fish found in their markets.

Biological

In general, American Samoa fishers felt that fish recruitment in 2024 was not as strong as observed in previous years or past decades. Fishers saw fewer wahoo on the banks in 2024 and

smaller billfish. Some noted fewer bird aggregations offshore and posited that even small-scale commercial alia vessels may be impacting the abundance of fish. Another reported that albacore fishing was still productive for one longline operation. Fishers also reported continued shark depredation, which happens while fishing on FADs or trolling. Their frustration is worsened by the lack of options available to deal with the problem, since harvesting sharks is illegal.

Physical/Oceanographic

In American Samoa, for physical/oceanographic issues, fishers mentioned several aspects of weather and wind patterns that affected American Samoa in 2024. Among the most frequently mentioned aspects was westerly winds, which are associated with La Niña. The westerly winds brought large amount of sargassum with them, which negatively affect fishing. Other issues related to weather/wind patterns was more calm weather days later in the year – a shift from the norm – and more rainfall and runoff that affected roads and transported sediment into the ocean. Additional issues mentioned included king tides that affected fishing trips, stronger currents, and warmer water temperatures, even in the middle of the winter, when the water should be cooler.

3.1.3 ANNUAL FISHER OBSERVATION MEETING FROM THE CNMI

Social

In the CNMI, the only comment associated with social aspects of fisher observations dealt with fishing infrastructure; repairs needed to the Rota boat ramp.

Economic

In the CNMI, fishers primarily focused on market conditions. They reported a lack of fish of all types – pelagic fish species in markets, and one fisher suggested that the weather, an abundance of earthquakes (which may affect other types of fishing more), and climate change may be to blame. Fish prices have remained stable since COVID-19 began and fuel prices remain high, which continue to challenge fishing in the archipelago.

Biological

In the CNMI, fishers stated that 2024 was an average year for pelagic recruitment. Fishers also noted an abundance of humpback whales sighted near the beach. One fisher felt that shark depredation decreased in 2024.

Physical/Oceanographic

In the CNMI, weather and earthquakes affected fishing trips. Currents were also observed moving west to east, opposite of how they normally move, which might be attributed to La Niña.

Management Uncertainty

In the CNMI, there were no comments related to management uncertainty at the 2024 annual summit meeting.

3.1.4 ANNUAL FISHER OBSERVATION MEETING FROM GUAM

Social

In Guam, fishing infrastructure issues (FADs and overcrowded boat ramps) were notable social aspects of Guam fisheries mentioned by meeting attendees in 2024. For the FADs, there was concern about FADs becoming unmoored shortly after deployment and the costs – and procurement/bidding process – associated with replacing one makes it difficult to quickly replace

them. Fishers also described crowding at Guam boat ramps, particularly Agana, where fishers compete with other ocean users and ocean recreation businesses such as sunset cruise boats. Upgrades to the marina reduced parking spots and derelict trailers further reduce places to park after launching a fishing vessel. Fishers also discussed the mixed blessing of social media and fishing: since they often use social media to sell their catch, when they post their catch, others go fishing (and then also sell their catch), which increases supply and reduces prices. Fishers also mentioned that several small vessels are fishing at night with no navigation lights, which is a danger to other mariners.

Economic

In Guam, market conditions permeated discussions about the economics of Guam fisheries in 2024. Some fishers reported steady prices, but noted that demand can easily drop if too much fish enters the market. Others felt they did not have a problem with selling their fish, utilized social media, or deliver to the flea market to sell their catch. With more H2 visa contract workers on the island, there may be a greater demand for fish. Likewise, tourism is increasing and some local chefs are marketing local fish, which is good for local fishers looking to sell their catch. Fishers also noted high costs of fishing, particularly fuel costs, which remain over \$5.10/gallon on Guam

Biological

In Guam, the beginning part of the year was good for pelagic fishing, especially mahimahi and marlin, perhaps in part due to an abundance of debris in the water acting as FADs. Depending on who you talked to, 2024 was not a good year for wahoo, which were either difficult to find and catch or big fish were being caught every week. In terms of phenology or timing/migration patterns, fishers noted an abundance of smaller marlins in the 50-100lb range. Guam fishers also frequently observed humpback whales or dolphins toward the end of 2024. Depredation continued on both pelagic fishing trips, making it difficult to land both tunas.

Physical/Oceanographic

In Guam, fishers reported abnormal weather conditions in 2025. Large westerly swells made trips out of west coast harbors difficult. Wet weather, tropical weather systems, and strong currents were noted throughout the year. Fishing was also affected by earthquakes.

Management Uncertainty

In Guam, fishers voiced concerns about military regulations that may affect fishing, fishing activity, or navigational safety. There is a bomb detonation site on the banks off of the Rota banks that fishers said is still active; and the surface danger zone of several firing ranges at the Marine Corps base extend 2-3 miles into the ocean, causing some fishers to avoid the area entirely whether fishing or transiting.

3.1.5 ANNUAL FISHER OBSERVATION MEETING FROM HAWAII

Social

In Hawai‘i, social issues reported by fishers included fishing infrastructure issues and reduced small boat fishing effort on Hawai‘i island. For fishing infrastructure, fishers referenced conflicts with tourism at Kaua‘i boat harbors over a lack of parking; the need to dredge and reopen Pohoiki and the impact that delay in dredging has had on fishers trying to launch out of Wailoa.

Economic

In Hawai‘i, economic issues described by Hawai‘i fishers included market conditions, marketing, changing consumer preferences, and a lack of markets on Kaua‘i. For market conditions, fishers described low prices for tombo in Hilo when markets were flooded with fish, the difficulty of timing markets for pelagic fish like ‘ahi and ono in Hilo, and the benefit of using iki jime to reduce lactic acid in fish after landing them to secure better prices. Fishers also described the challenges of marketing their catch, especially if they live on an outer island and need to transit their fish to the United Fishing Agency fish auction on O‘ahu. One fisher reported that the high fuel prices make people more selective about when they go fishing.

Biological

In Hawai‘i, fishers continued to catch numbers of tombo off Hawai‘i Island as they have the past couple years. Fishers across the islands reported catching marlin and striped marlin. Two granders were caught in 2024 out of Kailua-Kona. Fishers also noted some shifts in the timing in the arrival of forage fish, although some pelagic fish like tombo and ‘ahi were caught year-round. Depredation on trolling trips continued, making landing fish frustrating and difficult.

Physical/Oceanographic

In Hawai‘i, Kailua-Kona fishers observed strange currents at the beginning of 2024 with ka‘u currents transitioning to more regular kohala currents later in the year. The different currents may have driven greater tombo abundance around Hawai‘i island and smaller size classes of marlin. Fishers also noted warmer pelagic water temperatures, which may have led to greater catches of yellowfin tuna for Hawai‘i longliners. Fishers also noted increases in west swell events in Kona. Fishers also observed windy days and heavy rainfall that affected or prevented fishing trips in 2024.

Management Uncertainty

In Hawai‘i, fishers hoped that something could be done about increasing shark populations that make landing fish difficult.

3.2 SOCIOECONOMICS

The socioeconomics section outlines the pertinent economic, social, and community information available for assessing the performance of Fishery Ecosystem Plan (FEP) management measures for the Pelagic Fisheries (WPRFMC 2009a). This section meets the objective “Support Fishing Communities” adopted at the 165th Council meeting; specifically, it identifies the various social and economic groups and their interconnections within the region’s fishing communities. The section begins with an overview of the socioeconomic context for the region, and then provides a summary of relevant general studies and data for each jurisdiction, followed by summaries of relevant studies and data for each specific fishery within the jurisdiction.

In 1996, the Magnuson-Stevens Fishery Conservation and Management Act’s (MSA) National Standard 8 (NS8) specified that conservation and management measures consider the importance of fishery resources to fishing communities. In doing so, the measures would ensure the community’s sustained participation in fisheries and minimize associated adverse economic impacts provided that these considerations do not compromise local conservation. Unlike other

regions of the United States, the settlement of the Western Pacific region was intimately tied to the sea (Figure 117), which is reflected in local culture, customs, and traditions.



Figure 117. Settlement of the Pacific Islands¹

¹ Source: Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Polynesian_Migration.svg.

Polynesian voyagers relied on the ocean and marine resources on their long voyages in search of new islands, as well as in sustaining established island communities. Today, the population of the region also represents many Asian cultures from Pacific Rim countries, which hold similar significance for many marine resources. Thus, fishing and seafood are integral ways of life in the local community. This is reflected in the amount of seafood eaten in the region in comparison with the rest of the United States, as well as in the language, customs, ceremonies, and community events of the region. Because fishing is such an integral part of the culture, it is difficult to discern commercial from non-commercial fishing, with many trips involving multiple motivations and multiple uses of the catch landed. While economics are an important consideration, fishermen report other motivations (e.g., customary exchange) as being equally important, if not more so. Due to changing economies and westernization, recruitment of younger fishermen has become a concern for the sustainability of fishing and fishing traditions in the region. During the COVID-19 pandemic, the diversification of the fisheries in the region and their ability to adapt to shift from a national and global economy to a local one played a vital role in supporting local food systems, nutrition, food security, and community social cohesion (Kleiber et al. 2022; Smith et al. 2022).

3.2.1 RESPONSE TO PREVIOUS COUNCIL RECOMMENDATIONS

At its 199th meeting held in Honolulu and via web conference in June 2024, the Council directed staff to work with NMFS PIRO and PIFSC to explore approaches for maintaining data collection for American Samoa and Hawaii longline fisheries economic performance information through surveys. The NOAA Pacific Islands Regional Observer Program continues to collaborate in implementation of the PIFSC continuous economic trip cost data collection for regional longline fisheries. However, in light of declining human observer coverage rates, PIFSC and PIRO continue to work together to pursue future options to continue collecting economic performance data for American Samoa and Hawaii longline fisheries.

Additionally, during the 199th meeting, the Council also requested NMFS PIFSC compile information presented on cookie cutter shark depredation in Hawaii longline fisheries into a technical memorandum or report to share with Council advisory groups and stakeholders and to solicit feedback on what additional details would be useful to inform fishery operations. PIFSC SEES staff led a manuscript submitted to a peer review journal in late 2024 that estimates total revenue lost due to cookie cutter shark depredation and other damage.

At its 201st meeting held in Honolulu and via web conference in December 2024, the Council directed staff to work with NMFS PIFSC on developing a consistent definition for non-commercial fishing. During December 2024, PIFSC SEES staff presented recent published research (Leong et al. 2024) titled “Aligning fisheries terminology with diverse social benefits” to all of the Council’s Advisory Panel meetings held during this 201st meeting cycle. PIFSC SEES program is willing and able to work with Council staff, Advisory Panel’s and the Non-Commercial Fisheries Advisory Committee to develop a consistent definition that the fishing community can use when discussing non-commercial fishing and data collection.

3.2.2 SOCIAL AND CULTURAL ELEMENTS

3.2.2.1 AMERICAN SAMOA

3.2.2.1.1 Introduction

Fishing has played a crucial role in American Samoan culture and society since the Samoan archipelago was settled. An overview of American Samoa history, culture, geography, and relationship with the U.S. is described in Section 1.3 of the Fishery Ecosystem Plan for American Samoa (WPRFMC 2009b). Since the early 2000s, a number of studies have synthesized details about the role of fishing and marine resources in American Samoa, as well as information about the people who engage in the fisheries or use fishery resources (Levine and Allen 2009; Armstrong et al. 2011; Richmond and Levine 2012a; Grace-McCaskey 2015; Kleiber and Leong 2018; Fisk et al. 2023). These studies describe the importance of marine resources in cultural, economics, and subsistence aspects of American Samoan village life. Fishing was held in high esteem in traditional Samoan culture, with fishing skill bringing high social status and fishing activities figuring prominently in mythology. The basic components of Samoan social structure are the family and village, with the family acting as the central unit. The village leadership decides, according to season, what sort of community fishing should take place. The tautai, or master fishermen, of the village were key decision makers who were awarded higher status than others who might otherwise outrank him when it came to matters of fishing. Village-level systems of governance and resource tenure are still largely intact, and American Samoan cultural systems and representation are formally incorporated into the Territorial Government. Reciprocity is emphasized over individual accumulation. Gifts of food, especially fish and other marine resources, mark every occasion and are a pivotal part of

American Samoan social structure to this day. Women have emphasized the important role of fishing in intergenerational relationships and cultural subsistence with respect to elder care, and domestic labor, and fa'afafine have shared the cultural importance of ocean resources to their art, and design (Fisk et al. 2023).

The last U.S. Census in 2020 documented a population of just under 50K, with 98% of the population found on the island of Tutuila. This is part of 20-year downward population trend (American Samoa Government 2023). While some estimate a slight increase in population since 2020 (American Samoa Government 2023), others estimated a continued downward trend to be closer to 44K (World Factbook n.d.). American Samoa is homogeneous both ethnically and culturally. Polynesians account for the vast majority of the territory's people (at least 85%), and Samoan is the most common language (89%), though English is often spoken in school and business settings and about half the population (47%) "speak it well" (U.S. Decadal Census).

Contemporary American Samoan culture is characterized by a combination of traditional Samoan values and systems of social organization with a strong influence from Christianity. Maintaining "*fa'a samoa*", or "the Samoan way", was considered a priority under the Territorial constitution. Given the cultural homogeneity, nearly everyone in American Samoa accepts and complies with Samoan traditions of land and resource tenure.

However, over the last half century or more, fishing has become less prominent as a central and organizing community force. Through this time, modern fishing gears and new technologies were introduced, tuna canneries became a major economic force in Pago Pago, the population more than tripled, and the gradual but continuous introduction of Western cultural norms and practices altered locals' relationship with the sea. While many traditions and village-based systems of governance have been maintained, the islands have experienced a shift from a subsistence-oriented economy, where sharing of fish catch was extremely important, to a cash-based economy, where fishing is often viewed as a more commercial venture.

Levine et al. (2016) found that American Samoans still consume seafood frequently, with 78% of respondents stating that they eat fish or seafood at least once a week. Most American Samoans purchase seafood from stores or restaurants, with 65% of survey respondents listing this as their first or second choice for obtaining seafood. Other common means for obtaining fish include markets and roadside vendors (45%) and fish caught by household members (37%). This corroborates Levine and Allen's (2009) observation that American Samoans largely rely on, and in many cases prefer, store-bought food to locally-caught fish, with the majority of fish consumed in American Samoa imported from Samoa.

The introduction of outboard engines and other technology in the 1950s and 1960s allowed American Samoan boats to go farther and faster, but also made it necessary for boat owners and operators to sell a portion of their catch to pay for fuel and engine maintenance. The disruption of other traditional values, as well as the introduction of a cash economy based primarily on government jobs and cannery employment, also decreased reliance on traditional, subsistence fishing and allowed commercial fishing to develop on the islands (Levine and Allen, 2009).

Unlike other areas within the Western Pacific region, American Samoa also experienced the development of domestic industrial-scale fisheries, including tuna processing, transshipment, and home port industries. This is due to the excellent harbor at Pago Pago, 390,000 km² of surrounding exclusive economic zone (EEZ), and certain special provisions of U.S. law that allowed the development of the fish processing industry. For example, the territory is exempt

from the Nicholson Act, which prohibits foreign ships from landing their catches in U.S. ports, and American Samoan products with less than 50 percent market value from foreign sources enter the U.S. duty free.

The two most important economic sectors are the American Samoa Government (ASG), which receives income and capital subsidies from the Federal Government, and tuna canning. In 2022, main imports included fish brought in for processing (American Samoa Government 2023). Exports were primarily canned tuna and associated products. In 2022, domestic exports from American Samoa were valued at \$376 million of which \$371 million (over 98%) came from canned tuna sale (American Samoa Government 2023). Private business and commerce comprise a third sector. Unlike some of their neighbors in the South Pacific, American Samoa has never been known for having a robust tourist industry.

In 2022, the ASG employed 7,224 people (43% of total employment; American Samoa Government 2023), and the private sector employed 7,426 people (Figure 118). Supporting data for Figure 118 are provided in Table A-111. The canneries employed 2,275 people, which is 13% of the total people employed in the territory. Ancillary businesses involved in re-provisioning the fishing fleet generate a significant number of jobs and income for local residents.

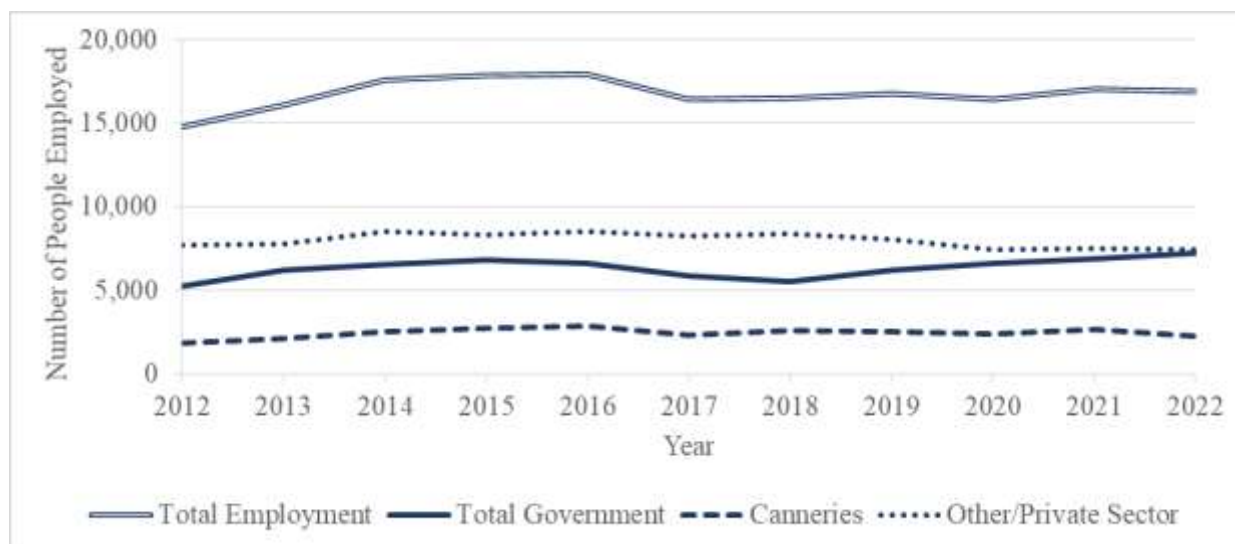


Figure 118. American Samoa employment estimates¹

¹ Source: American Samoa Government (2023).

The canneries in American Samoa have been operating since 1954, represent the largest private-sector source of employment in the region, and, until recently, were the principal industry in the Territory. Although as many as 90% of cannery workers are not American Samoa citizens, the canneries play a large role in the American Samoa economy (e.g., delivering goods or services to tuna processors and improving buying patterns of cannery workers). Trends in world trade, specifically reductions in tariffs, have been reducing the competitive advantage of American Samoa's duty-free access to the U.S. canned tuna market. This coupled with regulations related to fishing limits and minimum wage requirements in the U.S. territories has led to uncertainty for the economic viability of the canneries (Poblete 2020). In 2009, the Chicken of the Sea cannery closed, resulting in a loss of approximately 2,000 jobs. It was bought by Tri Marine International, which invested \$70 million in rebuilding and expansion, and reopened in 2015. In

October 2016, Starkist Co. suspended operations due to lack of fish, in part due to Effort Limit Area for Purse Seine (ELAPS) closures (Pacific Islands Report 2016). That same month, Tri Marine International announced that it would suspend production indefinitely in December 2016, and there are currently no plans to reopen (Pacific Islands Report 2017). Starkist Samoa is currently the only cannery operating in American Samoa and is the largest private employer with about 2,000 workers.

Even before Tri Marine International's closure, American Samoa's economy was identified as being in a highly transitional state that should be monitored closely (Grace-McCaskey 2015). It will be important to monitor any changes and developments related to the tuna industry, given the historically close connection between the tuna canneries, employment levels, population trends, and the economic welfare of the territory. It is also possible that increased federal aid in recent years has masked the full extent of the economic recession.

Members of the American Samoa fishing community had also expressed concerns about the impact of National Marine Sanctuary of American Samoa (NMSAS) expansion in 2012 and management of the Rose Atoll Marine National Monument, which was established in 2009. In both of these cases, the local communities have been concerned about the impacts on fishing practices as well as broader social and cultural issues, such as traditional marine tenure and the ability of villages to manage their own resources. In 2023 there was also strong local opposition to the proposed marine sanctuary designation for the Pacific Remote Island Areas (PRIA), including petitions signed by Starkist employees (Samoa News Staff 2023). In this case, the proposed PRIA National Marine Sanctuary raised concerns about potential impacts to the American Samoa economy related to potential reduction in fish offloaded at the cannery. A study using an IMPLAN model to examine economic contributions of U.S. commercial fisheries in American Samoa found that indirect, induced, and value-added effects of purse seine, longline, and small boat fisheries contributed the equivalent of 20% of total employment, 18% of total labor income, more than a quarter of the total economic output, and more than one-fifth of the 2019 GDP in American Samoa (Chan 2023). Hypothetical scenarios of reduced fish landings of 10%, 30%, and 50% showed large ripple effects on the local economy, leading to a potential 2-10% reduction in employment, 2-9% reduction in labor income, 2-11% reduction in GDP, and 3-14% reduction in output (Chan 2023).

In 2017, understanding the relationship of pelagic fisheries with cultural fishing practices took on a greater focus. During the peak of longline landings in 2002, NMFS created a Large Vessel Prohibited Area (LVPA) to prevent gear conflicts and catch competition between large and small vessels, as well as to preserve opportunities for fishing by American Samoa's small boat ("alia") fleet (NOAA 2017). Since 2002, both large and small vessels have experienced declining catch rates, fish prices, and increasing fuel and operating costs. In 2016, NMFS published an exemption to the LVPA rule to allow large U.S. vessels holding a federal American Samoa longline limited entry permit to fish in portions of the LVPA (NOAA 2016). NMFS and the Council were then sued by the American Samoa Government, who claimed that the 1900 and 1904 Deeds of Cession were not considered in the rulemaking process. The U.S. District Court ruled in favor of American Samoa in March 2017, requiring NMFS to preserve American Samoan cultural fishing practices as part of their obligations to the Deeds of Cession. A study examining dimensions of cultural fishing for the small and large longline fleets found that these fisheries play an important role in maintaining cultural practices, primarily through sharing of catch (Kleiber and Leong 2018). The Council took action to provide a four-year exemption for

vessels permitted under the American Samoa Longline Limited Entry permit, which reduced the area closed to large vessels from 25.5 to 11.5%. In September 2020 the Ninth Circuit Court of Appeals reversed the District Court decision in favor of NMFS. In February 2021, the ASG appealed to the Supreme Court of the United States, but the writ of certiorari was denied June 21, 2021. NMFS published the original 2016 LVPA exemption as a final rule, effective July 6, 2021.

3.2.2.1.2 People Who Fish

One household survey by Levine et al. (2016) found that over half of residents participate in fishing or gathering of marine resources. Approximately 15% reported fishing once a week or more and over 30% of households stated that they engaged in fishing or gathering at least once a month. Commercial fishing is very uncommon in American Samoa, with only 3% of those who fish stated that they frequently did so to sell their catch and 62% never selling their catch. More commonly, people fish to feed themselves and their family or to give to extended friends, family, pastors, and village leaders. Information at the fishery level will be reported in the fishery specific sections below. Qualitative research has resulted in some general observations about trends in fishing by American Samoans.

While fishing and marine resources are universally considered to be important aspects of *fa'a samoa*, limited income has made American Samoans less inclined to engage in strenuous fishing activities when food imports are relatively more available (Levine and Allen 2009). Only a small number of American Samoans engage in boat-based or commercial fishing. Our best source of information about the small boat fisheries come from periodic surveys. In 2021, a total of 33 fishers responded to a cost-earnings survey of the American Samoa small boat fishery of an estimated 60 potential active participants (Dombrow and Hospital 2023). Approximately 90% engaged in nearshore or shallow bottomfish fishing, 81% engaged in deep-water bottomfish fishing, and 75% went trolling. The largest percentage of respondents (27%) identified part-time commercial fishing as their primary motivation, followed by full-time commercial (21%) and cultural fishing (18%). While fishers sold approximately 46% of their catch, they gave away 26% and kept about 21% for personal or family consumption; nearly all fishers (94%) gave away a portion of their catch and 97% kept some catch for personal and family consumption (Dombrow and Hospital, 2023).

The average age of survey respondents was 50 years old, only 9% of respondents were women, and the average annual income was \$19,838. When compared to the general population this means that small-boat fishers tend to be older, much more likely to be men, and earn a smaller annual income than the average American Samoan resident. However, the majority of respondents describes themselves as Samoan (82%), which was similar to the general population (Dombrow and Hospital, 2023).

As described in the FEP, American Samoans have been discouraged from working on foreign longline vessels delivering tuna to the canneries for several reasons, including harsh working conditions, low wages, and long fishing trips. While American Samoans prefer employment on the U.S. purse seine vessels, the capital-intensive nature of purse seine operations limits the number of job opportunities for locals in that sector.

Local fishermen have indicated an interest in participating in the more lucrative overseas markets for fresh fish. However, they are limited by inadequate shore-side ice and cold storage facilities, as well as infrequent and expensive air transportation.

As noted by Levine and Allen (2009), the trend of decreasing reliance on local fish as a food source is reflective of a society that has been undergoing a shift from a subsistence-oriented economy to a cash economy. Changes such as a decrease in leisure time, a shift in dietary preferences towards store-bought foods, a preference to buy fish at the market rather than expend effort in fishing, and an increased availability of inexpensive imported reef fish from Western Samoa and Tonga are also likely contributing to decreasing rates of subsistence fishing in the region (Richmond and Levine 2012b).

However, during the COVID-19 pandemic, the local focus of American Samoa fisheries played a vital role in supporting local food systems, nutrition, food security, and community social cohesion (Kleiber et al. 2022). In 2023, fishers were still concerned about the slow rollout of COVID relief and CARES Act funds (Ayers et al. 2023).

3.2.2.1.3 American Samoa Longline

The American Samoa longline fishery only includes landings in American Samoa by American Samoa longline permitted vessels, it does not include the bigeye landings in Hawaii by the dual (Hawaii and American Samoa) permitted vessels. The American Samoa longline fishery is a limited entry fishery with a maximum of 60 permits. Under the limited access program, NMFS issued a total of 60 initial longline limited entry permits starting from 2005 to qualified candidates. The American Samoa longline limited entry permit is required for anyone using longline gear to fish for pelagic species within the EEZ around American Samoa or anyone landing or transshipping pelagic species in American Samoa that were caught within the EEZ around American Samoa. The total active permits (vessels) fishing in the South Pacific Ocean and landed in American Samoa in 2016 was 20. The American Samoa longline permit may be used to fish and land catch with longline gear in the EEZ around Guam, the CNMI, and the Pacific Remote Island Area (PRIA). It may not, however, be used to fish with longline gear in the Hawaii EEZ.

The American Samoa longline fishery faces many challenges in recent years. A cost-earnings study conducted in 2009 had already indicated a thin profit margin and significant economic challenges encountered by the longline fleet (Arita and Pan 2013). Pan (2015) also observed that at the end of 2013, the majority of the vessels in the American Samoa fleet were tied up at dock, and 18 vessels posted “For Sale” signs. They noted that the collapse of the fishery seemed inevitable due to the poor economic performance resulting from the continuous decline in catch per unit effort, increases in fuel prices, and a sharp drop in albacore prices in 2013. The small-scale alia fleet has been greatly reduced in recent years.

3.2.2.1.4 American Samoa Trolling

According to Levine and Allen (2009), until 1995, boat-based fishing in was primarily trolling and bottomfish handlining, with the pelagic fishery in American Samoa being largely troll-based. In 1996, the majority of trolling fishermen converted their alias to longlining, especially larger commercial trollers, although some continued to troll occasionally. Consequently, the alia fishery has experienced a decline in its catch and effort. In 1996, seven of the 35 trolling vessels rarely sold catch; their captains primarily fished for recreation on weekends, holidays, or competed in fishing tournaments. By 2001, longlining became the dominant fishing method in American Samoa and the number of trolling boats, and their total catch dropped dramatically. Nevertheless, alia longlining has dropped dramatically since then. The landings and revenue by alia longline are not included in this section but are included in the American Samoa longline section.

A small-boat cost-earnings survey in 2021 found that 75% of small-boat fishers engaged in trolling, with 100% of respondents in the Manu'a Islands participating in trolling (Dombrow and Hospital 2023). Trolling trips had the highest median trip costs, and boat fuel composed the majority of trip costs (Dombrow and Hospital 2023).

3.2.2.2 CNMI

3.2.2.2.1 Introduction

The ancestors of the indigenous Chamorro first arrived in the Marianas around 3,500 years ago and relied on seafood as their principal source of protein (WPRFMC 2009c; Allen and Amesbury 2012; Grace-McCaskey 2014). Similar to other archipelagos in the Western Pacific, fish and marine resources have played a central role in shaping the social, cultural, and economic fabric of the CNMI that continues today. They fished for both reef and pelagic species, collected mollusks and other invertebrates, and caught sea turtles. The occupation of CNMI by foreign nations dramatically changed the island's ecosystems, reshaped communities, and disrupted fishing traditions. In the 17th and 18th centuries, Spanish colonizers destroyed the Chamorro's seagoing canoes, suppressed offshore fishing practices, and relocated populations from their traditional home. The CNMI was briefly occupied by Germany from 1899 to the beginning of WWII. During WWII, the CNMI was occupied by the Japanese military, and then was captured by the United States. Throughout this time, fishing remained an important activity. Later immigrants to the islands from East and Southeast Asia also possessed a strong fishing tradition. Today, only Saipan, Rota, and Tinian are permanently inhabited, with 90% of the approximately 47 thousand population living on the island of Saipan. Although the CNMI has transitioned to a tourism-based economy, fishing still plays an important cultural role and serves as a reliable source of local food (Ayers 2018). In the 2020 Census, about 50% of CNMI's population that identified as one race, identified as Asian, while 23.9% identified as Chamorro, and 4.6% as Carolinian. The median age of the population was 34 years old.

Examination of the seascape of compliance across the US Pacific Island region found, that while the literature highlights the importance of enforcement, local experts emphasized barriers of capacity, governance process, and the lack of data. This suggests that non-instrumental and governance approaches can complement enforcement and should be part of an integrated compliance approach both in the region (Ayers and Leong 2020).

3.2.2.2.2 People Who Fish

Allen and Amesbury (2012) summarized results of studies that demonstrated the sociocultural importance of fishing to Saipan residents. In a 2005 study, most of the active or commercial fishermen who responded to the survey had fished for more than 10 years. They most often participated in snorkel spearfishing at night (participated in by 73% of the fishermen) and snorkel spear fishing during daytime (58% of the fishermen), followed by hook-and-line less than 100 ft. deep (36%), trolling (21%), cast net (talaya; 14%), hook-and-line more than 100 ft. deep (9%), trapping (octopus, crabs, etc.; 19%), and foraging the reef (8%); 18% said they participated in one or more other techniques. Less than a third (~30%) said they owned a boat. The primary reasons for fishing were social, cultural, and nutrition; in addition to reporting that they enjoy the activity itself (32%), many said they needed the fish to feed their family (23%), give to family and friends to strengthen social bonds (13%), that their family has always fished (12%), and that it strengthens bonds with their children/family (6%). Only 4% said they needed the money from the fish they sold. Other motivations included strengthening the bond with their

fellow fishermen, fishing to catch fish for festivals and parties, and seasonal fishing for manahak, ti'ao, and i'e (2% each).

The fishermen reported fishing an average of 71 days per year, with 26% going once every two to three days, and 24% fishing once every two weeks. Those surveyed also reported a decrease in the amount of time they have spent fishing in the past decade, fishing 93 days per year on average. Saipan reef fish were the most frequently harvested species (caught by 54% of the fishermen), followed by shallow-water bottomfish (23%) and reef invertebrates such as octopus, shellfish and crabs (14%).

As in other parts of the region, much of the fisher's catch in the CNMI was consumed by themselves and their immediate family (70%), with another 20% consumed by extended family and friends. Only 8% of the catch was sold. There were 18 respondents that identified themselves as commercial fishermen. They reported a median monthly income of \$200 from fishing, with average monthly income of just over \$1,000. Costs exceeded sales for almost every income category for fishermen, suggesting that fishing is not a business for most, but that catch is simply sold to cover some of the cost. Interviews with elder fishers conducted from 2009-2010 corroborated this finding, with the most common motivation to keep fish for food (94%) and commercial sale listed as the second most common reason (40%), including some expense fishing or minor sales of excess fish; giving away fish (19%) or providing for special occasions (10%) were also prominent motivations (Iwane and Levine 2023).

While fish remain an important part of the local diet and an integral part of the people's history and culture, adaptation to and integration with a more westernized lifestyle appears to have changed people's dietary preferences on Saipan. Nearly half (45%) of the survey respondents reported eating "somewhat less fish" than they did a decade ago, although the majority still ate fish between one and three times a week. The majority also purchased their fish from a store or restaurant (40%), while 31% purchased fish from roadside vendors. Less common was acquiring fish from an extended relative/friend (13%) or their own catch (11%). Most of the fish consumed came from the U.S. mainland (41%), with other important sources coming from Saipan's coral reefs (31%), deepwater or pelagic fish caught off of Saipan (23%), or fish imported from other Pacific islands (e.g., Chuuk; 10%).

Few other surveys have been conducted on fishing in the CNMI. A household survey conducted in 2012 found that 37% of households had at least one individual that self-identified as a fisherman (Kotowicz and Allen 2015). Respondents from fishing households tended to be younger, possess lower education levels, and have a higher rate of unemployment than respondents from non-fishing households.

The designation of the Marianas Trench Marine National Monument (the Monument) in 2009 has resulted in concerns about loss of fishing access (Kotowicz and Richmond 2013; Kotowicz and Allen 2015; Richmond and Kotowicz 2015; Kotowicz et al. 2017). Despite long distance, high cost, and inconvenience, travel to the areas now protected by the Monument were rare but culturally significant events, and fishing was an essential component. While CNMI residents generally supported designation of the monument, awareness was low regarding specific impacts (Kotowicz et al. 2017). In addition, fishing households showed higher awareness of the Monument, but were less likely to strongly support it.

3.2.2.2.3 CNMI Trolling

While proportionally few residents own a boat, more than 400 vessels were registered in the CNMI small boat fleet between 2010 and 2011 (Allen and Amesbury 2012). More than 200 of the vessels were active and operating in CNMI waters, and more than 100 of the vessels were involved in fishing activities. However, estimates of active vessels have declined in recent years. The active small boat fleet targets tunas, other small pelagics (through trolling), and bottomfish, although with the increases in the price of gas, pelagic fishing has dropped off somewhat. The fish are marketed locally, given away to family and friends, or used for ceremonial purposes such as parties, culturally significant fiestas, and each village's patron saint's day.

On Saipan, fisheries managers estimated the active small boat fleet at approximately 100 vessels in 2010 and 2011, but it is likely that active vessels have declined in recent years. Full-time commercial fishing is primarily conducted by ethnic nonindigenous minorities, namely Filipino residents (who fish primarily as independent owners and/or operators) and recent immigrants from the Federated States of Micronesia (who are primarily employed for wages). Chamorro and Carolinians, in contrast, primarily fish for recreational and subsistence purposes, selling catch to recoup costs. A few vessel owner operators are considered "Pescadores", a term used to refer to fishermen who provide fish for important community and familial events. Pescadores customarily provide 100-200 lb of reef fish for cooked dishes and pelagic species for kelaguen (i.e., a raw fish dish) for community and family celebrations. The system of seafood distribution underwent significant changes from approximately 2000-2010 with the establishment of large seafood vendors. In contrast to individual fishermen/vendors who only market their own catch, large vendors typically own and operate a number of vessels and purchase catch from independent fishermen to sell, which is reportedly depressing prices. In addition, increases in fuel prices, low market prices for fish, and downturns in the domestic economy have led to a general decline in participation in this fishery since 2000, with respect to numbers of fishermen, trips, landings, and seafood purchasers. The Saipan Fishermen's Association (SFA) is a nonprofit organization established in 1985 that holds annual fishing derbies and participated in community involvement projects, such as beach cleanup.

On Tinian, estimates of fleet size range from 15 to 20 vessels in 2010 and 2011. An estimated 1 to 3 fishermen fished consistently with the primary intent of selling fish. Respondents suggested that fishing and eating fish was more habitual, rather than geared toward a particular event. Increasing fuel prices have reportedly led to the decline in number of active fishermen, and fishermen frequently sell fish to cover fuel costs. Three restaurants and two stores in Tinian purchase fish, although fishermen also sell house to house and commonly have an established clientele. A few charter boats serve tourist clientele; however, they do not land much catch and even trolling trips serve more as photo opportunities. Charter boats are reportedly owned by nonlocal residents and target tourists from their country of origin (Japan, China, or Korea).

On Rota, fishermen target pelagic species when in season, and fish for bottomfish the rest of the year. Like on the other islands, the number and activity of fishermen have declined as a result of increased fuel prices. Family members will often make requests for certain kinds of fish, but they will also contribute money to purchase fuel for a fishing trip. In addition, fishermen will often check demand with local restaurants, based on fuel prices. In 2010-2011, fishermen sold catch to three restaurants, or to neighbors and friends within the community (door to door or from a cooler on the roadside). One general store sold fish caught by a family member, who fishes

specifically to sell. Rota holds one fishing derby in celebration of San Francisco, the saint of their island.

A survey of the small boat fleet was also conducted in 2011 (Hospital and Beavers 2014). On average, respondents were 41 years old and had been boat fishing for an average of 15 years, providing evidence of a deep tradition of boat fishing in the CNMI. They were more likely to identify themselves as Chamorro relative to the general population of the CNMI, although they were equally likely to have been born in the CNMI. In general, small boat fishermen were more educated than the general population and of comparable affluence. Pelagic trolling as the most popular gear type, followed by deep water bottomfish fishing, shallow-water bottomfish, and spear fishing. Most (71%) fishermen reported fishing at a Fish Aggregating Device (FAD) during the past 12 months, and on nearly 22% of their fishing trips. A high degree of seasonal fishing effort was reported across most subgroups of the fleet, although fishermen on Tinian and Rota were more likely to fish year-round.

Hospital and Beavers (2014) found that a majority of fishermen (74%) reported selling at least a portion of their catch in the past 12 months. However, less than half (43%) of survey respondents indicated that they could always sell all the fish that they wanted. A significant percentage of fish caught was consumed at home (28%) or given away to relatives, friends, or for cultural events (38%), reflecting the strong family and social connections associated with fishing in the CNMI. Approximately 29% of fish catch was sold, with the remaining catch either released (2%) or exchanged for goods and services (3%). Even fishermen who regularly sell fish still retain approximately 22% of their catch for home consumption and participation in traditional fish-sharing networks and customary exchange. Additionally, 86% of respondents considered the pelagic fish they catch to be an important source of food. These findings validate the importance of fishing in building and maintaining social and community networks, perpetuating fishing traditions, and providing fish to local communities as a source of food security.

Fishing in the CNMI is a social activity; only 3% of fishermen reported to fish alone, while 70% reported that their boat is used without them on occasion. In addition, the majority of fishermen (57%) agreed that as a fisherman, they are respected by the greater community. While nearly a third of respondents were neutral (27%) and some were hesitant to express an opinion or simply did not know (13%), the study found that very few (3%) felt that they were not respected by the community.

Overall, the CNMI small boat fisheries are a complex mix of subsistence, cultural, recreational, and quasi-commercial fishermen whose fishing behaviors provide evidence of the importance of fishing to the people of the CNMI. For nearly all fishery participants, the social and cultural motivations for fishing far outweigh any economic prospects. Nearly all fishermen supplement their income with other jobs and are predominantly subsistence fishermen, selling occasionally to recover trip expenses.

3.2.2.3 GUAM

3.2.2.3.1 Introduction

Guam is the largest and southernmost island of the Mariana Archipelago and is also the largest and most heavily populated island in Micronesia. Over the past decade, a number of studies have synthesized more details about the role of fishing and marine resources for residents of Guam, as

well as information about the people who engage in the fisheries and/or utilize fishery resources (WPRFMC 2009c).

The ancestors of the indigenous Chamorro first arrived in the Marianas around 3,500 years ago, and were expert fishermen and seafarers, relying on seafood as their principal source of protein (Allen and Bartram 2008; Hospital and Beavers 2012; Grace-McCaskey 2014). They fished on the high seas in large sailing canoes (proas) and used numerous methods to catch reef and bottomfish from boats. Similar to other archipelagos in the Western Pacific, fish and marine resources have played a central role in shaping the social, cultural, and economic fabric of Guam that continues today. Chamorro fished for both reef and pelagic species, collected mollusks and other invertebrates, and caught sea turtles.

The occupation of Guam by foreign nations dramatically changed the island's ecosystems, reshaped communities, and disrupted fishing traditions. In the 17th and 18th centuries, Spanish colonizers destroyed the Chamorro' seagoing canoes, suppressed offshore fishing practices, and relocated populations from their traditional home. Following the Spanish-American War in 1898, the U.S. Navy took control of Guam until it was occupied by Japan from 1941-1944. Guam became a U.S. territory in 1950, and the U.S. military is currently in the process of building up an even greater presence on the island. Throughout this time, fishing has remained an important activity, although by the time Guam became an American territory, the indigenous inhabitants had lost many of their seafaring skills, fishing skills, and even the native names of many of the offshore species. Later immigrants to the islands from East and Southeast Asia also possessed a strong fishing tradition. In 2020, 33% of Guam's population that identified as a single ethnicity were Chamorro, followed by 36% Asian (about 80% of whom were Filipino), 13% other Pacific Islander, 7% white, and 1% black. Despite rapid socioeconomic change, households still reflect the traditional pattern of extended families with multigenerational clustering of relatives, especially in Guam's southern villages. Social occasions such as neighborhood parties, wedding and baptismal parties, wakes and funerals, and especially village fiestas that follow the religious celebrations of village patron saints all require large quantities of fish and other traditional foods, reflecting the role of fish in maintaining social ties and cultural identities. Sometimes fish are also sold to earn money to buy gifts for friends and relatives on important Catholic religious occasions such as novenas, births and christenings, and other holidays.

Since the late 1970s, Guam's most important role in commercial fisheries activity has been as a major regional fish transshipment center and resupply base for domestic and foreign tuna fishing fleets. Services provided include fueling, provisioning, unloading, air and sea transshipment, net and vessel repair, crew repatriation, medical care, and warehousing. Among Guam's advantages as a home port are well-developed and highly efficient port facilities in Apra Harbor, an availability of relatively low-cost vessel fuel, a well-established marine supply/repair industry, and recreational amenities for crew shore leave. In addition, the Territory is exempt from the Nicholson Act, which prohibits foreign ships from landing their catches in U.S. ports. Initially, the majority of vessels calling in Apra Harbor to discharge frozen tuna for transshipment were Japanese purse seine boats and carrier vessels. In the late 1980s, Guam became an important port for Japanese and Taiwanese longline fleets, but port calls have steadily declined and the transshipment volume has declined accordingly. By the early 1990s, an air transshipment operation had also been established in Guam. Fresh tuna was flown into Guam from the Federated States of Micronesia and elsewhere on-air cargo planes and out of Guam to the Japanese market on wide-body passenger planes. Further, vessels from Japan and Taiwan also

landed directly into Guam, where their fish were packed and transshipped by air to Japan. A second air transshipment operation began in the mid-1990s that was transporting fish to Europe that did not meet Japanese sashimi market standards, but this has since ceased. Moreover, the entire transshipment industry has contracted markedly with only a few operators still making transshipments to Japan. Annual volumes of tuna transshipped between 2007 and 2011 averaged about 3,400 mt, with a 2012 estimate of 2,222 mt, compared to over 12,000 mt at the peak of operations between 1995 and 2001. As early as 2006, it was noted that the Port of Guam had lost much of its competitive advantage compared to alternative transshipment locations in the western Pacific and elsewhere, a trend that may not be reversible.

Otherwise, commercial fisheries have a relatively minor contribution to Guam's economy; the social and cultural importance of fisheries in Guam dwarfs their commercial value. Nearly all Guam domestic fishermen hold jobs outside the fishery, with fishing typically supplementing family subsistence. High value is placed on sharing one's fish catch with relatives and friends, and this social obligation extends to part-time and full-time commercial fishermen alike. A survey of Guam households in 2005 found that nearly one-quarter (24%) of fish consumed were caught by the respondent or an immediate family member, and an additional 14% were caught by a friend or extended family member (Allen and Bartram 2008). However, a little more than half (51%) of the fish consumed were purchased at a store or restaurant, and 9% were purchased at a flea market or from a roadside stand. The same study found that annual seafood consumption in Guam is estimated to be about 60 lb. per capita, with approximately 43% imported from the U.S.

The westernization of Guam, particularly since World War II, has not only resulted in a transition from a subsistence to wage-based economy, but has also contributed to dramatic changes in eating patterns, including lower seafood consumption. Indeed, recent years have seen steady declines in the market demand for fresh local fish across Guam (Hospital and Beavers 2012). While some families continue to supplement their diet by fishing and farming, no existing communities are completely dependent on local fishing as a source of food. A household survey conducted in 2016 found that only 29% of respondents participate in fishing (NCRMP 2016a).

As recently as the early 1970s, relatively few people from Guam fished offshore because boats and deep-sea fishing equipment were prohibitively expensive (Allen and Bartram 2008). During the economic boom from the late-1980s through most of the 1990s, Guam developed a small boat fishery that conducted trolling and bottomfish fishing mostly within 30 miles of shore.

The Guam Fishermen's Cooperative Association (GFCA) plays an important role in preserving important fishing traditions. It began operations in 1976 and was incorporated in 1977. In 2006, its membership included 164 full-time and part-time fishermen from every district in Guam, and it processed and marketed approximately 80% of the local commercial catch. In addition, it plays a role in fisheries data collection, marine education and training, and fisheries conservation and management. The GFCA strives to provide benefits not just to fishermen but to residents throughout Guam, benefitting the broader Guam community. It utilizes a Hazard Analysis and Critical Control Point (HACCP) system to ensure safe seafood, and tests fish for potential toxins or whenever requested by the Guam Department of Health and Sanitation. It has also become a focal point for community activities such as the Guam Marianas International Fishing Derby, cooking competitions, the Guam Fishermen's Festival, dissemination of educational materials on marine resources, vessel safety and seafood preparation, public meetings on resource management issues, and communications via radio base to relay information and coordinate rescues. It also has adopted a policy of purchasing local origin products that benefits 40 small

businesses in Guam, regularly donates seafood for village functions and charitable activities, and provides assistance to victims of periodic typhoons with emergency supplies of ice and fuel. In addition, the GFCFA has become a voice for Guam fishermen in the policy arena to ensure that concerns of fishermen are incorporated into issues such as the military buildup.

Fishing in Guam continues to be important not only in contributing to the subsistence needs of the Chamorro and other residents but in preserving their histories and identities. Knowledge of how fish are distributed and consumed locally is crucial to understanding the social and cultural significance of fishing in Guam.

3.2.2.3.2 People Who Fish

A household survey conducted in 2012 found that 35% of respondents said that they or someone else in their household was a fisherman (Kotowicz and Allen 2015). Respondents from fishing households tended to have lower education levels and have a higher rate of unemployment than respondents from non-fishing households.

A few studies have targeted pelagic fishermen or the small boat fleet. There is some indication that interest in small-boat commercial fishing for skipjack may be emerging using a specialized form of handlining (Iwane et al. 2023). While these boats also engage in bottomfish fishing and reef fishing, the primary pelagic fishing method is trolling, thus, results of these studies will be reported in the Guam Troll section.

3.2.2.3.3 Guam Trolling

Similar to the CNMI, Guam's small boat fisheries are a complex mix of subsistence, cultural, recreational, and quasi-commercial fishermen whose fishing behaviors provide evidence of the importance of fishing to the island of Guam. For nearly all fishery participants, the social and cultural motivations for fishing far outweigh any economic prospects. Nearly all fishermen supplement their income with other jobs and are predominantly subsistence fishermen, selling occasionally to recover trip expenses.

In 2018, a survey was conducted of the small boat fleet, which included questions about trolling, (Dombrow et al. 2025a). Trolling was the most commonly used gear type for all respondents (86%), with an average annual catch of 858 lb of pelagic fish by the fishers that target pelagic species, in 2017. An average pelagic fishing trip cost about \$241 per trip. 95% of the pelagic fishers were men, and 86% identified as Chamorro. The proportion of pelagic fishers with a bachelor's degree (14%) was mirrored in the full sample of respondents (14%). Pelagic fishers took an average of 23 trips per year, and reporting selling on average 20% of their catch. 40% of pelagic fishers that sold their catch reported yearly earnings of \$1000 or less, while 54% earned between \$1,001 and 10,000. Only 6% reporting earning over \$10,000 a year from pelagic fishing. Fishers who primarily targeted pelagics allocated their catch mainly to home consumption (38%), giving to family (22%), and selling (19%). For the most part, pelagic fishers identified their motivation for fishing as purely recreation (62%), subsistence (32%), recreational expense (31%), cultural (20%), or part-time commercial (4.6%). Only 2% of pelagic fishers identified full-time commercial fishing as a motivation. Over half of the respondents identified multiple motivations (54%).

Most pelagic fishers (73%) also agreed that they are respected by the Guam community, and 88% felt that fishing was an important part of their identity.

Respondents were also asked to list important research and management topics. The three top topics related to enforcement (95%), understanding reef and habitat health (93%), and building and maintaining fisheries infrastructure (93%). The majority also identified the importance of knowing how many fish there are (87%), having information about fishers and fishing communities (77%), and having fisher voices included in decision making (71%). Other identified topics included:

- Fish size regulations
- Improved boat ramp infrastructure
- Perpetuate fishing culture
- Make sure the price of fish is good so fishermen will continue fishing
- Respect among other fishers
- Stop illegal forms of fishing
- Support the next generation of fishers

3.2.2.4 HAWAII

3.2.2.4.1 Introduction

Traditional Native Hawaiian subsistence relied heavily on fishing, trapping shellfish, and collecting seaweed to supplement land-based diets. Native Hawaiians also maintained fishponds, some of which date back thousands of years are still used today. The Native Hawaiian land and marine tenure system, known as ahupua'a-based management, divided the islands into large parcels called moku, which are reflected in modern political boundaries (Census County Districts) (WPRFMC 2009d; Geslani et al. 2012; Richmond and Levine 2012b).

Immigrants from many other countries with high seafood consumption and cultural ties to fishing and the ocean came to work on the plantations around the turn of the 20th Century, establishing in Hawaii large populations of Chinese, Japanese, Koreans, Filipinos, and Portuguese, among others. In 1985, the Compact of Free Association also encouraged a large Micronesian population to migrate to Hawaii. According to the 2020 Census, the State of Hawaii's population is almost 1.5 million. Ethnically, it has the highest percentage of Asian Americans (37.2%) and Multiracial Americans (25.3%) and the lowest percentage of White Americans (22.9%) of all states. Approximately 27% of the population identifies as Native Hawaiian or part Native Hawaiian. Tourism from many of these Asian countries also increases the demand for fresh, high-quality seafood, especially sushi, sashimi, and related raw fish products such as poke.

Today, fishing continues to play a central role in the local Hawaiian culture, diet, and economy. In 2012, an estimated 486,000 people were employed in marine-related businesses in Hawaii, with the level of commercial fishing-related employment well above the national average (Richmond et al. 2015). The Fisheries Economics of the United States (FEUS) 2022 report found an increase in sales and jobs in the commercial fishing and seafood industry in Hawaii (including the commercial harvest sector, seafood processors and dealers, seafood wholesalers and distributors, importers, and seafood retailers), when compared to the FEUS 2020 report. In 2022 commercial fishing and the seafood industry generated \$824 million in sales impacts (up from \$557 million in 2020) and approximately 10,229 full and part-time jobs that year, which is twice the number of jobs reported in the FEUS 2020 report (NMFS 2023). However, within the recreational fisheries sector there was a decrease in sales and jobs when compared to 2020. It is

estimated that recreational anglers took 3.9 million fishing trips, with \$379 million in sales impacts (down from \$465 million in 2020) and 2,062 full- and part-time jobs (down from 3,929 in 2020) were generated by recreational fishing activities in the State during 2022 (NMFS 2023). Due to changes in data availability NMFS does not currently report recreational angler participation at the State level.

Seafood consumption in Hawai'i is estimated at approximately two to three times higher than the rest of the entire U.S., and Hawai'i consumes more fresh and frozen finfish while shellfish and processed seafood is consumed more across the rest of the country (Davidson et al. 2012; Geslani et al. 2012). In addition, studies have shown that seafood is eaten frequently, nearly one-third of residents ate seafood about once a week and only 3% never consumed seafood, although there is a decreasing trend in the percent of residents who consume seafood every day or a few times a week and an increase in residents who consume seafood 1-3 times a month (NCRMP 2016b; Allen et al. 2022). Fresh seafood is the most popular type of seafood purchased, and while most is purchased at markets or restaurants, a sizeable amount is reported as caught by friends, neighbors, or extended family (NCRMP 2016, 2020; Davidson et al. 2012).

At the same time, local supply is inadequate to meet the high seafood demand. In 2010, 75% of all seafood consumed in the State of Hawaii was imported from either the U.S. mainland or foreign markets, and the rise in imported fish has influenced the price of local catch (Arita et al. 2011; Hospital et al. 2011). In addition, rising costs of fuel and other expenses have made it more difficult to recover trip costs (Hospital et al. 2011). A majority of commercial fishermen report selling their fish simply to recover these costs, not necessarily to make income (Hospital et al. 2011). Many describe the importance of sharing fish as a part of maintaining relationships within family or other networks as being more important than earning income from fishing (Calhoun et al. 2020).

Pelagic fish play a large role in seafood consumption, with Hawaii residents regularly consuming substantial amounts of fresh bigeye and yellowfin tuna as 'ahi poke (bite-sized cubes of seasoned raw tuna) and ahi sashimi (sliced raw tuna). 'Ahi is also a significant part of cultural celebrations, especially during the holiday period from late November (Thanksgiving) through late January to mid-February (Lunar New Year). Changes in bigeye regulations can have far-reaching effects not only on the fishing community in Hawai'i but also on the general population (Richmond et al. 2015). While most of the fresh tuna consumed in Hawaii is supplied by the local industry, market observations suggest that imported tuna is becoming more commonplace to meet local demands (Pan 2014). However, on average, only 18% of tuna consumed is imported (Dombrow et al. 2022).

Examination of the seascape of compliance across the US Pacific Island region found, that while the literature highlights the importance of enforcement, local experts emphasized barriers of capacity, governance process, and the lack of data. This suggests that non-instrumental and governance approaches can complement enforcement and should be part of an integrated compliance approach both in the region (Ayers and Leong 2020).

3.2.2.4.2 People Who Fish

Hawaii includes a mix of commercial, non-commercial, and subsistence characteristics across fisheries. Archipelagic fisheries are primarily accessed via a small boat fleet and through shoreline fishing. Within the small boat fleet, there is a nearly continuous gradation from the full-time and part-time commercial fleet to the charter and personal recreation fleets. A single

boat (and trip) will often utilize multiple gear types and target fish from multiple fisheries. Thus, other than the longline fishery, these fisheries are typically not studied individually. Rather, studies have typically been conducted based on ability to reach potential respondents. Studies have targeted fishermen via State of Hawaii Commercial Marine Licenses (CMLs) (Madge et al. 2016; Chan and Pan 2017), shoreline and boat ramp intercepts (Hospital et al. 2011; Madge et al. 2016), and vessel and angler registries (Madge et al. 2016).

The Hawaii small boat pelagic fleet was studied in 2007-2008 (hereafter, referred to as the 2008 study), following a design last utilized in 1997 (Hospital et al. 2011). Because respondents also targeted insular fish, the study is included in this report. Their work was updated in 2014 and 2021 (Chan and Pan 2017; Chan 2023) for the small boat fleet in general. All studies found that the small boat fleet is predominantly owner-operated and a male dominated activity (98% of respondents were male in all studies). The ethnic composition was predominantly Asian (45% in 2008, 41% in 2014, 38.6% in 2021) and White (23% in 2008, 26% in 2014, 26.5% in 2021), which is similar to the demographics of the State population as a whole. In 2021, proportionally more Native Hawaiians and Pacific Islanders responded to the survey than are represented in the general population (18.6% vs. 10%). In addition, most respondents had a household income above \$50,000 (75% in 2008, 69% in 2014, 76% in 2021).

These studies also asked respondents to identify their motivation for fishing and allowed for multiple responses, whereas the 2014 survey had asked how they defined themselves as a fisherman. When comparing primary motivations to self-identified fisherman type, the percentage of part-time commercial fishermen decreased from 51% to 30% while the percentage of recreational expense fishermen increased from 27% to 34% and subsistence fishermen increased from 3% to 16%, perhaps in response to the COVID-19 pandemic – the survey conducted in 2021 asked respondents about conditions and activities in 2020. When comparing all three motivations reported in 2021, recreational expense, subsistence, and part-time commercial were listed by almost half or more of respondents, whereas all other motivations were reported by fewer than 30% (Chan 2023). Different activities were then compared based on motivations.

As previously mentioned, the Hawaii small boat fishery is a mixed-gear fishery. In 2008, 47% of respondents reported using more than one gear type, predominantly trolling (for pelagic fish) and handline (for bottomfish). In 2014, 65% of respondents reported trolling as their most common gear, 16% indicated bottomfish handline, and 12% stated pelagic handline was their most commonly used gear. Trolling was more commonly used by recreational fishermen whereas pelagic handline and bottomfish gears were more commonly used by commercial fishermen. In the 2021 study, trolling was still the most common gear type, but dropped to 54%. The other answer choices were changed slightly, but the majority of remaining responses still reflected bottomfish (23%) and pelagic (14%) gear types. The 2014 and 2021 studies also asked about species composition of catch. While over 90% of the respondents reporting landing pelagic fish in the past year in both studies, about half of respondents in the 2014 study also reported they caught and landed bottomfish or reef fish. In the 2021 study 56% of respondents reported catching bottomfish while 16% reported catching reef fish. Results from the 2021 study were compared to the State of Hawai‘i DAR reporting system and were found to match very well. Thus, the small boat fleet includes not only a mixture of gear types, but also targets both pelagic and insular fish stocks.

Studies also examined fisher motivations and self-identification vs. their commercial and non-commercial activities. Many people who considered themselves recreational, subsistence, or cultural fishers still sold fish. In 2008, 42% of fishermen self-classified as commercial fishermen, yet 60% of respondents reported selling fish in the past 12 months. In addition, just over 30% of fishermen who self-classified as recreational reported selling fish in the past year. Results for the 2014 study are shown in Table 43.

Table 43. Catch disposition by fisher category

	Number of respondents (n)	Caught and released (%)	Given away (%)	Consumed at home (%)	Sold (%)
All Respondents (2014)	738	5.6	13.9	15.4	65.0
By Fisherman Classification...					
Full-time commercial	55	6.2	9.4	11.6	72.8
Part-time commercial	369	5.2	12.9	14.4	67.5
Recreational expense	200	6.7	19.8	21.7	51.8
Purely recreational	78	5.4	37.3	29.6	27.6
Subsistence	24	1.9	20.7	31.0	46.5
Cultural	8	4.0	36.8	22.5	36.7
All Respondents (2021)	328	3.7	12.4	14.3	69.6
By Primary Motivation:					
Recreational expense	98	6.5	25.4	23.0	45.1
Part-time commercial	92	4.6	13.5	12.9	69.0
Subsistence	47	2.9	23.9	28.4	44.8
Full-time commercial	34	2.7	4.8	9.5	83.0
Purely recreational	25	6.0	36.5	30.3	27.1
Cultural	4	0.9	17.9	18.7	62.5

Source: Chan and Pan (2017); Chan (2023)

In 2021, the average value of fish sold by all respondents was approximately \$11,913 and was seen to match well with the State of Hawaii DAR Dealer Reporting System (Chan 2023). Full-time commercial fishermen reported the highest value of fish sold (\$35,709 annually), part-time commercial fishermen reported \$8,983 annually, cultural fishermen \$19,250, recreational expenses fishermen \$3,917, subsistence fishermen \$6,382, and purely recreational fishermen reported selling \$2,939 annually. When adjusted for inflation, average annual revenue for full - and part-time commercial fishers decreased 5% and 11% respectively from 2014 values. Recreational expense revenue increased by 29%, while revenue from purely recreational fishing increased 162%, revenue from subsistence fishing increased 197%, and revenue from cultural fishing increased 338%. While income from fish selling served as an important source of personal income for full-time commercial fishermen, the majority of fishermen reported selling fish to cover trip expenses, not necessarily to make a profit; few fishermen reported substantial, if any, profits from fishing. In the 2008 study, respondents expressed concern about their ability to cover trip costs, noting that trip costs continued to increase from year to year, but fish prices remained relatively flat.

The 2008 study also attempted to quantify the scale of unsold fish that was shared within community networks. Approximately 38% of pelagic fish caught by commercial fishermen was not sold, 97% of survey respondents indicated they participated in fish sharing networks with friends and relatives, and more than 62% considered the fish they catch as an important food

source for their family. Community networks were also present in the outlets where fish were sold, which included the United Fishing Agency (UFA) auction in Honolulu, dealers/wholesalers, markets/stores, restaurants, roadside, but also sales to friends, neighbors, and coworkers. The 2014 study documented 27.3% of sales to friends, neighbors, or coworkers, which jumped to 49% in 2021 and 7.9% of sales at roadside/farmers' markets, which rose to 14% in 2021, illustrating the importance of informal markets. In addition, Table 59 also documents the importance of giving away fish for all self-classification categories, reflecting the prevalence of a gift economy. In the 2014 study, 17% of respondents (who all held CMLs) sold no fish in the past 12 months.

Taken together, the results from these studies suggest a disconnect between the disposition of Hawaii fishermen and public perception of their fishing activity relative to current regulatory frameworks. The small boat fleet is extremely heterogeneous with respect to gear type, target species, and catch disposition, while regulations attempt to treat each separately with clear distinctions between commercial and recreational activities. In addition to providing income, the Hawaii small boat fleet serves many vital nonmarket functions, including building social and community networks, perpetuating fishing traditions, and providing fish to local communities.

A survey was also conducted on the attitudes and preferences of Hawaii non-commercial fishers (see Madge et al. 2016). Nearly all survey respondents were male (96%). Their average age was 53, and, on average, they had engaged in non-commercial saltwater fishing in Hawaii for 31 years. The majority had household income equal to or greater than \$60,000, reported high levels of education, and reflected a large racial diversity (primarily various Asian ethnicities and White). They primarily fished via private motorboat (61%), followed by shore, including beach, pier, and bridge (38%). Offshore trolling and whipping/casting, and free-dive spearfishing were the most frequent gears reported as "always" used, and a majority of respondents reported using multiple gears on a single fishing trip.

As with the small boat fleet, even though this study targeted "non-commercial fishermen", 9% reported that their primary motivation for fishing was to sell some catch to recover trip expenses. However, the primary motivation for the majority (51%) was purely for recreational purposes (only for sport or pleasure). A total of 78% of respondents indicated they "always" or "often" share catch with family and friends, and only 35% indicated they "never" supply fish for community/cultural events. Fishing for home/personal consumption was the most important trip catch outcome (36% rated it "extremely important"), followed by catching enough fish to be able to share with friends and family (20%). Thirty-six percent indicated that their catch was extremely or very important to their regular diet. Thus, similar to the small boat fleet, non-commercial fishermen demonstrate mixed motivations that include commercial activities. They also play an important role in providing fish via social and community networks, even though they report their primary motivation as fishing only for sport or pleasure.

NMFS and the Hawaii DAR have been collecting information on recreational fishing in Hawaii, administered through the Hawaii Marine Recreational Fishing Survey (HMRFS) (Allen and Bartlett 2008; Ma and Ogawa 2016). The program collected data from 1979-1981, but not from 1982-2000, and then began annual data collection again in 2001. A dual survey approach is currently used. A telephone survey of a random sample of households determines how many have done any fishing in the ocean, their mode of fishing, methods used, and effort. The telephone survey component will be discontinued after 2017 due to declining land line coverage. Concurrently, surveyors conduct in-person intercept surveys at boat launch ramps, small boat

harbors, and shoreline fishing sites. Fisher county of residence and zip code are regularly collected in the intercept surveys but has not yet been compared to the composition of the general public. As observed in the other surveys, this program documented wide range of gears used to catch a variety of both pelagic and insular fish. The majority of trips from the onsite interviews were from “pure recreational fishermen” (defined as people who do not sell their catch), with an average of almost 60% to over 80% depending on year and island. However, they also noted that in Hawaii the divisions between commercial, non-commercial, or recreational are not clearly defined, and results suggested that the majority of catch for some categories of fishermen may be consumed by themselves or given away, further reinforcing common themes from other studies.

3.2.2.4.3 Hawaii Longline

The Hawaii longline fishery (HLF) is the dominant commercial fishery in the Hawaiian Islands and is described in detail in Richmond et al. (2015). It operates out of the port of Honolulu, and in 2018 there were 142 active vessels. The majority of longline fish is sold at the Honolulu fish auction, modeled after the Tsukiji auction in Tokyo, where dealers bid on individual fish. Over 40 dealers representing a variety of different market strategies regularly purchase fish at the auction. Many dealers represent locally-owned small businesses. Additional businesses connected to the bigeye fishery include processors, airline and shipping companies, ice distributors, gear stores, restaurants, and retail outlets.

Owners and operators of Hawaii’s longline vessels comprise three main ethnic groups: Korean-American (K-A), Vietnamese-American (V-A), and Euro-American (E-A) (Allen and Gough 2007); and the crew is predominantly Filipino (Allen and Gough 2006). Unlike the broader Asian-American population in Hawaii, most HLF K-A and V-A fishers are first generation immigrants and speak limited English. E-A fishers largely consist of individuals from the mainland U.S. whose native language is English. The fishery is considered well regulated, although there are concerns about growing social and economic impacts from increased competition and regulation. Social network analysis revealed that fishers interacted more within ethnic groups than across ethnic groups. V-A fishers reported the most cross-scale linkages, whereas K-A fishers reported only one tie to an industry leader outside their community (Barnes-Mauthe et al. 2013). This indicates that the interests of K-A fishers may not be adequately represented in the management and policy arena. It also supports previous research that suggests the three ethnic communities should not be assumed to utilize the same fishing practices, exhibit the same attitudes toward fishery management and regulations, or display the same level of trust across groups. According to Kalberg and Pan (2016), The V-A group had the highest number of active vessels in 2012 (n=70), while the E-A had 44 active vessels, and K-A had 15. In addition, on average each vessel had more foreign crew than U.S. crew members.

An economic model documented some of the major changes to the fishery’s role in the local economy, based on 2005 data (Arita et al. 2011). These included rising fuel costs, a steady rise in foreign crewmembers, and weakening profits. From 2003-2004, a study was conducted on Filipino crew members in the longline fleet (Allen and Gough 2006). Filipino crew sampled ranged from 21 to 52 years of age in 2003; the average age was 37, and 55% were older than 36. A total of 89% had completed high school, nearly 30% also completed an associate or trade school degree (often focused on maritime studies), an additional 16% completed at least some college coursework, and 5% completed college studies. In many cases, they had received more formal education than the captains or owners for whom they were working in Hawaii. Crew were

responsible for an average of five dependents, and all respondents indicated that their households depended heavily on the Hawaii longline industry for income, with 63% relying on the fishery as their sole source of income. Many had an extensive background in commercial fishing, with an average of 11 years of experience. In comparison, only 25% of respondents reported more than 5 years total involvement in seafaring in a 2004 study of overall seafarers. While there are a number of challenges to obtaining foreign laborers for employment on Hawaii longline vessels, they are often willing to work for less money and earn more money as a crew member than they would in their home country. Crew must reside on the vessel and do not receive a ‘shore pass’ to leave the pier area. However, many developed strong social networks and a number of Hawaii-based Filipinos developed businesses in the pier area to serve crew needs. The average annual income of a Hawaii-longline crew member was well over double the average earned in the Philippines; even the lowest paid crew members earned 62% more than the family average for the Philippines and did not have to pay for food or housing while living on the longline vessel. Nearly 70% reported high or very high levels of job satisfaction while nearly 80% reported a reasonable income and no problem with their workload or living conditions.

In 2010, the bigeye tuna fishery experienced the first extended closure of the western and central Pacific Ocean (WCPO) to U.S. longliners from the State of Hawaii. Richmond et al. (2015) monitored the socioeconomic impacts of this closure to examine how the bigeye fishery community (including fishermen, a large fish auction, dealers, processors, retailers, consumers, and support industries) perceived and were affected by the constraints of the 40-day closure over the holiday season. During the closure period, they found a reduced supply and quality of bigeye landed, an increase in price for high quality fish, and longer distances traveled to fish in rougher waters. These factors resulted in increased stress and in some cases lost revenue for individuals and businesses connected to the fishery. Different stakeholder groups responded differently to the closure, with fish dealers among those most affected. Some dealers chose to purchase high quality tuna despite abnormally high prices and sell at a loss to maintain relationships with their customers. During the closure, U.S. boats could continue to fish for bigeye in the Eastern Pacific Ocean and foreign and dual permitted vessels could still fish in the WCPO, which mitigated some of the impacts to the fishery. U.S. legislation and federal rules that have prevented subsequent closures of the fishery have since been put in place.

Frozen tuna treated with carbon monoxide to enhance color has appeared in Hawaii markets since the late 1990s. It is often labeled as “Tasteless Smoke” and is sold in markets in thawed form, which is similar in appearance to fresh ‘ahi poke. The price of Tasteless Smoke tuna is lower than the price of fresh tuna landed by local vessels. During the closure, imported products were available in retail markets and the price in the retail market stayed consistent, suggesting that local and imported products are substitutes and that imports increase quickly to meet demand when local landings are low (Pan 2014). However, conversation with multiple dealers suggested that only a few dealers increased their reliance on imports during the closure (Richmond et al. 2015).

In the fall of 2016, concerns about the working conditions of foreign crewmembers garnered national media attention. In response, the Hawaii Longline Association commissioned a follow-up study, based on the methodology developed by Allen and Gough (2006), and conducted by one of the same researchers (Gough 2016). Many of the same crew members were interviewed in both 2006 and 2016 due to high retention in the fleet. The study interviewed crew from 75% of Hawaii longline vessels on crew recruitment and fees, on board conditions and access, pay

structure, medical care, document retention on board, and grievance mechanisms. There were no indications of foreign crew employed against their will, nor were there records of respondents who wished to return to their country of origin but were unable to do so; trends reported did not reflect forced labor or human trafficking. While no exploitation was reported, the study also identified potential operational flaws that could result in exploitation of foreign crew. It also suggested recommendations to improve those systems to reduce industry vulnerability to scrutiny, including safeguards for both crew and vessel owners.

On August 26, 2016, a Presidential proclamation expanded the Papahānaumokuākea Marine National Monument to include the majority of the United States Exclusive Economic Zone surrounding the Hawaiian Islands, which would largely affect the longline fleet. An internal report noted the potential for differential impacts (e.g., based on target species, vessel size, or ethnicity; see PIFSC 2017). For example, the shallow-set fishery appears to have nominally higher share of catch, effort, and revenues from the Northwest Hawaiian Islands, compared to the deep-set fishery. Multiple evaluations of the effects from the Monument expansion were published in 2020 (Chan 2002; Lynham et al. 2020).

3.2.2.4.4 Hawaii Trolling

Trolling was one of the gear types included in the 2014 and 2021 Small Boat Surveys (Chan and Pan 2017; Chan 2023). Fisher demographics and catch disposition were summarized in Chapter 2. Most small boat fishermen trolled, with 65% of respondents stating that trolling was their most commonly used gear in 2014 and 54% in 2020. In 2014, approximately half of their trips occurred in State waters, and half in federal waters. Also reported in the 2014 study, a higher percentage of those who identified troll as their most commonly used gear reported using only a single gear (35%) in comparison to respondents who most commonly used other gear types; however, a larger percentage (45%) reported using two types of gear. In 2020, trolling was most commonly used by those whose primary motivation was cultural, although this was a very small number (4). The next highest percentages were purely recreational (65.4%) and recreational expense (64.2%), although respondents spanned all response categories (full-time commercial, part-time commercial, recreational expense, purely recreational, subsistence, and cultural). This finding corroborates the observation that the troll fishery has a significant cultural and subsistence role in Hawaii's fishing communities (Markrich and Hawkins 2016).

3.2.2.4.5 Hawaii Pelagic Handline

Pelagic handline was one of the gear types included in the 2014 Small Boat Survey (Chan and Pan 2017) and was modified to the motivation "bait for pelagic" in 2021 (Chan 2023). Fisher demographics and catch disposition were summarized in Chapter 2. Only 12% of respondents indicated this category was their most commonly used gear in 2014, 14% in 2021. In 2014, a larger percentage of their fishing trips occurred in State waters (62%) vs. federal waters (38%). In addition, in comparison to respondents who most commonly used other gear types, those who identified pelagic handline as their most commonly used gear in 2014 reported the lowest percentage of single gear use (8%). They predominantly reported using two types of gear (49%). In both years, pelagic handline was most commonly used by fishermen whose primary motivation was full-time commercial (57.4% in 2014, 24.2% in 2021) and respondents spanned all response categories except cultural in 2021. This finding corroborates the observation that the pelagic handline fishery has a significant cultural and subsistence role in Hawaii's fishing communities (Markrich and Hawkins 2016).

3.2.2.4.6 Offshore Handline

Pelagic offshore handline was one of the gear types included in the 2014 Small Boat Survey (Chan and Pan 2017) and fisher demographics and catch disposition on the offshore handline were available in Chan and Pan (2019b).

3.2.2.4.7 Other Gears (including Aku Boat/Pole and Line)

This category represents pelagic species caught by methods or in areas other than those methods of longline, MHI troll and handline, and offshore handline. There is currently no socioeconomic information specific to this group of fisheries. Aku boat was included in the group. Fishers trolling in areas outside of the MHI (the distant water albacore troll fishery) or PMUS caught close to shore by diving, spearfishing, squidding, or netting inside of the MHI are also included in this category.

3.2.3 ECONOMIC PERFORMANCE OF MAIN COMMERCIAL FISHERIES

3.2.3.1 AMERICAN SAMOA

3.2.3.1.1 American Samoa Longline

3.2.3.1.1.1 Commercial Participation, Landings, Revenue, and Prices

The American Samoa longline fishery includes large longline vessels and small longline vessels (alia boats). Alia longline fishing has experienced declining trends in participation over the years, and no alia vessels participated in fishing activities in recent three years (i.e., 2021-2023). In 2023, there were only 10 large longline vessels (64 feet or larger), one less than in 2022, that actively fished in American Samoa EEZ. The American Samoa longline fishery mainly targets albacore, which differs from the Hawaii longline fishery targeting bigeye tuna and swordfish. The American Samoa longline fishery, especially the large longline vessels, sell the majority of their catch to the local cannery. The species sold to the local cannery includes four tuna species, albacore, yellowfin, bigeye, and skipjack, and one non-tuna species, wahoo.

In 2024, the total fleet revenue (i.e., estimated landed value for the five species sold to cannery only) was \$3.23 million from 3.40 million pounds of total landings (for all species). The five species (Albacore, yellowfin, bigeye, skipjack, and wahoo) sold to cannery composed 94% of the total American Samoa longline commercial landings (estimated pounds kept). No official statistical data was available on the sold value of the 6% of the non-cannery species landings. In 2024, albacore composed over 79% of the commercial value sold to cannery while the other four primary species (yellowfin, bigeye, skipjack, and wahoo) contributed 21% of the revenue. Wahoo was one of the five species that canneries accepted and commonly sold in local markets. Traditionally, most all wahoo harvested by American Samoa longline are sold to the canneries. In recent years, fishers indicated they sold more wahoo to local markets instead of the cannery since local markets pay a higher price for wahoo. However, we used cannery price to estimate the total commercial landings of wahoo because the portion and price that sold to local markets for wahoo are not available.

Figure 119 presents the trends of commercial landings and revenue (for cannery only) from 2005-2024. Revenue presented here represents only the revenue from sale to the cannery. Supporting data for Figure 119 are provided in Table A-112. In general, American Samoa longline landings and revenue have been declining since 2008. Commercial landings in 2024

were up by 24% compared to 2023, but revenue decreased 9% in 2024 due to lower fish price by 26%.

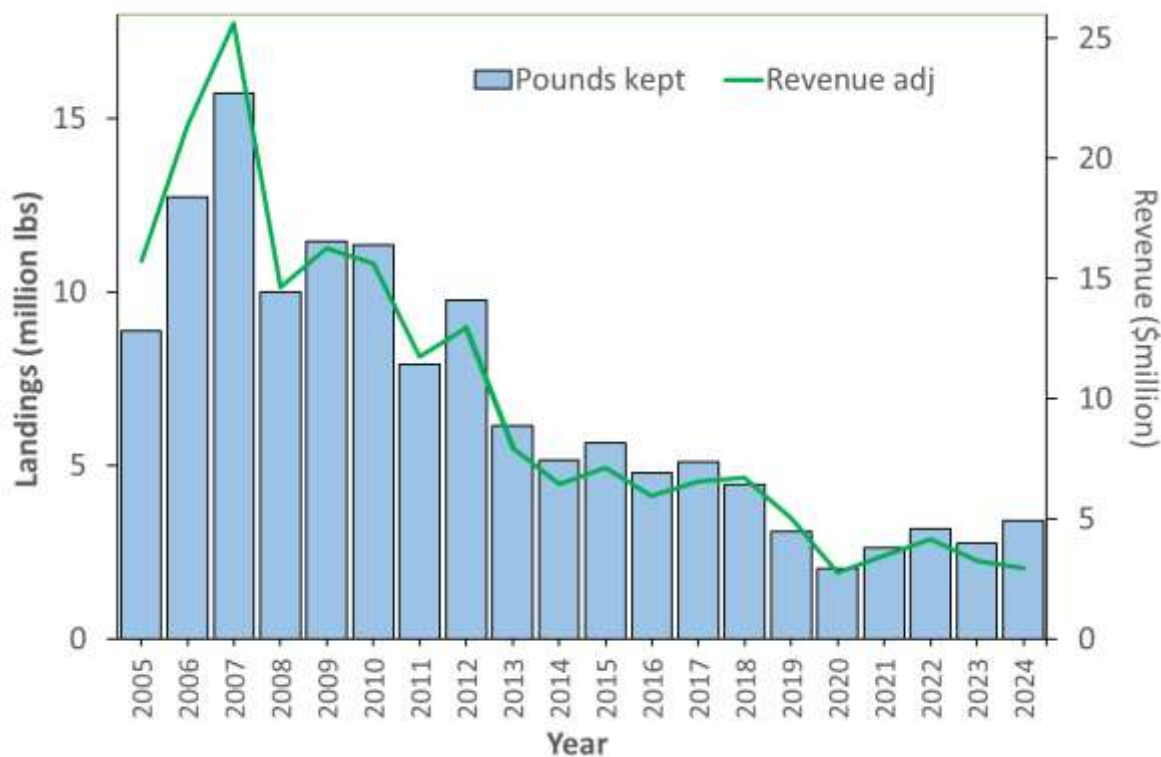


Figure 119. Commercial landings and revenue for the American Samoa longline fishery (adjusted to 2024 dollars)¹

¹ Data source: Pacific Islands Fisheries Science Center: Fishery Economic Performance Measures (Tier 1 indicators). <https://inport.nmfs.noaa.gov/inport/item/46097>. CPI information for 2023 and 2024 were not available and assumed to be the same as 2022.

Fish price data for the five main species harvested by American Samoa longline have been collected through annual in-person interviews by PIFSC economists with owners or agents of the fishery since 2012. During 2020 and 2021 were collected by the PIRO observer program in American Samoa, as travel restrictions were in place during the pandemic period and no in-person interviews with local fishermen were able to be conducted.

Trends in albacore price from 2012 to 2024 are presented in Figure 120. Supporting data for Figure 120 are presented in Table A-113. The albacore price continued dropping in 2024 by 17% compared to 2023. The albacore price increased substantially in 2019 because the American Samoa-based US longline fleet secured certification from the Marine Stewardship Council (MSC) and Starkist Co., which led to the higher albacore price with an additional \$200 per metric ton provided for vessels that fish exclusively in the US EEZ around American Samoa. The nominal average albacore price in 2019 reached a historical high of \$1.61 per pound (whole weight), or \$3,542 per metric ton. However, both nominal and the adjusted price decreased after 2019. The nominal price of albacore in 2024 dropped to \$1.15/lb (\$3057/mt) from \$1.39/lb in 2023. Table A-113 also shows the average fish price of all species sold to canneries.

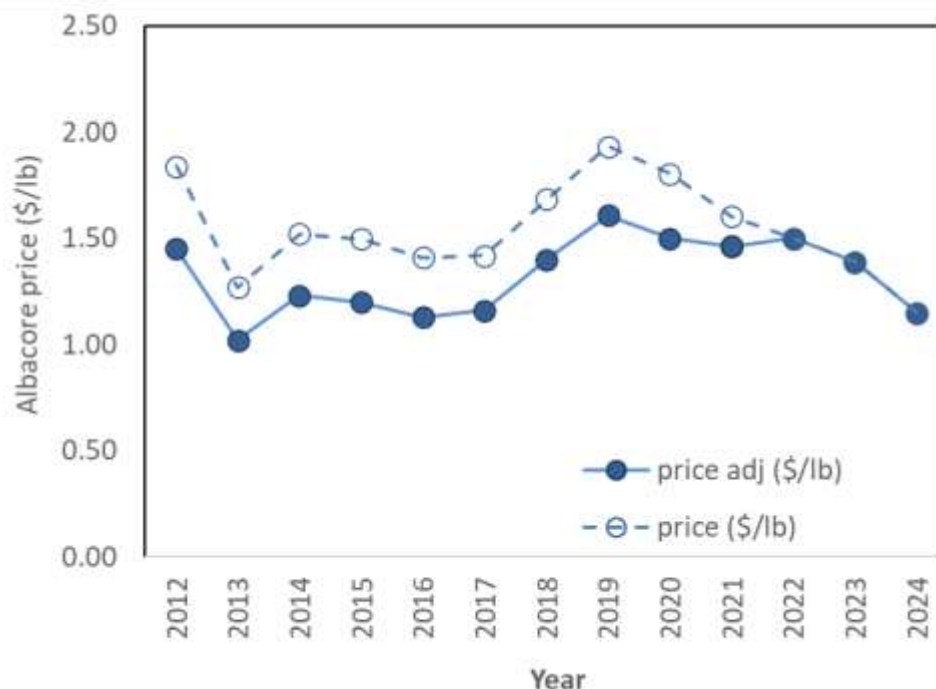


Figure 120. Albacore whole-weight price as reported by American Samoan fishers (adjusted to 2024 dollars)¹

¹ Data source: PIFSC Continuous Economic Data Collection Program (Pan 2018).

3.2.3.1.1.2 Fishing Costs

The American Samoa longline continuous economic data collection program started in 2006, the same time as PIRO started their observer program in the fishery (Pan 2018, 2019). Fisher participation in the economic data collection program is voluntary. Similar to the Hawaii longline fisheries' continuous economic data collection program, the American Samoa continuous economic data collection obtains information on the fishery via a form requesting data on 10 variable cost items common to American Samoa longline trip expenditures, excluding labor costs. For the main cost items, including diesel fuel, engine oil, and bait, information is collected on unit price, quantity used, and total cost. For other items, such as gear, provisions, and communications, information is collected on total cost only. It was often difficult for observers to collect trip cost data when vessels were operated by hired captains. In an effort to increase the number of observations for the economic data collection program, PIFSC economists began to supplement observer data by traveling to American Samoa to conduct in-person interviews of owners or agents starting in 2012. The details of the data collection program are described in a NOAA technical memorandum (Pan 2018).

Although cost data from 2020 and 2021 were not available at the reporting time because there were no in-person surveys conducted during these two years due to pandemic-related travel restrictions, the data gap were able to fill out during the 2023 in person survey with fishermen (owners or agents). Fishing trip cost data prior to 2006 were not available since trip cost data collection did not begin until 2006.

Figure 121 shows the cost structure for an average American Samoa longline trip in 2024. In 2024, the average trip costs were \$44,460. While fuel usually comprises over 50% of trip costs,

in 2024 the percentage of fuel cost was 52%. While cost per trip data were collected, we present the cost per set (not per trip) to reflect better the fishing cost changes across years, as the variation in trip length is considerable across years and cost per set could better reflect cost trend overtime for this fishery. Figure 122 presents the trends in costs per set for 2006 to 2024. The cost per set in 2024 was slightly lower than 2023 due to lower fuel usage (i.e., 7,386 gallons per trip in 2023 and 6,736 gallons per trip in 2024).

The data supporting Figure 122 are presented in Table A-114. Using the average cost per set can be a better index to examine the cost trend across years because the average trip length (total trip days) for the American Samoa longline fleet varies substantially.

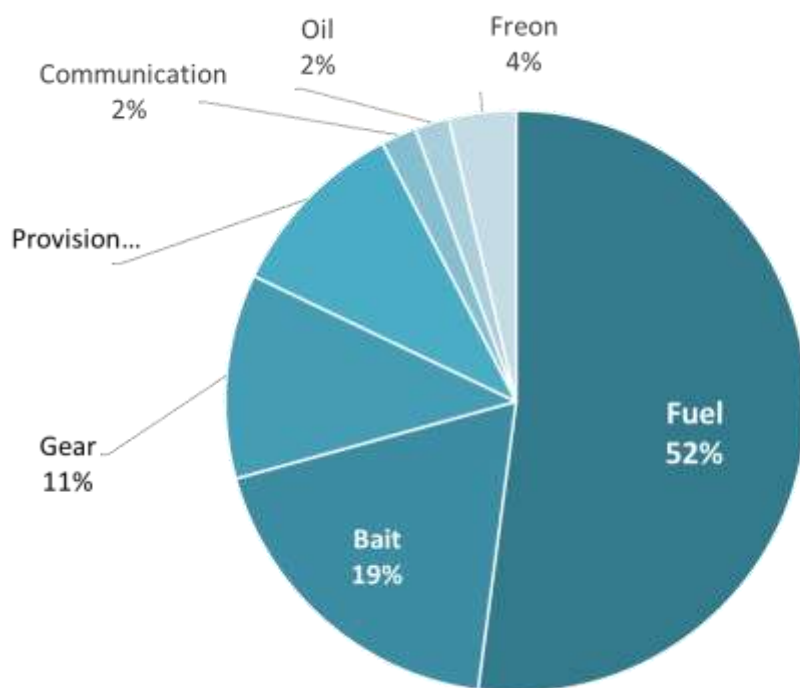


Figure 121. The cost structure for an average American Samoa longline trip in 2024¹

¹ Data source: PIFSC Continuous Economic Data Collection Program (Pan 2018).

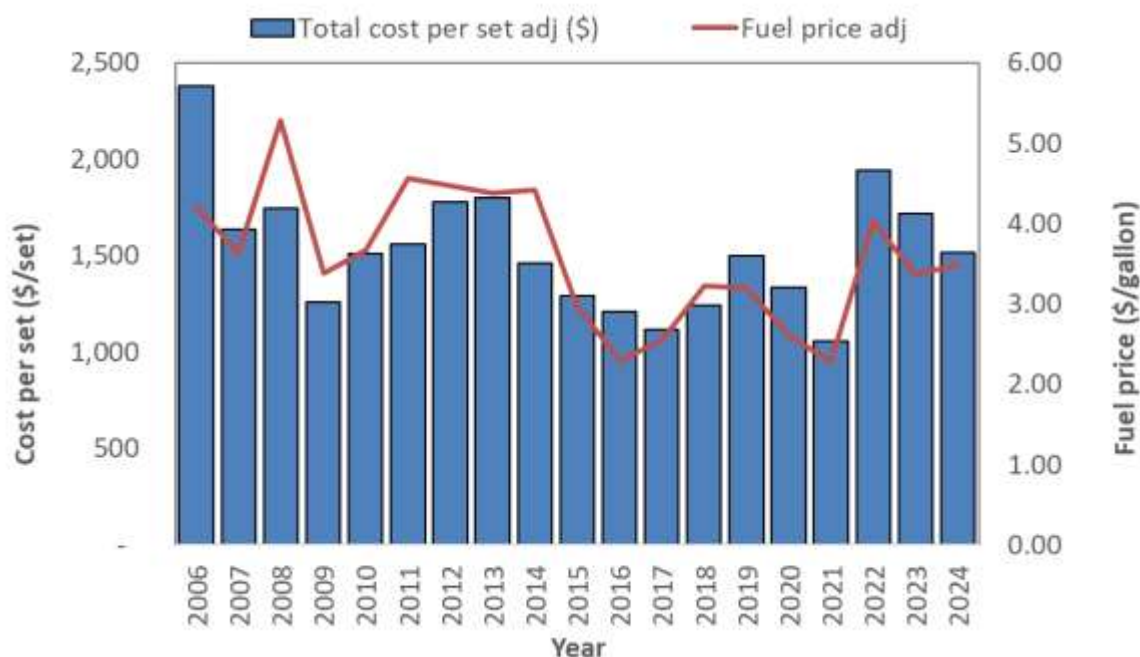


Figure 122. Costs per set¹ for the American Samoa longline fishery not including labor cost and fixed costs (adjusted to 2024 dollars)²

¹ Data source: PIFSC Continuous Economic Data Collection Program (Pan 2018). CPI figures are not available for 2023 and 2024).

3.2.3.1.1.3 Economic Performance Indicators

The continuous economic data collection program allows for the monitoring of variation in fishing costs over time (Pan 2018). Compiling the revenue with cost and effort data, it is possible to measure the economic performance in terms of net revenue and monitor changes over time.

Figure 123 presents trends in net revenue per set for the period from 2006 to 2024. The data supporting Figure 123 are provided in Table A-114. Using the average net revenue per set can be a better index than the average net revenue per trip to present the revenue and cost trends because the average trip length (i.e., in total trip days) for the American Samoa longline fleet has varied substantially over the years. Figure 123 shows a downward trend in the economic performance (in net revenue per set) from 2006 to 2024. During this period, two deep drops in net revenue appeared in 2013 and 2020, respectively. . The economic performance per set improved in 2022 due to higher albacore CPUE. However, net revenue per set dropped again in 2023 and 2024.

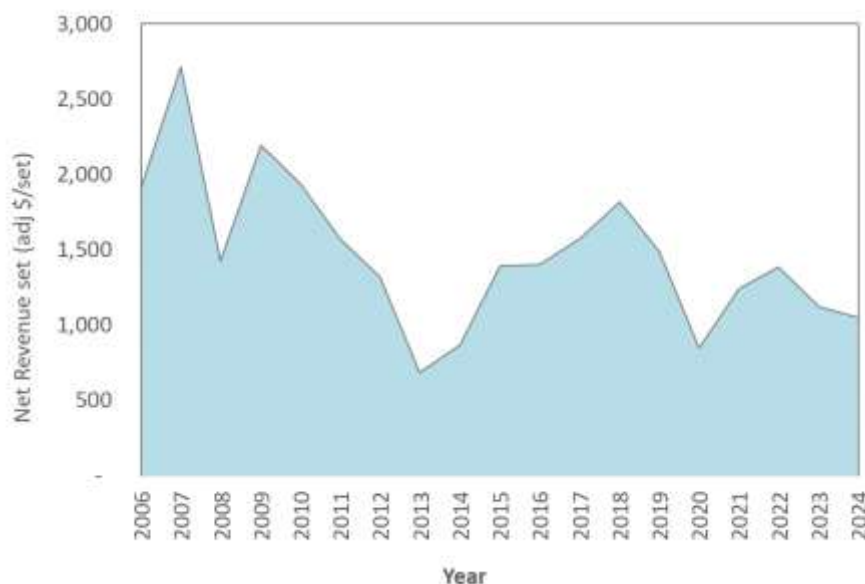


Figure 123. Net revenue per set for the American Samoa longline fishery (adjusted to 2024 dollars)¹

¹ Data source: PIFSC economic data collection program (Pan 2018). CPI figures are not available for 2023 and 2024).

In addition to the measurement of the net revenue, NOAA Fisheries has established a national set of economic performance indicators to monitor the economic health of the nation's fisheries (Brinson et al. 2015). The PIFSC Socioeconomics Program has used this framework to evaluate select regional fisheries; specifically, the American Samoa Longline, Hawaii Longline, and Main Hawaiian Islands (MHI) Deep 7 bottomfish fisheries. These indicators include metrics related to catch, effort, and revenues. For the American Samoa longline fishery, this section will present revenue performance metrics of (a) total revenue per day at sea, (b) annual revenue per vessel, and (c) Gini coefficient (while b and c are both shown in the same figure) of annual revenue per vessel.

The Gini coefficient (value 0 to 1) measures the equality of the distribution of revenue among active vessels in the fishery. A value of zero represents a perfectly equal distribution of revenue amongst these vessels, whereas a value of one represents a perfectly unequal distribution, in the case that a single vessel earns all of the revenue. Data on aggregate revenue from species in fishery per-day-at-sea and revenue per vessel calculation (for Gini coefficient) are from Pacific Islands Fisheries Science Center, data run for the Fishery Economic Performance Measures (Tier 1 indicators).

Trends in fishery revenue per day are shown Figure 124, while the trends in revenue per vessel and distribution among vessels (i.e., the Gini coefficient) are shown in Figure 125. The revenue is presented in nominal terms to be consistent with the national Tier 1 measure. Supporting data are provided in Table A-115. The revenue per fishing day has been steady in nominal value but shows a decreasing trend in adjusted values, while the change in revenue per vessel in nominal value over time was greater than per fishing day. In nominal value, revenue per vessel in recent 10 years (i.e., 2013-2024) were generally lower than the previous 10 years (i.e., 2004-2012). The revenue per vessel and per day went down again in 2023 and 2024. The Gini coefficient was lower in 2024 compared the previous year. In general, the Gini coefficient of American Samoa

longline was relatively variable over time, indicating the variation of revenue received among individual vessels were substantial, especially compared to the Hawaii longline fishery,

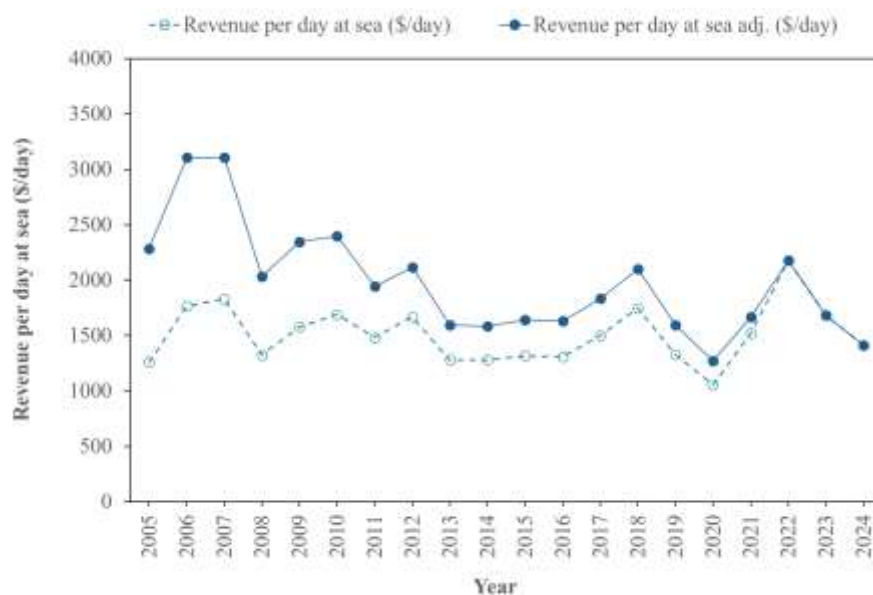


Figure 124. Revenue per-day-at-sea for the American Samoa longline fishery¹

¹ Data sourced from the Pacific Islands Fisheries Science Center: Fishery Economic Performance Measures (Tier 1 indicators). <https://inport.nmfs.noaa.gov/inport/item/46097>.

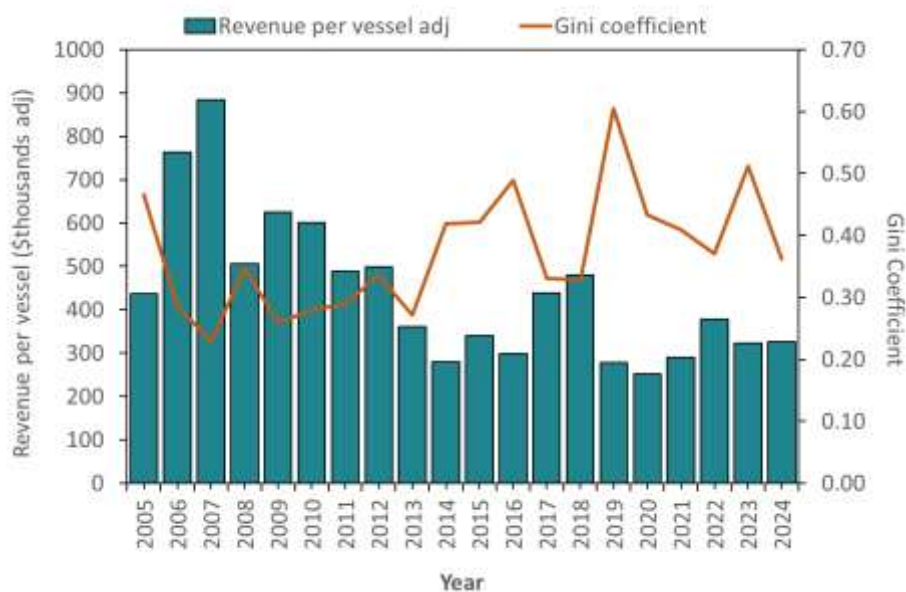


Figure 125. Revenue distribution (revenue per vessel and Gini coefficient) for the American Samoa longline fishery¹

¹ Data sourced from the Pacific Islands Fisheries Science Center: Fishery Economic Performance Measures (Tier 1 indicators). <https://inport.nmfs.noaa.gov/inport/item/46097>.

3.2.3.1.2 American Samoa Trolling

3.2.3.1.2.1 Commercial Participation, Landings, Revenue, and Prices

This section describes trends in commercial participation, landings, revenue, and price for the American Samoa troll fishery. The PMUS harvested by alia longliners are not included in this section as alia fishing is included with longlining despite the small size of vessels. Figure 126 presents the trends of revenue and pounds sold for the troll fishery from 2005 to 2024, and Figure 127 presents the trend in price for PMUS sold by the trollers during this period. Supporting data for Figure 126 and Figure 127 are presented in Table A-116. There were 11 years of commercial landings and revenue data during the 20-year period were available to present while data from the other years data (including 2024) were confidential due to fewer than three vendors submitting commercial receipts to the data collection program. On average, the PMUS commercial landings from trollers have been 21% of the total landings for the non-longline pelagic fisheries (average by the years with commercial landings data available).

It is worth noting that the data for pounds caught and pounds sold are collected by two different data collection methods. The data for pounds sold were collected through [“Commercial Sales Receipt Books” Program](#), while the data for pounds caught were collected through [Boat-based and Shore-based creel surveys](#) and expanded to an estimated total. The coverage rates of two data collection methods may change independently across individual years. Therefore, the two time-series may not move coherently with each other. For example, the low percentage of pounds sold compared to pounds caught could be due to the low coverage of dealer participation in the Commercial Receipt Books Program. In addition, the data summary for PMUS in socioeconomic module is based on the PMUS species defined in the [Ecosystem Management Plan](#) and the raw dataset frozen on March 15, 2024.

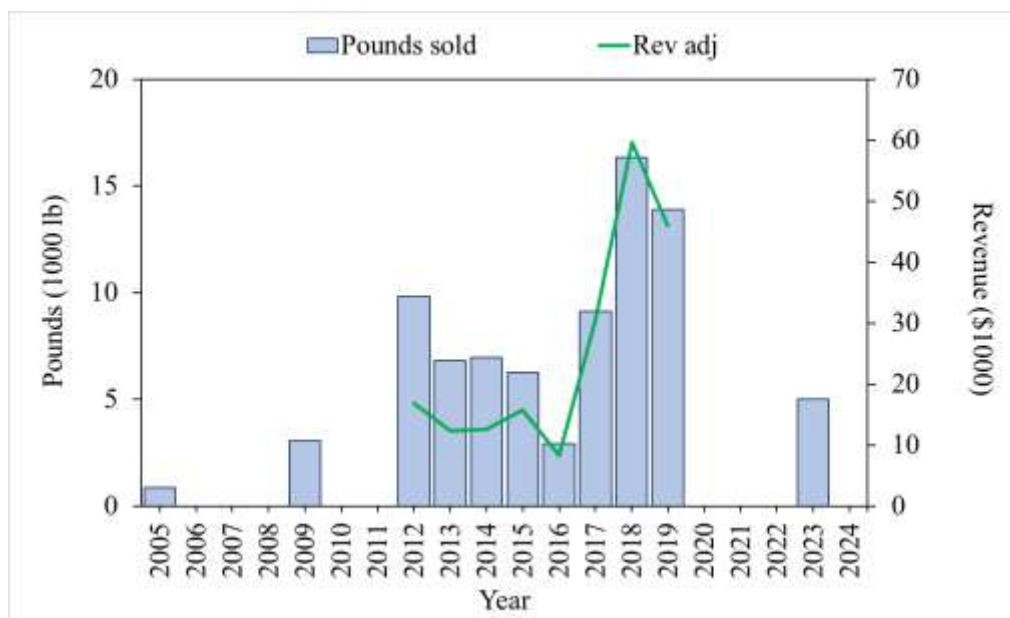


Figure 126. PMUS pounds sold and revenue in the American Samoa troll fishery (adjusted to 2024 dollars)¹

¹ Data sourced from the PIFSC WPacFIN. CPI 2023 and 2024 is available at report time

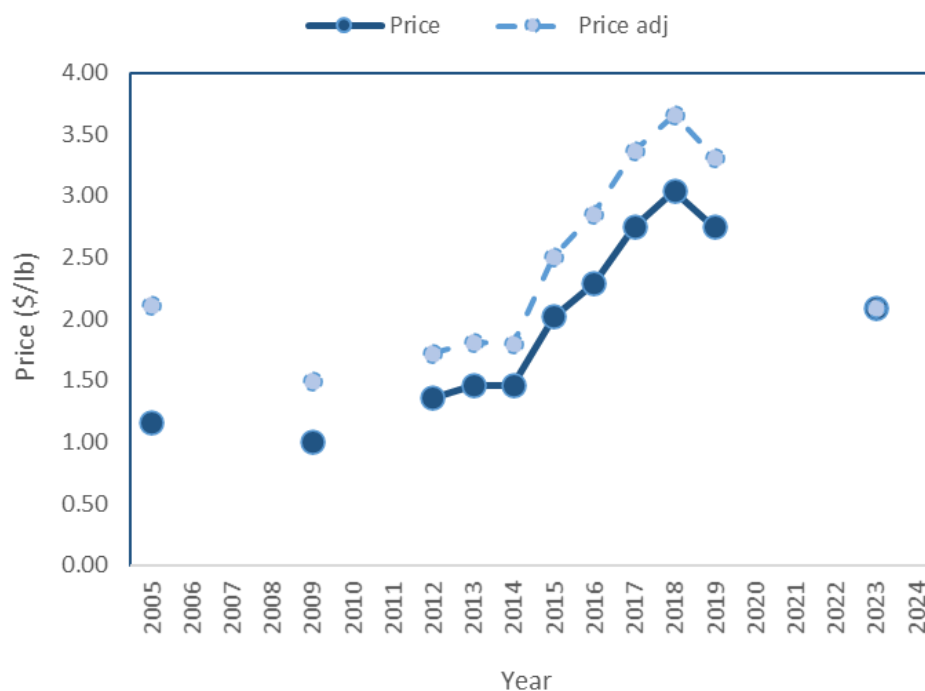


Figure 127. Adjusted and nominal price of PMUS harvested by trolling in American Samoa (adjusted to 2024 dollars)¹

¹ Data sourced from PIFSC. Only 11 years of sale data were available to present. CPI 2023 and 2024 are not available.

3.2.3.1.2.2 Fishing Costs

Since 2009, PIFSC economists have maintained a continuous small boat economic data collection program in American Samoa through collaboration with the PIFSC Fisheries Research and Monitoring Division (FRMD). The economic data collection gathers fishing expenditure data for boat-based reef fish, bottomfish, and pelagic fishing trips (trolling) on an ongoing basis. Data for fishing trip expenses include gallons of fuel used, price per gallon of fuel, cost of ice used, cost of bait & chum used, cost of fishing gear lost, and the engine type of the boat. These economic data are collected from same subset of fishing trips as the boat-based creel survey carried out by the local fisheries management agencies and PIFSC FRMD.

Figure 128 presents the average costs for American Samoa troll trips from 2009 to 2024 (adjusted to 2024 dollars). Supporting data for Figure 128 are presented in Table A-117. In general, the fishing costs of an average troll trip slightly declined during the period of 2011 to 2016, mainly as a result of decreased fuel costs. Since 2017, fuel costs have risen primarily due to fuel price increases and trip costs picked in 2021. Trip costs in 2024 was up compared to 2023 due to higher fuel usages. .

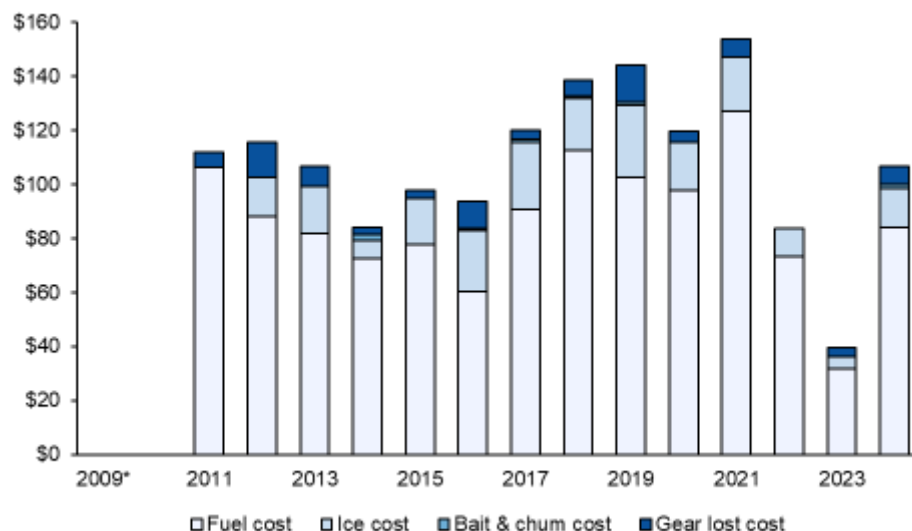


Figure 128. Average cost for American Samoa troll trips (adjusted to 2024 dollars)¹

¹ Data sourced from Chan and Pan (2019a); CPI 2023 and 2024 are not available. *Confidential data.

3.2.3.2 CNMI

3.2.3.2.1 CNMI Trolling

3.2.3.2.1.1 Commercial Participation, Landings, Revenue, and Prices

This section presents the pounds sold, revenue, and price for all PMUS in the CNMI by all gears. Unlike American Samoa, the data for pounds sold by gear are not available for the CNMI. Figure 129 and Figure 130 present the trends of total pounds sold and revenue for all PMUS in the CNMI from 2004 to 2023. Supporting data for these two figures are presented in Table A-118.

Pelagic fishing is an important commercial fishery in the CNMI. Nearly half a million pounds of pelagic species are landed annually before 2022. However, both commercial and total PMUS landings went down considerably since 2022. Revenue from PMUS sold were \$84 thousand pounds and commercial landings were 99,415 pounds. The high ratio of commercial landings to total landings since 2021 is likely a result of improvements in the implementation of the commercial data collection program. In the CNMI, a mandatory reporting program was implemented in 2019 and follow-up outreach efforts have resulted in increased vendor reporting participation, as 37 out of 42 vendors reported in 2021. The average pelagic fish price has increased since 2007 gradually up to 2022. Pelagic fish price in 2024 was 11% down compared to in 2023.

It is worth noting that the data for pounds caught and pounds sold are collected by two different data collection methods. The data for pounds sold were collected through [“Commercial Sales Receipt Books” Program](#) and expanded to an estimated total. While the data for pounds caught were collected through [Boat-based and Shore-based creel surveys](#). Both data series are generated from an expansion algorithm built on a non-census data collection program, and the survey coverage rates of two data collection methods may change independently in individual years. Therefore, the two data series may not move coherently with each other. For example, the low percentage of pounds sold compared to pounds caught could be due to the low coverage of dealer participations in the Commercial Receipt Books Program or vice versa.

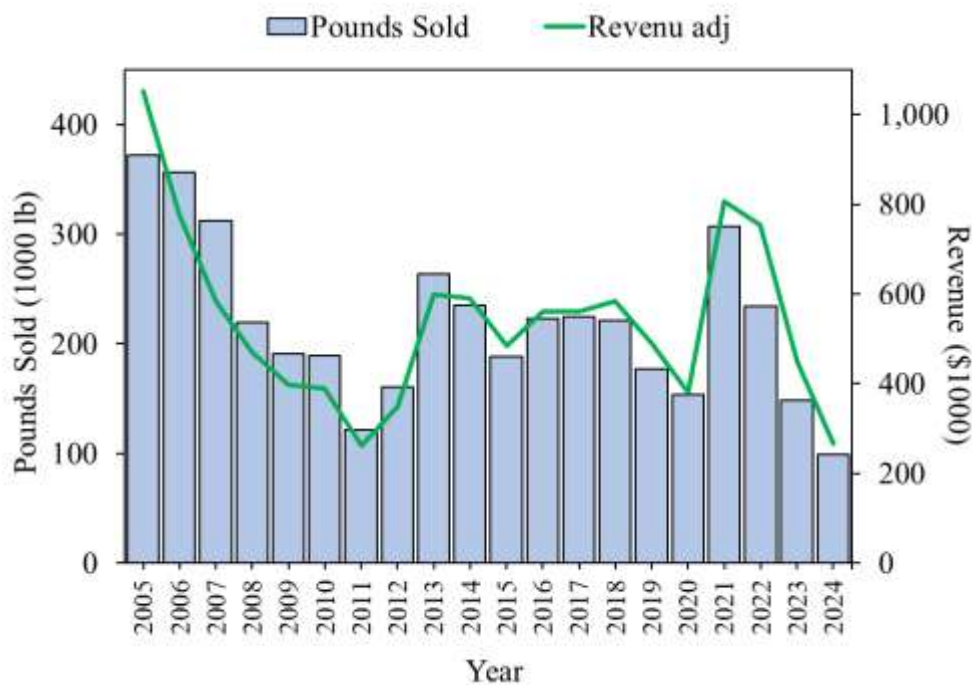


Figure 129. PMUS pounds sold and revenue in the CNMI for all gears (adjusted to 2024 dollars)¹

¹ Data sourced from PIFSC FRMD.

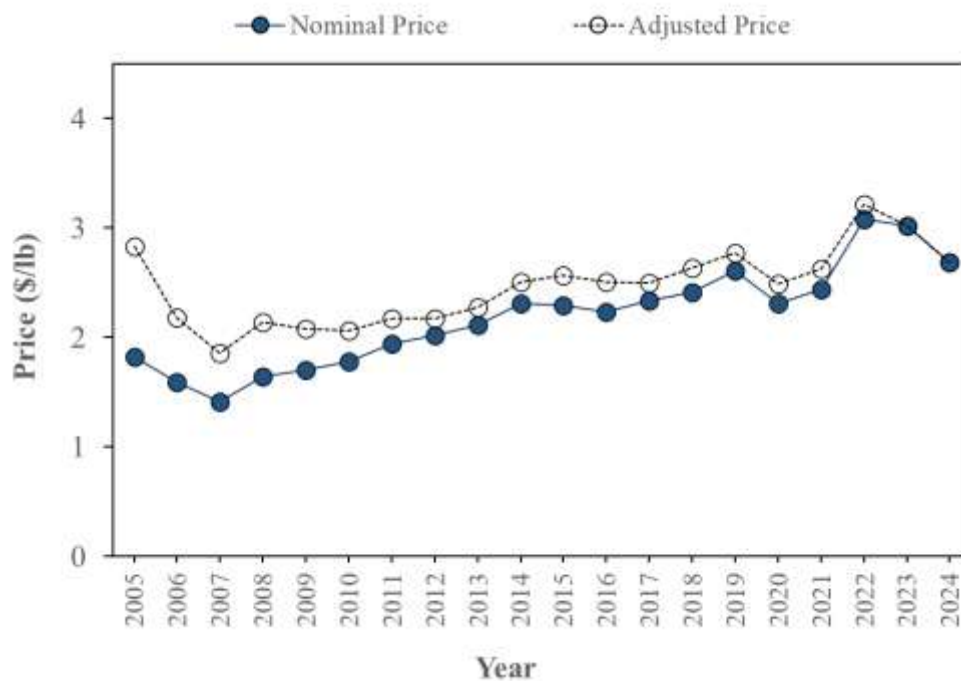


Figure 130. Adjusted and nominal prices of PMUS for fish sold in the CNMI from all gears¹

¹ Data sourced from PIFSC FRMD.

3.2.3.2.1.2 Fishing Costs

Since 2009 the PIFSC Socioeconomics Program has maintained a continuous economic data collection program in Saipan through collaboration with the PIFSC FRMD. The economic data collection program gathers fishing expenditure data for boat-based reef fish, bottomfish, and pelagic fishing trips on an ongoing basis. Data for fishing trip expenses include gallons of fuel used, price per gallon of fuel, cost of ice used, cost of bait & chum used, cost of fishing gear lost, and the engine type of the boat. These economic data are collected from same subset of fishing trips as the boat-based creel survey carried out by the local fisheries management agencies and PIFSC FRMD.

Figure 131 presents the average trip costs for CNMI troll trips from 2009 to 2022 (adjusted to 2022 dollars). In general, the costs of trolling trips had small changes across years. Costs moved up and down mainly related to changes in fuel costs. In 2023, the average cost of trolling trips was around \$88, \$13 lower than 2022. Fuel cost is the main component of the trolling trip costs and fuel price in 2023 was \$5.41, lower than that in 2022. Supporting data for Figure 131 is presented in Table A-119. There was no updated for 2024 due to low activities in data collection.

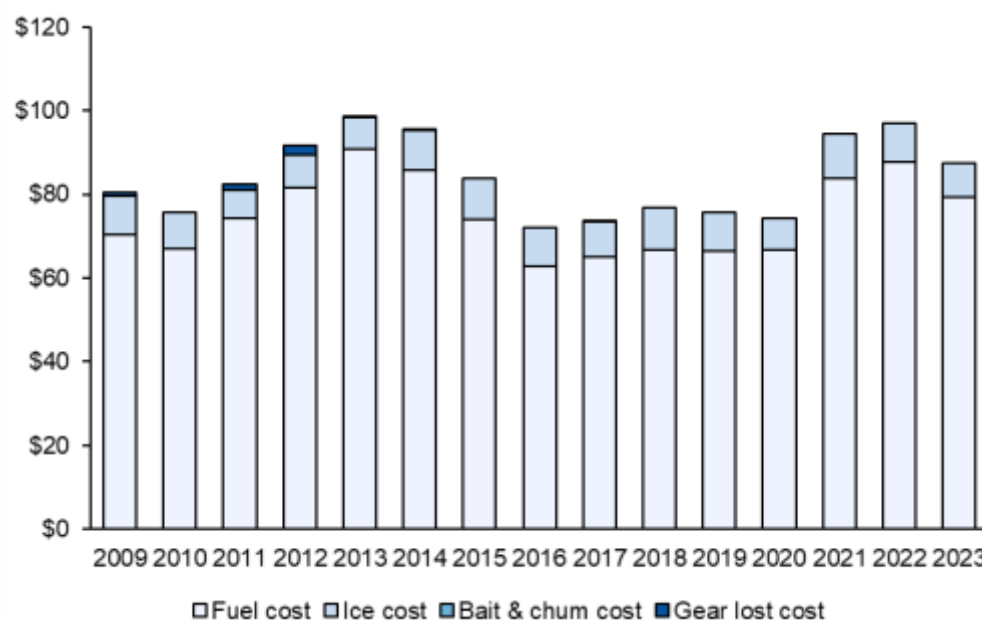


Figure 131. Average cost for CNMI troll trips (adjusted to 2023 dollars)¹

¹ Data sourced from PIFSC Continuous Cost Data Collection Program (Chan and Pan 2019a). Trip cost data collection began in 2009. No update in 2024 due to low survey responses.

3.2.3.3 GUAM

3.2.3.3.1 Guam Trolling

3.2.3.3.1.1 Commercial Participation, Landings, Revenue, and Prices

This section describes trends in commercial landings, revenue, and price of PMUS in Guam. Figure 132 presents the trends of pounds sold and revenue for PMUS in Guam fisheries and

Figure 133 presents the trend of PMUS price during 2005 to 2024. Supporting data for Figure 132 and Figure 133 are shown in Table A-120.

Pelagic fishing is an important fishery in Guam. The average annual total pounds landed has been around 715,781 lb with 131,634 lb of commercial landings for the 14 years with data presented. Figure 132 shows only 14 years of commercial landings and revenue during the period between 2005 and 2024, because the data for the other years were confidential when there were fewer than three reporting vendors. For the 14 years presented, the average pounds sold were 18% of the total pounds landed annually. The average price of all PMUS was relatively flat over the 14 years and it was at \$2.07/lb in nominal value, the most recent year with data presented, and both nominal price and inflation adjusted price showed a slowly increasing trend.

It should be noted that the data for pounds caught and pounds sold are collected by two different data collection methods. The data for pounds sold were collected through [“Commercial Sales Receipt Books” Program](#), while the data for pounds caught were collected through [Boat-based and Shore-based creel surveys](#). Both data series are generated from an expansion algorithm built on a non-census data collection program, and the survey coverage rates of two data collection methods may change independently in individual years. Therefore, the two data series may not move coherently with each other. For example, the low percentage of pounds sold compared to pounds caught could be due to the low coverage of dealer participations in the Commercial Receipt Books Program, or vice versa.

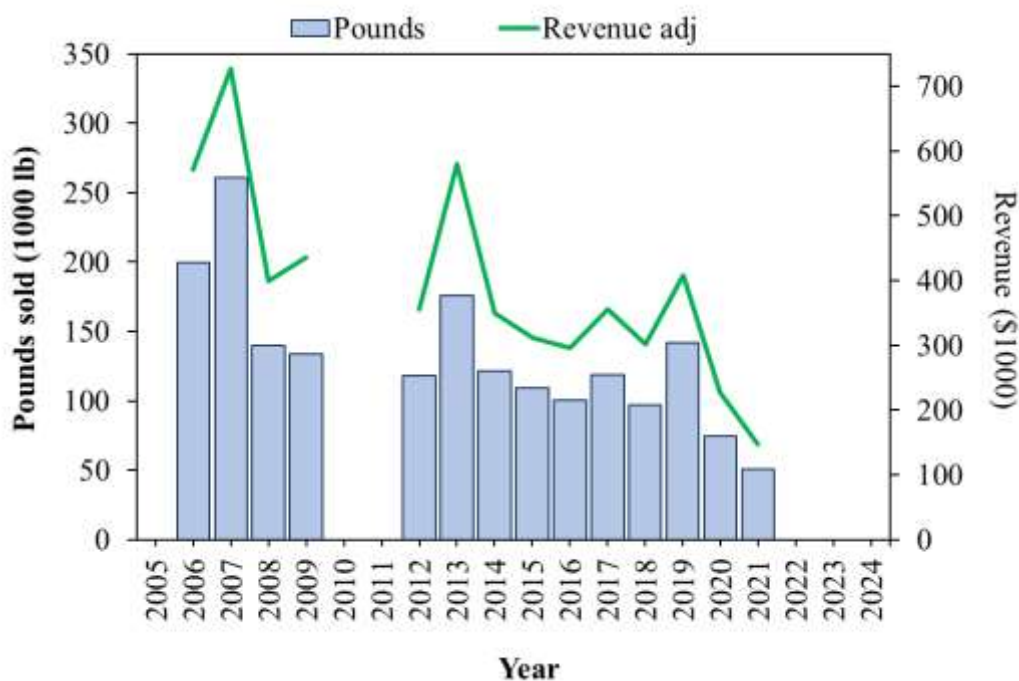


Figure 132. PMUS pounds sold and revenue in Guam for all gears (adjusted to 2024 dollars)¹
¹ Data sourced from PIFSC FRMD.

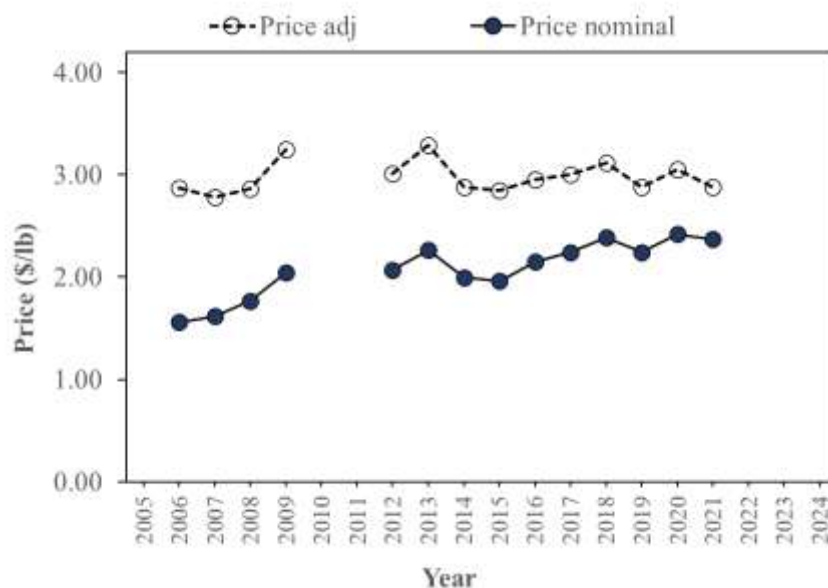


Figure 133. Adjusted and nominal prices of PMUS for fish sold in the CNMI from all gears¹
¹Data sourced from PIFSC FRMD.

3.2.3.3.1.2 Fishing Costs

Since 2011, the PIFSC Socioeconomics Program has maintained a continuous economic data collection program on Guam through collaboration with PIFSC FRMD. The economic data collection gathers fishing expenditure data for boat-based reef fish, bottomfish, and pelagic fishing trips on an ongoing basis. Data for fishing trip expenses include gallons of fuel used, price per gallon of fuel, cost of ice used, cost of bait & chum used, cost of fishing gear lost, and the engine type of the boat. These economic data are collected from same subset of fishing trips as the boat-based creel survey carried out by the local fisheries management agencies and PIFSC FRMD.

Figure 134 shows the trend of costs for trolling trips in Guam from 2011 to 2024. Costs tend to move up and down over time mainly due to changes in fuel costs. The average cost of trolling trips in 2024 was \$79 in Guam, \$2 higher than the previous year. Supporting data for Figure 134 are presented in Table A-121.

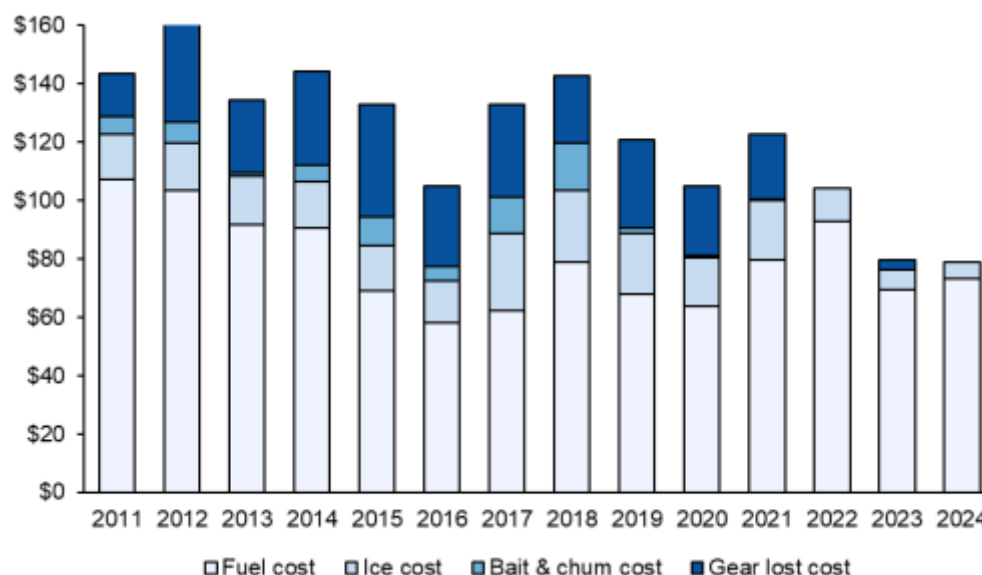


Figure 134. Average cost for Guam troll trips (adjusted to 2024 dollars)¹

¹ Data sourced from PIFSC (Chan and Pan 2019a).

3.2.3.4 HAWAII

3.2.3.4.1 Hawaii Longline

3.2.3.4.1.1 Commercial Participation, Landings, Revenue, and Prices

The Hawaii permitted longline fishery conducts two types of fishing to target the bigeye tuna (deep-set) and swordfish (shallow-set) by setting the fishing gear at different depths in the water column. Most of the vessels only target tuna while some vessels switch between these two types of fishing depending on the season. The majority of the catches by the Hawaii permitted longline vessels were landed and sold in Honolulu, while some of catches were landed and sold on the West Coast of the US Mainland. For the period from 2003 to 2020 for which landings and revenue data are available, the fish landed and sold on the West Coast increased gradually since 2008 and stabilized from 2009 to 2020. Based on the West Coast dealers' reports, an average of \$5.3 million in revenue (2.3 million pounds sold) was generated annually from West Coast during the years from 2015 to 2020, and the average annual revenue sold in Hawaii was \$94 million (26 million pounds sold). However, the data of commercial landings for the West Coast were not available from 2021 to 2024. Due to the concerns of incomplete market reports, the total commercial landings and revenue trend of the Hawaii longline presented in Figure 135 were generated only from total pounds kept, value, and the fish price from Hawaii dealers.

The total active number of vessels landing fish in 2024 was 147, same as the previous year. The fleet generated total revenues sold in Hawaii markets (revenue generated from HDAR dealer reports) as presented in Figure 135, which only included the total revenue generated from HDAR dealer reports (sold in Hawaii markets). The pounds sold in Hawaii markets reported from the HDAR dealers accounted for 98% of the total estimated value of the total pelagic landings (estimated by the pounds kept from fishermen's report in 2024 assuming all pounds caught were landed and sold) by the entire fleet. In 2024, the fleet revenue (sold in Hawaii markets) was

\$102.9 million, a 4% decrease compared to the previous year, although the landings increased by 13%. The total pounds sold in the Hawaii market in 2024 was 25.28 million pounds valued at \$102.9 million. The average fish prices of all species in 2024 decreased to \$4.07/lb from \$4.98/lb in 2023 (adjusted).

Please note that the revenue in the fishery economic performance section here may differ from the revenue reported in the fishery performance section, because the revenue here were compiled based on the landed year while the other uses haul year. In addition, the total revenue of the Hawaii longline fishery can be estimated based on the reported pounds kept from the NMFS logbooks and the fish price data from fish sales of Hawaii markets. Thus, the total estimated landings by Hawaii longline fleet in 2024 was 31.0 million pounds, valued at 104.5 million. Supporting data of Figure 135 are presented in Table A-122.

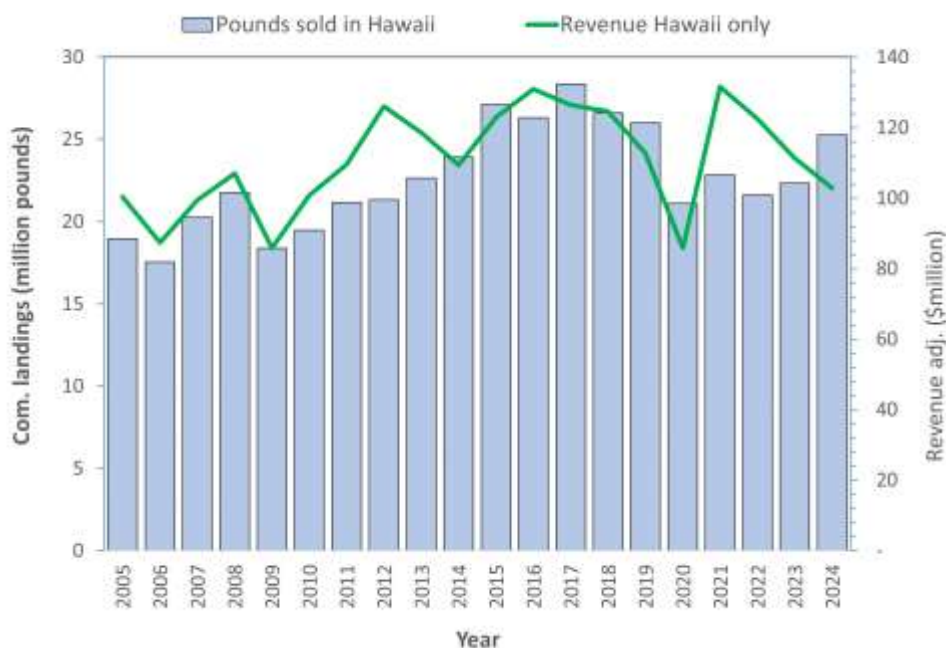


Figure 135. Commercial landings and revenue of Hawaii-permitted longline fleet (landed in Hawaii markets; adjusted to 2024 dollars)¹

¹ Source: PIFSC Tier 1 indicators data request.

Figure 136 shows the trends of the revenue composition (based on the estimated total value, instead of sold revenue from the pounds kept) from the main species (bigeye, swordfish, and yellowfin) and others from 2005 to 2024, and Figure 137 shows the price trends for bigeye, swordfish, and yellowfin for the same period. Supporting data for Figure 136 and Figure 137 are presented in Table A-123 and Table A-124, respectively.

It can be observed that bigeye tuna comprised the majority of fishery revenue for the longline fleet during 2005 to 2024. In 2024, bigeye tuna comprised 54% of revenue for Hawaii permitted longline vessels, dropped substantially compared with the previous years, due to lower landings and price, followed by yellowfin tuna at 32%, swordfish at 5%, and other species at 9% of the total Hawaii longline revenue, while the 20-year averages were 65%, 12%, 9%, and 15%, respectively. In 2024, the nominal prices of all the three main species went down, decreasing by 15%, 3%, and 17%, respectively, compared to that in 2023.

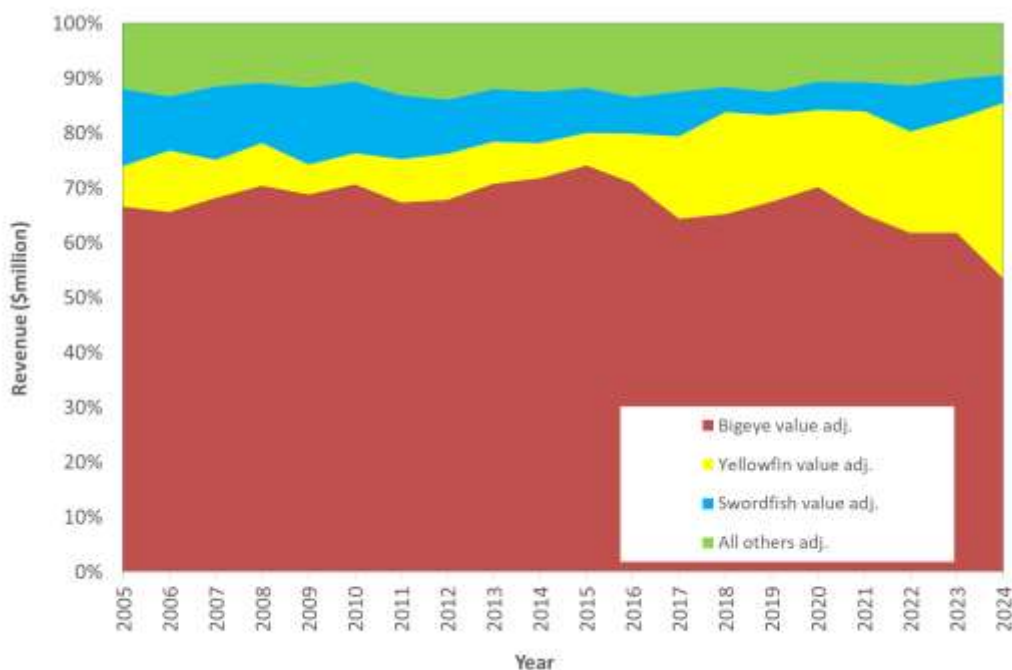


Figure 136. Trends in Hawaii longline revenue species composition (nominal value)¹

¹ Data Source: PIFSC Tier 1 data request.

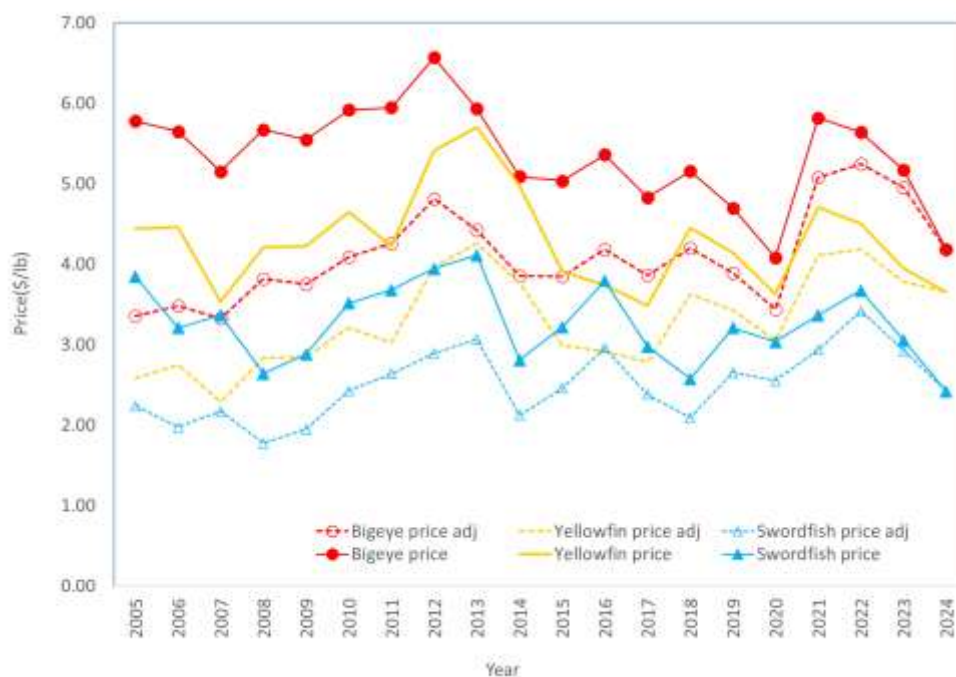


Figure 137. Adjusted and nominal price trends for three main species (bigeye tuna, yellowfin tuna, and swordfish) harvested by the Hawaii longline fishery¹

¹ Source: Pacific Islands Fisheries Science Center, Tier 1 data request.

3.2.3.4.1.2 Fishing Costs

The Economic Cost Data Collection Program for the Hawaii longline fishery was the first to establish continuous (routine) trip expenditure collection in the Pacific Islands Region. The program was implemented in August 2004 through cross-agency collaboration by the PIFSC Economics Program and the NOAA Observer Program managed by PIRO (Pan 2018). Before the establishment of these programs, trip-level economic information on the fisheries was limited primarily to the dockside value of landed fish. Data on fishing expenses were obtained intermittently through one-time surveys conducted roughly every five years (Hamilton and Huffman 1997; O'Malley and Pooley 2002; Kalberg and Pan 2016). The continuous economic data collection program has provided important trend data to track changes in economic performance for the Hawaii longline fishery on a continuous basis.

The continuous data collection form is comprised of eight cost items commonly arising in Hawaii longline trips, but it excludes labor costs. Non-labor cost items collected include diesel fuel, engine oil, bait, ice, as well as total costs for gear replacement, provisions, and communications. The form requests unit price, quantity used, and total costs of fuel, bait, and oil usage. In addition, the total number of crew members, and the subset who are not United States nationals, is collected for both tuna and swordfish trips. Survey forms are produced and available in first languages (i.e., English, Korean, and Vietnamese) to ease survey burden.

The project is designed to collect data from all observed trips. Observers conduct interviews with the captains on board while returning to port or when a trip is completed. The participation of fishers in the economic data survey is voluntary. Observers accompany 100% of the Hawaii-based shallow-set longline trips (targeting swordfish) and about 20% of the deep-set trips (targeting bigeye tuna). Since the economic data collection project was implemented in August 2004, the average response rate based on observed trips has been around 60%. The data collection program would not succeed without the generous support of vessel owners and operators. A detailed description of the continuous data collection program can be found in a NOAA technical memorandum (Pan 2018).

This report presents trip-level fishing costs for each type of longline trip since shallow-set (swordfish) trips often have a longer trip length compared to deep-set (bigeye tuna) trips. The data series of trip costs and net revenue data have been presented in the annual SAFE report from 2005 to present, as the first full-year's data were available beginning in 2005. Average swordfish trip costs generally are higher than tuna trips because the trip length of a swordfish trip is longer than a tuna trip. The average trip length for swordfish trips was 31 days per trip during the period of 2005 to 2024, while it was 22 days for tuna trips. A decreasing trend in trip length for swordfish trips has been observed over recent years. The average trip length in 2024 was consistent with the 20-year average (i.e., 31 days).

In terms of cost structure in 2024, fuel cost accounts for the largest share of total fishing trip costs (i.e., non-labor items) for both tuna and swordfish trips. Figure 138 and Figure 141 show the cost structures of an average tuna and swordfish trip, respectively, in 2024. In 2024, fuel cost was the leading item of trip costs, comprising 54% of total tuna trip costs, a lower share than 2022 (57%). Bait was the second largest item, accounting for 23% of tuna trip costs. Fuel and bait costs together made up over 77% of the trip costs for tuna fishing. For swordfish trips, the cost of fuel also made up 54% of swordfish trip costs, lower than 2022 (57%), while bait cost made up 15% of total swordfish trip costs. The cost of the lightstick gear is unique to swordfish

fishing, and it made up 13% of the total trip costs of swordfish trips in 2024. In 2024, the average trip cost for swordfish trips was \$54,371 while it was \$32,361 for tuna trips. Supporting data for Figure 140 and Figure 141 are presented in Table A-125 and Table A-126.

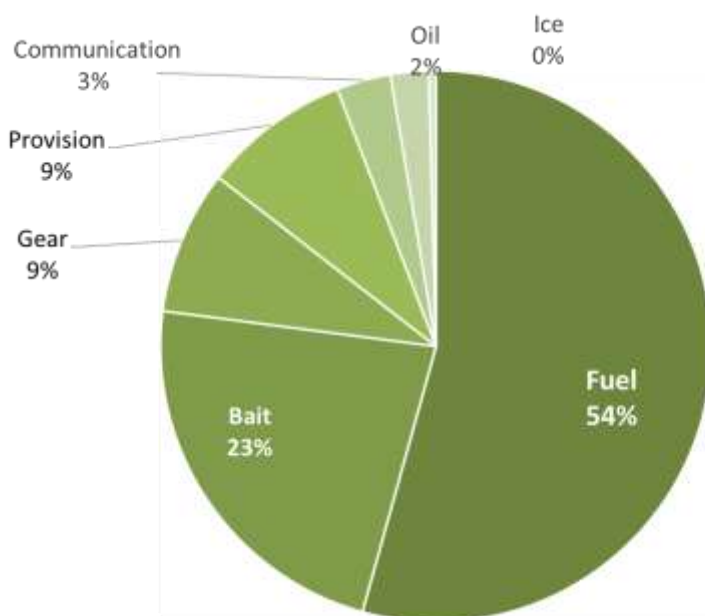


Figure 138. The cost structure of an average deep-set fishing trip¹

¹ Data source: PIFSC continuous economic data collection program (Pan 2018).

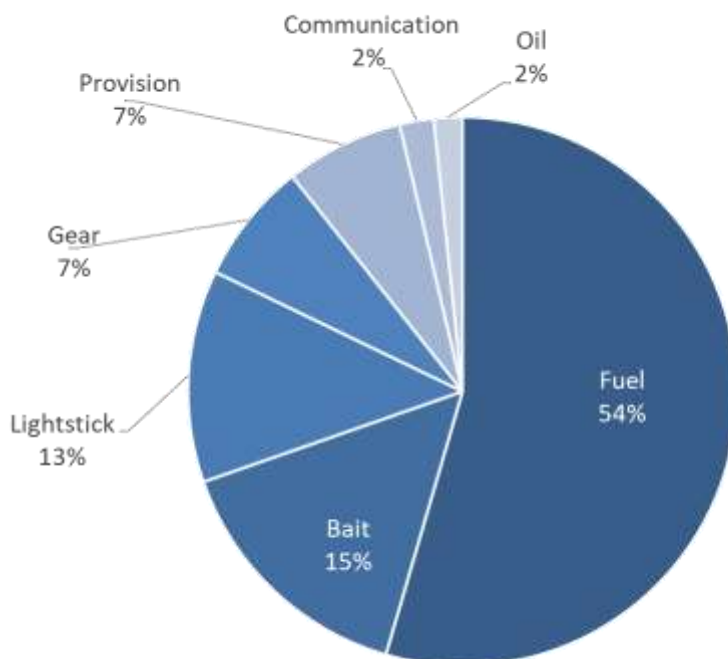


Figure 139. The cost structure of an average shallow-set fishing trip¹

¹ Data source: PIFSC continuous economic data collection program (Pan 2018).

Figure 140 and Figure 141 show the trends of average trip costs for tuna and swordfish trips, respectively, in the Hawaii longline fishery for the 2005-2024 period. Supporting data for Figure 140 and Figure 141 are presented in Table A-125 and Table A-126. The average trip costs for both trip types differ, and swordfish trips (i.e., with longer trip lengths) usually cost more than tuna trips. The variations of trip costs across years were mainly the results of fuel costs across years, while the other trip costs were relatively steady across years. In 2024, trip costs for tuna fishing (\$32,361) went down 8% compared to that in 2023, due to lower fuel price. The trip costs of swordfish fishing went up 3%, probably due to longer trip length in 2024 compared to 2023.

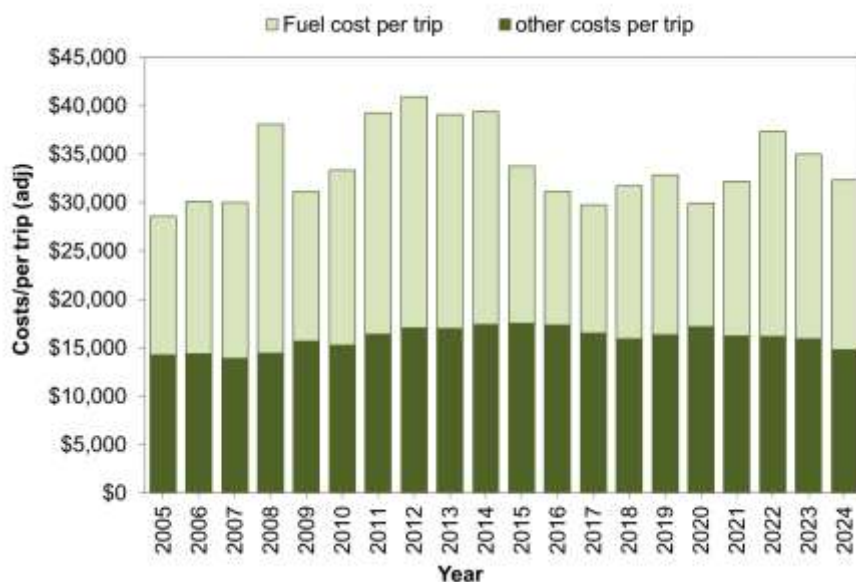


Figure 140. Average trip costs for Hawaii longline deep-set fishing (adjusted to 2024 dollars)¹

¹ Data source: PIFSC continuous economic data collection program (Pan 2018).

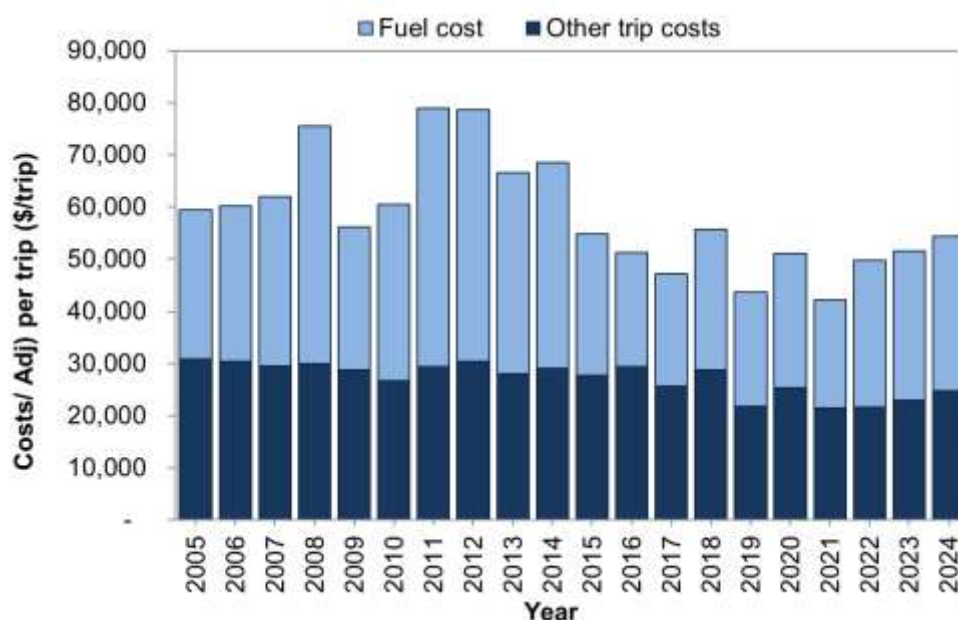


Figure 141. Average trip costs for Hawaii longline shallow-set fishing (adjusted to 2024 dollars)¹

¹ Data source: PIFSC continuous economic data collection program (Pan 2018).

3.2.3.4.1.3 Economic Performance Indicators

The continuous economic data collection program allows for the monitoring of trends in fishing cost over time (Pan 2018). Compiling revenue data with cost and effort data allows for the measurement of the economic performance in terms of trip net revenue. Figure 142 and Figure 143 present the trends of trip net revenues for two trip types for the period of 2005 to 2024. Supporting data for Figure 142 and Figure 143 are presented in Table A-127 and Table A-128, respectively. The net revenue of tuna (i.e., deep-set) fishing varied across years and peaked in 2016. However, tuna trip net revenue was in a downward trend after 2016, and it was \$31,449 per trip, a historical low for the 20-year (i.e., 2005-2024) period. The net trip revenue for swordfish trips was highest in 2022 and it went down in 2023 and 2024 (\$131,025 in 2022 vs. \$36,670 in 2024).

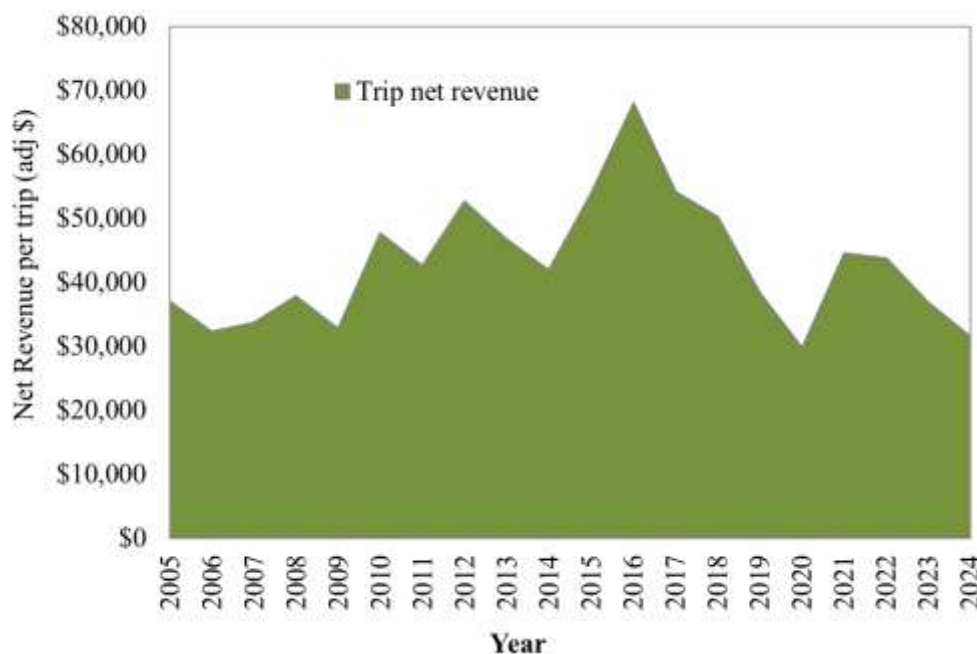


Figure 142. Average net revenue per trip for Hawaii longline deep-set trips (adjusted to 2024 dollars)¹

¹ Data source: PIFSC continuous economic data collection program (Pan 2018).

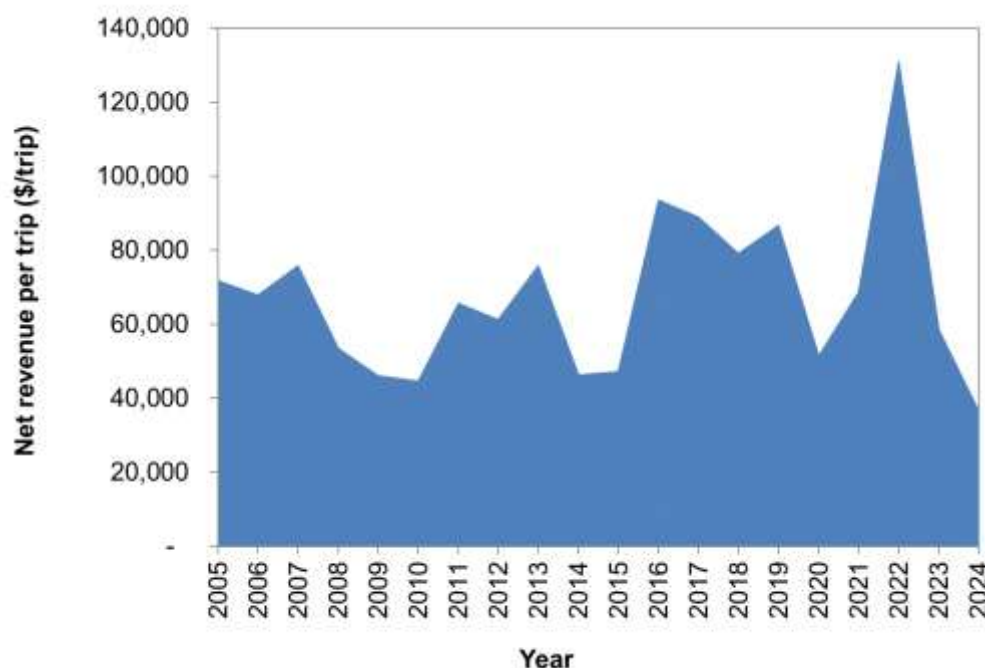


Figure 143. Average net revenue per trip for Hawaii longline shallow-set trips (adjusted to 2024 dollars)¹

¹ Data source: PIFSC continuous economic data collection program (Pan 2018).

In addition to the measurement of the net revenue, NOAA Fisheries has established a national set of economic performance indicators to monitor the economic health of the nation's fisheries (Brinson et al. 2015). The PIFSC SEES Program has used this framework to evaluate select regional fisheries; specifically, the American Samoa Longline, Hawaii Longline, and Main Hawaiian Islands (MHI) Deep 7 bottomfish fisheries. These indicators include metrics related to catch, effort, and revenue. For the American Samoa longline fishery, this section presents revenue performance metrics of the total revenue per day at sea, annual revenue per vessel, and the Gini coefficient based on individual vessels.

The Gini coefficient measures the equality of the distribution of revenue among active vessels in the fishery. A value of zero represents a perfectly equal distribution of revenue amongst these vessels, whereas a value of one represents a perfectly unequal distribution, in the case that a single vessel earns all of the revenue. Data on aggregate revenue from species in fishery per-day-at-sea and revenue per vessel calculation (for Gini coefficient) are sourced from PIFSC FRMD. Figure 144 and Figure 145 present the revenue per-day-at-sea, revenue per vessel, and the Gini coefficient for the Hawaii longline fisheries during the period of 2005 to 2024. Supporting data for Figure 144 and Figure 145 are presented in Table A-129.

One of the economic performance indicators, revenue per-day-at-sea for the Hawaii longline fishery, presents an upward trend in general. It increased notably in 2021 and 2022 was at a similar level as 2021. However, it went down again in 2023 and 2024. Another economic performance indicator, revenue per vessel dropped notably in recent 3 years (i.e., 2022, 2023, and 2024). The income distribution (i.e., Gini coefficient in terms of revenue per vessel) among

vessels is relatively stable over the same period 2005-2024, which indicates that the variation of revenue received by individual vessels was small across the fleet.

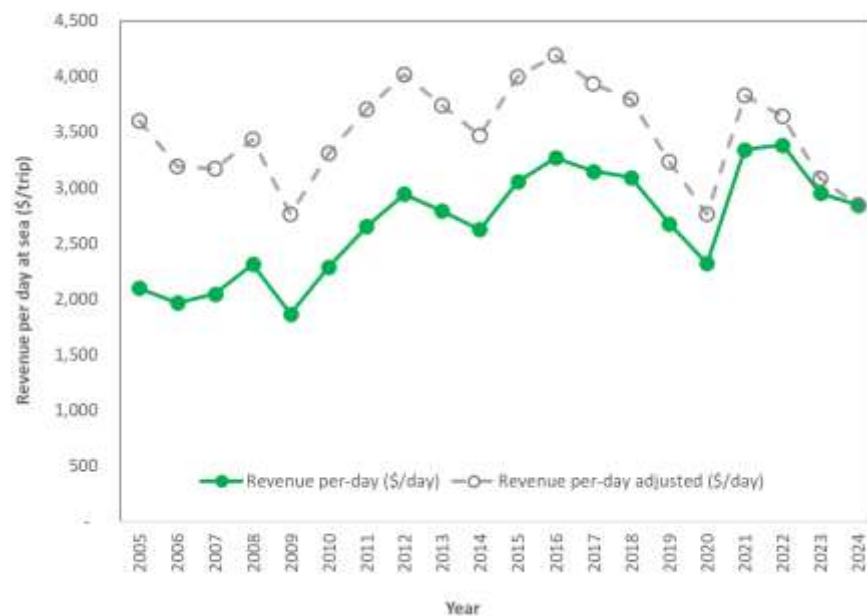


Figure 144. Revenue per-day-at-sea for the Hawaii longline fishery (adjusted to 2024 dollars)¹
¹ Data Source: PIFSC Tier 1 indicators data request.

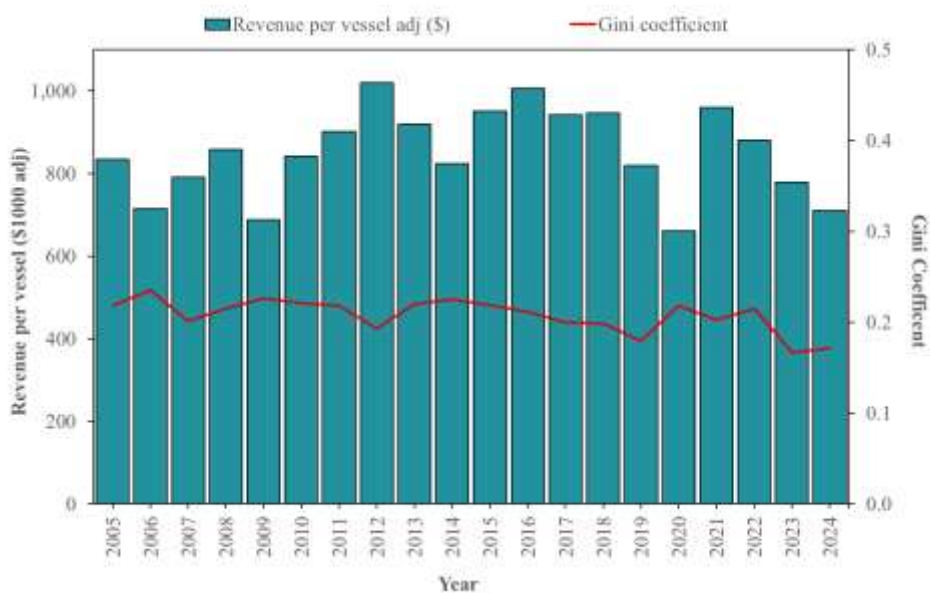


Figure 145. Revenue per vessel and Gini coefficient for the Hawaii longline fishery¹ (adjusted to 2024 dollars)²

¹ Revenue per vessel includes the estimation of revenue landed on the West Coast.

² Data source: PIFSC Tier 1 indicators data request

3.2.3.4.2 Overview of the Hawaii Non-Longline Gears for PMUS

In addition to the Hawaii permitted longline vessels, there are the smaller scale fisheries, such as the MHI troll, MHI handline, offshore handline, aku boats (i.e., pole and line), among other gears, that harvest PMUS and sell to the Hawaii markets. The following figures present an overview of these various gears in terms of pounds sold, revenue, price, and participants. Aku boats were not included in “other gears” because the fishery has been declining and the number of active vessels has been less than three since 2010. In terms of participants in the fisheries, Figure 146 presents the total fishers participating in these non-longline PMUS fisheries, including the total number of fishers who reported PMUS caught in fishers reports and the total number of fishers who reported PMUS sold in the dealer reports. The number of fishers has experienced a downward trend since 2013. In 2024, the number of fishers for PMUS was 1056, a decrease of 124 fishers, compared to 2023. The number of fishers with fish sold in 2024 were 845, which is 118 fishers fewer than 2023.

Including pelagic fish landed and sold in the Hawaii markets from all gear types (including longline), the total revenue generated from Hawaii’s pelagic fisheries sold in Hawaii markets was \$110.8 million in 2024 and the non-longline fisheries contributed 7% of the total PMUS revenue sold in Hawaii markets in 2024. Among the total revenue of the non-longline gears, the MHI troll was the leading sector with \$4.2 million revenue and the MHI handline fishery followed at \$2.2 million. The offshore handline fishery was worth \$0.5 million in 2024. There has been a sharp decline in aku boat fishing since 2016 and detailed figures are not reported since 2019 due to confidentiality considerations. Figure 147 presents the trend of commercial landings by different non-longline gears, and Figure 148 presents the trend of commercial revenue by non-longline gears. The commercial landings and revenue peaked in 2004 and 2012, respectively, and were in general declining trends after 2012. Compared to the estimated total landings reported from fishers’ reports, around 80% of PMUS caught by non-longline gears were sold during the period of 2005-2024. Supporting data for the Figure 147 and Figure 148 are presented in Table A-130 and Table A-131, respectively.

Figure 149 presents the price trends of PMUS harvested and sold by different gears, 2005-2024 (adjusted to 2024 dollars). As dealer data do not record gear types, the prices by species by gear were estimated by assuming that the gear distributions of fish sold in the dealers reports by species were the same as in fishers’ reports. Thus, the prices by species by gear presented here may not reflect the actual price differences among gears for the same species. The estimated price data by species by gear are presented in Figure 149. In general, pelagic fish price went down slightly in 2024 for all gear types. Supporting data for Figure 149 are presented in Table A-132. Figure 150 presents the fishing trip costs by the three main small boat gears for pelagic fishing.

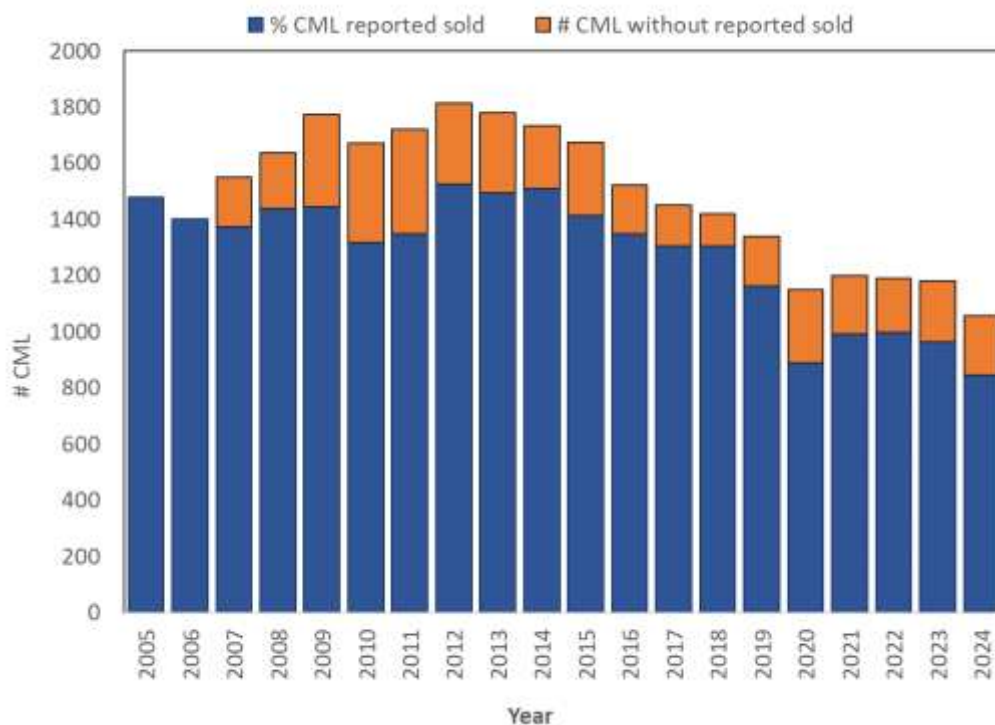


Figure 146. Total number of licensed fishers participating in small scale (i.e., non-longline) PMUS fisheries in Hawaii¹

¹ Data source: PIFSC Pelagic Module data request.

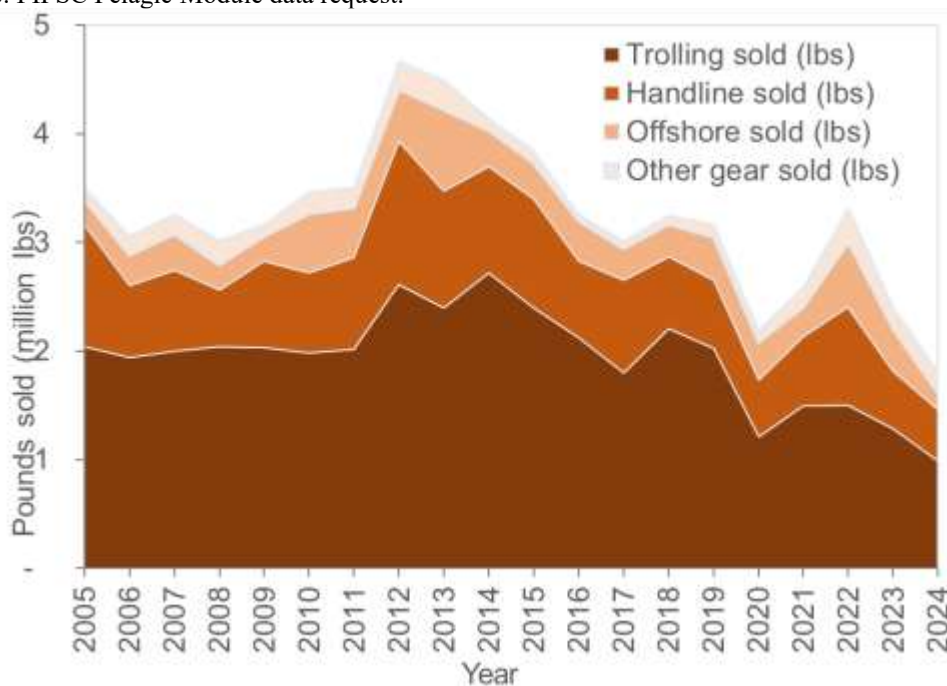


Figure 147. Total pounds sold from MHI commercial non-longline gears¹

¹ Data source: PIFSC Pelagic Module data request.

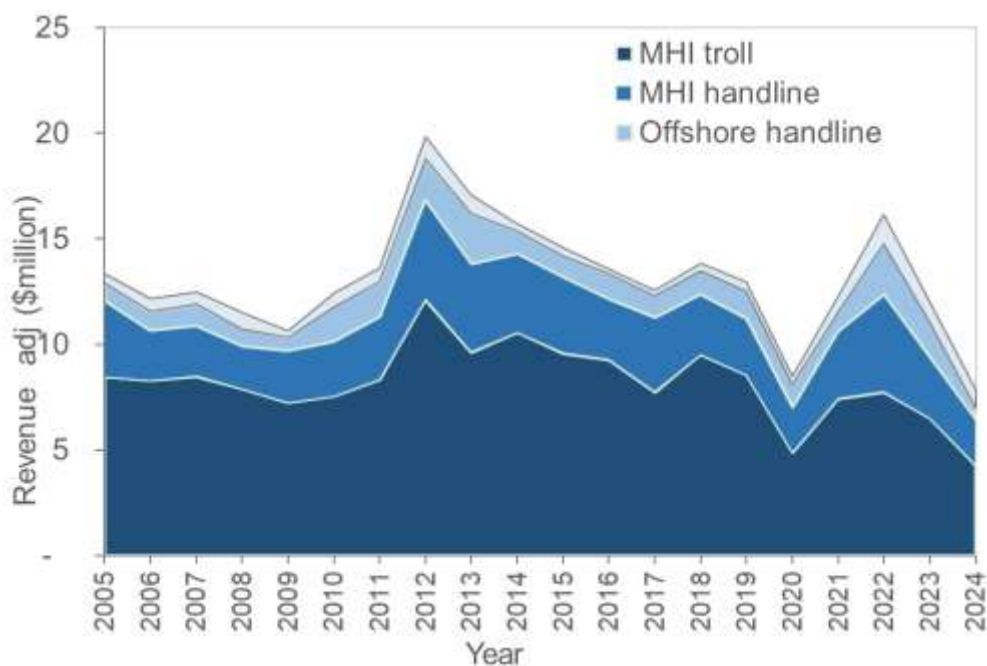


Figure 148. Revenue from Hawaii pelagic non-longline gears (adjusted to 2024 dollars)¹

¹ Data source: PIFSC Pelagic Module data request.

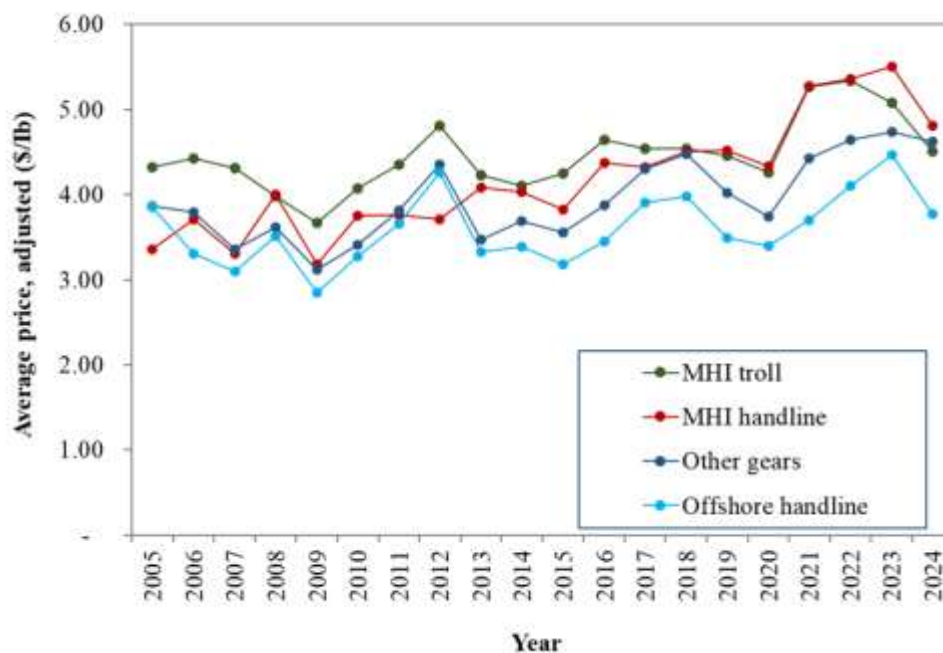


Figure 149. Price trends of PMUS by gear (adjusted to 2024 dollars)¹

¹ Data source: PIFSC Pelagic Module data request.

3.2.3.4.2.1 Fishing Costs

There is no continuous cost data collection program established for the non-longline PMUS fisheries in Hawaii. Past periodic research has documented the costs of pelagic small boat fishing in Hawaii; both trip expenditure and annual fishing expenditures (i.e., fixed costs) are provided in the literature (Hamilton and Huffman 1997; Hospital et al. 2011; Chan and Pan 2017; Chan 2022). The trip costs by gear type, collected in 2014 and 2021 studies (Chan and Pan 2017; Chan 2022), are presented in Figure 150.

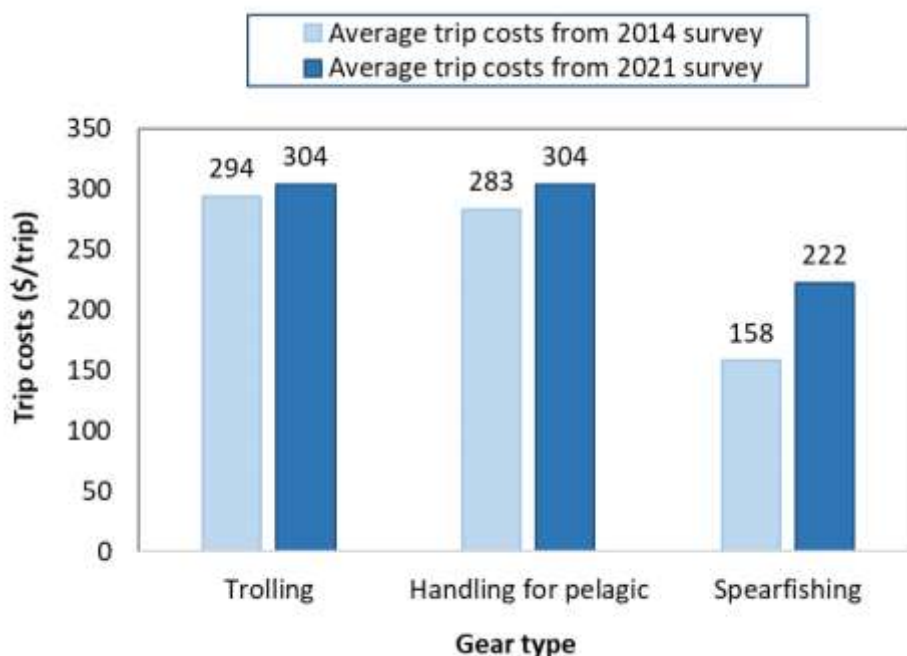


Figure 150. Fishing trip cost by gear type in 2014 and 2021¹

¹ Data sourced from a 2014 and 2021 Hawaii small boat survey (Chan and Pan 2017 and Chan 2022)

3.2.3.4.3 Hawaii Trolling

3.2.3.4.3.1 Commercial Participation, Landings, Revenue, and Prices

This section describes trends in commercial participation, landings, revenues, and prices for the Hawaii troll fishery. Figure 151 presents the pounds sold and revenue (adjusted to 2024 dollars) for the MHI troll fishery from 2005-2024. Supporting data of Figure 151 are presented in Table A-130 and Table A-131. Among the non-longline gears, the Hawaii troll fishery landed the largest number of pelagic fish. The commercial revenue from Hawaii troll fishery peaked in 2012 with revenue of over \$10 million (inflation adjusted to 2024 dollars) from 2.6 million pounds sold, while commercial landings peaked in 2014. Since then, both commercial landings and revenue have experienced a declining trend. Landings and revenue decreased in 2024 compared to 2023. Price information is available in Figure 149.

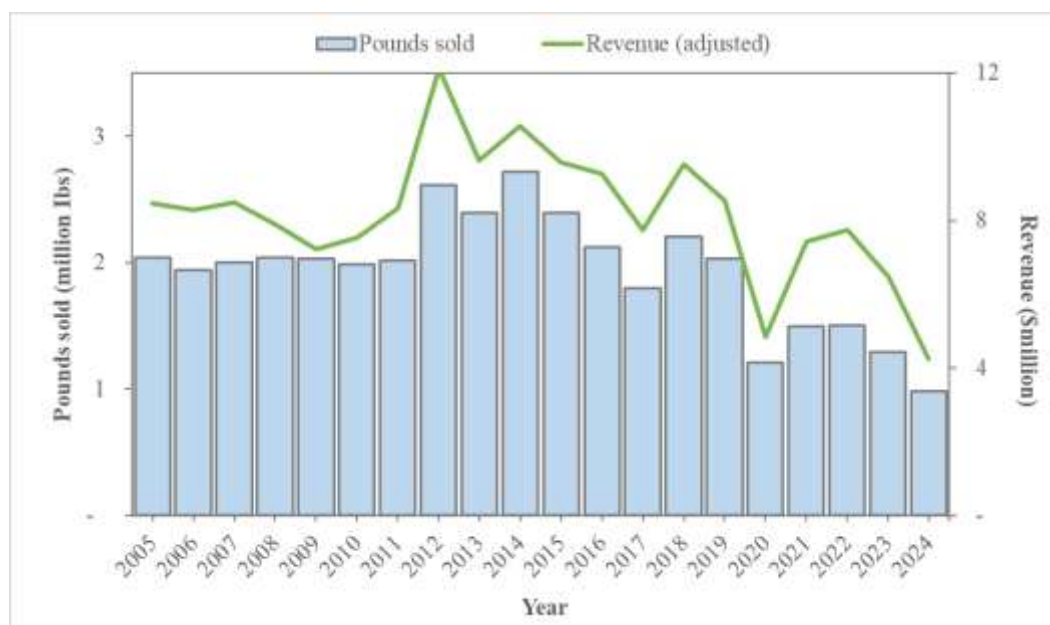


Figure 151. Pounds sold and revenue for the MHI troll fishery (adjusted to 2024 dollars)¹

¹ Data source: PIFSC Pelagic Module data request.

3.2.3.4.3.2 Fishing Costs

There are no continuous cost data collection program established for the non-longline PMUS fisheries in Hawaii. Past periodic research has documented the costs of pelagic small boat fishing in Hawaii; both trip expenditure and annual fishing expenditures (fixed costs) are provided in the literature (Hamilton and Huffman 1997; Hospital et al. 2011; Chan and Pan 2017; Chan 2022). The most updated cost data for a Hawaii trolling trip are presented in Figure 150.

3.2.3.4.4 Hawaii Pelagic Handline

3.2.3.4.4.1 Commercial Participation, Landings, Revenue, and Prices

This section describes trends in commercial participation, landings, revenues, and prices for the Hawaii pelagic handline fishery. Figure 152 presents the pounds sold and revenue (adjusted to 2022 dollars) for the MHI handline fishery from 2005-2024. Supporting data for Figure 152 can be found in Table A-130 and Table A-131. The landings and revenue from the Hawaii handline fishery peaked in 2012 with 1.3 million pounds sold, valued at over \$4 million (adjusted in 2024 dollars), before experiencing a general declining trend since 2013. Commercial landings of Hawaii handline in 2024 were 0.6 million pounds, valued at \$2.2 million, both were lower than that in 2022. Price information is available in Figure 149.

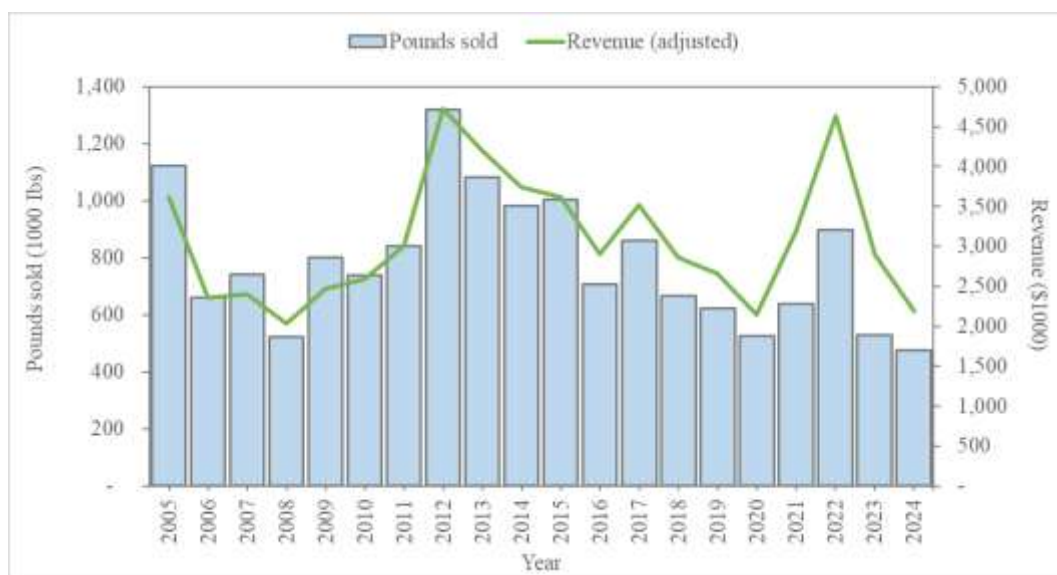


Figure 152. Pounds sold and revenue for MHI handline fishery (adjusted to 2024 dollars)¹

¹ Data sourced from the PIFSC Pelagic Module data request.

3.2.3.4.4.2 Fishing Costs

There is no continuous cost data collection program established for the non-longline PMUS fisheries in Hawaii. Past periodical research has documented the costs of pelagic small boat fishing in Hawaii; both trip expenditure and annual fishing expenditures (fixed costs) are provided in the literature (Hamilton and Huffman 1997; Hospital et al. 2011; Chan and Pan 2017; Chan 2022). The most recent cost data for MHI handline trips are presented Figure 150.

3.2.3.4.5 Offshore Handline

3.2.3.4.5.1 Commercial Participation, Landings, Revenue, and Prices

This section describes trends in pounds sold and revenues for the Hawaii offshore handline fishery. Figure 153 presents the pounds sold and revenue (adjusted to 2024 dollars) of the offshore handline, 2005-2025. Supporting data for Figure 153 can be found in Table A-130 and Table A-131. The offshore handline fishery seems relatively stable in most of the years during the period of 2005-2024, except that the pounds sold and revenue jumped up considerably in 2013 and 2022. The offshore handline in 2024 went down to the all-time low in 2024. Price information is available in Figure 149.

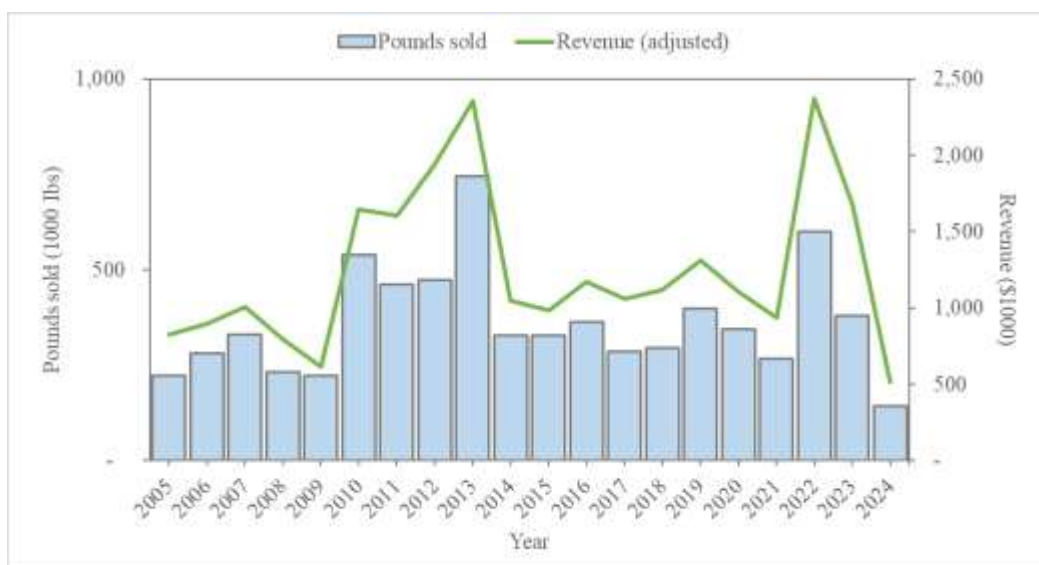


Figure 153. The pounds sold and revenue for the offshore handline (adjusted to 2024 dollars)¹
¹ Data sourced from the PIFSC Pelagic Module data request.

3.2.3.4.5.2 Fishing Costs

Fishing costs for offshore handline were first studied in the 2014 Hawaii small boat survey (Chan and Pan 2019b). Fishing trip costs were collected from the 2014 Hawaii small boat survey (Chan and Pan 2017). Fishermen were asked their fishing trip costs for the most common and second most common gear types they used in the past 12 months and the survey provides information on the variable costs incurred during the operation of vessel including boat fuel, truck fuel, oil, ice, bait, food and beverage, daily maintenance and repair, and other. However, the 2021 survey did not receive any updated cost information on the offshore handline.

3.2.3.4.6 Other Gears (Including Aku Boat/Pole and Line)

3.2.3.4.6.1 Commercial Participation, Landings, Revenue, and Prices

This section will describe trends in commercial pounds sold and revenues for the “other gears”. Figure 154 presents the pounds sold and revenue (adjusted to 2024 dollars) of the other gears 2005-2024 (excluding aku boats because data are confidential since 2019 and the dramatic changes from over \$1 million revenue in 2005 to under \$2,000 in 2016). Supporting data for Figure 154 can be found in Table A-130 and Table A-131. The fisheries in 2024 was similar to 2023.

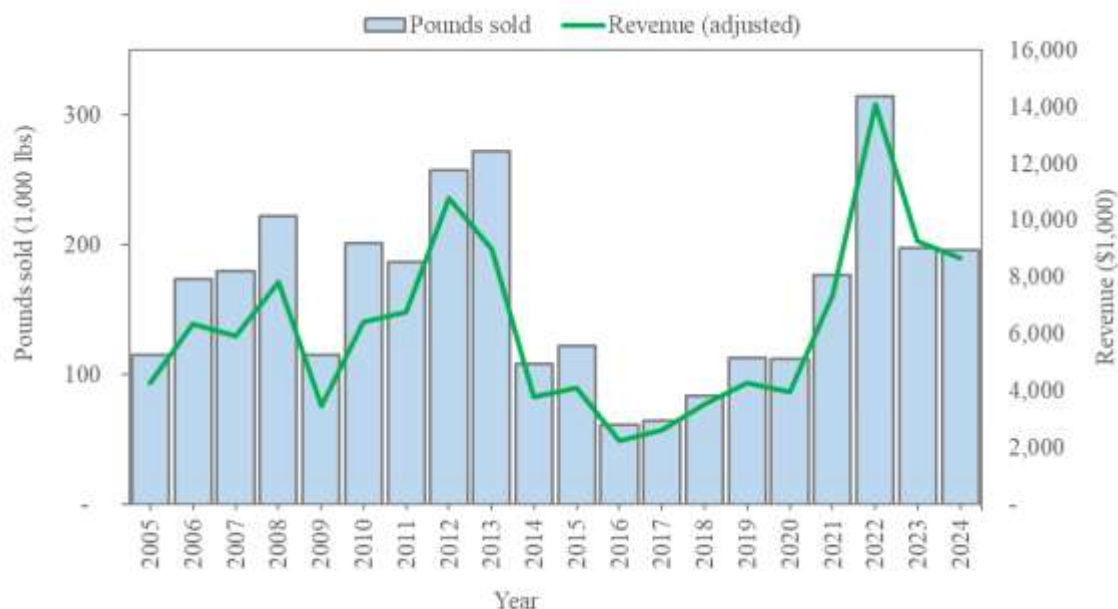


Figure 154. Pounds sold and revenue for all other pelagic gears in Hawaii (excluding aku boat; adjusted to 2024 dollars)¹

¹ Data source: PIFSC Pelagic Module data request.

3.2.3.4.6.2 Fishing Costs

Fishing cost data for the other presented gears were not available at the time of publication.

3.2.4 ONGOING RESEARCH AND INFORMATION COLLECTION

Each year, the PIFSC reports on the status of economic data collections for select regional commercial fisheries. This supports a national economic data monitoring effort known as the Commercial Fishing Economic Assessment Index (CFEAI). Details on the CFEAI and access to data from other regions is available at: <https://www.st.nmfs.noaa.gov/data-and-tools/CFEAI-RFEAI/>.

The table below represents the most recent data available for CFEAI metrics for select regional commercial fisheries for 2024. Entries for Pelagic fisheries are bolded in red. These values represent the most recent year of data for key economic data monitoring parameters (fishing revenues, operating costs, and fixed costs). The assessment column indicates the most recent publication year for specific economic assessments (returns above operating cost, profit), where available.

Table 44. Pacific Islands Region 2024 Commercial Fishing Economic Assessment Index

	2024 CFEAI				
	2024 Reporting Year (1/2024-12/2024)				
	Data			Assessment	
Pacific Islands Fisheries	Fishing Revenue Most Recent Year	Operating Cost Most Recent Year	Fixed Cost Most Recent Year	Returns Above Operating Costs (Quasi Rent) Assessment Most Recent Year	Profit Assessment Most Recent Year
HI Longline	2024	2024	2023	2024	2024
ASam Longline	2024	2024	2016	2024	2019
HI Offshore Handline	2024	2021	2021	2019	2019
HI Small Boat (pelagic)	2024	2021	2021	2023	2023
HI Small Boat (bottomfish)	2024	2021	2021	2023	2023
HI Small Boat (reef)	2024	2021	2021	2023	2023
Guam Small boat	2024	2024	2019	2024	
CNMI Small boat	2024	2024	2019	2025	
ASam Small boat	2024	2024	2021	2023	

The Economic Cost Data Collection Program for tracking change of Hawaii longline and American Samoa longline has been done in collaboration between PIFSC with the Pacific Islands Regional Observer Program (PIROP) to provide a 20-year time series of trip-level expenditures excluding labor cost (Pan 2018). However, there is uncertainty with the continuation of this data collection program due to the digitization of the PIROP system, whereas the economic performance data has been collected through paper forms. The data collection program may need to explore approaches to continue the data collection in the most feasible and efficient format for useful representation.

PIFSC also generates projections for upcoming fiscal years, and the table below provides the projected CFEAI report for 2025 (*all projected activities and analyses are subject to funding*). Based on early projections PIFSC intends to maintain ongoing economic data collections for the Hawaii and American Samoa longline fisheries (Pan 2018) and small boat fisheries in American Samoa, Guam and the CNMI (Chan and Pan 2019a) during 2025.

Table 45. Pacific Islands Region 2025 Commercial Fishing Economic Assessment Index

	2025 Projected CFEAI				
	2025 Reporting Year (1/2025-12/2025)				
	Data			Assessment	
Pacific Islands Fisheries	Fishing Revenue Most Recent Year	Operating Cost Most Recent Year	Fixed Cost Most Recent Year	Returns Above Operating Costs (Quasi Rent) Assessment Most Recent Year	Profit Assessment Most Recent Year
HI Longline	2025	2025	2023	2025	2024
ASam Longline	2025	2025	2016	2025	2019
HI Offshore Handline	2025	2021	2021	2019	2019
HI Small Boat (pelagic)	2025	2021	2021	2023	2023
HI Small Boat (bottomfish)	2025	2021	2021	2023	2023
HI Small Boat (reef)	2025	2021	2021	2023	2023
Guam Small boat	2025	2025	2025	2024	
CNMI Small boat	2025	2025	2025	2025	
ASam Small boat	2025	2025	2021	2023	

PIFSC fielded an update the Hawaii longline cost-earnings survey in 2023 and this survey provided updated information on fixed costs, labor costs, and allow for a more in-depth analysis of economic performance for the fleet while the last survey was fielded in 2013 (Kalberg and Pan 2016). Data analysis and summary are underway and PIFSC intends final survey results to be published during 2025.

PIFSC completed a cost-earnings survey of small boat fisheries in Guam and the CNMI during 2018-2019 (Dombrow et al. 2025a, 2025b), to serve as an update to the previous 2011 cost-earnings survey (Hospital and Beavers 2012, 2014). This 2018-2019 survey collected data on fishing revenues, operating costs, and fixed costs, as well as numerous elements related to fishing behavior, market participation, and fishery demographics. A cost-earnings survey of small boat fisheries in Guam and the CNMI is planned for implementation during 2025 and will provide more timely updates using a consistent survey questionnaire as the 2011 and 2018 surveys.

Community social indicators have been generated for U.S. Territories in the Pacific Islands Region (Kleiber et al. 2018) in accordance with a national framework (Jepson and Colburn 2013). Efforts are underway at PIFSC during 2025 to develop additional social indicators that are relevant to communities in the U.S. Territories of the Pacific Islands Region. Otherwise, PIFSC will continue to collect and monitor annual community social indicators (Kleiber et al. 2018; Hospital and Leong 2021) for Hawaii fishing communities, in accordance with a national framework (Jepson and Colburn 2013).

3.2.5 RELEVANT PIFSC ECONOMICS AND HUMAN DIMENSIONS PUBLICATIONS: 2024

Publication	MSRA priority
Advani S, JK. O'Hara, SM. Shoffler, P Pinto da Silva, J Agar, J Arnett, L Brislen, M Cutler, A Harley, J Hospital, K Norman, E Ragland, D Squires, B Stoffle, M Szymkowiak, AJ Vega-Labiosa, JS. Stoll. 2024. Estimating the scope, scale, and contribution of direct seafood marketing to the United States seafood sector. <i>Marine Policy</i> 165, 106188. https://doi.org/10.1016/j.marpol.2024.106188	HC1.1.4
Ayers, A., Leong, K., Hospital, J., Tam, C., and Morioka, R. (2024). 2023 American Samoa fisher observations data summary and analysis. Department of Commerce. NOAA PIFSC Data Report. DR-24-13. 23 p. https://doi.org/10.25923/x85x-0y72	HC3.1.1 HC3.1.3 HC2.1.4 PF1
Ayers, A., Leong, K., Hospital, J., Tam, C., and Morioka, R. 2024. 2023 Guam and CNMI fisher observations data summary and analysis Department of Commerce. NOAA PIFSC Data Report. DR-24-12. 20 p. https://doi.org/10.25923/zh4f-4k39	HC3.1.1 HC3.1.3 HC2.1.4 PF1
Ayers A, Leong K, Hospital J, Tam C, Morioka R. 2024. 2023 Hawaii fisher observations data summary and analysis. Pacific Islands Fisheries Science Center, PIFSC Data Report, DR-24-09, 30 p. https://doi.org/10.25923/yyfz-a677	HC3.1.1 HC3.1.3 HC2.1.4 PF1
Chan HL, Cai J, Leung P. 2024. Aquaculture production and diversification: What causes what? <i>Aquaculture</i> 583, 740626. https://doi.org/10.1016/j.aquaculture.2024.740626	PF4

Chan HL. 2024. Economic Contributions of Small Boat Fisheries in Guam and the CNMI. U.S. Dept. of Commerce, NOAA Technical Memorandum NOAA-TM-NMFS-PIFSC-160, 29 p. https://doi.org/10.25923/nsxb-my70	HC1.1.7 HC1.1.5
Dombrow, C., Rollins E., Ayers, A.L., & Hospital J. 2024. Economic and social characteristics of Guam's small boat fisheries, 2018. Department of Commerce. NOAA Administrative Report. NMFS-PIFSC-H-25-01. https://doi.org/10.25923/0c8s-tc37	HC1.1.1 HC1.1.2 HC1.1.4 HC1.1.7 HC3.1.3 HC3.1.4
Fisk JJ, Leong KM, Berl REW, Long JW, Landon AC, Adams MM, Hankins DL, Williams CK, Lake FK, Salerno J. 2024. Evolving wildlife management cultures of governance through Indigenous Knowledges and perspectives. <i>Journal of Wildlife Management</i> . https://doi.org/10.1002/jwmg.22584	HC2.1.4 HC3.1
Ingram, R. J., Leong, K. M., Nakachi, A., & Gove, J. M. (2024). Dimensions of cultural ecosystem service contributions to human well-being in marine environments. <i>Ecosystems and People</i> , 20(1). https://doi.org/10.1080/26395916.2024.2378155	HC2.1.1 HC2.1.4 HC3.1
Kleiber D, Terry J, Elliot S, Selgrath, J, et al. 2024. NOAA and Demographic Data Collection. U.S. Dept. of Commerce, NOAA Technical Memorandum NOAA-TM-NMFS-PIFSC-163, 77 p. https://doi.org/10.25923/kw71-b226	HC1.2.1
Leong KM, Ingram RJ, Kleiber D, Long SH, Mastitski A, Norman K, Weng C, Wise S 2024. Aligning fisheries terminology with diverse social benefits <i>Marine Policy</i> , 170,106377. https://doi.org/10.1016/j.marpol.2024.106377	HC1.1.2 HC1.1.4
Leong KM, Quiocho K, Blacklow A, Rosa S, Kleiber D, Winter KB, Long KS, Puniwai N, Poe MR. 2024. Relational research to elevate cultural dimensions of marine organisms in Hawai'i. <i>Ecology and Society</i> 29 (4):30. https://doi.org/10.5751/ES-15573-290430	HC2.1.1 HC2.1.4 HC3.1
Perng L, Leong K, Weijerman M, Oleson K. 2024. A multi-decadal assessment of social thresholds and outcomes in marine social-ecological systems in Hawai'i. <i>Marine Policy</i> , 163, 106141. https://doi.org/10.1016/j.marpol.2024.106141	HC2.1
Wallmo K, Kleiber D, Tomberlin D, Woodworth-Jefcoats P and Oliver T (2024) The Diversity of Science Behind U.S. Seafood. <i>Front. Young Minds</i> . 12:1331893. https://doi.org/10.3389/frym.2024.1331893	HC1.1

3.3 PROTECTED SPECIES

This section of the report summarizes information on protected species interactions in fisheries managed under the Pelagic FEP. Protected species covered in this report include sea turtles, seabirds, marine mammals, elasmobranchs, and corals. Most of these species are protected under the Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), and/or the Migratory Bird Treaty Act (MBTA). A list of protected species found in or near waters where fisheries managed under the Pelagic FEP operate and a list of critical habitat designations in the Pacific Ocean are included in Appendix B.

3.3.1 HAWAII SHALLOW-SET LONGLINE FISHERY

3.3.1.1 INDICATORS FOR MONITORING PROTECTED SPECIES INTERACTIONS AND EFFECTIVENESS OF MANAGEMENT MEASURES IN THE HAWAII SHALLOW-SET LONGLINE FISHERY

This report monitors the status of protected species interactions in the Hawaii shallow-set longline fishery using the following indicators:

- General interaction trends over time
- Effectiveness of FEP conservation measures
- Take levels compared to the incidental take statement (ITS) levels under the ESA
- Take levels compared to marine mammal Potential Biological Removals (PBRs), where applicable

Details of these indicators are discussed below.

3.3.1.1.1 Conservation Measures

The Pelagic FEP includes a number of conservation measures to mitigate seabird and sea turtle interactions in the shallow-set longline fishery. These measures include the following:

- Longline vessel owners/operators are required to adhere to regulations for safe handling and release of sea turtles and seabirds.
- Longline vessel owners/operators must have on board the vessel all required turtle handling/dehooking gear specified in regulations.
- Longline vessel owners/operators are required to remove trailing gear from oceanic whitetip sharks and cut the line as close to the hook as possible.
- Longline vessel owners/operators can choose between side-setting or stern-setting longline gear with additional regulatory specifications to reduce seabird interactions (e.g., night-setting, blue-dyed bait, weighted branch lines, strategic offal discards, using a “bird curtain”).
- When shallow-set longline fishing north of the Equator:
 - Use 18/0 or larger circle hooks with no more than 10° offset.
 - Use mackerel-type bait.
 - Vessel owners and operators required to annually attend protected species workshop
 - Closure for remainder of year when fishery reaches annual interaction limits (“hard caps”). Since September 17, 2020, the fishery has operated under a hard cap of 16 leatherback turtles and no hard cap for loggerhead turtles (see Section 3.3.1.3.2, this report)

- Effective September 17, 2020, vessels required to return to port when an individual trip interaction limit of 5 loggerhead turtles or 2 leatherback turtles is reached, with additional requirements if the vessel reaches the same trip limit for the second time in a calendar year (see Section 3.3.1.3.2 of this report)

In 2024, the Council initiated development of a regulatory amendment to the Pelagic FEP that would implement a crew training requirement for Hawaii and American Samoa longline fisheries. PIRO Sustainable Fisheries Division, in coordination with the Hawaii Longline Association, PIRO Protected Resources Division, and the Council initiated a one-year pilot crew training program in April 2024. The Council is scheduled to consider final action on the regulatory amendment at the 203rd Council in June 2025.

3.3.1.1.2 ESA Consultations

Three valid Biological Opinions document the effects of the shallow-set fishery on ESA listed species. On January 6, 2012, the U.S. Fish and Wildlife Service issued a Biological Opinion on the effects of the Hawaii deep-set and shallow-set longline fisheries on ESA-listed seabirds (USFWS 2012). The USFWS concluded that the shallow-set fishery would not jeopardize the short-tailed albatross and included an incidental take statement of one short-tailed albatross interaction every five years. To date the fishery has not interacted with any short-tailed albatross.

On June 26, 2019, NMFS issued a biological opinion on the effects of the shallow-set fishery on ESA-listed marine species (NMFS 2019). In total, 49 listed resources comprised of 40 listed species and nine critical habitat designations occur within the area the shallow-set fishery operates and were analyzed in the 2019 Biological Opinion. These also include listed fish, marine invertebrates, and other critical habitat in vessel transiting areas of the shallow-set fishery primarily in California (Long Beach, San Francisco, and San Diego).

NMFS concluded that the continued authorization of the fishery is not likely to jeopardize the continued existence of any of the following: endangered North Pacific loggerhead sea turtle distinct population segment (DPS); endangered leatherback sea turtle; endangered Mexico breeding population of olive ridley sea turtle, and threatened (other) populations of olive ridley sea turtle; threatened Eastern Pacific green sea turtle DPS; threatened Central North Pacific green sea turtle DPS; threatened East Indian-West Pacific green sea turtle DPS; endangered Central West Pacific green sea turtle DPS; threatened Southwest Pacific green sea turtle DPS; endangered Central South Pacific green sea turtle DPS; threatened oceanic whitetip shark; threatened giant manta ray; and threatened Guadalupe fur seal.

In its 2019 Biological Opinion, NMFS issued an ITS for the loggerhead, leatherback, green, olive ridley, Guadalupe fur seal, oceanic whitetip shark, and giant manta ray, which were derived from interaction predictions generated by McCracken (2018) using a Bayesian inferential approach (

Table 47). These predictions are based on observer data from 2005-2017 for all species, except for loggerheads (2005-2018) where more recent data were available.

Additionally, the 2019 Biological Opinion concluded that the shallow-set fishery may affect, but is not likely to adversely affect the following: hawksbill sea turtle; MHI insular false killer whale DPS; Mexico and Central America humpback whale DPSs; fin whale; blue whale; North Pacific right whale; sei whale; sperm whale; Eastern Pacific scalloped hammerhead shark DPS; and listed fish and invertebrate species common to transiting areas off the coast of California (Central

California coast coho salmon, Central Valley spring-run Chinook salmon, Sacramento River winter-run Chinook salmon, Central California coast steelhead, California coast steelhead, Southern North American green sturgeon, Black abalone, and White abalone).

The 2019 Biological Opinion also concluded that the shallow-set fishery is not likely to adversely modify designated critical habitat for the following: leatherback sea turtle; Hawaiian monk seal; MHI insular false killer whale; Steller sea lion; and critical habitat for listed fish and invertebrate species common to transiting areas off the coast of California (Central California coast coho salmon, Sacramento River winter-run Chinook salmon, California coast steelhead, Southern North American green sturgeon, and Black abalone).

On October 27, 2023, NMFS reinitiated ESA Section 7 consultation for the shallow-set longline fishery due to exceedance of the ITS of 36 loggerhead sea turtles in the 2019 Biological Opinion, and determined that the conduct of the fishery during the period of the consultation will not violate ESA Sections 7(a)(2) and 7(d). On March 12, 2024, NMFS issued a Supplemental Biological Opinion for loggerhead sea turtles, which concluded that the shallow-set longline fishery is not likely to jeopardize species. The new ITS took effect when the Supplemental Biological Opinion was signed in 2024 and is reflected in the tables below. The 2019 Biological Opinion remains valid for all other species.

Table 46. Summary of ESA consultations for the Hawaii shallow-set longline fishery

Species or DPS	Consultation Date	Consultation Type ^a	Outcome ^b
Loggerhead turtle, North Pacific DPS	2024-03-12	BiOp	LAA, non-jeopardy
Leatherback turtle	2019-06-26	BiOp	LAA, non-jeopardy
Olive ridley turtle	2019-06-26	BiOp	LAA, non-jeopardy
Green turtle	2019-06-26	BiOp	LAA, non-jeopardy
Hawksbill turtle	2019-06-26	BiOp	NLAA
False killer whale, MHI insular DPS	2019-06-26	BiOp	NLAA
Fin whale	2019-06-26	BiOp	NLAA
Blue whale	2019-06-26	BiOp	NLAA
North Pacific right whale	2019-06-26	BiOp	NLAA
Sei whale	2019-06-26	BiOp	NLAA
Sperm whale	2019-06-26	BiOp	NLAA
Hawaiian monk seal	2019-06-26	BiOp	NLAA
Guadalupe fur seal	2019-06-26	BiOp	LAA, non-jeopardy
Scalloped hammerhead shark, Eastern Pacific DPS	2019-06-26	BiOp	NLAA
Oceanic whitetip shark	2019-06-26	BiOp	LAA, non-jeopardy
Giant manta ray	2019-06-26	BiOp	LAA, non-jeopardy
Listed fish and invertebrate species ^c	2019-06-26	BiOp	NLAA
Short-tailed albatross	2012-01-06	BiOp (FWS)	LAA, non-jeopardy
Critical Habitat	Consultation Date	Consultation Type ^a	Outcome ^b
Hawaiian monk seal	2019-06-26	BiOp	NLAA
False killer whale, MHI insular DPS	2019-06-26	BiOp	NLAA
Leatherback turtle	2019-06-26	BiOp	NLAA
Steller sea lion	2019-06-26	BiOp	NLAA
Listed fish and invertebrate species ^d	2019-06-26	BiOp	NLAA

^a BiOp = Biological Opinion; LOC = Letter of Concurrence.

^b LAA = likely to adversely affect; NLAA = not likely to adversely affect.

^c Listed fish and invertebrate species = Central California coast coho salmon, Central Valley spring-run Chinook salmon, Sacramento River winter-run Chinook salmon, Central California coast steelhead, California coast steelhead, Southern North American green sturgeon, Black abalone, and White abalone.

^d Listed fish and invertebrate species = Central California coast coho salmon, Sacramento River winter-run Chinook salmon, California coast steelhead, Southern North American green sturgeon, and Black abalone.

Table 47. Summary of Incidental Take Statements (ITS) for the Hawaii shallow-set longline fishery

Species	ITS Time Period	Takes	Mortalities	Source BiOp
Loggerhead turtle (North Pacific DPS)	5-year	135	-	NMFS (2024)
Leatherback turtle	1-year	21	3	NMFS (2019)
Olive ridley turtle	1-year	5	1	NMFS (2019)
Green turtle	1-year	5	1	NMFS (2019)
Oceanic whitetip shark	1-year	102	32	NMFS (2019)
Giant manta ray	1-year	13	4	NMFS (2019)

Species	ITS Time Period	Takes	Mortalities	Source BiOp
Guadalupe fur seal	1-year	11	9	NMFS (2019)
Short-tailed albatross	5-year	1 injury or death		USFWS (2012)

3.3.1.1.3 Non-ESA Marine Mammals

Fishery impacts to marine mammal stocks are primarily assessed and monitored through the Stock Assessment Reports (SARs) prepared pursuant to the MMPA. The SARs include detailed information on these species' geographic range, abundance, potential biological removal (PBR) estimates, bycatch estimates, and status. The most recent SARs are available online at:

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>.

The Hawaii shallow-set longline fishery is a Category II under the MMPA 2024 List of Fisheries (LOF; 89 FR 12257, February 16, 2024), meaning that this fishery has occasional incidental mortality and serious injuries of marine mammals. The 2024 LOF lists the following marine mammal stocks that are incidentally killed or injured in this fishery:³

- Bottlenose dolphin, HI Pelagic stock
- False killer whale, HI Pelagic stock
- Guadalupe fur seal
- Risso's dolphin, HI stock
- Striped dolphin, HI stock

Most bycatch estimates in the SARs are based on the most recently available 5-year period, but there is a data lag of at least two years due to the SAR review process. This annual report focuses on available long-term interaction trends and summarizes relevant information from the most recent SAR.

3.3.1.2 DATA SOURCE FOR MONITORING PROTECTED SPECIES INTERACTIONS IN THE HAWAII SHALLOW-SET LONGLINE FISHERY

Protected species interactions in the Hawaii longline fishery have been monitored through mandatory observer coverage since 1994. Observer coverage in the Hawaii longline fishery was between 3 and 5 percent from 1994 through 1999 and increased to 10 percent in 2000. Since 2004, the shallow-set component of the Hawaii longline fishery has had 100 percent observer coverage.

NMFS uses the date of the interaction for tracking interactions against the ITS and the shallow-set longline sea turtle hard caps, while the PIRO Observer Program Quarterly and Annual Reports through 2020 summarized interaction data by vessel arrival dates. As a result, the annual number of interactions counting toward the ITS and hard caps may differ from the numbers reported on the historical Observer Program Quarterly and Annual Reports.⁴ Starting in 2021, the PIRO Observer Program Quarterly and Annual Reports began summarizing interaction data by haul begin dates (proxy for interaction date). This report presents protected species interactions

³ This fishery is listed in the LOF under Commercial Fisheries in the Pacific Ocean and Commercial Fisheries on the High Seas. Stocks from both lists are included here.

⁴ <https://www.fisheries.noaa.gov/resource/data/pacific-islands-longline-quarterly-and-annual-reports>

summarized by interaction date for the Hawaii shallow-set longline fishery. For the Hawaii deep-set and American Samoa longline fisheries, the annual observed interactions are based on vessel arrival date. This difference in reporting between fisheries is due to differences in management needs and observer coverage rates. In the shallow-set fishery, which has 100% observer coverage, interactions are tracked in near-real time to monitor the fleet-wide hard caps and individual trip limits for sea turtles. In the Hawaii deep-set and American Samoa longline fisheries, which have partial observer coverage, total interactions are extrapolated by PIFSC at the trip level as opposed to individual sets or interaction dates using vessels arrival date.

In 2006 and 2019, the shallow-set longline fishery closed in March, and in 2018 the fishery closed in May (see Section 3.3.1.3.2, this report). Due to these early closures in first and second quarters, data for these years are not representative of typical fishing years and should be interpreted with caution.

3.3.1.3 SEA TURTLE INTERACTIONS IN THE HAWAII SHALLOW-SET LONGLINE FISHERY

Table 48 summarizes the sea turtle interaction data based on interaction date to allow comparison with the hard caps. The incidental take data in this section were compiled from unpublished observer data and are for monitoring purposes. Since there is full observer coverage for this fishery, all sea turtle interactions have been documented. Many of these interactions have been examined further by PIFSC, and updated information necessary for any data analyses is available from PIFSC. The incidental take data for the fourth quarter of 2007 were combined with 2008 data due to vessel confidentiality rules.

Nearly all sea turtles observed in the Hawaii shallow-set longline fishery from 2004 to 2024 (Table 48) were released alive, with the exception of four total loggerhead turtles released dead in 2018, 2020, and 2023, and one olive ridley turtle released dead in 2019. Additionally, one loggerhead in 2013 was entangled in marine debris that was entangled with fishing gear and NMFS did not count this turtle towards the annual shallow-set interaction limit. Unidentified hardshell turtles are classified by NMFS as loggerheads per protocol and count towards the annual shallow-set interaction limit or individual trip limit for loggerheads. The highest interaction rates involved both leatherback and loggerhead turtles, whereas interactions with greens, olive ridleys, and unidentified hard-shell turtles were much less frequent.

The observed number of sea turtle takes per year has been variable for green, olive ridley, leatherback, and unidentified hard shell turtles. Higher numbers of interactions with loggerhead turtles were observed starting in late 2017. In total, 21, 33, and 20 loggerhead turtles were observed in 2017, 2018, 2019, respectively, based on interaction date summary (Table 48) The fishery was closed May-December 2018 due to a stipulated settlement, and March-December 2019 due to reaching the loggerhead hard cap, thus interaction rate data for these years are not directly comparable to other years in which the fishery operated throughout the year. Loggerhead turtle interactions in 2020 were lower than the previous three years, although shallow-set effort in 2020 was not reflective of a typical fishing year due to 1) the shallow-set vessels voluntarily reducing effort in the first quarter after majority of the 2020 loggerhead turtle interactions were observed in January; and 2) impacts from the COVID-19 pandemic especially in second quarter. Observed loggerhead turtle interactions in 2021 and 2022 returned to 2017-2019 levels with 19

and 24 interactions respectively. Observed number of loggerhead turtle interactions in 2024 was lower than in 2023, which had the highest (48) since the reopening of the fishery in 2004.

Additional discussion regarding the higher number of loggerhead turtle interactions observed since 2017, as well as the outcome of a Pelagic Plan Team Working Group review of the trip limit measure in 2024, are provided in Section 3.3.1.3.2, and a summary of an analysis evaluating the experimental oceanographic TurtleWatch product is provided in Section 4.1.

Table 48. Observed takes, mortalities (M), and takes per fishing effort (1,000 hooks) for sea turtles in the Hawaii shallow-set longline fishery based on interaction date for comparison with the shallow-set sea turtle hard caps, 2004-2024^a

Year	Observer Coverage (%)	Sets	Hooks	Green		Leatherback		Loggerhead		Olive ridley		Unidentified hard shell	
				Takes	Takes/ 1,000 hooks	Takes	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes	Takes/1,000 hooks
2004	100	135	115,718	0	0.000	1	0.009	1	0.009	0	0.000	0	0.000
2005	100	1,646	1,358,247	0	0.000	8	0.006	12 ^b	0.009	0	0.000	0	0.000
2006	100	850	676,716	0	0.000	2	0.003	15 ^b	0.022	0	0.000	2 ^{c, g}	0.003
2007 ^d	100	1,569	1,353,761	0	0.000	5	0.004	15	0.011	1	0.001	0	0.000
2008	100	1,595	1,460,042	1	0.001	2	0.001	0	0.000	2	0.001	0	0.000
2009	100	1,761	1,694,550	1	0.001	9	0.005	3	0.002	0	0.000	0	0.000
2010	100	1,872	1,835,182	0	0.000	8	0.004	7	0.004	0	0.000	0	0.000
2011	100	1,474	1,505,467	4	0.003	16	0.011	12	0.008	0	0.000	0	0.000
2012	100	1,364	1,476,969	0	0.000	7 ^e	0.005	6	0.004	0	0.000	0	0.000
2013	100	962	1,074,909	0	0.000	11	0.009	6 ^f	0.006	0	0.000	1 ^g	0.001
2014	100	1,338	1,470,683	1	0.001	16	0.011	14	0.010	1	0.001	1	0.001
2015	100	1,156	1,274,805	0	0.000	5	0.004	13	0.011	1	0.001	0	0.000
2016	100	727	796,165	0	0.000	5	0.006	15	0.019	0	0.000	0	0.000
2017	100	1,005	1,083,216	2	0.002	4	0.004	21(1)	0.019	4	0.004	0	0.000
2018	100	420	486,013	1	0.002	6	0.012	33(1)	0.068	1	0.002	0	0.000
2019	100	314	374,487	0	0.000	0	0.000	20	0.053	2(1)	0.005	0	0.000
2020	100	479	624,579	0	0.000	2	0.003	15(1)	0.024	0	0.000	0	0.000
2021	100	804	1,026,373	1	0.001	3	0.003	19	0.019	2	0.002	1	0.001
2022	100	971	1,242,997	0	0.000	11	0.009	24	0.019	2	0.002	0	0.000
2023	100	909	1,139,864	0	0.000	11	0.010	48(1)	0.042	2	0.002	1 ^g	0.001
2024	100	875	1,170,372	0	0.000	8	0.007	37	0.032	2	0.002	0	0.001

^a Take data based on interaction dates. Set and hook data based on haul begin date as a proxy for interaction date.

^b The released conditions of one loggerhead was unknown.

^c The released condition of one unidentified hard shell turtle was unknown.

^d Due to vessel confidentiality rules, data for the fourth quarter in 2007 are combined with data for 2008. Take data for 2007 reflect those from first, second and third quarters.

^e The released condition of one leatherback was unknown.

^f One injured loggerhead was entangled in marine debris, which became entangled with fishing gear. This loggerhead will not count toward the annual shallow-set interaction limit but is included in this table.

^g Turtles listed as an unidentified hard shell sea turtle in the Observer Program Status Report are classified as a loggerhead per protocol for the shallow-set interaction limit and count toward the annual shallow-set limit or individual trip limit.

Sources: PIRO Sustainable Fisheries Division unpublished data.

3.3.1.3.1 Comparison of Interactions with ITS

Due to a fishery closure in March 2019, the Hawaii shallow-set longline fishery in 2019 operated solely under the ITSs in the 2012 Biological Opinion (NMFS 2012). The ITS from the June 26, 2019 Biological Opinion took effect in January 2020 when the fishery reopened.

Under the 2019 Biological Opinion, NMFS will monitor the ITSs for the Hawaii shallow-set longline fishery annually starting in January 2020 to track incidental take. NMFS uses the date of the interaction for tracking sea turtle interactions against the ITS (Table 49), regardless of when the vessel returns to port. NMFS uses the post-hooking mortality criteria (Ryder et al. 2006) to estimate sea turtle mortality rates. Total mortality estimates are rounded to the nearest integer.

The ITS for loggerhead sea turtles were exceeded in 2023. On October 27, 2023, NMFS reinitiated ESA Section 7 consultation for the shallow-set longline fishery due to exceedance of the ITS of 36 loggerhead sea turtles in the 2019 Biological Opinion and determined that the conduct of the fishery during the period of the consultation will not violate ESA Sections 7(a)(2) and 7(d). On March 12, 2024, NMFS issued a Supplemental Biological Opinion for loggerhead sea turtles, which concluded that the shallow-set longline fishery is not likely to jeopardize species. The new ITS for loggerhead sea turtles took effect when the Supplemental Biological Opinion was signed in 2024.

The 2019 Biological Opinion remains valid for all other species, and no ITS was exceeded in 2024.

Table 49. Observed interactions and estimated total mortality (M)^a (using Ryder et al. 2006) of sea turtles in the Hawaii shallow-set longline fishery compared to the 1-year ITS in the 2019 Biological Opinion^b and the 5-year ITS in the 2024 Supplemental Biological Opinion for Loggerhead Sea Turtles

Species	1-year ITS Interactions (M)	5-year ITS Interactions (M)	Interactions (M)				
			2020	2021	2022	2023	2024
Green turtle	5(1)	-	0(0)	1(0)	0(0)	1(0)	0(0)
Leatherback turtle	21(3)	-	2(1)	3(1)	11(3)	11(3)	8(2)
Olive ridley turtle	5(1)	-	0(0)	2(0)	2(0)	2(0)	2(0)
Loggerhead turtle (North Pacific DPS)	-	135	15(2)	20(4) ^c	24(4)	49(10) ^c	37(6)

^a Mortality estimates are round to the nearest whole number.

^b Takes are counted based on interaction date.

^c Includes one unidentified hardshell turtle

3.3.1.3.2 Effectiveness of FEP Conservation Measures

Management measures in the Hawaii shallow-set longline fishery have been effective in reducing the number of sea turtle interactions. The introduction of sea turtle bycatch reduction measures for the fishery in 2004, such as switching from J-hooks to circle hooks, and from squid bait to mackerel bait, resulted in an 89% decrease in sea turtle interactions in 2004-2006 compared to interactions observed in 1994 through 2002 (Gilman et al. 2007). Swimmer et al. (2017) found similar reductions of 84% and 95% for leatherback and loggerhead turtle interactions respectively for data through 2014. The rate of deeply hooked sea turtles, which is thought to

result in higher mortality levels, also declined after those measures were implemented (Gilman et al. 2007).

From 2012 to 2018, the fishery did not reach the annual hard cap for either leatherback or loggerhead turtles (26 and 34, respectively, based on the 2012 Biological Opinion ITSs). The Hawaii shallow-set longline fishery was closed in May 2018 pursuant to a settlement agreement. At the time of the closure, the fishery had 33 loggerhead interactions (Table 48), thus the fishery was closed prior to reaching the annual hard cap limit of 34 turtles. From 2004 to 2012, the shallow-set fishery operated under hard caps of 17 loggerhead turtles and 16 leatherback turtles (except in 2010 when the loggerhead hard cap was 46 under Pelagic FEP Amendment 18; later returned to 17 loggerheads due to litigation). The fishery reached the loggerhead hard cap in 2006 and the leatherback hard cap in 2011 (Table 48). Due to the 2018 stipulated settlement agreement, the hard cap limit of 17 loggerhead turtles was reinstated based on the 2004 Biological Opinion when the fishery reopened on January 1, 2019, and remained in place until September 17, 2020. In 2019, the fishery closed on March 19 due to reaching the loggerhead hard cap limit of 17⁵, and the fishery reopened on January 1, 2020.

In 2017–2019, loggerhead turtle interactions in the Hawaii shallow-set longline fishery were higher than levels previously observed since the fishery reopened in 2004. A total of 21 loggerhead interactions were observed in 2017, 33 loggerhead interactions observed from January 2018 to the fishery closure in May, and 20 loggerhead interactions observed from January 2019 to the fishery closure in March. The increase in loggerhead interactions may be explained by the high reproductive output at their source nesting beaches in Japan. Loggerhead turtle nest counts increased nearly an order of magnitude from 1997 to 2014. The high levels of nesting likely resulted in higher hatchling production. Most of the loggerhead turtles observed interacting with the Hawaii shallow-set longline fishery in 2017 and 2018 were in the range of 40 to 60 cm straight carapace length, which is estimated to be approximately 3 to 10 years in age and consistent with the period of high nesting in Japan.

In response to the higher number of loggerhead turtle interactions in the shallow-set fishery, the Council in 2018 developed management measures to provide managers and fishery participants with the necessary tools to respond to and mitigate fluctuations in loggerhead and leatherback turtle interactions, and to ensure a continued supply of fresh swordfish to U.S. markets, consistent with the conservation needs of these sea turtles. At its 179th Meeting in August 2019, the Council took final action to amend the Pelagic FEP to modify sea turtle mitigation measures for the shallow-set fishery, incorporating provisions required under the 2019 Biological Opinion Reasonable and Prudent Measures (RPMs) and Terms and Conditions 1a and 1b. Specifically, the Council recommended 1) setting an annual fleet-wide hard cap limit on the number of leatherback turtle interactions at 16, consistent with RPMs and Terms and Conditions 1a under the 2019 Biological Opinion; 2) not setting an annual fleet-wide hard cap limit on the number of North Pacific loggerhead turtle interactions; and 3) establishing individual trip interaction limits for loggerhead and leatherback turtles for the shallow-set fishery, consistent with RPMs and Terms and Conditions 1b under the 2019 Biological Opinion. NMFS published the Notice of Availability for Amendment 10 on January 23, 2020 (85 FR 3889) and the proposed rule on February 4, 2020 (85 FR 6131). Amendment 10 became effective on April 22, 2020, and the

⁵ The actual observed number of interactions for 2019 was 20 loggerhead turtles due to the fishery having multiple observed interactions on the day the hard cap was reached.

regulations implementing the amendment became effective on September 17, 2020 (85 FR 57988).

As part of the final action for Amendment 10, the Council recommended an annual review of the fishery's performance under the trip interaction limits in the Annual SAFE Report. Table 50 shows the distribution of the shallow-set vessels' interactions with loggerhead and leatherback turtle interactions from January 1 – December 31, 2024. The current limits are five loggerhead turtle interactions per trip or two leatherback turtle interactions per trip. In 2024, no trips reached the leatherback or the loggerhead trip limit.

Recognizing the relatively high turtle catch in 2023, the Pelagic Plan Team at its May 2023 meeting formed a working group to initiate a detailed review of fishery performance under the loggerhead and leatherback turtle trip interaction limits. The Working Group provided its report to the Pelagic Plan Team and other advisory groups at their May 2024 meetings, and to the Council in June 2024. Loggerhead turtle interactions appear to have increased following the removal of the hard cap, but the Working Group's analysis indicate there is no statistical difference in the interactions before and after the measure change, in part due to the fishery closures in 2018 and 2019. The Working Group's analysis also looked at fisher behavior, but there is no significant difference in the distance that the SSL vessels move after they had a turtle encounter, although there is some indication that the vessels may make bigger moves after the fourth loggerhead interaction. There were also no significant differences with the leatherback turtle interactions before and after the measure. The Working Group concluded that additional years of monitoring is warranted before the Council considers any revisions to the trip limits.

Table 50. Number of shallow-set longline trips by the number of loggerhead and leatherback turtle interactions per trip, January 1 – December 31, 2024. The total number of trips in this period was 54.

Loggerhead turtles		Leatherback turtles	
Number of turtles per trip	Number of trips ^a	Number of turtles per trip	Number of trips
0	29	0	46
1	17	1	8
2	5	≥2	0
3	2	--	--
4	1	--	--

^a Number of trips based on haul begin date.

3.3.1.4 MARINE MAMMAL INTERACTIONS IN THE HAWAII SHALLOW-SET LONGLINE FISHERY

Table 51 through Table 55 summarize the incidental take data of marine mammals from 2004 to 2024 in the Hawaii shallow-set longline fishery. Since there is full observer coverage for this fishery, all marine mammal interactions are documented. The incidental take data in this section were compiled from the PIRO Observer Program Annual Status Reports and are for monitoring purposes. Reported interactions listed in these tables reflect all observed interactions, including mortalities, serious injuries, and non-serious injuries. Refer to the most recent SARs for mortality and serious injury estimates and stock-specific estimates of interactions. Many of these interactions have been further examined by NMFS, and updated information necessary for any data analyses is available from PIFSC. The incidental take data for the fourth quarter of 2007 were combined with 2008 data due to vessel confidentiality rules.

The majority of observed cetacean interactions and all mortalities during this time period involved small dolphin species (Table 51). Of these species, Risso's dolphins had the highest rate of interactions over time, followed by bottlenose dolphins, striped dolphins, common dolphins, and rough-toothed dolphins with a single take. In 2023, a spotted dolphin was recorded observed in the fishery for the first time and in 2024, a Cuvier's beaked whale was recorded observed for the first time. Marine mammals grouped as small whales (Table 52) and large whales (Table 53) had comparatively lower rates of interactions than most small dolphin species. Small and large whales with observed interactions since 2004 include false killer whale, Blainville's beaked whale, unidentified *Kogia* species, ginkgo-tooth beaked whale, Bryde's whale, humpback whale, and fin whale. Observed interactions with unidentified cetaceans are shown in Table 54.

Interactions with pinnipeds, including Northern elephant seals, Guadalupe fur seals, and unidentified pinniped species have been occasionally observed since 2013 (Table 55). All pinniped interactions were observed outside of the EEZ off of California, while fishing under the Hawaii longline limited entry permit. No pinniped interactions were observed in 2016, 2018, 2021, 2023, and 2024.

Most of the pinniped interactions to date have occurred in the fourth quarter in areas east of 130 degrees west. Effort in this quarter has increased since 2012, which likely partially explains the increase in pinniped interactions. However, demographic and oceanographic influences may also be playing a role in the increase in interactions, particularly for Guadalupe fur seals. The rebound of this species from near extinction has resulted in an increase in both the overall number of seals and their spatial extent, as they reoccupy the northern portion of their historic migration range (D'Agnese et al. 2020). Further, foraging studies have indicated that during anomalous warming events in the northeastern Pacific, such as those that occurred between 2014 and 2016, Guadalupe fur seals expand their foraging areas to the north and offshore (Amador-Capitanachi et al. 2020). These conditions may have also precipitated the Unusual Mortality Event, which has involved the stranding of over 700 predominantly young Guadalupe fur seals along the US West Coast between 2015 and 2021.⁶ Although the marine heatwave of 2014-2016 was the largest and longest on record since monitoring began in 1982, large marine heatwaves have occurred each year since 2019.⁷ The occurrence of Guadalupe fur seal interactions in 2015-2017, 2020, and 2022 is thus not surprising. In 2018, 2021, 2023 and 2024, there was limited fishing effort east of 130 degrees west and no pinniped interactions, suggesting a dynamic relationship between oceanographic conditions and fishing effort is likely driving pinniped interactions in this fishery.

⁶ <https://www.fisheries.noaa.gov/national/marine-life-distress/2015-2021-guadalupe-fur-seal-unusual-mortality-event-california>

⁷ <https://www.integratedecosystemassessment.noaa.gov/california-current-marine-heatwave-tracker-blobtracker>

Table 51. Observed takes, mortalities (M), and takes per fishing effort (1,000 hooks) for dolphins in the Hawaii shallow-set longline fishery, 2004-2024^a

Year	Observer Coverage (%)	Sets	Hooks	Bottlenose dolphin		Risso's dolphin		Rough-toothed dolphin		Short-beaked common dolphin		Striped dolphin		Pantropical spotted dolphin	
				Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks
2004	100	135	115,718	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2005	100	1,646	1,358,247	0	0.000	1	0.001	0	0.000	0	0.000	0	0.000	0	0.000
2006	100	850	676,716	1	0.001	2(1)	0.003	0	0.000	0	0.000	0	0.000	0	0.000
2007 ^b	100	1,569	1,353,761	3	0.002	3	0.002	0	0.000	0	0.000	0	0.000	0	0.000
2008	100	1,595	1,460,042	0	0.000	5(1)	0.003	0	0.000	0	0.000	1	0.001	0	0.000
2009	100	1,761	1,694,550	0	0.000	3(1)	0.002	0	0.000	0	0.000	0	0.000	0	0.000
2010	100	1,872	1,835,182	3	0.002	7	0.004	0	0.000	0	0.000	2(1)	0.001	0	0.000
2011	100	1,474	1,505,467	1	0.001	3	0.002	0	0.000	1 ^c	0.001	0	0.000	0	0.000
2012	100	1,364	1,476,969	1	0.001	0	0.000	0	0.000	0	0.000	1	0.001	0	0.000
2013	100	962	1,074,909	2(1)	0.002	4	0.004	1(1)	0.001	0	0.000	0	0.000	0	0.000
2014	100	1,338	1,470,683	4	0.003	5(2)	0.003	0	0.000	1	0.001	2	0.001	0	0.000
2015	100	1,156	1,274,805	2	0.002	3(2)	0.002	0	0.000	0	0.000	0	0.000	0	0.000
2016	100	727	796,165	1	0.001	2	0.003	0	0.000	0	0.000	2	0.003	0	0.000
2017	100	1,005	1,083,216	0	0.000	3	0.003	0	0.000	0	0.000	0	0.001	0	0.000
2018	100	420	486,013	1	0.002	1	0.002	0	0.000	0	0.000	0	0.000	0	0.000
2019	100	314	374,487	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2020	100	479	624,579	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2021	100	804	1,026,373	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2022	100	971	1,242,997	1	0.001	2	0.002	0	0.000	0	0.000	0	0.000	0	0.000
2023	100	909	1,139,864	2(1)	0.002	2(1)	0.002	0	0.000	0	0.000	0	0.000	1	0.001
2024	100	875	1,170,372	1	0.001	3 ^d	0.003	0	0.000	0	0.000	1	0.001	0	0.000

^a Take data based on interaction dates. Set and hook data based on haul begin date as a proxy for interaction date.^b Due to vessel confidentiality rules, data for the fourth quarter in 2007 are combined with data for 2008. Take data for 2007 reflect those from first, second and third quarters.^c Animal is identified as only a common dolphin in the Observer Program Status Report.^d One of the three observed Risso's dolphin was accompanied by a dependent calf, which will be counted as an additional take for purposes of estimating MSI in the SAR.Source: [2004-2020 PIRO Observer Program Annual and Quarterly Status Reports](#), PIRO Sustainable Fisheries Division unpublished data.

Table 52. Observed takes, mortalities (M), and takes per fishing effort (1,000 hooks) for small whales in the Hawaii shallow-set longline fishery, 2004-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Blainville's beaked whale		False killer whale		Kogia spp.		Cuvier's Beaked Whale		Ginkgo-toothed beaked whale	
				Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks
2004	100	135	115,718	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2005	100	1,646	1,358,247	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2006	100	850	676,716	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2007 ^b	100	1,569	1,353,761	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2008	100	1,595	1,460,042	0	0.000	1	0.001	1	0.001	0	0.000	0	0.000
2009	100	1,761	1,694,550	0	0.000	1	0.001	0	0.000	0	0.000	0	0.000
2010	100	1,872	1,835,182	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2011	100	1,474	1,505,467	1	0.001	1	0.001	0	0.000	0	0.000	0	0.000
2012	100	1,364	1,476,969	0	0.000	1	0.001	0	0.000	0	0.000	0	0.000
2013	100	962	1,074,909	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2014	100	1,338	1,470,683	0	0.000	1	0.001	0	0.000	0	0.000	1	0.001
2015	100	1,156	1,274,805	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2016	100	727	796,165	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2017	100	1,005	1,083,216	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2018	100	420	486,013	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2019	100	314	374,487	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2020	100	479	624,579	0	0.000	1	0.002	0	0.000	0	0.000	0	0.000
2021	100	804	1,026,373	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2022	100	971	1,242,997	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2023	100	909	1,139,864	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2024	100	875	1,170,372	0	0.000	0	0.000	0	0.000	1	0.001	0	0.000

^a Take data based on interaction dates. Set and hook data based on haul begin date as a proxy for interaction date.

^b Due to vessel confidentiality rules, data for the fourth quarter in 2007 are combined with data for 2008. Take data for 2007 reflect those from first, second and third quarters. Source: [2004-2020 PIRO Observer Program Annual and Quarterly Status Reports](#); PIRO Sustainable Fisheries Division unpublished data.

Table 53. Observed takes, mortalities (M), and takes per fishing effort (1,000 hooks) for large whales in the Hawaii shallow-set longline fishery, 2004-2024^a

Year	Observer Coverage (%)	Sets	Hooks	Bryde's whale		Humpback whale		Fin whale	
				Takes (M)	Takes/1,000 hooks	Takes (M)	Takes/1,000 hooks	Takes (M)	Takes/1,000 hooks
2004	100	135	115,718	0	0.000	0	0.000	0	0.000
2005	100	1,646	1,358,247	1	0.001	0	0.000	0	0.000
2006	100	850	676,716	0	0.000	1	0.001	0	0.000
2007 ^b	100	1,569	1,353,761	0	0.000	0	0.000	0	0.000
2008	100	1,595	1,460,042	0	0.000	1	0.001	0	0.000
2009	100	1,761	1,694,550	0	0.000	0	0.000	0	0.000
2010	100	1,872	1,835,182	0	0.000	0	0.000	0	0.000
2011	100	1,474	1,505,467	0	0.000	1	0.001	0	0.000
2012	100	1,364	1,476,969	0	0.000	0	0.000	0	0.000
2013	100	962	1,074,909	0	0.000	0	0.000	0	0.000
2014	100	1,338	1,470,683	0	0.000	0	0.000	0	0.000
2015	100	1,156	1,274,805	0	0.000	1	0.001	1	0.001
2016	100	727	796,165	0	0.000	0	0.000	0	0.000
2017	100	1,005	1,083,216	0	0.000	0	0.000	0	0.000
2018	100	420	486,013	0	0.000	0	0.000	0	0.000
2019	100	314	374,487	0	0.000	0	0.000	0	0.000
2020	100	479	624,579	0	0.000	0	0.000	0	0.000
2021	100	804	1,026,373	0	0.000	0	0.000	0	0.000
2022	100	971	1,242,997	0	0.000	0	0.000	0	0.000
2023	100	909	1,139,864	0	0.000	0	0.000	0	0.000
2024	100	875	1,170,372	0	0.000	1	0.001	0	0.000

^a Take data based on interaction dates. Set and hook data based on haul begin date as a proxy for interaction date.

^b Due to vessel confidentiality rules, data for the fourth quarter in 2007 are combined with data for 2008. Take data for 2007 reflect those from first, second and third quarters.

Source: [2004-2020 PIRO Observer Program Annual and Quarterly Status Reports](#); PIRO Sustainable Fisheries Division unpublished data.

Table 54. Observed takes, mortalities (M), and takes per fishing effort (1,000 hooks) for unidentified dolphins, beaked whales, and cetaceans in the Hawaii shallow-set longline fishery, 2004-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Unidentified dolphin ^b		Unidentified beaked whale		Unidentified cetacean ^b	
				Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks
2004	100	135	115,718	0	0.000	0	0.000	0	0.000
2005	100	1,646	1,358,247	0	0.000	0	0.000	0	0.000
2006	100	850	676,716	0	0.000	0	0.000	0	0.000
2007 ^c	100	1,569	1,353,761	0	0.000	0	0.000	0	0.000
2008	100	1,595	1,460,042	0	0.000	0	0.000	2	0.001
2009	100	1,761	1,694,550	0	0.000	0	0.000	0	0.000
2010	100	1,872	1,835,182	1	0.001	0	0.000	1	0.001
2011	100	1,474	1,505,467	0	0.000	1	0.001	1	0.001
2012	100	1,364	1,476,969	0	0.000	0	0.000	1	0.001
2013	100	962	1,074,909	0	0.000	2	0.002	0	0.000
2014	100	1,338	1,470,683	0	0.000	0	0.000	0	0.000
2015	100	1,156	1,274,805	0	0.000	0	0.000	0	0.000
2016	100	727	796,165	0	0.000	0	0.000	0	0.000
2017	100	1,005	1,083,216	0	0.000	0	0.000	0	0.000
2018	100	420	486,013	0	0.000	0	0.000	0	0.000
2019	100	314	374,487	0	0.000	0	0.000	0	0.000
2020	100	479	624,579	0	0.000	0	0.000	0	0.000
2021	100	804	1,026,373	0	0.000	1	0.001	0	0.000
2022	100	971	1,242,997	0	0.000	1	0.001	0	0.000
2023	100	909	1,139,864	0	0.000	1	0.001	1	0.001
2024	100	875	1,170,372	0	0.000	0	0.000	0	0.000

^a Take data based on interaction dates. Set and hook data based on haul begin date as a proxy for interaction date.

^b Unidentified species identification based on PIRO Observer Program classifications. Unidentified cetacean refers to a marine mammal not including pinnipeds (seal or sea lion), and for the purpose of this table, includes animals coded as unidentified whales; unidentified dolphin refers to a small cetacean with a visible beak; and unidentified beaked whale refers to an animal in the Ziphiidae family. Further classifications based on observer description, sketches, photos, and videos may be available from the PIFSC.

^c Due to vessel confidentiality rules, data for the fourth quarter in 2007 are combined with data for 2008. Take data for 2007 reflect those from first, second and third quarters.

Source: [2004-2020 PIRO Observer Program Annual and Quarterly Status Reports](#); PIRO Sustainable Fisheries Division unpublished data.

Table 55. Observed takes, mortalities (M), and takes per fishing effort (1,000 hooks) for pinnipeds in the Hawaii shallow-set longline fishery, 2004-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Northern elephant seal		Guadalupe fur seal		Unidentified pinniped		Unidentified sea lion		Unidentified seal		Unidentified fur seal	
				Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks
2004	100	135	115,718	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2005	100	1,646	1,358,247	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2006	100	850	676,716	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2007 ^b	100	1,569	1,353,761	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2008	100	1,595	1,460,042	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2009	100	1,761	1,694,550	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2010	100	1,872	1,835,182	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2011	100	1,474	1,505,467	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2012	100	1,364	1,476,969	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2013	100	962	1,074,909	1	0.001	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2014	100	1,338	1,470,683	1	0.001	0	0.000	0	0.000	1	0.001	0	0.000	0	0.000
2015	100	1,156	1,274,805	0	0.000	1	0.001	3 ^c	0.002	2 ^c	0.002	0	0.000	0	0.000
2016	100	727	796,165	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2017	100	1,005	1,083,216	0	0.000	3 ^c	0.003	0	0.000	0	0.000	0	0.000	0	0.000
2018	100	420	486,013	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2019	100	314	374,487	0	0.000	0	0.000	0	0.000	0	0.000	1	0.003	0	0.000
2020	100	479	624,579	0	0.000	7	0.011	0	0.000	0	0.000	0	0.000	2	0.003
2021	100	804	1,026,373	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2022	100	971	1,242,997	0	0.000	2(1)	0.002	1	0.001	0	0.000	0	0.000	0	0.000
2023	100	909	1,139,864	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
2024	100	875	1,170,372	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000

^a Take data based on interaction dates. Set and hook data based on haul begin date as a proxy for interaction date.^b Due to vessel confidentiality rules, data for the fourth quarter in 2007 are combined with data for 2008. Take data for 2007 reflect those from first, second and third quarters.^c The interactions with these pinnipeds and sea lions occurred off the California coast, outside the EEZ, while fishing under the Hawaii Longline Permit.Source: [2004-2020 PIRO Observer Program Annual and Quarterly Status Reports](#); PIRO Sustainable Fisheries Division unpublished data.

3.3.1.4.1 Comparison of Interactions with ITS

The 2019 Biological Opinion includes a 1-year ITS of 11 interactions and 9 mortalities with the Guadalupe fur seal. NMFS will monitor the ITSs for the Hawaii shallow-set longline fishery annually starting in January 2020 to track incidental take. NMFS uses the date of the interaction for tracking pinniped interactions against the ITS (Table 56) regardless of when the vessel returns to port. Prior to 2021, NMFS counted interactions based on vessel arrival dates in the PIRO Observer Program Quarterly and Annual Reports. For this reason, the number of annual interactions counted against an ITS may vary from those reported on the Observer Program's quarterly and annual reports. For the purpose of ITS tracking, NMFS uses the mortality rate estimate of 0.80 from the 2019 Biological Opinion to estimate the Guadalupe fur seal mortalities.

Table 56. Observed interactions and estimated total mortalities (M) of Guadalupe fur seals in the Hawaii shallow-set longline fishery compared to the 1-year ITS in the 2019 Biological Opinion^a

Species	1-year ITS Interactions (M)	Interactions (M)				
		2020	2021	2022	2023	2024
Guadalupe fur seal	11(9)	7(6)	0(0)	2(2)	0(0)	0(0)
Unidentified fur seal ^b	N/A	2(2)	0(0)	0(0)	0(0)	0(0)
Unidentified pinniped	N/A	0(0)	0(0)	1(1)	0(0)	0(0)

^a Takes are counted based on interaction date.

^b Unidentified fur seal interactions are also tracked as the ITS was based on interaction data that included unidentified pinniped species that may have been Guadalupe fur seals.

3.3.1.4.2 Comparison of Interactions with PBR under the MMPA

Marine mammal takes against the PBR are monitored through the SARs. A summary of the current mean annual M&SI and the PBR for stocks relevant to the Hawaii shallow-set longline fishery is presented in Table 57. The PBR of a stock reflects only marine mammals of that stock observed within the EEZ around Hawaii, with the exception of the Hawaii stock of humpback whales and Guadalupe fur seals for which PBR applies to the entire stock. The mean annual M&SI specified in the SARs includes only interactions determined as mortalities and serious injuries; it does not include interactions classified as non-serious injuries.

For marine mammal stocks where the PBR is available, the mean annual M&SI for the shallow-set longline fishery inside the EEZ around Hawaii is well below the corresponding PBR in the time period covered by the current SAR (Table 57).

Table 57. Summary of mean annual mortality and serious injury (M&SI) and potential biological removal (PBR) by marine mammal stocks with observed interactions in the Hawaii shallow-set longline fishery

Stock	Years Included in 2023 SAR	Outside EEZ ^a	Inside EEZ	
		Mean Annual M&SI	Mean Annual M&SI	PBR (Inside EEZ only) ^c
Bottlenose dolphin, HI Pelagic	2017-2021	1	0	158
Risso's dolphin, HI	2017-2021	0.8	0	53
Rough-toothed dolphin, HI	2017-2021	0	0	511
Striped dolphin, HI	2017-2021	0.2	0	511
Pantropical spotted dolphin, HI Pelagic	2017-2021	N/A	N/A	538
Blainville's beaked whale, HI	2014-2018	0	0	5.6
False killer whale, HI Pelagic	2017-2021	0	0.2	15
Short-finned pilot whale, HI	2017-2021	0	0	159
<i>Kogia</i> spp. whale (Pygmy or dwarf sperm whale), HI	2014-2018	Pygmy = 0 Dwarf = 0	Pygmy = 0 Dwarf = 0	Pygmy = 257 Dwarf = undetermined
Humpback whale, HI	2016-2020	0		127 ^b
Fin whale, HI	2014-2018	0	0	0.2
Guadalupe fur seal, CA	2013-2017	0.4		1,062 ^b

^a PBR estimates are not available for portions of the stock outside of the U.S. EEZ around Hawaii, except for the Central North Pacific stock of humpback whales for which PBR applies to the entire stock.

^b PBR and M&SI for the Hawaii stock for humpback whales and Guadalupe fur seals apply to the entire stock.

^c PBR estimates for Hawaii stocks are only available for portions of the stock within the U.S. EEZ around Hawaii.

Source: [Final 2023 Marine Mammal SARs](#).

3.3.1.5 SEABIRD INTERACTIONS IN THE HAWAII SHALLOW-SET LONGLINE FISHERY

Table 58 summarizes the incidental take data of seabirds from 2004 to 2024 in the Hawaii shallow-set longline fishery. Since there is full observer coverage for this fishery, the interactions in Table 58 represent fishery-wide totals.

Interaction data provided here may vary slightly from other sources depending on how interactions were reported (date of trip departure or arrival, set date, or haul date in any given year). The incidental take data in this section were compiled from the PIRO Observer Program Annual Status Reports and are for monitoring purposes. Many of these interactions have been further examined by NMFS, and updated information necessary for any data analyses is available from NMFS.

NMFS annually publishes the report Seabird Interactions and Mitigation Efforts in Hawaii Longline Fisheries (Seabird Annual Report), which includes verified numbers of seabird interactions and information on fishing regulations and effort, interaction rates, and band recovery data for seabirds caught in the shallow-set and deep-set fisheries. Recent reports are available at: <https://www.fisheries.noaa.gov/pacific-islands/bycatch/seabird-interactions-pelagic-longline-fishery>.

The majority of observed interactions and all mortalities during this time period involved Laysan albatrosses and black-footed albatrosses. The fishery has also had a small number of

interactions with shearwaters and a northern fulmar, all of which were released injured, and one interaction with an unidentified gull that was released dead. NMFS identified the shearwaters as sooty shearwaters (NMFS 2016). There have been no observed takes of short-tailed albatrosses by this fishery.

Table 58 shows an increase in takes of black-footed albatrosses 2008 through 2017. Black-footed albatross takes from 2018 to 2020 were lower, which may be explained by temporal patterns in interactions. In typical years, the majority of black-footed albatross interactions occur in the second quarter (April-June), but there was lower than average or no fishing effort in that quarter in 2018 through 2020. The shallow-set longline fishery was closed May-December 2018 and March-December 2019 and had limited effort in the second quarter in 2020 due to the COVID-19 pandemic. Laysan albatross interactions were also low in 2017-2018. Interaction rate data for 2018-2020 are therefore not directly comparable to other years in which the fishery operated throughout the year. In 2024, Laysan and black-footed albatross interactions were within the range of historical levels but the numbers include a total of 24 interactions (19 Laysan and 4 black-footed albatrosses) captured during the experimental study (see additional information below).

In the process of developing a regulatory amendment to modify seabird mitigation measures in the Hawaii deep-set longline fishery (see Section 3.3.2.5), the Council at the 185th meeting in March 2021 considered options for modifying the shallow-set longline fishery seabird mitigation measures. Based on input from its advisory bodies and industry representatives and because conditions differ in the shallow-set longline fishery as compared to the deep-set longline fishery, the Council recommended additional research under an Experimental Fishing Permit (EFP) and development of an appropriate combination of mitigation measures for the shallow-set longline fishery. The Council placed high priority on identifying a combination of mitigation measures that maintain effectiveness of seabird deterrence during dusk compared to the existing night-setting suite of measures, to provide operational flexibility in starting the setting operations before sunset. During 2024, a pilot study was conducted to test the efficacy of paired tori lines set prior to local sunset compared to night setting while using blue-dyed bait. The study was conducted under an EFP issued by NMFS to the Hawaii Longline Association in March 2022. The results showed that albatross captures were significantly more likely to occur on partial daylight tori line sets compared to night setting with blue-dyed bait (Chaloupka et al. 2024). The Council at the 200th meeting in September 2024 subsequently recommended further research to inform revision of seabird mitigation measures in the shallow-set longline fishery, including experimental trials evaluating: a) night setting with and without blue-dyed bait; and b) experimental trials to evaluate the efficacy of hook-shielding devices to enable partial daytime setting.

3.3.1.5.1 Comparison of Interactions with ITS

The short-tailed albatross ITS in the USFWS 2012 Biological Opinion for the Hawaii longline fishery is 1 incidental take every 5 years in the shallow-set fishery. Exceeding this number will lead to reinitiating consultation of the impact of this fishery on the species. Since there have been no observed takes of short-tailed albatrosses in the fishery, the ITS has not been exceeded as of the end of 2024.

Table 58. Observed takes, mortalities (M), and takes per fishing effort (1,000 hooks) for seabirds in the Hawaii shallow-set longline fishery, 2004-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Laysan Albatross		Black-footed Albatross		Northern fulmar		Unidentified shearwater		Unidentified gull		Short-tailed Albatross
				Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks	Takes (M)
2004	100	135	115,718	1	0.009	0	0.000	0	0.000	0	0.000	0	0.000	0
2005	100	1,646	1,358,247	62(18)	0.046	7(4)	0.005	0	0.000	0	0.000	0	0.000	0
2006	100	850	676,716	8(3)	0.0112	3(3)	0.004	0	0.000	0	0.000	0	0.000	0
2007 ^b	100	1,569	1,353,761	40(6)	0.030	8(2)	0.006	0	0.000	0	0.000	0	0.000	0
2008	100	1,595	1,460,042	33(11)	0.023	6(4)	0.004	0	0.000	0	0.000	0	0.000	0
2009	100	1,761	1,694,550	81(17)	0.048	30(7)	0.018	0	0.000	1 ^c	0.001	0	0.000	0
2010	100	1,872	1,835,182	40(7)	0.022	38(11)	0.021	1	0.001	0	0.000	0	0.000	0
2011	100	1,474	1,505,467	49(10)	0.033	19(5)	0.013	0	0.000	0	0.000	0	0.000	0
2012	100	1,364	1,476,969	62(11)	0.042	37(10)	0.025	0	0.000	0	0.000	0	0.000	0
2013	100	962	1,074,909	45(10)	0.042	28(17)	0.026	0	0.000	2 ^c	0.002	0	0.000	0
2014	100	1,338	1,470,683	39(2)	0.027	32(14)	0.022	0	0.000	1 ^c	0.001	0	0.000	0
2015	100	1,156	1,274,805	43(6)	0.034	38(10)	0.030	0	0.000	0	0.000	0	0.000	0
2016	100	727	796,165	25(3)	0.031	40(12)	0.050	0	0.000	0	0.000	0	0.000	0
2017	100	1,005	1,083,216	6(1)	0.006	53(20)	0.049	0	0.000	0	0.000	1(1)	0.001	0
2018	100	420	486,013	2	0.004	7(2)	0.014	0	0.000	0	0.000	0	0.000	0
2019	100	314	374,487	15(3)	0.040	19(5)	0.051	0	0.000	0	0.000	0	0.000	0
2020	100	479	624,579	26	0.042	5	0.008	1	0.002	0	0.000	0	0.000	0
2021	100	804	1,026,373	10(1)	0.010	45(11)	0.044	0	0.000	2	0.002	0	0.000	0
2022	100	971	1,242,997	38(5)	0.031	72(20)	0.057	0	0.000	0	0.000	0	0.000	0
2023	100	909	1,139,864	15(2)	0.011	23(4)	0.018	0	0.000	0	0.000	0	0.000	0
2024 ^d	100	875	1,170,372	54(23)	0.046	37(14)	0.032	0	0.000	0	0.000	0	0.000	0

^a Take and effort data are based on haul begin dates. ^b Due to vessel confidentiality rules, data for the fourth quarter in 2007 are combined with data for 2008. Take data for 2007 reflect those from first, second and third quarters. ^c These birds were later identified as sooty shearwaters in the NMFS Seabird Annual Report.

^d Observed interactions for 2024 include albatross interactions that occurred during EFP study.

Source: [2004-2020 PIRO Observer Program Annual and Quarterly Status Reports](#); PIRO Sustainable Fisheries Division unpublished data.

3.3.1.6 ELASMOBRANCH INTERACTIONS IN THE HAWAII SHALLOW-SET LONGLINE FISHERY

Table 59 summarizes the incidental take data of ESA-listed elasmobranchs from 2004 to 2024 in the Hawaii shallow-set longline fishery.

Oceanic whitetip sharks constitute the majority of the interactions. Observed oceanic whitetip shark interactions were substantially lower in 2004, 2006, 2018, and 2019 likely due to fishery closures. Spatial distribution of shallow-set fishing effort primarily overlaps with oceanic whitetip shark distribution (south of 30°N) in the summer months (May-June). Most of the oceanic whitetip sharks that are caught in the shallow-set fishery are released alive. Interactions in 2022 were the highest observed since 2011. Although it is premature to derive any theories on the factors driving the higher interaction rates, one possibility is the potential for increased spatial overlap of oceanic whitetip habitat with fishing effort due to warming oceans. Higher interaction rates may also be the result of potential increases in population density in the region because of international management measures prohibiting retention of the species through IATTC since 2011 and WCPFC since 2013 (WCPFC measure implemented under U.S. regulations in 2015), but these require further investigation.

Giant manta ray interactions with this fishery are rare. There were no observed interactions with scalloped hammerheads in the shallow-set fishery since 2004. Furthermore, there have been no recorded or observed take of scalloped hammerhead sharks in the range of the Eastern Pacific DPS in the shallow-set fishery. Based on the known range and likely occurrence for the Eastern Pacific DPS, it is unlikely that these sharks occur in the area where shallow-set fishing occurs.

Table 59. Observed and estimated interactions with elasmobranchs in the Hawaii shallow-set longline fishery, 2004-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Scalloped hammerhead shark		Oceanic whitetip shark		Giant manta ray	
				Takes (M ^b)	Takes/ 1,000 hooks	Takes (M ^b)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks
2004	100	135	115,718	0	0.0000	3	0.0259	0	0.0000
2005	100	1,646	1,358,247	0	0.0000	348(32)	0.2562	0	0.0000
2006	100	850	676,716	0	0.0000	1	0.0015	0	0.0000
2007	100	1,569	1,353,761	0	0.0000	98(7)	0.0724	5(2)	0.0037
2008	100	1,595	1,460,042	0	0.0000	48(8)	0.0329	0	0.0000
2009	100	1,761	1,694,550	1(1)	0.0006	53(13)	0.0313	0	0.0000
2010	100	1,872	1,835,182	0	0.0000	90(17)	0.0490	6	0.0033
2011	100	1,474	1,505,467	0	0.0000	78(9)	0.0518	3(2)	0.0020
2012	100	1,364	1,476,969	1(1)	0.0007	24(2)	0.0162	0	0.0000
2013	100	962	1,074,909	0	0.0000	27(2)	0.0251	0	0.0000
2014	100	1,338	1,470,683	0	0.0000	21(3)	0.0143	1	0.0007
2015	100	1,156	1,274,805	0	0.0000	22(2)	0.0173	0	0.0000
2016	100	727	796,165	0	0.0000	32(3)	0.0402	0	0.0000

Year	Obs. Cov. (%)	Sets	Hooks	Scalloped hammerhead shark		Oceanic whitetip shark		Giant manta ray	
				Takes (M ^b)	Takes/ 1,000 hooks	Takes (M ^b)	Takes/ 1,000 hooks	Takes (M)	Takes/ 1,000 hooks
2017	100	1,005	1,083,216	0	0.0000	29(1)	0.0268	2	0.0018
2018	100	420	486,013	0	0.0000	1(1)	0.0021	0	0.0000
2019	100	314	374,487	0	0.0000	0	0.0000	0	0.0000
2020	100	479	624,579	0	0.0000	13(1)	0.0208	0	0.0000
2021	100	804	1,026,373	0	0.0000	45(6)	0.0438	0	0.0000
2022	100	971	1,242,997	0	0.0000	54(7)	0.0434	3	0.0024
2023	100	909	1,139,864	0	0.0000	13	0.0114	0	0.0000
2024	100	875	1,170,372	0	0.0000	3	0.003	0	0.000

^a Take and effort data are based on haul begin dates.

^b Mortality numbers include sharks that were released dead or retained (prior to applicable prohibition on retention).

Source: PIRO Sustainable Fisheries Division unpublished data.

3.3.1.6.1 Comparison of Interactions with ITS

An ITS is not required to provide protective coverage for oceanic whitetip sharks and giant manta rays because there are no take prohibitions under ESA section 4(d) for these species.⁸ However, the 2019 Biological Opinion includes 1-year ITSs for oceanic whitetip sharks and giant manta rays to serve as a check on the no-jeopardy conclusion by providing a reinitiation trigger if the level of take analyzed in the Biological Opinion is exceeded.

NMFS will monitor the ITSs for the Hawaii shallow-set longline fishery annually starting in January 2020 to track incidental take. NMFS uses the date of the interaction (begin haul date) for tracking elasmobranch interactions against the ITS (Table 60) regardless of when the vessel returns to port. Prior to 2021, NMFS counted sea turtle interactions based on vessel arrival dates the PIRO Observer Program Quarterly and Annual Reports. For this reason, the number of annual interactions counted against an ITS may vary from those reported on the Observer Program's quarterly and annual reports. For the purpose of ITS tracking, NMFS uses the mortality rate estimates of 0.19 for oceanic whitetip sharks and 0.41 for large rays from the 2019 Biological Opinion to estimate mortalities.

Table 60. Observed interactions and estimated total mortalities (M) of oceanic whitetip shark and giant manta ray in the Hawaii shallow-set longline fishery compared to the 1-year ITS in the 2019 Biological Opinion^a

Species	1-year ITS Interactions (M)	Interactions (M ^c)				
		2020	2021	2022	2023	2024
Oceanic whitetip shark	102(32)	13(3)	45(13)	54(16)	13(2)	3(1)
Giant manta ray	13(4)	0(0)	0(0)	3(1)	0	0

⁸ On May 14, 2024, NMFS issued a proposed rule to issue protective regulations under section 4(d) which would apply to all of the prohibitions listed under sections 9(a)(1)(A) to 9(a)(1)(G) to oceanic whitetip sharks (89 FR 41917). The proposed rule has not been finalized.

<i>Manta/Mobula</i> ^b		1(0)	4(2)	0	1(0)	0

^a Takes are counted based on begin haul date.

^b 24.6% of manta/mobula interactions are also tracked as the ITS for giant manta ray was based on interaction data that included rays classified as manta/mobula in the observer record that may have been giant manta rays.

^c Mortality rates are from the 2019 Biological Opinion and are based on 2004-2018 interaction data.

3.3.2 HAWAII DEEP-SET LONGLINE FISHERY

3.3.2.1 INDICATORS FOR MONITORING PROTECTED SPECIES INTERACTIONS AND EFFECTIVENESS OF MANAGEMENT MEASURES IN THE HAWAII DEEP-SET LONGLINE FISHERY

In this annual report, the Council monitors protected species interactions in the Hawaii deep-set longline fishery using the following indicators:

- General interaction trends over time
- Effectiveness of FEP conservation measures
- Take levels compared to the incidental take statement levels under ESA
- Take levels compared to marine mammal PBRs, where applicable

3.3.2.1.1 Conservation Measures

The Pelagic FEP includes a number of conservation measures to mitigate seabird and sea turtle interactions in the deep-set longline fishery. These measures include the following:

- Longline vessel owners/operators are required to adhere to regulations for safe handling and release of sea turtles and seabirds.
- Longline vessel owners/operators must have on board the vessel all required turtle handling/dehooking gear specified in regulations.
- Longline vessel owners/operators are required to remove trailing gear from oceanic whitetip sharks and cut the line as close to the hook as possible.
- Deep-set fishing operations north of 23° N latitude are required to comply with seabird mitigation regulations, which include choosing between side-setting or stern-setting longline gear with additional regulatory specifications (e.g. weighted branch lines, using a tori line or bird scaring line, using a “bird curtain”).
- Vessel owners and operators are required to annually attend a protected species workshop.
- When deep-set longline fishing, the use of wire leaders is prohibited.

The final rule for the following regulatory amendment to the Pelagic FEP that affect conservation measures for the Hawaii deep-set longline fishery was issued on March 1, 2024 (89 FR 15062) and took effect on April 1, 2024:

- Replace blue-dyed thawed bait and strategic offal discharge measures required for stern-setting deep-set longline vessels with a new tori line requirement (Council final action in December 2021; see Section 3.3.2.5 of this report for more information).

In 2024, the Council initiated development of a regulatory amendment to the Pelagic FEP that would implement a crew training requirement for Hawaii and American Samoa longline fisheries. PIRO Sustainable Fisheries Division, in coordination with the Hawaii Longline Association, PIRO Protected Resources Division, and the Council initiated a one-year pilot

crew training program in April 2024. The Council is scheduled to consider final action on the regulatory amendment at the 203rd Council in June 2025.

3.3.2.1.2 ESA Consultations

A USFWS Biological Opinion dated January 6, 2012, concluded that the fishery is not likely to jeopardize short-tailed albatrosses (USFWS 2012). This Biological Opinion remains valid.

On May 18, 2023, NMFS issued a Biological Opinion covering all applicable ESA-listed species, which concluded that the fishery is not likely to jeopardize the following species: giant manta ray; Indo-West Pacific scalloped hammerhead shark; oceanic whitetip shark; Central North Pacific, East Indian-West Pacific, East Pacific, Southwest Pacific, Central West Pacific and Central South Pacific green sea turtles; leatherback sea turtles; North Pacific loggerhead sea turtles; olive ridley sea turtles, sperm whale, and main Hawaiian Islands insular false killer whale. The new ITSs took effect when the new Biological Opinion was signed. The new ITS has a 5-year term and all captures in 2023 will count towards the first year of the term, although captures prior to the date on the 2023 Biological Opinion signature are exempted under the previous biological opinion.

NMFS and USFWS have issued ITSs for species included in the Biological Opinions and determined these levels of take would not jeopardize the species (Table 62). Exceedance of the ITSs requires reinitiation of consultation on the fishery under the ESA.

Table 61. Summary of ESA consultations for the Hawaii deep-set longline fishery

Species or DPS	Consultation Date	Consultation Type ^a	Outcome ^b
Loggerhead turtle, North Pacific DPS	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Leatherback turtle	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Olive ridley turtle (all species or DPS)	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Green turtle (all species or DPS)	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Giant manta ray	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Oceanic whitetip shark	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Scalloped hammerhead shark, Indo-West Pacific DPS	2023-05-18 ^c	BiOp	LAA, non-jeopardy
False killer whale, MHI insular DPS	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Sperm whale	2023-05-18 ^c	BiOp	LAA, non-jeopardy
Fin whale	2023-05-18 ^c	BiOp	NLAA
Blue whale	2023-05-18 ^c	BiOp	NLAA
North Pacific right whale	2023-05-18 ^c	BiOp	NLAA
Sei whale	2023-05-18 ^c	BiOp	NLAA
Mexican humpback whale	2023-05-18 ^c	BiOp	NLAA
Southern Resident killer whale	2023-05-18 ^c	BiOp	NLAA
Hawaiian monk seal	2023-05-18 ^c	BiOp	NLAA
Scalloped hammerhead shark, Eastern Pacific DPS	2023-05-18 ^c	BiOp	NLAA
Hawksbill turtle	2023-05-18 ^c	BiOp	NLAA

Species or DPS	Consultation Date	Consultation Type ^a	Outcome ^b
Loggerhead turtle, south Pacific DPS	2023-05-18 ^c	BiOp	NLAA
Listed fishes and invertebrate species ^d	2023-05-18 ^c	BiOp	NLAA
Short-tailed albatross	2012-01-06	BiOp (FWS)	LAA, non-jeopardy
Critical Habitat	Consultation Date	Consultation Type ^a	Outcome ^b
Main Hawaiian Islands insular false killer whale	2023-05-18 ^c	BiOp	NLAA
Steller sea lion	2023-05-18 ^c	BiOp	NLAA
Hawaiian monk seal	2023-05-18 ^c	BiOp	NLAA
Leatherback sea turtle	2023-05-18 ^c	BiOp	NLAA
Listed fishes and invertebrate species ^e	2023-05-18 ^c	BiOp	NLAA

^a BiOp = Biological Opinion.

^b LAA = likely to adversely affect; NLAA = not likely to adversely affect.

^c With correction to the Incidental Take Statement Table in the Hawaii Deep-set Longline Fishery Biological Opinion on May 22, 2023.

^d Listed fish and invertebrate species = Central Coast coho, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, California coast steelhead, California Central Valley and southern California coast steelhead, Southern North American green sturgeon, Corals, Black and white abalone

^e Critical habitat for listed fish and invertebrate species = Central Coast coho, Sacramento River winter-run Chinook salmon, California coast steelhead, Southern North American green sturgeon, Black abalone

Table 62. Summary of ITSs for the Hawaii deep-set longline fishery

Species	ITS Time Period	Takes	Source BiOp
Loggerhead turtle, North Pacific DPS	5-year running sum	43	NMFS 2023
Leatherback turtle	5-year running sum	92	NMFS 2023
Olive ridley turtle (all species or DPS)	5-year running sum	592	NMFS 2023
Green turtle (all species or DPS)	5-year running sum	77	NMFS 2023
Sperm whale	5-year running sum	6	NMFS 2023
False killer whale (MHI insular DPS)	5-year running sum	0.427 or 1 observed	NMFS 2023
Scalloped hammerhead shark (Indo-West Pacific DPS) ^a	5-year running sum	14	NMFS 2023
Oceanic whitetip shark ^a	5-year running sum	10,589	NMFS 2023
Giant manta ray ^a	5-year running sum	181	NMFS 2023
Short-tailed albatross	5-year	2	USFWS 2012

^a An ITS is not required due to the lack of take prohibition under ESA section 4(d), but NMFS included an ITS to serve as a check on the no-jeopardy conclusion by providing a reinitiation trigger.

3.3.2.1.3 Non-ESA Marine Mammals

Fishery impacts to marine mammal stocks are primarily assessed and monitored through the SARs prepared pursuant to the MMPA. The SARs include detailed information on these species' geographic range, abundance, PBR estimates, bycatch estimates, and status. The most recent SARs are available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>.

The Hawaii deep-set longline fishery is a Category I fishery under the MMPA 2024 LOF (89 FR 12257, February 16, 2024), meaning that NMFS has determined that this fishery has frequent incidental mortality and serious injuries of marine mammals. The 2024 LOF lists the following marine mammal stocks that are incidentally killed or injured in this fishery:⁹

- Bottlenose dolphin, HI Pelagic stock
- False killer whale, MHI Insular stock (also ESA-listed)
- False killer whale, HI Pelagic stock
- False killer whale, NWHI stock
- *Kogia* spp. (Pygmy or dwarf sperm whale), HI stock
- Risso's dolphin, HI stock
- Rough-toothed dolphin, HI stock
- Short-finned pilot whale, HI stock

Most bycatch estimates in the SARs are based on the most recently available 5-year period, but there is a data lag of approximately 2 years due to the SAR review process. This annual report focuses on available long-term interaction trends and summarizes relevant information from the most recent SAR.

3.3.2.2 DATA SOURCE FOR MONITORING PROTECTED SPECIES INTERACTIONS IN THE HAWAII DEEP-SET LONGLINE FISHERY

Protected species interactions in the Hawaii longline fishery have been monitored through mandatory observer coverage since 1994. Observer coverage in the Hawaii longline fishery was between 3 and 5 percent from 1994 through 1999, increased to 10 percent in 2000, then to 20 percent in 2001.

In response to the emerging COVID-19 crisis, and to ensure the safety and protect the health of fishermen, observers, and others, NMFS issued an emergency action on March 27, 2020 (85 FR 17285), to provide the authority, on a case-by-case basis, to waive observer coverage. This action was extended on September 21, 2020 (85 FR 59199) and again on March 29, 2021 (86 FR 16307). Under this emergency action, a NMFS Regional Administrator, Office Director, or Science Center Director had the ability to waive observer coverage requirements if:

- Local, state, or national governments, or private companies or organizations that deploy observers pursuant to NMFS regulations, restrict travel or otherwise issue COVID-19-related social control guidance, or requirement(s) addressing COVID-19-related concerns, such that it is inconsistent with the requirement(s) or not recommended to place an observer(s); or
- No qualified observer(s) are available for placement due to health, safety, or training issues related to COVID-19.

The PIRO Regional Administrator granted waivers on a case-by-case basis consistent with the emergency rule resulting in reduced annual coverage for the Hawaii deep-set longline fishery for 2020 and 2021 at 15.25% and 17.84% respectively. Observer coverage was also variable in 2020 ranging from 7.7% to 18.2% in a quarter. While 2021 saw an improved

⁹ This fishery is listed in the LOF under Commercial Fisheries in the Pacific Ocean and Commercial Fisheries on the High Seas. Stocks from both lists are included here.

coverage rate and less coverage variability (14.3% to 21.1% in a quarter), fleet-wide interaction estimates for 2021 may still have greater uncertainty than usual. Annual observer coverage rate returned to 20.2% in 2022. NMFS reduced observer coverage in the Hawaii deep-set longline fishery from 20 to 15% in October of 2023 and again reduced coverage to 13% in April of 2024 due to increased program costs. NMFS is evaluating options to manage observer efforts moving forward, including assessing alternative long-term options such as electronic technologies to supplement monitoring and collecting fishery data. Annual coverage in 2024 was 13.4%.

This report summarizes protected species interactions in the Hawaii deep-set longline fishery since 2002, when separate reporting by deep-set and shallow-set components of the longline fishery began. Annual observed interactions are tallied based on vessel arrival date (rather than interaction date) for the purposes of this report for consistency with the methods used to estimate the annual total interactions. Comparison of annual incidental takes within a year to the ITSs are based on the interaction date rather than the vessel arrival date, consistent with the 2023 BiOp. Annual summary data presented in this report may differ from those in the PIRO Observer Program Quarterly and Annual Reports, which began summarizing interaction data by haul begin dates (proxy for interaction date) in 2021.

3.3.2.3 SEA TURTLE INTERACTIONS IN THE HAWAII DEEP-SET LONGLINE FISHERY

Table 63 summarizes the incidental take data of sea turtles from 2002 to 2024 in the Hawaii deep-set longline fishery. The incidental take data in this section were compiled from the PIRO Observer Program Annual Status Reports through 2020 and from PIRO Sustainable Fisheries Division unpublished data beginning in 2021 and are for monitoring purposes. Many of these interactions have been further examined by NMFS, and updated information necessary for any data analyses is available from PIFSC. Observed take data are expanded to represent the estimated number of incidental takes for the entire fishery by PIFSC (referred to in this document as “McCracken estimates (ME)”). When ME are not available, a standard expansion factor estimate is used ($EF\ Est. = 100 / \% \text{ observer coverage} * \# \text{ takes}$).

Observed sea turtle takes year to year were variable. The most commonly observed sea turtle species being olive ridley sea turtles, whereas interactions with leatherbacks, greens, and loggerheads were much less frequent.

Preliminary results from an analysis conducted by PIFSC and presented to the Scientific and Statistical Committee at its 122nd Meeting in March 2016 showed that leatherback interactions in 2014 were significantly higher than levels expected from previous years (2007-2013). The higher level of interactions in 2014 was considered in the 2014 Biological Opinion, which concluded that the fishery is not likely to jeopardize leatherback turtles. Leatherback interactions, since the 2014 Biological Opinion, remain below the ITS. The Council at its 165th Meeting in March 2016 recommended continued monitoring of the interactions and further analysis to evaluate patterns of leatherback interactions in the Hawaii deep-set longline fishery. Leatherback turtle interactions in 2017-2019 were lower than 2014-2015. Observed interactions in 2024 were the same as 2014, but the estimated total interactions was the highest since 2002 due to the lower observer coverage rate and higher effort in 2024 compared to 2014. The higher leatherback turtle interactions in 2024 appear to be in part associated with the spatial distribution of fishing effort, with a higher proportion of

overall effort occurring south of the MHI than in typical years. A Pelagic Plan Team Working Group is currently evaluating the factors affecting the decline in target catch (bigeye tuna) CPUE over the last decade, which may provide further understanding of the spatial effort patterns in recent years.

The highest number of observed olive ridley interactions occurred in 2016 with 31 takes. This was followed by three years of high olive ridley interactions with 26, 18, and 29 interactions in 2017, 2018, and 2019, respectively. Interactions in 2020-2023 were within the range observed prior to 2016. Due to the depth of the deep-set longline gear, most of the interactions result in mortalities. The higher level of olive ridley turtle interactions was considered in the 2023 Biological Opinion, which concluded that the fishery is not likely to jeopardize olive ridley turtles after considering this higher level of interaction. The Council's Protected Species Advisory Committee at its March 2017 meeting discussed the olive ridley turtle interaction trend and recommended evaluation of the increasing trend in conjunction with the previously recommended effort to evaluate ecosystem factors influencing bycatch in the longline fishery. This recommendation led to a collaborative ecosystem-based fisheries management project between Council, PIFSC, PIRO and University of Florida to develop a protected species ensemble random forest (PSERF) model. Additional information on this effort is included in Section 4.1.

Top variables for defining olive ridley turtle interaction determined using the PSERF model indicate an influence of mean wind direction and shows that SW-W-NW winds seem to have higher probability of interactions than normal. Eddy-based features such as Okubo-Weiss (negative values indicate vorticity dominated regions e.g., eddies), eddy kinetic energy (positive values indicate high eddy activity) and current speed also seems to have higher than average probability of interactions. Together, these seem to indicate that features that result in higher turtle movement rates (wind, currents) or aggregate turtles (eddies) increase the probability of interactions with olive ridley turtles. Aggregate mean characteristics from the fishing sets indicate that for sets from 2015-2019, higher eddy activity, higher current speeds, and winds blowing from the west-southwest increased whereas these conditions waned after 2020.

Table 63. Observed takes, mortalities (M), takes per fishing effort (1,000 hooks), and estimated annual takes using expansion factor estimates and ME for sea turtles in the Hawaii deep-set longline fishery, 2002-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Green				Leatherback				Loggerhead				Olive ridley				Unidentified hard shell			
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks						
2002	24.6	3,523	6,786,303	1(1)	0.0001	-	3	2	0.0003	-	5	4(1)	0.0006	-	17	7(7)	0.0010	-	31	0	0.0000	-	-
2003	22.2	3,204	6,442,221	0	0.0000	-	0	1(1)	0.0002	-	4	0	0.0000	-	0	3(3)	0.0005	-	14	0	0.0000	-	-
2004	24.6	3,958	7,900,681	1(1)	0.0001	-	5	3	0.0004	-	15	0	0.0000	-	0	13(13)	0.0016	-	46	0	0.0000	-	-
2005	26.1	4,602	9,360,671	0	0.0000	-	0	1	0.0001	-	4	0	0.0000	-	0	4(4)	0.0004	-	16	0	0.0000	-	-
2006	21.2	3,605	7,540,286	2(2)	0.0003	-	6	2(2)	0.0003	-	9	0	0.0000	-	0	11(10)	0.0015	-	54	0	0.0000	-	-
2007	20.1	3,506	7,620,083	0	0.0000	-	0	2	0.0003	-	4	1(1)	0.0001	-	7	7(7)	0.0009	-	26	0	0.0000	-	-
2008	21.7	3,915	8,775,951	0	0.0000	-	0	1	0.0001	-	11	0	0.0000	-	0	3(3)	0.0003	-	18	0	0.0000	-	-
2009	20.6	3,520	7,877,861	0	0.0000	-	0	1(1)	0.0001	-	4	0	0.0000	-	0	4(4)	0.0005	-	18	0	0.0000	-	-
2010	21.1	3,580	8,184,127	1(1)	0.0001	-	1	1(1)	0.0001	-	6	1(1)	0.0001	-	6	4(3) ^b	0.0005	-	10	0	0.0000	-	-
2011	20.3	3,540	8,260,092	1(1)	0.0001	-	5	3	0.0004	-	14	0	0.0000	-	0	7(6)	0.0008	-	36	0	0.0000	-	-
2012	20.4	3,659	8,768,728	0	0.0000	-	0	1(1)	0.0001	-	6	0	0.0000	-	0	6(6)	0.0007	-	34	0	0.0000	-	-
2013	20.4	3,830	9,278,133	1(1)	0.0001	-	5	3	0.0003	-	15	2(2)	0.0002	-	11	9(9)	0.0010	-	42	0	0.0000	-	-
2014	20.8	3,831	9,608,244	3(3)	0.0003	-	16	7(2)	0.0007	-	38	0	0.0000	-	0	8(7)	0.0008	-	50	0	0.0000	-	-
2015	20.6	3,728	9,393,234	1(1)	0.0001	-	4	4(2)	0.0004	-	18	2(2)	0.0002	-	9	13(12)	0.0014	-	69	0	0.0000	-	-
2016	20.1	3,880	9,872,439	1(1)	0.0001	-	5	3(1)	0.0003	-	15	2(1)	0.0002	-	7	31(28)	0.0031	-	162	1(1)	0.0001	-	5
2017	20.4	3,832	10,148,195	3(1)	0.0003	-	18	0	0.0000	-	0	3	0.0003	-	12	26(23)	0.0026	-	119	0	0.0000	-	-
2018	20.4	4,332	11,751,144	3(3)	0.0003	-	17	2	0.0002	-	12	1(1)	0.0001	-	4	18(16)	0.0015	-	96	0	0.0000	-	-
2019	20.5	4,697	12,948,077	2(2)	0.0002	-	12	3	0.0002	-	14	0	0.0000	-	0	29(28)	0.0022	-	138	0	0.0000	-	-
2020	15.25	3,131	8,738,011	2(2)	0.0002	-	13	4	0.0005	-	31	3(1)	0.0003	-	19	11(9)	0.0013	-	79	0	0.0000	-	-
2021	17.84	3,972	11,454,331	3(3)	0.0003	-	17	1	0.0001	-	8	1	0.0001	-	5	7(5)	0.0006	-	46	0	0.0000	-	-
2022	20.22	4,314	12,473,293	1(1)	0.0001	-	6	5	0.0004	-	24	3	0.0002	-	19	10(8)	0.0008	-	49	0	0.0000	-	-
2023	17.41	3,807	10,988,431	2(2)	0.0002	-	10	4	0.0004		19	0	0.0000	-	0	12(11)	0.0011	-	68	1(1)	0.0001	-	7
2024	13.35	2,796	8,174,744	1(1)	0.0001	7	-	7(4)	0.0009	52	-	0	0.0000	0	-	12(12)	0.0015	90	-	0	0.0000	0	-

^a Take and effort data are based on vessel arrival dates. ^b One olive ridley turtle interaction (released injured) occurred inside the American Samoa EEZ. This interaction was included in the Observer Program Annual Report for the Hawaii deep-set fishery because the vessel departed Honolulu under the Hawaii longline permit. Sources: Take data—[2002-2020 PIRO Observer Program Annual and Quarterly Status Reports](#), PIRO Sustainable Fisheries Division unpublished data. Expansion estimates for 2002-2003, NMFS 2005.ME—[McCracken, 2005](#); [McCracken, 2006](#); [McCracken, 2007](#); [McCracken, 2008](#); [McCracken, 2009](#); [McCracken, 2010](#); [McCracken, 2011b](#); [McCracken, 2012](#); [McCracken, 2013](#); [McCracken, 2014](#); [McCracken 2017c](#), [McCracken 2017d](#), [McCracken 2019b](#), [McCracken 2019d](#), [McCracken and Cooper 2020a](#), [McCracken and Cooper \(in review\)](#).

3.3.2.3.1 Comparison of Interactions with ITS

The 2023 Biological Opinion includes ITSs for sea turtle species based on the maximum 5-year running sum for each species (Table 64). The new ITS went into effect May 18, 2023. For the purposes of monitoring the ITS, all captures in 2023 will count towards the first year of the 5-year term. Exceeding the maximum 5-year running sum within any 5 or fewer consecutive years will lead to reinitiating consultation of the impact of this fishery on these species.

NMFS uses the interaction date for tracking sea turtle interactions against the ITS, regardless of vessel arrival date. Prior to 2021, NMFS in its PIRO Observer Program Quarterly and Annual Reports counted sea turtle interactions based on vessel arrival dates. For this reason, the number of quarterly or annual sea turtle interactions counted against an ITS may vary from those reported on the Observer Program’s quarterly and annual reports.

Table 64. Estimated total interactions (extrapolated using quarterly observer coverage) of sea turtles in the Hawaii deep-set longline fishery compared to the 5-year running sum ITS in the 2024 Biological Opinion^a

Species	5-year running sum ITS Interactions	Estimated Total Interactions and Mortalities	
		2023	2024
Leatherback turtle	92	23(8)	51(22)
Green turtle	77	10(10)	8(8)
Loggerhead turtle	43	0	0
Olive ridley turtle (all species or DPS)	592	63(60)	89(84)

^a Takes are counted based on interaction date.

3.3.2.4 MARINE MAMMAL INTERACTIONS IN THE HAWAII DEEP-SET LONGLINE FISHERY

Table 65 through Table 68 summarize the incidental take data of marine mammals from 2002 to 2023 in the Hawaii deep-set longline fishery. The incidental take data in this section were compiled from the PIRO Observer Program Annual Status Reports and are for monitoring purposes. Reported interactions listed in these tables reflect all observed interactions, including mortalities, serious injuries, and non-serious injuries. Refer to the most recent SARs for mortality and serious injury estimates and stock-specific abundance estimates and geographic range. Many of these interactions have been further examined, and updated information necessary for any data analyses is available from PIFSC. Observed take data are expanded to represent the estimated number of annual incidental takes for the entire fishery by PIFSC (referred to in this document as “ME”). When ME are not available, a standard expansion factor estimate is listed in the table (EF Est. = 100 / % observer coverage * # takes).

The majority of observed interactions and all observed mortalities since 2002 involved dolphin and small whale species. False killer whales also had the highest interaction rate over the entire 2002-2024 period, with the highest number of observed interactions occurring in 2019 and 2021. Short-finned pilot whales, bottlenose dolphins, Risso’s dolphins, and rough-

toothed dolphins are also occasionally observed, but in 2024, only one Risso's dolphin and no short-finned pilot whales or bottlenose dolphin interactions were observed. Similar to 2020, rough-toothed dolphin interactions were higher in 2024 compared to other years, which is notable given that observer coverage rate was the lowest in 2024. All 2024 rough-toothed dolphin observed interactions occurred in the second half of the year and north of the MHI along the EEZ boundary, with two pairs of interactions occurring one to three days apart. These patterns suggest a clustering of interactions in space and time. Very few interactions were observed with striped dolphins, pantropical spotted dolphins, Blainville's beaked whales, pygmy killer whales, and *Kogia* spp. whales. Interactions with marine mammals grouped as large whales were also rare, with observed interactions recorded with humpback whales and one sperm whale in 2011 (Table 67). Observed interactions with unidentified cetacean groups are shown in Table 68. In 2024, there were two observed unidentified cetacean interactions.

Table 65. Observed takes, mortalities (M), takes per fishing effort (1,000 hooks), and estimated annual takes using expansion factor estimates and ME for dolphins in the Hawaii deep-set longline fishery, 2002-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Bottlenose dolphin				Pantropical spotted dolphin				Rough-toothed dolphin				Risso's dolphin				Striped dolphin			
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks		
2002	24.6	3,523	6,786,303	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-
2003	22.2	3,204	6,442,221	1(1)	0.0002	5	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-
2004	24.6	3,958	7,900,681	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	0	-
2005	26.1	4,602	9,360,671	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	0	-	1	0.0001	-	3	0	0.0000	0	-
2006	21.2	3,605	7,540,286	1	0.0001	-	1	0	0.0000	-	0	0	0.0000	0	-	2	0.0003	-	5	1(1)	0.0001	-	6
2007	20.1	3,506	7,620,083	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	0	-	1(1)	0.0001	-	3	0	0.0000	-	0
2008	21.7	3,915	8,775,951	0	0.0000	-	0	1(1)	0.0001	-	3	0	0.0000	0	-	1	0.0001	-	2	0	0.0000	-	0
2009	20.6	3,520	7,877,861	1	0.0001	-	5	0	0.0000	-	0	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	-	0
2010	21.1	3,580	8,184,127	1	0.0001	-	4	0	0.0000	-	0	0	0.0000	-	0	1	0.0001	-	3	0	0.0000	-	0
2011	20.3	3,540	8,260,092	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	1(1)	0.0001	-	4
2012	20.4	3,659	8,768,728	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2013	20.4	3,830	9,278,133	2(1)	0.0002	-	11	0	0.0000	-	0	1(1)	0.0001	-	5	0	0.0000	-	0	0	0.0000	-	0
2014	20.8	3,831	9,608,244	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2015	20.6	3,728	9,393,234	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	2(1)	0.0002	-	10	0 ^b	0.0000	-	4 ^b
2016	20.1	3,880	9,872,439	1	0.0001	-	5	0	0.0000	-	0	1(1)	0.0001	-	5	0	0.0000	-	0	0	0.0000	-	0
2017	20.4	3,832	10,148,195	1	0.0001	-	7	0	0.0000	-	0	0	0.0000	-	0	1	0.0001	-	5	0	0.0000	-	0
2018	20.4	4,332	11,751,144	1	0.0001	-	3	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2019	20.5	4,697	12,948,077	0	0.0000	-	0	0	0.0000	-	0	1	0.0001	-	4	1(1)	0.0001	-	7	0	0.0000	-	0
2020	15.25	3,131	8,738,011	1	0.0001	-	10	0	0.0000	-	0	5(2)	0.0006	-	29	2	0.0002	-	16	0	0.0000	-	0
2021	17.84	3,972	11,454,331	3	0.0003	17	-	0	0.0000	0	-	2(1)	0.0002	11	-	0	0.0000	0	-	0	0.0000	0	-
2022	20.22	4,314	12,473,293	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	1	0.0001	5	-	0	0.0000	0	-
2023	17.41	3,807	10,988,431	0	0.0000	0	-	0	0.0000	0	-	2	0.0002	11	-	1	0.0001	6	-	0	0.0000	0	-
2024	13.35	2,796	8,174,744	0	0.0000	0	-	0	0.0000	0	-	6(1)	0.0007	45	-	1	0.0001	7	-	0	0.0000	0	-

^a Take and effort data are based on vessel arrival dates.

^b One unidentified dolphin was later identified as a striped dolphin but is listed as an unidentified dolphin in the 2015 Annual Observer Report.

Source: Take data—[2002-2020 PIRO Observer Program Annual and Quarterly Status Reports](#), PIRO Sustainable Fisheries Division unpublished data.

ME—(McCracken 2005, 2006, 2011a, 2016, 2017a, 2019b; McCracken and Cooper 2022a)

Table 66. Observed takes, mortalities (M), takes per fishing effort (1,000 hooks), and estimated annual takes using expansion factor estimates and ME for small whales in the Hawaii deep-set longline fishery, 2002-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Blainville's beaked whale				False killer whale				Kogia spp.				Pygmy killer whale				Short-finned pilot whale			
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks		
2002	24.6	3,523	6,786,303	1(1)	0.0001	4	-	5	0.0007	20	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-
2003	22.2	3,204	6,442,221	0	0.0000	0	-	2	0.0003	9	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-
2004	24.6	3,958	7,900,681	0	0.0000	-	0	6(1)	0.0008	-	28	0	0.0000	0	-	0	0.0000	0	-	1	0.0001	-	3
2005	26.1	4,602	9,360,671	1	0.0001	-	6	2(1)	0.0002	-	6	0	0.0000	0	-	0	0.0000	0	-	1	0.0001	-	6
2006	21.2	3,605	7,540,286	0	0.0000	-	0	4	0.0005	-	17	0	0.0000	0	-	0	0.0000	0	-	2	0.0003	-	6
2007	20.1	3,506	7,620,083	0	0.0000	-	0	4	0.0005	-	15	0	0.0000	0	-	0	0.0000	0	-	1	0.0001	-	2
2008	21.7	3,915	8,775,951	0	0.0000	-	0	3	0.0003	-	11	0	0.0000	0	-	0	0.0000	0	-	3	0.0003	-	5
2009	20.6	3,520	7,877,861	0	0.0000	-	0	10(1)	0.0013	-	55	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	-	0
2010	21.1	3,580	8,184,127	0	0.0000	-	0	4	0.0005	-	19	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2011	20.3	3,540	8,260,092	0	0.0000	-	0	3	0.0004	-	10	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2012	20.4	3,659	8,768,728	0	0.0000	-	0	3	0.0003	-	15	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2013	20.4	3,830	9,278,133	0	0.0000	-	0	4	0.0004	-	22	0	0.0000	-	0	1(1)	0.0001	-	5	1(1)	0.0001	-	4
2014	20.8	3,831	9,608,244	0	0.0000	-	0	11	0.0011	-	55	1	0.0001	-	10	0	0.0000	-	0	0	0.0000	-	0
2015	20.6	3,728	9,393,234	0	0.0000	-	0	5(1)	0.0005	-	21	0	0.0000	-	0	0	0.0000	-	0	1	0.0001	-	4
2016	20.1	3,880	9,872,439	0	0.0000	-	0	7	0.0007	-	39	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2017	20.4	3,832	10,148,195	0	0.0000	-	0	8(2)	0.0008	-	45	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2018	20.4	4,332	11,751,144	0	0.0000	-	0	12	0.0010	-	49	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2019	20.5	4,697	12,948,077	0	0.0000	-	0	15(3)	0.0012	-	75	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	0
2020	15.25	3,131	8,738,011	0	0.0000	-	0	4	0.0005	-	22	1	0.0001	-	4	0	0.0000	-	0	0	0.0000	-	0
2021	17.84	3,972	11,454,331	0	0.0000	0	-	15(2)	0.0013	-	81	0	0.0000	0	-	0	0.0000	0	-	1	0.0000	6	-
2022	20.22	4,314	12,473,293	0	0.0000	0	-	7	0.0006	-	45	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-
2023	17.41	3,807	10,988,431	0	0.0000	0	-	6	0.0006	-	35	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-
2024	13.35	2,796	8,174,744	0	0.0000	0	-	4	0.0005	30	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-

^a Take and effort data are based on vessel arrival dates.

Source: Take data—[2002-2020 PIRO Observer Program Annual and Quarterly Status Reports](#); PIRO Sustainable Fisheries Division unpublished data

ME—(McCracken 2005, 2006, 2011b, 2016, 2017a, 2019b; McCracken and Cooper 2022b; Cooper and McCracken 2025)

Table 67. Observed takes, takes per fishing effort (1,000 hooks), and estimated annual takes using expansion factor estimates and ME for large whales in the Hawaii deep-set longline fishery, 2002-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Humpback whale				Sperm whale			
				Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes	Takes/1,000 hooks			Takes	Takes/1,000 hooks		
2002	24.6	3,523	6,786,303	1	0.0001	4	-	0	0.0000	0	-
2003	22.2	3,204	6,442,221	0	0.0000	0	-	0	0.0000	0	-
2004	24.6	3,958	7,900,681	1	0.0001	-	6	0	0.0000	-	0
2005	26.1	4,602	9,360,671	0	0.0000	-	0	0	0.0000	-	0
2006	21.2	3,605	7,540,286	0	0.0000	-	0	0	0.0000	0	-
2007	20.1	3,506	7,620,083	0	0.0000	-	0	0	0.0000	0	-
2008	21.7	3,915	8,775,951	0	0.0000	-	0	0	0.0000	0	-
2009	20.6	3,520	7,877,861	0	0.0000	-	0	0	0.0000	0	-
2010	21.1	3,580	8,184,127	0	0.0000	-	0	0	0.0000	-	0
2011	20.3	3,540	8,260,092	0	0.0000	-	0	1	0.0001	-	6
2012	20.4	3,659	8,768,728	0	0.0000	-	0	0	0.0000	-	0
2013	20.4	3,830	9,278,133	0	0.0000	-	0	0	0.0000	-	0
2014	20.8	3,831	9,608,244	1	0.0001	-	5	0	0.0000	-	0
2015	20.6	3,728	9,393,234	0	0.0000	-	0	0	0.0000	-	0
2016	20.1	3,880	9,872,439	0	0.0000	-	0	0	0.0000	-	0
2017	20.4	3,832	10,148,195	0	0.0000	-	0	0	0.0000	-	0
2018	20.4	4,332	11,751,144	0	0.0000	-	0	0	0.0000	-	0
2019	20.5	4,697	12,948,077	0	0.0000	-	0	0	0.0000	-	0
2020	15.25	3,131	8,738,011	0	0.0000	-	0	0	0.0000	-	0
2021	17.84	3,972	11,454,331	0	0.0000	0	-	0	0.0000	0	-
2022	20.22	4,314	12,473,293	0	0.0000	0	-	0	0.0000	0	-
2023	17.41	3,807	10,988,431	0	0.0000	0	-	0	0.0000	0	-
2024	13.35	2,795	8,174,744	0	0.0000	0	-	0	0.0000	0	-

^a Take and effort data are based on vessel arrival dates.

Source: Take data—[2002-2020 PIRO Observer Program Annual and Quarterly Status Reports](#), PIRO Sustainable Fisheries Division unpublished data.

ME—(McCracken 2005, 2006, 2011a, 2016, 2017a, 2019b; McCracken and Cooper 2022b)

Table 68. Observed takes, takes per fishing effort (1,000 hooks), and estimated annual takes using expansion factor estimates for unidentified species of cetaceans in the Hawaii deep-set longline fishery, 2002-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Unidentified cetacean ^b			Unidentified whale ^b			Unidentified dolphin ^b			Unidentified beaked whale ^b		
				Observed		EF Est.	Observed		EF Est.	Observed		EF Est.	Observed		EF Est.
				Takes	Takes/ 1,000 hooks		Takes	Takes/ 1,000 hooks		Takes	Takes/ 1,000 hooks		Takes	Takes/ 1,000 hooks	
2002	24.6	3,523	6,786,303	2	0.0003	8	0	0.0000	0	0	0.0000	0	0	0.0000	0
2003	22.2	3,204	6,442,221	1	0.0002	5	1	0.0002	5	0	0.0000	0	0	0.0000	0
2004	24.6	3,958	7,900,681	0	0.0000	0	0	0.0000	0	0	0.0000	0	0	0.0000	0
2005	26.1	4,602	9,360,671	1	0.0001	4	0	0.0000	0	0	0.0000	0	0	0.0000	0
2006	21.2	3,605	7,540,286	0	0.0000	0	2	0.0003	9	2	0.0003	9	0	0.0000	0
2007	20.1	3,506	7,620,083	1	0.0001	5	0	0.0000	0	1	0.0001	5	0	0.0000	0
2008	21.7	3,915	8,775,951	2	0.0002	9	2	0.0002	9	0	0.0000	0	0	0.0000	0
2009	20.6	3,520	7,877,861	0	0.0000	0	3	0.0004	15	0	0.0000	0	0	0.0000	0
2010	21.1	3,580	8,184,127	0	0.0000	0	3	0.0004	14	0	0.0000	0	0	0.0000	0
2011	20.3	3,540	8,260,092	2	0.0002	10	0	0.0000	0	0	0.0000	0	0	0.0000	0
2012	20.4	3,659	8,768,728	2	0.0002	10	0	0.0000	0	0	0.0000	0	0	0.0000	0
2013	20.4	3,830	9,278,133	2	0.0002	10	0	0.0000	0	0	0.0000	0	0	0.0000	0
2014	20.8	3,831	9,608,244	2	0.0002	10	0	0.0000	0	0	0.0000	0	0	0.0000	0
2015	20.6	3,728	9,393,234	1	0.0001	5	0	0.0000	0	1 ^c	0.0001	5	0	0.0000	0
2016	20.1	3,880	9,872,439	2	0.0002	10	0	0.0000	0	0	0.0000	0	1	0.0001	5
2017	20.4	3,832	10,148,195	4	0.0004	20	0	0.0000	0	0	0.0000	0	0	0.0000	0
2018	20.4	4,332	11,751,144	4	0.0003	20	0	0.0000	0	0	0.0000	0	0	0.0000	0
2019	20.5	4,697	12,948,077	3	0.0002	15	0	0.0000	0	0	0.0000	0	1	0.0001	5
2020	15.3	3,131	8,738,011	4	0.0005	26	0	0.0000	0	0	0.0000	0	1	0.0001	7
2021	17.8	3,972	11,454,331	4(1)	0.0003	22	0	0.0000	0	0	0.0000	0	0	0.0000	0
2022	20.22	4,314	12,473,293	2	0.0002	10	0	0.0000	0	0	0.0000	0	0	0.0000	0
2023	17.41	3,807	10,988,431	4	0.0004	23	0	0.0000	0	0	0.0000	0	0	0.0000	0
2024	13.35	2,795	8,174,744	2	0.0002	15	0	0.0000	0	0	0.0000	0	0	0.0000	0

^a Take and effort data are based on vessel arrival dates.

^b Unidentified species identification based on PIRO Observer Program classifications. Unidentified cetacean refers to a marine mammal not including pinnipeds (seal or sea lion); unidentified whale refers to a large whale; unidentified dolphin refers to a small cetacean with a visible beak; and unidentified beaked whale refers to an animal in the Ziphiidae family. Further classifications based on observer description, sketches, photos, and videos may be available from the Pacific Islands Fisheries Science Center.

^c This dolphin was later identified as a striped dolphin but is listed as an unidentified dolphin in the 2015 Annual Observer Report.

Source: Take data—[2002-2020 PIRO Observer Program Annual and Quarterly Status Reports](#), PIRO Sustainable Fisheries Division unpublished data.

3.3.2.4.1 Comparison of Interactions with ITS

The 2023 Biological Opinion includes ITSs for marine mammal species protected under the ESA based on the maximum 5-year running sum for each species, which includes sperm whales and the MHI insular DPS of false killer whales (

Table 69). The new ITS went into effect May 18, 2023. For the purposes of monitoring the ITS, all captures in 2023 will count towards the first year of the 5-year term. Exceeding the maximum 5-year running sum within any 5 consecutive years will lead to reinitiating consultation of the impact of this fishery on these species.

NMFS uses the interaction date for tracking marine mammal interactions against the ITS, regardless of vessel arrival date. Prior to 2021, NMFS in its PIRO Observer Program Quarterly and Annual Reports counted marine mammal interactions based on vessel arrival dates. For this reason, the number of quarterly or annual marine mammal interactions counted against an ITS may vary from those reported in the Observer Program's quarterly and annual reports.

Table 69. Estimated total interactions (extrapolated using quarterly observer coverage) of cetaceans in the Hawaii deep-set longline fishery compared to the 5-year running sum ITS in the 2024 Biological Opinion^a

Species	5-year running sum ITS Interactions	Estimated Total Interactions	
		2023	2024
Sperm whale	6	0	0
MHI insular false killer whale	0.427 or 1 observed	Data not yet available.	Data not yet available.

^a Takes are counted based on interaction date.

3.3.2.4.2 Comparison of Interactions with PBR under the MMPA

Marine mammal takes against the PBR are monitored through the SARs. A summary of the current mean estimated annual M&SI and the PBR for stocks relevant to the Hawaii deep-set longline fishery is presented in Table 70. The PBR of a stock reflects only marine mammals of that stock observed within the EEZ around Hawaii, with the exception of the Hawaii stock of humpback whales for which PBR applies to the entire stock. The mean estimated annual M&SI specified in the SARs includes only interactions determined as mortalities and serious injuries and not interactions classified as non-serious injuries.

For most marine mammal stocks where the PBR is available, the number of observed takes of marine mammal species in the deep-set longline fishery inside the EEZ around Hawaii is well below the PBR in the time period covered by the most current SAR (Table 70).

The M&SI interactions inside the Hawaii EEZ for the HI Pelagic stock of false killer whales previously exceeded the PBR for this stock. A False Killer Whale Take Reduction Team was formed in 2010 pursuant to the MMPA to address incidental takes of false killer whales in the Hawaii-permitted longline fisheries. NMFS implemented the False Killer Whale Take Reduction Plan in 2012. The objective of the plan is to reduce mortality and serious injury of false killer whales in the Hawaii-permitted longline fisheries.

Monitoring of false killer whale interactions in the MHI Insular and HI Pelagic stocks is ongoing under the False Killer Whale Take Reduction Plan. In the 2023 SAR, NMFS began using the pelagic stock assessment area defined using all genetic, telemetry, sighting and bycatch location known or assumed to be of pelagic stock animals. The M&SI interactions within this assessment

area for the 2017-2021 period was 47, which exceeds the PBR of 36 for the same area. PBR for inside the Hawaii EEZ is 15, and the corresponding MSI is 16.8 (Table 70).

On July 24, 2018, the Southern Exclusion Zone (SEZ) was closed pursuant to the False Killer Whale Take Reduction Plan following two false killer whale interactions within the EEZ resulting in a M&SI (83 FR 33848). The SEZ was closed for the remainder of the year and was reopened on January 1, 2019. On February 22, 2019, the SEZ closed from reaching the closure trigger (84 FR 5356), and was reopened on August 25, 2020, after at least one of the reopening criteria defined in the Take Reduction Plan implementing regulations was met (85 FR 50959). In 2021, the revised SEZ trigger of four M&SI was met, but SEZ did not close because the fourth interaction was not confirmed until January 2022 when the timeframe for closing the SEZ in 2021 had passed (87 FR 12941). The SEZ trigger was not met in 2022 and 2023.

On February 23, 2024, NMFS announced a revision to the SEZ trigger from four to three M&SI due to a change in observer coverage levels for the Hawaii deep-set longline fishery (89 FR 13694). The SEZ trigger was not met in 2024.

Table 70. Mean estimated annual M&SI and PBR by marine mammal stocks with observed interactions in the Hawaii deep-set longline fishery

Stock	Years Included in 2023 SAR	Outside EEZ ^a	Inside EEZ ^b	
		Mean Estimated Annual M&SI	Mean Estimated Annual M&SI	PBR (Inside EEZ only)
Bottlenose dolphin, HI Pelagic	2017-2021	5.6	0	158
Pantropical spotted dolphin, HI Pelagic	2017-2021	N/A	N/A	538
Rough-toothed dolphin, HI	2017-2021	4.4	3.2	511
Risso's dolphin, HI	2017-2021	5.0	0	53
Striped dolphin, HI	2017-2021	0	0	511
Blainville's beaked whale, HI	2014-2018	0	0	5.6
False killer whale, MHI Insular	2017-2021	N/A	0.1	0.3
False killer whale, HI Pelagic	2017-2021	30.0	16.8	15
False killer whale, NWHI	2017-2021	N/A	0.2	1.43
False killer whale, Palmyra Atoll	2006-2010	N/A	0.3	6.4
Kogia spp. whale (Pygmy or dwarf sperm whale), HI	2014-2018	Pygmy = 0 Dwarf = 0	Pygmy = 0 Dwarf = 0	Pygmy = 257 Dwarf = undetermined
Pygmy killer whale, HI	2014-2018	0	0	59
Short-finned pilot whale, HI	2017-2021	0.3	0.9	87
Humpback whale, HI	2016-2020	0		127 ^c
Sperm whale, HI	2014-2018	0	0	18

^a PBR estimates are not available for portions of the stock outside of the U.S. EEZ around Hawaii, except for the Central North Pacific stock of humpback whales for which PBR applies to the entire stock.

^b PBR estimates are only available for portions of the stock within the U.S. EEZ around Hawaii.

^c PBR for the Hawaii stock for humpback whales apply to the entire stock.

Source: [Final 2022 Marine Mammal SARs](#).

3.3.2.5 SEABIRD INTERACTIONS IN THE HAWAII DEEP-SET LONGLINE FISHERY

The incidental take data in this section were compiled from the PIRO Observer Program Annual Status Reports and are for monitoring purposes. Many of these interactions have been further examined by NMFS, and updated information necessary for any data analyses is available from NMFS. Observed take data are expanded to represent the estimated number of annual incidental takes for the entire fishery by PIFSC (hereafter “ME”). When ME are not available, a standard expansion factor estimate is listed in the table (EF Est. = 100 / % observer coverage * # takes).

Interaction data provided here may vary slightly from other sources depending on how interactions were reported (date of trip departure or arrival, set date, or haul date in a given year). NMFS annually publishes the report *Seabird Interactions and Mitigation Efforts in Hawaii Longline Fisheries* (Seabird Annual Report), which includes verified numbers of seabird interactions and information on fishing regulations and effort, interaction rates, and band recovery data for seabirds caught in the shallow-set and deep-set fisheries. Recent reports are available at: <https://www.fisheries.noaa.gov/pacific-islands/bycatch/seabird-interactions-pelagic-longline-fishery>.

Table 71 and Table 72 summarize the incidental take data of seabirds from 2002 to 2023 in the Hawaii deep-set longline fishery. The most common observed interactions during this time period involved black-footed albatrosses and Laysan albatrosses. Additional takes of unidentified shearwaters, sooty shearwaters, brown boobies, red-footed boobies, unidentified gulls, unidentified albatross, and unidentified seabirds have been observed. Most of the unidentified shearwaters have been identified as sooty shearwaters (NMFS 2016). There have been no observed takes of short-tailed albatrosses by this fishery. Interactions with sooty shearwaters and boobies are relatively infrequent.

Interactions with black-footed albatrosses beginning in 2015 were substantially higher compared to previous years with the highest number observed in 2018. From 2019 to 2023, the observed number of black-footed albatross interactions has declined every year returning to pre 2015 interaction rates in 2023. In 2024, black-footed and Laysan albatross interactions declined to low levels due to very little fishing effort north of the main Hawaiian Islands during the first and second quarters.

Black-footed albatross nests in the Northwestern Hawaiian Islands, and their main foraging habitat while nesting are the productive fronts to the north and east of the Hawaiian Islands. During a positive Pacific Decadal Oscillation (PDO), an intensification of the Westerlies displaces the frontal region to the south bringing with it cold productive waters, increasing the overlap between the albatross forage area and the deep-set longline fishing grounds, which in turn contribute to an increase in interactions with the longline fleet (Wren et al. 2019; Hyrenbach et al. 2021). During a negative PDO, the westerlies relax and the productive fronts the birds forage in are displaced northward reducing the overlap between the albatross foraging grounds and the deep-set longline fishing grounds, resulting in a reduction in interactions. The most recent positive PDO ended in 2016, and current conditions are in a negative PDO phase. PDO works in combination with El Niño Southern Oscillation (ENSO) where El Niño enhances (dampens) a positive (negative) PDO while a La Niña dampens (enhances) it. These large scale climate variabilities may in part explain why black-footed albatross interactions with the deep-set

longline fishery peaked in 2019, which was a negative PDO and El Niño year, and has been declining ever since (negative PDO and La Niña).

In response to the higher BFAL interactions in the DSLF fishery beginning in 2015, the Council convened two workshops in 2017 and 2018. The 2017 workshop explored the causes of higher BFAL interactions (Hyrenbach et al. 2021), and the 2018 workshop reviewed seabird mitigation requirements and the best scientific information available for the Hawaii longline fishery (Gilman and Ishizaki 2018). The 2018 workshop identified blue-dyed bait as a candidate for removal from the existing suite of seabird mitigation measures, and identified deterrents such as tori lines to be a high priority for further research as a potential alternative to blue-dyed bait. Two joint cooperative research projects by the Council, Hawaii Longline Association, PIFSC and PIRO were implemented between 2019 and 2021 to design and test tori lines for use in the Hawaii deep-set longline fishery as an alternative mitigation measure to blue-dyed bait. The results of the studies showed that tori lines are significantly more effective in deterring albatross attempts and contacts on fishing gear compared to blue-dyed bait (Chaloupka et al. 2021; Gilman et al. 2021). The Council at its 189th Meeting on December 7-9, 2021, took final action and recommended regulatory amendments under the Pelagic FEP to improve the overall operational practicality and mitigation efficacy of required measures for the Hawaii deep-set longline fishery. Specifically, the Council recommended replacing blue-dyed thawed bait and strategic offal discharge measures required for stern-setting deep-set longline vessels with a new tori line requirement. In lieu of a regulatory requirement for a strategic offal discharge measure, the Council recommended implementing best practices training on offal management as part of the annual protected species workshop, based on the best practices as presented, or any update thereof. The Council additionally recommended tori line regulatory specifications. NMFS published the proposed rule for this regulatory amendment on October 17, 2023 (88 FR 71523), and final rule on March 1, 2024 (89 FR 15062). The regulatory amendment took effect on April 1, 2024. Additional history on this regulatory change is described in the regulatory amendment (WPRFMC and NMFS 2023).

3.3.2.5.1 Comparison of Interactions with ITS

The short-tailed albatross ITS in the USFWS 2012 Biological Opinion for the Hawaii longline fishery is two incidental takes every five years in the deep-set fishery. Exceeding this number will lead to reinitiating consultation of the impact of this fishery on the species. Since there have been no observed takes of short-tailed albatrosses in the fishery, the ITS has not been exceeded as of the end of 2023.

Table 71. Observed takes, mortalities (M), takes per fishing effort (sets and 1,000 hooks), and estimated annual takes using expansion factor estimates and ME for albatross species in the Hawaii deep-set longline fishery, 2002-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Laysan albatross				Black-footed albatross				Unidentified albatross				Short-tailed albatross
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed
				Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/1,000 hooks			Takes (M)
2002	24.6	3,523	6,786,303	16(13)	0.0024	65	-	18(17)	0.0027	73	-	0	0.0000	0	-	0
2003	22.2	3,204	6,442,221	44(44)	0.0068	198	-	24(23)	0.0037	108	-	0	0.0000	0	-	0
2004	24.6	3,958	7,900,681	2(2)	0.0003	-	10	4(4)	0.0005	-	16	0	0.0000	0	-	0
2005	26.1	4,602	9,360,671	6(6)	0.0006	-	43	12(12)	0.0013	-	82	0	0.0000	0	-	0
2006	21.2	3,605	7,540,286	1(1)	0.0001	-	7	17(17)	0.0023	-	70	0	0.0000	0	-	0
2007	20.1	3,506	7,620,083	7(7)	0.0009	-	44	14(14)	0.0018	-	77	0	0.0000	0	-	0
2008 ^d	21.7	3,915	8,775,951	14(13)	0.0016	-	55	34(33)	0.0039	-	118	0	0.0000	0	-	0
2009	20.6	3,520	7,877,861	18(18)	0.0023	-	60	23(23)	0.0029	-	110	0	0.0000	0	-	0
2010	21.1	3,580	8,184,127	39(38)	0.0048	-	155	17(17)	0.0021	-	65	0	0.0000	0	-	0
2011	20.3	3,540	8,260,092	32(31)	0.0039	-	187	13(12)	0.0016	-	73	0	0.0000	0	-	0
2012	20.4	3,659	8,768,728	30(25)	0.0034	-	136	35(35)	0.0040	-	167	0	0.0000	0	-	0
2013	20.4	3,830	9,278,133	48(46)	0.0052	-	236	50(47)	0.0054	-	257	0	0.0000	0	-	0
2014	20.8	3,831	9,608,244	13(10)	0.0014	-	77	32(29)	0.0033	-	175	0	0.0000	0	-	0
2015	20.6	3,728	9,393,234	24(22)	0.0026	-	119	107(92)	0.0114	-	541	0	0.0000	0	-	0
2016	20.1	3,880	9,872,439	34(32)	0.0034	-	166	104(99)	0.0105	-	485	1(1)	0.0003	-	7	0
2017	20.4	3,832	10,148,195	38(38)	0.0037	-	226	97(85)	0.0096	-	471	0	0.0000	0	-	0
2018	20.4	4,332	11,751,144	33(29)	0.0028	-	157	194(168)	0.0165	-	931	0	0.0000	0	-	0
2019	20.5	4,697	12,948,077	45(44)	0.0035	-	231	146(139)	0.0113	-	767	0	0.0000	0	-	0
2020	15.25	3,131	8,738,011	59(55)	0.0068	-	315	96(87)	0.0110	-	590	0	0.0000	0	-	0
2021	17.84	3,972	11,454,331	38(35)	0.0033	-	244	87(80)	0.0076	-	536	0	0.0000	0	-	0
2022	20.22	4,314	12,473,293	56(56)	0.0045	-	366	47(45)	0.0038	-	269	0	0.0000	0	-	0
2023	17.41	3,807	10,988,431	11(11)	0.0010	-	68	32(31)	0.0029	-	208	0	0.0000	0	-	0
2024	13.35	2,795	8,174,744	3(3)	0.0004	22	-	8(8)	0.0010	60	-	0	0.0000	0	-	0

^a Take and effort data are based on vessel arrival dates. Source: Take data—[2002-2019 PIRO Observer Program Annual and Quarterly Status Reports](#), PIRO Sustainable Fisheries Division unpublished data.

ME—(McCracken 2005, 2006, 2017b, 2017c, 2019b, 2007, 2008, 2009, 2010, 2011b, 2012, 2013, 2014; McCracken and Cooper 2020, 2022d)

Table 72. Observed takes, mortalities (M), takes per fishing effort (sets and 1,000 hooks), and estimated annual takes using expansion factor estimates and ME for other seabird species in the Hawaii deep-set longline fishery, 2002-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Booby species				Sooty shearwater			Unidentified shearwater				Unidentified gull			
				Observed		EF Est.	ME	Observed		EF Est.	Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks		Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks		
2002	24.6	3,523	6,786,303	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	-	-
2003	22.2	3,204	6,442,221	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	-	-
2004	24.6	3,958	7,900,681	0	0.0000	0	-	0	0.0000	0	2(2)	0.0003	8	-	0	0.0000	-	-
2005	26.1	4,602	9,360,671	1(1) ^b	0.0001	4	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	-	-
2006	21.2	3,605	7,540,286	0	0.0000	0	-	3(3)	0.0004	14	2(2) ^c	0.0003	9	-	0	0.0000	-	-
2007	20.1	3,506	7,620,083	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	-	-
2008 ^d	21.7	3,915	8,775,951	1 ^e	0.0001	-	4	0	0.0000	0	14(14) ^c	0.0016	-	62	0	0.0000	-	-
2009	20.6	3,520	7,877,861	0	0.0000	-	0	0	0.0000	0	4(4) ^c	0.0005	-	24	0	0.0000	-	-
2010	21.1	3,580	8,184,127	0	0.0000	-	0	0	0.0000	0	1(1) ^c	0.0001	-	0	0	0.0000	-	-
2011	20.3	3,540	8,260,092	0	0.0000	-	0	0	0.0000	0	3(3) ^c	0.0004	-	19	0	0.0000	-	-
2012	20.4	3,659	8,768,728	0	0.0000	-	0	1(1)	0.0001	5	6(6) ^c	0.0007	-	36	0	0.0000	-	-
2013	20.4	3,830	9,278,133	0	0.0000	-	0	0	0.0000	0	8(8) ^c	0.0009	-	43	0	0.0000	-	-
2014	20.8	3,831	9,608,244	0	0.0000	-	0	0	0.0000	0	1(1) ^c	0.0001	-	7	0	0.0000	-	-
2015	20.6	3,728	9,393,234	1(1) ^g	0.0001	-	6	5(4)	0.0005	5	0	0.0000	-	21 ^f	0	0.0000	-	-
2016	20.1	3,880	9,872,439	2(1) ^g	0.0002	-	12	4(4)	0.0004	20	0	0.0000	0	-	0	0.0000	-	-
2017	20.4	3,832	10,148,195	0	0.0000	-	0	0	0.0000	0	0	0.0000	-	0	1	0.0001	-	6
2018	20.4	4,332	11,751,144	2(2) ^h	0.0002	-	11	0	0.0000	0	10(10)	0.0009	-	40	0	0.0000	-	0
2019	20.5	4,697	12,948,077	1(1) ^j	0.0001	-	4	0	0.0000	0	0	0.0000	-	0	0	0.0000	-	0
2020	15.25	3,131	8,738,011	1(1) ^j	0.0001	-	5	1(1)	0.0001	7	0	0.0000	-	0	0	0.0000	-	0
2021	17.84	3,972	11,454,331	0	0.0000	-	0	0	0.0000	0	2	0.0000	-	9	0	0.0000	-	0
2022	20.22	4,314	12,473,293	1(1) ^j	0.0001	-	6	0	0.0000	0	0	0.0000	-	0	0	0.0000	-	0
2023	17.41	3,807	10,988,431	2(1)	0.0002	-	12	1	0.0001	6	0	0.0000	0	0	0	0.0000	-	0
2024	13.35	2,795	8,174,744	1(1)	0.0001	7	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-

^a Take and effort data are based on vessel arrival dates.^b This animal was identified as a brown booby on the 2005 PIRO Observer Program Annual and Quarterly Status reports.^c These were later identified as sooty shearwaters in NMFS Seabird Interactions and Mitigation Efforts in Hawaii Longline Fisheries (Seabird Annual Report).^d One unidentified seabird was released injured in the second quarter of 2008 (takes/1,000 hooks < 0.001, ME = 2).^e This animal was identified as a red-footed booby on the 2008 PIRO Observer Program Annual and Quarterly Status reports.^f These birds were identified as sooty shearwaters in the 2015 PIRO Observer Program Annual and Quarterly Status reports.^g These birds were identified as red-footed boobies in the 2015 and 2016 PIRO Observer Program Annual and Quarterly Status reports.^h One of the booby species was identified as a red-footed booby and one was identified as a brown booby on the 2018 PIRO Observer Program Annual and Quarterly Status reports.ⁱ This animal was identified as a brown booby in the 2019 PIRO Observer Program Annual and Quarterly Status reports.^j This animal was identified as a brown booby in the unpublished observer data.^k One of the booby species was identified as a red-footed booby and one was identified as a masked booby in the unpublished observer data.

Source: Take data—2002-2020 PIRO Observer Program Annual and Quarterly Status Reports, PIRO Sustainable Fisheries Division unpublished data.

ME—(McCracken 2005, 2006, 2017b, 2017c, 2019b, 2007, 2008, 2009, 2010, 2011b, 2012, 2013, 2014; McCracken and Cooper 2020, 2022d)

3.3.2.6 ELASMOBRANCH INTERACTIONS IN THE HAWAII DEEP-SET LONGLINE FISHERY

Table 73 summarizes the incidental take data for the Indo-West Pacific DPS of scalloped hammerhead sharks, oceanic whitetip sharks, and giant manta rays in the Hawaii deep-set longline fishery. The most common observed interactions from 2004 to 2023 were of oceanic whitetip sharks, with giant manta rays observed infrequently. Three observed interactions with the Indo-West Pacific DPS of scalloped hammerhead shark have been recorded since 2004. Observed take data are expanded to represent the estimated number of annual incidental takes for the entire fishery by PIFSC (referred to in this document as “ME”). When ME are not available, a standard expansion factor estimate is listed in the table (EF Est. = 100 / % observer coverage * # takes).

The scalloped hammerhead shark data only include interactions that occurred within the range of the Indo-West Pacific DPS of scalloped hammerhead sharks, and do not include interactions occurred within the range of the Central Pacific DPS, which is not listed under the ESA. Giant manta rays were listed under the ESA on January 22, 2018 (83 FR 2916), and oceanic whitetip sharks were listed on January 30, 2018 (83 FR 4153).

In an effort to reduce impacts to oceanic whitetip sharks in the Hawaii deep-set longline fishery, the Hawaii Longline Association (HLA) announced in late 2020 that its members, comprising more than 90% of the Hawaii deep-set longline fleet of approximately 146 active vessels, would voluntarily switch from wire to monofilament leaders. At the 186th meeting in June 2021, the Council recommended that wire leaders be prohibited in the Hawaii deep-set fishery, along with the requirement to remove trailing gear in all longline fisheries operating under the Pelagic FEP. The proposed rule for this regulatory amendment was published on January 19, 2022 (87 FR 2742) and the final rule published on April 28, 2022 (87 FR 25153) with an effective date of May 31, 2022.

Oceanic whitetip shark interactions in 2024 were significantly higher than in previous years, likely driven in part due to high effort south of the MHI and closer to equatorial waters, where there are higher densities of oceanic whitetip shark populations especially between 10°N and 10°S (NMFS 2024). The higher interactions may also be associated with potential increases in population density in the region because of international management measures prohibiting retention of the species through IATTC since 2011 and WCPFC since 2013 (WCPFC measure implemented under U.S. regulations in 2015), but these require further investigation. A new stock assessment for the oceanic whitetip shark in the WCPO is expected in 2025.

Table 73. Observed takes, mortalities (M), takes per fishing effort (sets and 1,000 hooks), and estimated annual takes using expansion factor estimates and ME for ESA-listed elasmobranch species in the Hawaii deep-set longline fishery, 2004-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Scalloped hammerhead shark				Oceanic whitetip shark				Giant manta ray			
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes (M ^b)	Takes/ 1,000 hooks			Takes (M ^b)	Takes/ 1,000 hooks			Takes (M ^b)	Takes/ 1,000 hooks		
2004	24.6	3,958	7,900,681	2	0.0003	-	6	434(101)	0.0549	-	2,938	1	0.0001	-	3
2005	26.1	4,602	9,360,671	0	0.0000	-	0	341(80)	0.0364	-	1,282	2	0.0002	-	7
2006	21.2	3,605	7,540,286	0	0.0000	-	0	331(78)	0.0439	-	1,346	2(1)	0.0003	-	11
2007	20.1	3,506	7,620,083	1	0.0001	-	7	262(72)	0.0344	-	1,341	2	0.0003	-	5
2008	21.7	3,915	8,775,951	0	0.0000	-	0	144(36)	0.0164	-	741	2	0.0002	-	10
2009	20.6	3,520	7,877,861	0	0.0000	-	0	244(55)	0.0310	-	1,236	4	0.0005	-	23
2010	21.1	3,580	8,184,127	0	0.0000	-	0	253(44)	0.0309	-	1,198	17(1)	0.0021	-	95
2011	20.3	3,540	8,260,092	0	0.0000	-	0	225(43)	0.0272	-	1,176	1	0.0001	-	5
2012	20.4	3,659	8,768,728	0	0.0000	-	0	172(38)	0.0196	-	878	2	0.0002	-	11
2013	20.4	3,830	9,278,133	0	0.0000	-	0	196(36)	0.0211	-	973	1	0.0001	-	5
2014	20.8	3,831	9,608,244	0	0.0000	-	0	374(68)	0.0389	-	1,670	3	0.0003	-	11
2015	20.6	3,728	9,393,234	0	0.0000	-	0	531(139)	0.0565	-	2,654	2	0.0002	-	10
2016	20.1	3,880	9,872,439	0	0.0000	-	0	423(123)	0.0428	-	2,188	4	0.0004	-	22
2017	20.4	3,832	10,148,195	0	0.0000	-	0	242(57)	0.0238	-	1,257	0	0.0000	-	0
2018	20.4	4,332	11,751,144	0	0.0000	-	0	224(62)	0.0191	-	1,092	1	0.0001	-	3
2019	20.5	4,697	12,948,077	0	0.0000	-	0	435(99)	0.0336	-	2,125	0	0.0000	-	0
2020	15.25	3,131	8,738,011	0	0.0000	0	-	302(83)	0.0346	-	1,959	1	0.0001	-	7
2021	17.84	3,972	11,454,331	0	0.0000	-	0	522(103)	0.0456	-	3,084	2(2)	0.0002	-	11
2022	20.22	4,314	12,473,293	0	0.0000	-	0	480(130)	0.0385	-	2,362	0	0.0000	-	0
2023	17.41	3,807	10,988,431	0	0.0000	-	0	452(134)	0.0411	-	2,593	2	0.0002	-	11
2024	13.35	2,795	8,174,744	0	0.0000	0	-	814(235)	0.0996	6,097	-	4	0.0005	30	-

^a Take and effort data are based on vessel arrival dates.

^b Mortality numbers include animals that were released dead, finned (prior to passage of the Shark Conservation Act of 2010), and kept. Source: [NMFS 2014 \(2004-2013\)](#), PIRO Sustainable Fisheries Division unpublished data (2014-2018),(McCracken 2019a; McCracken and Cooper 2020, 2021, 2024).

3.3.2.6.1 Comparison of Interactions with ITS

An ITS is not required to provide protective coverage for the ESA listed elasmobranchs including the Indo-West Pacific scalloped hammerhead shark DPS, the oceanic whitetip shark, or the giant manta ray, because there are no take prohibitions under ESA section 4(d) for these species. However, ITS were included for these species in their relevant Biological Opinions to serve as a check on the no-jeopardy conclusions by providing a reinitiation trigger.

The 2023 Biological Opinion includes ITSs for ESA listed elasmobranchs based on a maximum 5-year running sum for each species (Table 74). The new ITS went into effect May 18, 2023. For the purposes of monitoring the ITS, all captures in 2023 will count towards the first year of the 5-year term. Exceeding the maximum 5-year running sum within any 5 consecutive years will lead to reinitiating consultation of the impact of this fishery on these species.

NMFS counts takes for the Indo-West Pacific DPS of scalloped hammerhead shark, oceanic whitetip shark, and giant manta ray based on the end of haul incidental take date.

Table 74. Estimated total interactions (extrapolated using quarterly observer coverage) of oceanic whitetip sharks and giant manta rays in the Hawaii deep-set longline fishery compared to the 5-year running sum ITS in the 2024 Biological Opinion^a

Species	5-year Running Sum ITS	Estimated Total Interactions	
		2023	2024
Scalloped hammerhead shark, Indo-West Pacific DPS	14	0	0
Oceanic whitetip shark	10,589	2,568	6,474
Giant manta ray	181	12	59
<i>Manta/Mobula</i> ^b		110	7

^a Take data are based on haul begin dates.

^b 12% of manta/mobula interactions are also tracked as the ITS for giant manta ray was based on interaction data that included rays classified as manta/mobula in the observer record that may have been giant manta rays.

3.3.2.6.2 Effectiveness of FEP Conservation Measures

In June 2021, the Council recommended a regulatory amendment that would prohibit wire leaders in the Hawaii deep-set fishery and require removal of trailing gear for oceanic whitetip sharks in all longline fisheries operating under the Pelagic FEP. The rule change took effect in May 2022.

During 2021, the Hawaii deep-set longline fleet initiated the voluntary transition from wire to monofilament nylon leaders. Figure 158 shows the monthly proportion of leader material used for observed sets, with most of the vessels using monofilament nylon leaders by December 2021.

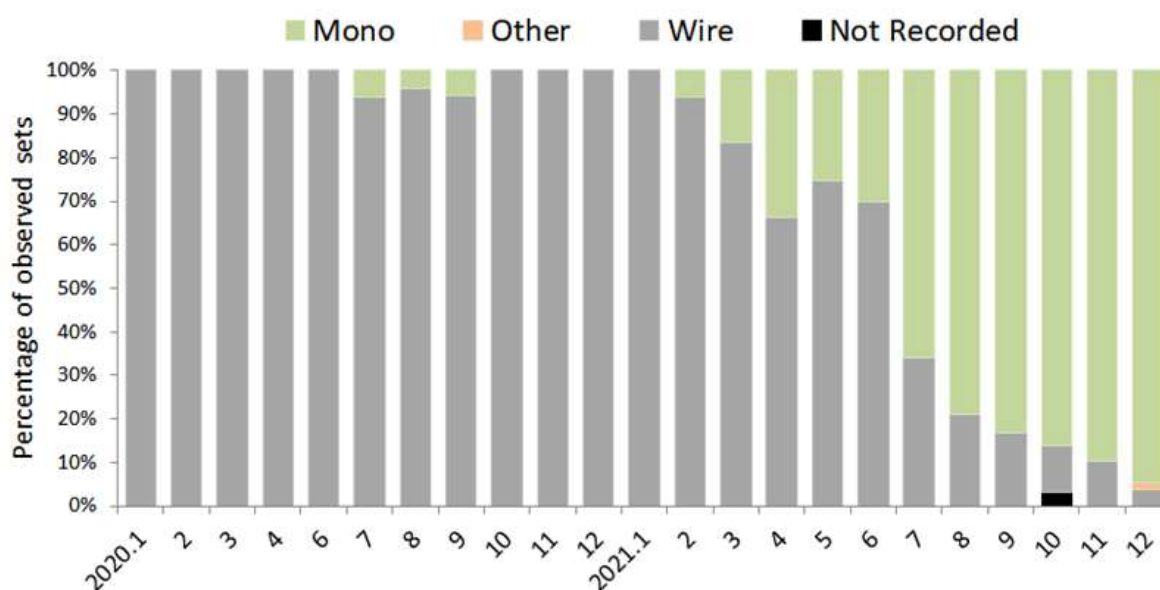


Figure 155. Leader material (based on observed sets) used in the Hawaii deep-set longline fishery by month before and during the voluntary transition period (2020–2021)

As part of the final action for the regulatory amendment, the Council recommended that observer data on leader material used in the Hawaii deep-set longline fishery be reported in the Annual Pelagic SAFE Report to track proportion of effort using leader material other than monofilament nylon. The annual proportion of leader material used for observed sets are shown in Table 76. In 2022, less than 6%, in 2023, less than 3%, and in 2024, 0% of observed sets used leader material other than monofilament nylon.

Table 75. Annual proportion of leader material used in the Hawaii deep-set longline fishery by month, 2020-2024^a

Year	Obs sets	Mono		Wire		Other		Not Recorded	
		n	%	n	%	n	%	n	%
2020	3131	48	1.5%	3083	98.5%	0	0.0%	0	0.0%
2021	3972	2185	55.0%	1775	44.7%	0	0.0%	12	0.3%
2022 ^b	4314	4059	94.1%	224	5.2%	31	0.7%	0	0.0%
2023	3807	3703	97.3	84	2.2%	20	0.5%	0	0.0%
2024	2796	2796	100%	0	0.0%	0	0.0%	0	0.0%

^a Based on leader material recorded for each observed set, by vessel arrival date.

^b Wire leader prohibition went into effect in May 2022.

A new data collection form for the observer program was created in 2022 to track detailed information on protected elasmobranch interaction events and handling. The first shark recorded on this form was on April 29, 2022. Based on haul begin date, of the 327 oceanic whitetip shark events recorded on this new form in 2022, 29% were cut below the weight, 51% were estimated to have 1m or less line remaining, and the average length of branch line left on an oceanic whitetip shark after cutting the line was 2.8 m (Table 76). Of the 440 oceanic whitetip shark events recorded on this form in 2023, 30% were cut below the weight,

51% were estimated to have 1m or less line remaining and the average length of branch line left on an oceanic whitetip shark after cutting the line was 2.7 m. Of the 816 oceanic whitetip shark events recorded on this form in 2024, 46% were cut below the weight, 60% were estimated to have 1m or less line remaining, and the average length of branch line left on an oceanic whitetip shark after cutting the line was 2.5 m. Prior to the wire leader prohibition, the line was rarely cut below the weight due to difficulty of cutting through the wire from deck height, and the best available estimate of the average length of trailing gear remaining on an oceanic whitetip shark in the Hawaii deep-set longline fishery was 5.44 m (Hutchinson et al. 2021). The handling outcomes data from the new observer form indicate that the new rule on wire leader prohibition and handling requirements that went into effect in May 2022 has reduced the amount of trailing gear left on oceanic whitetip sharks. The additional improvements in 2024 may be reflective of the pilot crew training program initiated in April 2024 (see section 3.3.2.1.1).

Table 76. Summary of oceanic whitetip shark interaction events reported on the observer program's elasmobranch form, 2022-2024.

Year	Total oceanic whitetip events recorded on form	% of events with line cut below weight	% of events with ≤1m line remaining	Average length of branch line left
2022 ^a	327	29%	51%	2.8m
2023	440	30%	51%	2.7m
2024	816	46%	60%	2.5m

^a Partial year data; first record on form was on April 29, 2022.

3.3.3 AMERICAN SAMOA LONGLINE FISHERY

3.3.3.1 INDICATORS FOR MONITORING PROTECTED SPECIES INTERACTIONS AND EFFECTIVENESS OF MANAGEMENT MEASURES IN THE AMERICAN SAMOA LONGLINE FISHERY

In this annual report, the Council monitors protected species interactions in the American Samoa longline fishery using the following indicators:

- General interaction trends over time
- Effectiveness of FEP conservation measures
- Take levels compared to the incidental take statement levels under ESA
- Take levels compared to marine mammal PBRs, where applicable

Details of these indicators are discussed below.

3.3.3.1.1 FEP Conservation Measures

The Pelagic FEP includes conservation measures to mitigate sea turtle interactions in the American Samoa longline fishery. These measures include the following:

- Longline vessel owners/operators are required to adhere to regulations for safe handling and release of sea turtles and seabirds.
- Longline vessel owners/operators must have on board the vessel all required turtle handling/dehooking gear specified in regulations.

- Longline vessel owners/operators are required to remove trailing gear from oceanic whitetip sharks and cut the line as close to the hook as possible.
- Longline vessel owners/operators are required to annually complete a protected species workshop.
- Owners and operators of vessels longer than 40 ft (12.2 m) must use longline gear that meet the following requirements:
 - Each float line must be at least 30 m long.
 - At least 15 branch lines must be attached to the mainline between any two float lines attached to the mainline.
 - Each branch line must be at least 10 m long.
 - No branch line may be attached to the mainline closer than 70 m to any float line.

Additionally, the American Samoa longline fishery has had observer coverage since 2006.

In 2024, the Council initiated development of a regulatory amendment to the Pelagic FEP that would implement a crew training requirement for Hawaii and American Samoa longline fisheries. PIRO Sustainable Fisheries Division, in coordination with the Hawaii Longline Association, PIRO Protected Resources Division, and the Council initiated a one-year pilot crew training program in April 2024. The Council is scheduled to consider final action on the regulatory amendment at the 203rd Council in June 2025.

3.3.3.1.2 ESA Consultations

On May 15, 2023, NMFS issued a Biological Opinion covering all applicable ESA-listed species, which concluded that the fishery is not likely to jeopardize the following species: Leatherback sea turtle, green sea turtles in the East Pacific, East Indian-West Pacific, Southwest Pacific, Central West Pacific and Central South Pacific; olive ridley sea turtles; hawksbill sea turtles, oceanic whitetip sharks, Indo-West Pacific scalloped hammerhead sharks, and giant manta ray (Table 77). The 2023 Biological Opinion also concluded that the fishery is not likely to adversely affect South Pacific loggerhead turtles, sperm whales, or reef-building corals. The new ITSs took effect when the new Biological Opinion was signed. The new ITS has a 5-year term and all captures in 2023 will count towards the first year of the term, although captures prior to the date on the 2023 Biological Opinion signature are exempted under the previous biological opinion.

NMFS has issued ITSs for species with a non-jeopardy determination in the Biological Opinions (Table 78). Exceeding the ITSs requires reinitiation of consultation on the fishery under the ESA.

Additionally, an informal consultation conducted by USFWS in 2011 concluded that the fishery is not likely to adversely affect the Newell's shearwater. NMFS has also determined that the fishery has no effect on three marine mammal species (fin, blue, and sei whale) or three petrel species (Chatham, Fiji, and magenta petrel).

Table 77. Summary of ESA consultations for the American Samoa longline fishery

Species	Consultation Date	Consultation Type ^a	Outcome ^b
Leatherback turtle	2023-5-15	BiOp	LAA, non-jeopardy
Olive ridley turtle	2023-5-15	BiOp	LAA, non-jeopardy
Green turtle, Central South Pacific DPS	2023-5-15	BiOp	LAA, non-jeopardy
Green turtle, Southwest Pacific DPS	2023-5-15	BiOp	LAA, non-jeopardy
Green turtle, East Pacific DPS	2023-5-15	BiOp	LAA, non-jeopardy
Green turtle, Central West Pacific DPS	2023-5-15	BiOp	LAA, non-jeopardy
Green turtle, East Indian-West Pacific DPS	2023-5-15	BiOp	LAA, non-jeopardy
Hawksbill turtle	2023-5-15	BiOp	LAA, non-jeopardy
Loggerhead turtle, South Pacific DPS	2023-5-15	BiOp	NLAA
Scalloped hammerhead shark, Indo-West Pacific DPS	2023-5-15	BiOp	LAA, non-jeopardy
Oceanic whitetip shark	2023-5-15	BiOp	LAA, non-jeopardy
Giant manta ray	2023-5-15	BiOp	LAA, non-jeopardy
Sperm whale	2023-5-15	LOC	NLAA
Reef-building corals	2023-5-15	BiOp	NLAA
Fin whale	2010-05-12	No Effects Memo	No effect
Blue whale	2010-05-12	No Effects Memo	No effect
Sei whale	2010-05-12	No Effects Memo	No effect
Newell's shearwater	2011-05-19	LOC (FWS)	NLAA
Chatham petrel	2011-07-29	No Effects Memo	No effect
Fiji petrel	2011-07-29	No Effects Memo	No effect
Magenta petrel	2011-07-29	No Effects Memo	No effect

^a BiOp = Biological Opinion; LOC = Letter of Concurrence.

^b LAA = likely to adversely affect; NLAA = not likely to adversely affect.

Table 78. Summary of ITSs for the American Samoa longline fishery

Species	ITS Time Period	Takes	Source BiOp
Green turtle	5-year running sum	96	NMFS 2023
Leatherback turtle	5-year running sum	48	NMFS 2023
Olive ridley turtle	5-year running sum	61	NMFS 2023
Hawksbill turtle	5-year running sum	30	NMFS 2023
Scalloped hammerhead shark, Indo-West Pacific DPS ^a	5-year running sum	45	NMFS 2023
Oceanic whitetip shark ^a	5-year running sum	3,520	NMFS 2023
Giant manta ray ^a	5-year running sum	57	NMFS 2023

^a An ITS is not required for the Indo-West Pacific DPS of scalloped hammerhead sharks, oceanic whitetip sharks and giant manta ray due to the lack of take prohibition under ESA section 4(d), but NMFS included an ITS to serve as a check on the no-jeopardy conclusion by providing a re-initiation trigger.

3.3.3.1.3 Non-ESA Marine Mammals

Fishery impacts to marine mammal stocks are primarily assessed and monitored through the SARs prepared pursuant to the MMPA. The SARs include detailed information on these

species' geographic range, abundance, PBR estimates, bycatch estimates, and status. The most recent SARs are available online at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>.

The American Samoa longline fishery is a Category II under the MMPA 2024 LOF (89 FR 12257, February 16, 2024), meaning that this fishery has occasional incidental mortality and serious injuries of marine mammals. The 2024 LOF lists the following marine mammal stocks that are incidentally killed or injured in this fishery:

- False killer whale, American Samoa stock
- Rough-toothed dolphin, American Samoa stock
- Striped dolphin, unknown stock

Most bycatch estimates in the SARs are based on the most recently available 5-year period, but there is a data lag of approximately two years due to the SAR review process. This annual report focuses on available long-term interaction trends and summarizes relevant information from the most recent SAR.

3.3.3.2 DATA SOURCE FOR MONITORING PROTECTED SPECIES INTERACTIONS IN THE AMERICAN SAMOA LONGLINE FISHERY

Protected species interactions in the American Samoa longline fishery have been monitored through mandatory observer coverage since 2006. Observer coverage in the fishery ranged between 6 and 8 percent from 2006-2009, increased to 25 percent in 2010 and 33 percent in 2011. Coverage ranged between 15-22 percent in 2012-2019.

In response to the emerging COVID-19 crisis, and to ensure the safety and protect the health of fishermen, observers, and others, NMFS issued an emergency action on March 27, 2020 (85 FR 17285), to provide the authority, on a case-by-case basis, to waive observer coverage. This action was extended on September 21, 2020 (85 FR 59199) and again on March 29, 2021 (86 FR 16307). Under this emergency action, a NMFS Regional Administrator, Office Director, or Science Center Director had the ability to waive observer coverage requirements if:

- Local, state, or national governments, or private companies or organizations that deploy observers pursuant to NMFS regulations, restrict travel or otherwise issue COVID-19-related social control guidance, or requirement(s) addressing COVID-19-related concerns, such that it is inconsistent with the requirement(s) or not recommended to place an observer(s); or
- No qualified observer(s) are available for placement due to health, safety, or training issues related to COVID-19.

The PIRO Regional Administrator granted waivers on a case-by-case basis consistent with the emergency rule resulting in reduced coverage for the American Samoa longline fishery for 2020 at 2.13%, for 2021 at 4.65%, for 2022 at 8.70%, for 2023 8.82%, and 2024 9.3%. Observer coverage remained below pre-COVID-19 rates in 2022 through 2024 for this fishery due to the logistics and costs of deploying observers in American Samoa. NMFS is looking into designing a program that would allow for easier hire of local observers to increase coverage rates.

This report summarizes protected species interactions in the American Samoa longline fishery since 2006. Data for 2020 and 2021 are not reported due to data confidentiality rules associated with the low observer coverage. Annual observed interactions are tallied based on vessel arrival date (rather than interaction date) for the purposes of this report for consistency with the methods used to estimate the annual total interactions. Comparison of annual incidental takes within a year to the ITs are based on the interaction date rather than the vessel arrival date, consistent with the 2015 Biological Opinion and associated supplements. Annual summary data presented in this report may differ from those in the PIRO Observer Program Quarterly and Annual Reports, which began summarizing interaction data by haul begin dates (proxy for interaction date) in 2021.

3.3.3.3 SEA TURTLE INTERACTIONS IN THE AMERICAN SAMOA LONGLINE FISHERY

Table 79 summarizes the incidental take data of sea turtles from 2006 to 2024 in the American Samoa longline fishery. The incidental take data in this section were compiled from the PIRO Observer Program Annual Status Reports and are for monitoring purposes. Many of these interactions have been further examined by NMFS, and updated information necessary for any data analyses is available from PIFSC. Observed take data are expanded to represent the estimated number of incidental takes for the entire fishery by PIFSC (referred to in this document as “McCracken estimates (ME)”). When ME are not available, a standard expansion factor estimate is used ($EF\ Est. = 100 / \% \text{ observer coverage} * \# \text{ takes}$). PIFSC generated estimated number of interactions for 2020-2021 based on observer data from 2012-2020 (McCracken and Cooper 2022a, 2022e).

Between 2006 and 2019, the PIRO Observer Program reported interactions with green, leatherback, olive ridley, and hawksbill sea turtles, but no observed interactions were reported with loggerhead sea turtles. The highest observed interaction rate involved green sea turtles, whereas interactions with leatherbacks, olive ridleys, and hawksbills were less frequent. 2020 and 2021 data cannot be reported due to confidentiality rules.

Green sea turtle takes were variable year to year, ranging between 0-11 observed takes (0-50 expanded annual estimated takes). From 2016 to 2019, four annual interactions per year with green turtles were observed, all of which resulted in mortalities. The interaction rate in 2018 was the highest since 2006. At its 170th Meeting in June 2017, the Council recommended evaluation of the effectiveness of the 2011 green turtle measure that required gear configuration to set hooks below 100 meters in the American Samoa longline fishery. PIFSC in response indicated they do not recommend evaluation at that time due to the low statistical power. At its 173rd Meeting in June 2018, the Council recommended PIFSC conduct an economic cost-benefit analysis on the use of large circle hooks in the American Samoa longline fishery to determine whether modifying the green turtle mitigation measures in the fishery may contribute to further reductions in interactions in the fishery without significant negative impacts on fishery operations and revenue. In response, PIFSC conducted a feasibility assessment for conducting a cost-benefit analysis, which indicated that a detailed analysis is not likely to provide new information beyond what is known from the Council-funded large circle hook study (Curran and Beverly 2012) due to data limitations (Raynor 2018).

All leatherback, olive ridley, and hawksbill sea turtle interactions were observed after 2010, with hawksbill interactions first occurring in 2016. Observer coverage was relatively low in 2006-2009 when interactions with these species were not observed (average observer coverage = 10.8%) compared to 2010-2019 (above 15%). Since leatherback, olive ridley, and hawksbill interactions with this fishery are relatively uncommon, it is possible the recent occurrence of interactions after 2010 is due to higher observer coverage as opposed to a true increase in interactions in the fishery.

Table 79. Observed takes, mortalities (M), takes per fishing effort (1,000 hooks), estimated annual takes using expansion factor estimates and ME for sea turtles in the American Samoa longline fishery, 2006-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Green				Leatherback				Olive ridley				Hawksbill			
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME
2006	8.1	287	797,221	3(3)	0.0038	37	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	-	-
2007	7.1	410	1,255,329	1(1)	0.0008	14	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	-	-
2008	6.4	379	1,194,096	1(1)	0.0008	16	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	-	-
2009	7.7	306	880,612	3(3)	0.0034	39	-	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	-	-
2010	25.0	798	2,301,396	6(5)	0.0026	-	50	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	-	-
2011	33.3	1,257	3,605,897	11(10)	0.0031	-	32	2(1)	0.0006	-	4	1	0.0003	-	4	0	0.0000	-	-
2012	19.8	662	1,880,525	0	0.0000	-	0	1	0.0005	-	6	1(1)	0.0005	-	6	0	0.0000	-	-
2013	19.4	585	1,690,962	2(2)	0.0012	-	19	2(1)	0.0012	-	13	1	0.0006	-	4	0	0.0000	-	-
2014	19.4	565	1,490,416	2(2)	0.0013	-	17	0	0.0000	-	4	2	0.0013	-	5	0	0.0000	-	-
2015	22.0	504	1,441,706	0	0.0000	-	0	3(3)	0.0021	-	22	1	0.0007	-	6	0	0.0000	-	-
2016	19.4	424	1,179,532	4(4)	0.0034	-	17	1(1)	0.0008	-	3	3(3)	0.0025	-	12	1(1)	0.0008	-	4
2017	20.0	447	1,271,803	4(4)	0.0031	-	22	1	0.0008	-	3	2(2)	0.0016	-	12	0	0.0000	-	3
2018	17.5	276	732,476	4(4)	0.0055	-	20	1	0.0014	-	5	2(2)	0.0027	-	11	2(2)	0.0027	-	5
2019	15.7	380	1,087,860	4(4)	0.0037	-	26	1(1)	0.0009	-	7	3(3)	0.0028	-	29	0	0.0000	-	0
2020	2.13	*	*	*	*	*	11	*	*	*	7	*	*	*	6	*	*	*	2
2021	4.65	*	*	*	*	*	10	*	*	*	6	*	*	*	7	*	*	*	2
2022	8.70	90	260,768	0	0.0000	-	4	0	0.0000	-	2	1(1)	0.0038	-	8	0	0.0000	-	0
2023	8.82	154	507,460	2(2)	0.0039	-	23	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	0	0
2024	9.3	135	411,595	1(1)	0.0024	11	-	1	0.0000	11	-	1(1)	0.0024	11	-	0	0.0000	0	-

^a Take and effort data are based on vessel arrival dates.

*2020 and 2021 data are not reported due to confidentiality rules.

Source: Take data—[2006-2020 PIRO Observer Program Annual and Quarterly Status Reports](#)

ME—(McCracken, 2015; McCracken, 2017a; McCracken 2019a; McCracken 2020b; McCracken and Cooper 2022a; McCracken and Cooper 2022e)

3.3.3.3.1 Comparison of Interactions with ITS

The 2023 Biological Opinion includes ITSs for sea turtle species based on the maximum 5-year running sum for each species (Table 80). The new ITS went into effect May 15, 2023. For the purposes of monitoring the ITS, all captures in 2023 will count towards the first year

of the 5-year term. Exceeding the maximum 5-year running sum within any 5 consecutive years will lead to reinitiating consultation of the impact of this fishery on these species.

NMFS uses the interaction date for tracking sea turtle interactions against the ITS, regardless of vessel arrival date. Prior to 2021, NMFS in its PIRO Observer Program Quarterly and Annual Reports counted sea turtle interactions based on vessel arrival dates. For this reason, the number of quarterly or annual sea turtle interactions counted against an ITS may vary from those reported on the Observer Program’s quarterly and annual reports.

Table 80. Estimated total interactions^a (extrapolated using quarterly observer coverage) of sea turtles in the American Samoa longline fishery compared to the 5-year running sum Incidental Take Statement (ITS) in the 2023 Biological Opinion

Species	5-year running sum ITS Interactions	Estimated Total Interactions and Mortalities	
		2023 ^b	2024
Green turtle	96	13(12)	11(10)
Leatherback turtle	48	0(0)	11(7)
Olive ridley turtle	61	0(0)	11(9)
Hawksbill turtle	30	0(0)	0(0)

^a Takes are counted based on interaction date.

^b Estimated total interactions for 2023 were calculated using the number of observed interactions multiplied by the expansion factor.

3.3.3.4 MARINE MAMMAL INTERACTIONS IN THE AMERICAN SAMOA LONGLINE FISHERY

Table 81 summarizes the incidental take data of marine mammals from 2006 to 2024 in the American Samoa longline fishery. Reported interactions listed in these tables reflect all observed interactions, including mortalities, serious injuries, and non-serious injuries. Refer to the most recent SARs for mortality and serious injury estimates and stock-specific abundance estimates and geographic range. Many of these interactions have been further examined by NMFS, and updated information necessary for any data analyses is available from PIFSC. Observed take data were expanded to represent the estimated number of incidental takes for the entire fishery using a standard expansion factor estimate (EF Est. = $100 / \% \text{ observer coverage} * \# \text{ takes}$). PIFSC generated estimated number of interactions for 2020-2021 based on observer data from 2012-2020 (McCracken and Cooper 2022b; McCracken 2022) and the logbook and observer data were also used to derive the 2021 estimates (McCracken 2022).

Observed marine mammal interactions with the American Samoa longline fishery between 2006 and 2019 were relatively infrequent with only one striped dolphin interactions in 2019. False killer whales had the highest interaction rate over this period, followed by rough-toothed dolphins, Cuvier’s beaked whales, short-finned pilot whales, and 2 unidentified cetaceans. Between 2006 and 2022, there were 7 years of no observed marine mammal interactions with this fishery (2006, 2007, 2009, 2010, 2012, 2022, 2023, and 2024).

3.3.3.4.1 Comparison of Interactions with PBR under the MMPA

SARs are only available for four species of marine mammals for which stocks have been identified around American Samoa (humpback whale, false killer whale, rough-toothed

dolphin, and spinner dolphin). PBR comparisons with estimates of mortality and serious injury are not available for American Samoa stocks of marine mammals due to the lack of abundance estimates.

Table 81. Observed takes, mortalities (M), takes per fishing effort (1,000 hooks), and estimated annual takes using expansion factor estimates for marine mammals in the American Samoa longline fishery, 2006-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Cuvier's beaked whale			False killer whale				Rough-toothed dolphin				Short-finned pilot whale			Striped dolphin				Unidentified cetacean		
				Observed		EF Est.	Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	Observed		EF Est.	M E	Observed		EF Est.
				Takes (M)	Takes/ 1,000 hooks		Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks		Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks	
2006	8.1	287	797,221	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2007	7.1	410	1,255,329	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2008	6.4	379	1,194,096	0	0.0000	0	2(1)	0.0017	31	-	1	0.0008	16	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2009	7.7	306	880,612	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2010	25.0	798	2,301,396	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2011	33.3	1,257	3,605,897	1(1)	0.0003	3	3	0.0008	9	-	5	0.0014	15	-	0	0.0000	0	0	0.0000	0	-	2	0.0006	6
2012	19.8	662	1,880,525	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2013	19.4	585	1,690,962	0	0.0000	0	1	0.0006	5	-	1(1)	0.0006	5	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2014	19.4	565	1,490,416	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	1	0.0007	5	0	0.0000	0	-	0	0.0000	0
2015	22.0	504	1,441,706	0	0.0000	0	2(1)	0.0014	-	5	0	0.0000	-	0	0	0.0000	0	0	0.0000	-	0	0	0.0000	0
2016	19.4	424	1,179,532	0	0.0000	0	2	0.0017	-	10	2(2)	0.0017	-	10	0	0.0000	0	0	0.0000	-	0	0	0.0000	0
2017	20.0	447	1,271,803	0	0.0000	0	1	0.0008	-	6	1	0.0008	-	4	0	0.0000	0	0	0.0000	-	0	0	0.0000	0
2018	17.5	276	732,476	0	0.0000	0	1	0.0014	-	5	1(1)	0.0014	-	3	0	0.0000	0	0	0.0000	-	2	0	0.0000	0
2019	15.7	380	1,087,860	0	0.0000	0	0	0.0000	-	0	0	0.0000	-	0	0	0.0000	0	1	0.0009	-	5	0	0.0000	0
2020	2.13	*	*	*	*	*	1	*	-	5	1	*	-	3	0	*	-	0	0	*	-	0	*	*
2021	4.65	*	*	*	*	*	*	*	*		*	*	*		*	*	*		*	*	*		*	*
2022	8.70	90	260,768	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	0	0	0	-	0.0000	0
2023	8.82	154	507,460	0	0.0000	0	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	0	0.0000	0	-	0	0.0000	0
2024	9.3	135	411,595	0	0.0000	0	0	0.0000	0		0	0.0000	0		0	0.0000	0	0	0.0000	0		0	0.0000	0

^a Take and effort data are based on vessel arrival dates.

*2020 and 2021 data are not reported due to confidentiality rules.

Source: [2006-2020 PIRO Observer Program Annual and Quarterly Status Reports](#) and unpublished observer data; (McCracken 2020a; McCracken and Cooper 2022b; McCracken and Cooper 2022g).

3.3.3.5 SEABIRD INTERACTIONS IN THE AMERICAN SAMOA LONGLINE FISHERY

Table 82 summarizes the incidental take data of seabirds from 2006 to 2022 in the American Samoa longline fishery. Many of these interactions have been further examined by NMFS, and updated information necessary for any data analyses is available from PIFSC. Observed take data are expanded to represent the estimated number of annual incidental takes for the entire fishery by PIFSC (referred to in this document as McCracken Estimates, or “ME”). When ME are not available, a standard expansion factor estimate is listed in the table (EF Est. = 100 / % observer coverage * # takes). 2020-2021 data cannot be reported due to confidentiality rules. PIFSC generated estimated number of interactions for 2020-2021 based on observer data from 2012-2020 (McCracken and Cooper 2022a, 2022c).

Observed seabird interactions with the American Samoa longline fishery between 2006 and 2024 were uncommon, including interactions with two unidentified shearwaters and one frigatebird. Additionally, the observer program report for 2015 included 13 observed interactions with black-footed albatrosses that occurred in the North Pacific with vessels departing American Samoa and landing in California. There was one unidentified shearwater was observed in 2019, and no other observed seabird interactions from 2016-2024.

Table 82. Observed takes, mortalities (M), takes per fishing effort (1,000 hooks), and estimated annual takes using expansion factor estimates and ME for seabirds in the American Samoa longline fishery, 2006-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Black-footed Albatross				Unidentified shearwater				Unidentified frigatebird				Brown booby
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	
				Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			
2006	8.1	287	797,221	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	
2007	7.1	410	1,255,329	0	0.0000	0	-	1(1)	0.0008	14	-	0	0.0000	0	-	
2008	6.4	379	1,194,096	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	
2009	7.7	306	880,612	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	
2010	25.0	798	2,301,396	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	-	0	
2011	33.3	1,257	3,605,897	0	0.0000	0	-	1(1)	0.0003	-	2	0	0.0000	-	0	
2012	19.8	662	1,880,525	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	-	0	
2013	19.4	585	1,690,962	0	0.0000	0	-	0	0.0000	-	0	1(1)	0.0006	-	5	
2014	19.4	565	1,490,416	0	0.0000	-	0	0	0.0000	0	-	0	0.0000	-	0	
2015	22.0	504	1,441,706	13(13) ^b	0.0090	-	13	0	0.0000	0	-	0	0.0000	-	0	
2016	19.4	424	1,179,532	0	0.0000	0		0	0.0000	-	0	0	0.0000	0	-	
2017	20.0	447	1,271,803	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	0	-	
2018	17.5	276	732,476	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	0	-	
2019	15.7	380	1,087,860	0	0.0000	0	-	1(1)	0.0009	-	7	0	0.0000	0	-	
2020	2.13	*	*	*	*	*	0	*	*	*	1	*	*	*	1	

Year	Obs. Cov. (%)	Sets	Hooks	Black-footed Albatross				Unidentified shearwater				Unidentified frigatebird				Brown booby
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME	
				Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			Takes (M)	Takes/ 1,000 hooks			
2021	4.65	*	*	*	*	*	0	*	*	*	1	*	*	*	1	
2022	8.70	90	260,768	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	-	0	
2023	8.82	154	507,460	0	0.0000	0	-	0	0.0000	-	0	0	0.0000	-	0	
2024	9.3	135	411,595	0	0.0000	0	-	0	0.0000	0	-	0	0.0000	0	-	1

^a Take data are based on vessel arrival dates.

^b These seabird interactions occurred in the North Pacific by vessels departing American Samoa and landing in California.

*2020 data are not reported due to confidentiality rules.

Source: [2006-2019 PIRO Observer Program Annual and Quarterly Status Reports](#)

ME—(McCracken 2015, 2017d, 2020, 2023; McCracken and Cooper 2022b, 2022d).

3.3.3.6 ELASMOBRANCH INTERACTIONS IN THE AMERICAN SAMOA LONGLINE FISHERY

Table 83 summarizes the incidental take data for the Indo-West Pacific DPS scalloped hammerhead sharks, oceanic whitetip sharks, and giant manta rays in the American Samoa longline fishery. Giant manta rays were listed under the ESA on January 22, 2018 (83 FR 2916), and oceanic whitetip sharks were listed on January 30, 2018 (83 FR 4153). On April 3, 2019, NMFS reinitiated consultation for the American Samoa longline fishery and determined that the conduct of the fishery during the period of consultation will not violate ESA Sections 7(a)(2) and 7(d). 2020 and 2021 data cannot be reported due to confidentiality rules. PIFSC generated estimated number of interactions for 2020-2021 based on observer data from 2012-2020 (McCracken and Cooper 2022a, 2022e).

Observed interactions with oceanic whitetip sharks are most common in the American Samoa longline fishery. In 2024, oceanic whitetip shark interactions were the highest since 2010. The higher interactions may be associated with potential increases in population density in the region because of international management measures prohibiting retention of the species through IATTC since 2011 and WCPFC since 2013 (WCPFC measure implemented under U.S. regulations in 2015), but further investigation is needed. A new stock assessment for the oceanic whitetip shark in the WCPO is expected in 2025. Scalloped hammerheads and giant manta rays are observed less frequently. There have been no observed takes of giant manta rays since 2014.

Table 83. Observed and estimated total elasmobranch interactions with the American Samoa longline fishery for 2006-2024^a

Year	Obs. Cov. (%)	Sets	Hooks	Scalloped hammerhead				Oceanic whitetip				Giant manta ray			
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes (M ^b)	Takes/1,000 hooks			Takes (M ^b)	Takes/1,000 hooks			Takes (M)	Takes/1,000 hooks		
2006	8.1	287	797,221	1(1)	0.0013	12	-	46(11)	0.0577	568	-	0	0.0000	0	-
2007	7.1	410	1,255,329	1	0.0008	14	-	62(18)	0.0494	873	-	0	0.0000	0	-
2008	6.4	379	1,194,096	0	0.0000	0	-	48(17)	0.0402	750	-	0	0.0000	0	-
2009	7.7	306	880,612	0	0.0000	0	-	45(13)	0.0511	584	-	1	0.0011	13	-

Year	Obs. Cov. (%)	Sets	Hooks	Scalloped hammerhead				Oceanic whitetip				Giant manta ray			
				Observed		EF Est.	ME	Observed		EF Est.	ME	Observed		EF Est.	ME
				Takes (M ^b)	Takes/1,000 hooks			Takes (M ^b)	Takes/1,000 hooks			Takes (M)	Takes/1,000 hooks		
2010	25	798	2,301,396	4(1)	0.0017	-	17	130(37)	0.0565	-	1,176	3	0.0013	-	11
2011	33.3	1,257	3,605,897	2(1)	0.0006	-	7	116(44)	0.0322	-	319	3	0.0008	-	11
2012	19.8	662	1,880,525	0	0.0000	-	0	71(26)	0.0378	-	470	3	0.0016	-	29
2013	19.4	585	1,690,962	0	0.0000	-	0	88(15)	0.0520	-	407	2	0.0012	-	8
2014	19.4	565	1,490,416	1	0.0007	-	6	104(37)	0.0698	-	464	1	0.0007	-	2
2015	22.0	504	1,441,706	1(1)	0.0007	-	3	168(59)	0.1165	-	827	0	0.0000	-	3
2016	19.4	424	1,179,532	1	0.0008	-	8	197(70)	0.1670	-	788	0	0.0000	-	0
2017	20.0	447	1,271,803	1	0.0008	-	7	63(22)	0.0495	-	484	0	0.0000	-	0
2018	17.5	276	732,476	3	0.0041	-	8	108(39)	0.1474	-	513	0	0.0000	0	-
2019	15.7	380	1,087,860	0	0.0000	-	0	140(51)	0.1287	-	870	0	0.0000	0	-
2020	2.13	*	*	*	*	*	4	*	*	*	469	*	*	*	3
2021	4.65	*	*	*	*	*	3	*	*	*	467	*	*	*	3
2022	8.70	90	260,768	0	0.0000	-	2	25(8)	0.0096	-	355	0	0.0000	-	3
2023	8.82	154	507,460	0	0.0000	-	0	58(18)	0.0114	-	657	0	0.0000	-	0
2024	9.3	135	411,595	0	0.0000	0	-	96(48)	0.2332	1,032	-	1	0.0024	11	0

^a Take data are based on vessel arrival dates.

^b Mortality numbers include sharks that were released dead, finned (prior to the passage of the Shark Conservation Act of 2010), and kept.

*2020 data are not reported due to confidentiality rules.

Source: [2006-2019 PIRO Observer Program Annual and Quarterly Status Reports](#) and unpublished observer data; (McCracken 2015a; McCracken 2017a, McCracken 2019a; McCracken 2020b; McCracken and Cooper 2022a).

3.3.3.6.1 Comparison of Interactions with ITS

An ITS is not required to provide protective coverage for the ESA listed elasmobranchs including the Indo-West Pacific scalloped hammerhead shark DPS, the oceanic whitetip shark, or the giant manta ray, because there are no take prohibitions under ESA section 4(d) for these species. However, ITS were included for these species in their relevant Biological Opinions to serve as a check on the no-jeopardy conclusions by providing a reinitiation trigger.

The 2023 Biological Opinion includes ITSs for ESA listed elasmobranchs based on a maximum 5-year running sum for each species (Table 85). The new ITS went into effect May 15, 2023. For the purposes of monitoring the ITS, all captures in 2023 will count towards the first year of the 5-year term. Exceeding the maximum 5-year running sum within any 5 consecutive years will lead to reinitiating consultation of the impact of this fishery on these species.

NMFS counts takes for the Indo-West Pacific DPS of scalloped hammerhead shark, oceanic whitetip shark, and giant manta ray based on the end of haul incidental take date.

Table 84. Estimated total interactions (extrapolated using quarterly observer coverage) of oceanic whitetip sharks and giant manta rays in the American Samoa longline fishery compared to the 5-year running sum ITS in the 2023 Biological Opinion^a

Species	5-year running ITS	Estimated Total Interactions	
		2023	2024
Scalloped hammerhead shark, Indo-West Pacific DPS	45	7	0
Oceanic whitetip shark	3,520	386	878

Giant manta ray	57	0	9
Manta/Mobula ^b		7	0

^a Take data are based on haul dates.

^b 28% of manta/mobula interactions are also tracked as the ITS for giant manta ray was based on interaction data that included rays classified as manta/mobula in the observer record that may have been giant manta rays

3.3.4 HAWAII TROLL FISHERY

3.3.4.1 INDICATORS FOR MONITORING PROTECTED SPECIES INTERACTIONS IN THE HAWAII TROLL FISHERY

In this report, the Council monitors protected species interactions in the Hawaii troll fishery using proxy indicators such as fishing effort and changes in gear types as this fishery does not have observer coverage.

3.3.4.1.1 Conservation Measures

The Hawaii troll fishery has not had reported interactions with protected species, and no specific regulations are in place to mitigate protected species interactions. The Pacific Pelagic FEP requires any vessel fishing under the FEP to comply with sea turtle handling and release regulations.

3.3.4.1.2 ESA Consultations

In a Biological Opinion completed on September 1, 2009 for the troll and handline fisheries in the western Pacific region, NMFS concluded that these fisheries are not likely to jeopardize the continued existence of green turtles and included an ITS of four animals killed per year from collisions with troll and handline fishing vessels (NMFS 2009). The Biological Opinion also concluded that the fisheries are not likely to adversely affect all other protected species in the region. NMFS also determined on October 6, 2014 that fisheries managed under the Pelagic FEP have no effects on ESA-listed reef-building corals.

3.3.4.1.3 Non-ESA Marine Mammals

The MMPA requires NMFS to annually publish a LOF that classifies commercial fisheries in one of three categories based on the level of mortality and serious injury of marine mammals associated with that fishery. According to the 2024 LOF (89 FR 12257, February 16, 2024), the Hawaii troll fishery (HI troll) is classified as a Category III fishery (i.e., a remote likelihood of or no known incidental mortality and serious injury of marine mammals). The 2024 LOF lists the following marine mammal stock that may be incidentally killed or injured in this fishery:

- Pantropical spotted dolphin, HI stock

While NMFS lists Pantropical spotted dolphin as potentially interacting with the Hawaii troll fishery in the LOF, there is a lack of direct evidence of serious injury or mortality in this fishery (78 FR 23708, April 22, 2013).

3.3.4.2 STATUS OF PROTECTED SPECIES INTERACTIONS IN THE HAWAII TROLL FISHERY

NMFS has determined that the Hawaii troll fishery operating under the Pacific Pelagic FEP is not likely to jeopardize green sea turtles and not likely to adversely affect other ESA-listed sea turtles, marine mammals, seabirds, scalloped hammerhead shark, and non ESA-listed marine

mammals, and has no effects on ESA-listed reef-building corals. The Hawaii troll fishery has minimal interactions with these protected species.

The ITS in the 2009 Biological Opinion estimates four green turtle mortalities annually in the troll and handline fisheries in the western Pacific region. There have not been any reported or observed collisions of troll and handline vessels with green turtles, and data are not available to attribute stranded turtle mortality source to troll and handline vessels.

Based on fishing effort and other characteristics described in Chapter 2, no notable changes have been observed in the fishery. There is no other information to indicate that impacts to protected species from this fishery have changed in recent years.

3.3.5 MHI HANDLINE FISHERY

3.3.5.1 INDICATORS FOR MONITORING PROTECTED SPECIES INTERACTIONS IN THE MHI HANDLINE FISHERY

In this report, the Council monitors protected species interactions in the MHI handline fishery using proxy indicators such as fishing effort and changes in gear types as this fishery does not have observer coverage.

3.3.5.1.1 Conservation Measures

The MHI handline fishery has not had reported interactions with protected species, and no specific regulations are in place to mitigate protected species interactions. The Pacific Pelagic FEP requires any vessel fishing under the FEP to comply with sea turtle handling and release regulations.

3.3.5.1.2 ESA Consultations

In a Biological Opinion completed on September 1, 2009 for the troll and handline fisheries in the western Pacific region, NMFS concluded that these fisheries are not likely to jeopardize the continued existence of green turtles and included an ITS of four animals killed per year from collisions with troll and handline fishing vessels (NMFS 2009). The Biological Opinion also concluded that the fisheries are not likely to adversely affect all other protected species in the region. NMFS also determined on October 16, 2014 that fisheries managed under the Pelagic FEP have no effects on ESA-listed reef-building corals.

3.3.5.1.3 Non-ESA Marine Mammals

The MMPA requires NMFS to annually publish an LOF that classifies commercial fisheries in one of three categories based on the level of mortality and serious injury of marine mammals associated with that fishery. According to the 2024 LOF (89 FR 12257, February 16, 2024), the MHI handline (HI pelagic handline) fishery is classified as a Category III fishery (i.e., a remote likelihood of or no known incidental mortality and serious injury of marine mammals).

3.3.5.2 STATUS OF PROTECTED SPECIES INTERACTIONS IN THE MHI HANDLINE FISHERY

NMFS has determined that the MHI handline fishery operating under the Pacific Pelagic FEP is not likely to jeopardize green sea turtles and not likely to adversely affect other ESA-listed sea turtles, marine mammals, seabirds, scalloped hammerhead shark, and non ESA-listed marine mammals, and has no effects on ESA-listed reef-building corals. The MHI handline fishery has minimal interactions with these protected species.

The ITS in the 2009 Biological Opinion estimates four green turtle mortalities annually in the troll and handline fisheries in the western Pacific region. There have not been any reported or observed collisions of troll and handline vessels with green turtles, and data are not available to attribute stranded turtle mortality source to troll and handline vessels.

Based on fishing effort and other characteristics described in Chapter 2, no notable changes have been observed in the fishery. There is no other information to indicate that impacts to protected species from this fishery have changed in recent years.

3.3.6 HAWAII OFFSHORE HANDLINE FISHERY

3.3.6.1 INDICATORS FOR MONITORING PROTECTED SPECIES INTERACTIONS IN THE HAWAII OFFSHORE HANDLINE FISHERY

In this report, the Council monitors protected species interactions in the Hawaii offshore handline fishery using proxy indicators such as fishing effort and changes in gear types as this fishery does not have observer coverage.

3.3.6.1.1 Conservation Measures

The Hawaii offshore handline fishery has not had reported interactions with protected species, and no specific regulations are in place to mitigate protected species interactions. The Pacific Pelagic FEP requires any vessel fishing under the FEP to comply with sea turtle handling and release regulations.

3.3.6.1.2 ESA Consultations

In a Biological Opinion completed on September 1, 2009 for the troll and handline fisheries in the Western Pacific region, NMFS concluded that these fisheries are not likely to jeopardize the continued existence of green turtles and included an ITS of four animals killed per year from collisions with troll and handline fishing vessels. The Biological Opinion also concluded that the fisheries are not likely to adversely affect all other protected species in the region. NMFS also determined on October 16, 2014 that fisheries managed under the Pelagic FEP have no effects on ESA-listed reef-building corals.

3.3.6.1.3 Non-ESA Marine Mammals

The MMPA requires NMFS to annually publish an LOF that classifies commercial fisheries in one of three categories based on the level of mortality and serious injury of marine mammals associated with that fishery. According to the 2024 LOF (89 FR 12257, February 16, 2024), the Hawaii offshore handline (HI pelagic handline) fishery is classified as a Category III fishery (i.e., a remote likelihood of or no known incidental mortality and serious injury of marine mammals).

3.3.6.2 STATUS OF PROTECTED SPECIES INTERACTIONS IN THE HAWAII OFFSHORE HANDLINE FISHERY

NMFS has determined that the Hawaii offshore handline fishery operating under the Pacific Pelagic FEP is not likely to jeopardize green sea turtles and not likely to adversely affect other ESA-listed sea turtles, marine mammals, seabirds, scalloped hammerhead shark, and non ESA-listed marine mammals, and have no effects on ESA-listed reef-building corals. The Hawaii offshore handline fishery has minimal interactions with these protected species.

The ITS in the 2009 Biological Opinion estimates four green turtle mortalities annually in the troll and handline fisheries in the western Pacific region. There have not been any reported or

observed collisions of troll and handline vessels with green turtles, and data are not available to attribute stranded turtle mortality source to troll and handline vessels.

Based on fishing effort and other characteristics described in Chapter 2, no notable changes have been observed in the fishery. There is no other information to indicate that impacts to protected species from this fishery have changed in recent years.

3.3.7 AMERICAN SAMOA, GUAM, AND CNMI TROLL FISHERY

3.3.7.1 INDICATORS FOR MONITORING PROTECTED SPECIES INTERACTIONS IN THE AMERICAN SAMOA, GUAM AND CNMI TROLL FISHERY

In this report, the Council monitors protected species interactions in the American Samoa, Guam, and CNMI troll fisheries using proxy indicators such as fishing effort and changes in gear types as these fisheries do not have observer coverage.

Details of these indicators are discussed in the sections below.

3.3.7.1.1 Conservation Measures

The American Samoa, Guam, and CNMI fisheries have not had reported interactions with protected species, and no specific regulations are in place to mitigate protected species interactions. The Pacific Pelagic FEP requires any vessel fishing under the FEP to comply with sea turtle handling and release regulations.

3.3.7.1.2 ESA Consultations

In a Biological Opinion completed on September 1, 2009 for the troll and handline fisheries in the Western Pacific region, NMFS concluded that these fisheries are not likely to jeopardize the continued existence of green turtles and included an ITS of four animals killed per year from collisions with troll and handline fishing vessels. The Biological Opinion also concluded that the fisheries are not likely to adversely affect all other protected species in the region. NMFS also determined on October 16, 2014 that fisheries managed under the Pelagic FEP have no effects on ESA-listed reef-building corals.

3.3.7.1.3 Non-ESA Marine Mammals

The MMPA requires NMFS to annually publish an LOF that classifies commercial fisheries in one of three categories based on the level of mortality and serious injury of marine mammals associated with that fishery. According to the 2024 LOF (89 FR 12257, February 16, 2024), troll fisheries in American Samoa, Guam and CNMI are classified as Category III fisheries (i.e., a remote likelihood of or no known incidental mortality and serious injury of marine mammals).

3.3.7.2 STATUS OF PROTECTED SPECIES INTERACTIONS IN THE AMERICAN SAMOA, GUAM AND CNMI TROLL FISHERY

NMFS has determined that the American Samoa, Guam, and CNMI fisheries operating under the Pacific Pelagic FEP are not likely to jeopardize green sea turtles and not likely to adversely affect other ESA-listed sea turtles, marine mammals, seabirds, scalloped hammerhead shark, and non ESA-listed marine mammals, and have no effects on ESA-listed reef-building corals. The American Samoa, Guam, and CNMI fisheries likely have minimal interactions with these protected species.

The ITS in the 2009 Biological Opinion estimates four green turtle mortalities annually in the troll and handline fisheries in the western Pacific region. There have not been any reported or observed collisions of troll and handline vessels with green turtles, and data are not available to attribute stranded turtle mortality source to troll and handline vessels.

Based on fishing effort and other characteristics described in Chapter 2, no notable changes have been observed in the American Samoa, Guam, and CNMI troll fisheries. There is no other information to indicate that impacts to protected species from these fisheries have changed in recent years.

3.3.8 IDENTIFICATION OF EMERGING ISSUES

Oceanic whitetip sharks were listed under the ESA in 2018. This species is incidentally captured in the Hawaii and American Samoa longline fisheries. RFMO conservation measures implemented in the U.S. domestic fisheries have required non-retention of oceanic whitetip sharks since 2011 in the IATTC area and 2015 in the WCPFC area. Additionally, the Cooperative Institute for Marine and Atmospheric Research and the Hawaii Institute of Marine Biology conducted a study to assess the post-release survivorship of five species of sharks including the oceanic whitetip shark released alive in the Hawaii and American Samoa longline fishery.

In the study (Hutchinson et al. 2021), PIFSC researchers worked with observer programs and fishermen to quantify post release mortality rates of blue, bigeye thresher, shortfin mako, oceanic whitetip, and silky sharks that are incidentally captured in the Hawaii deep-set longline fishery and oceanic whitetip and silky sharks in the American Samoa longline fishery, using pop-off archival satellite tags (PAT). This study also assessed the effects that standard shark bycatch handling and discard practices utilized in these fisheries may have on the post release fate of discarded sharks that are alive at haul back of the longline gear. Observers trained in the project methods collected shark condition and handling data on all incidental elasmobranchs captured during the study. Tagging was not conducted on Hawaii shallow-set longline trips targeting swordfish. The handling and damage data recorded by trained observers indicated that most of the five species of sharks considered in this study were released by cutting the line. Followed by; gear removal with jaw damage, gear removal with no damage to the shark, gear removal with removal of part of the shark (e.g., lobe of tail on tail-hooked bigeye thresher). A small proportion of these sharks escaped the gear on their own. Other handling methods that were observed included the use of a dehooker and a drag line. The length and composition of the trailing gear was also recorded by observers and varied by fishery and by species. The Hawaii deep-set longline fishery left the greatest amount of trailing gear on sharks, where sharks were released with an average of 8.75 m, ranging in length from 1.0–25.0 m, typically composed of a stainless-steel hook, 0.5 m of braided wire leader, a 45-gram weighted swivel, and monofilament branchline. Sharks released by cutting the line in American Samoa were released with an average of 2.98 m of trailing gear which is composed of a stainless-steel hook to an all monofilament line ranging in length from 1.0–10.0 m.

A proportional hazard model was implemented in a Bayesian framework to understand the impacts of several factors (fishery, condition at the vessel, handling and discard methods, approximate fork length, length of trailing gear) associated with the fishery interaction on survival. The baseline hazard was assumed to vary by species and tag deployment period. Of the species caught and tagged in the Hawaii deep-set longline fishery, blue shark had the lowest

survival rate, followed by bigeye thresher, oceanic whitetip, and shortfin mako at their mean interaction conditions. For the species caught in the American Samoa longline fishery, oceanic whitetip shark had a lower survival rate than silky shark at their mean interaction conditions. The only species tagged in both fisheries, oceanic whitetip shark, had lower survival in the American Samoa longline fishery than the Hawaii deep-set longline fishery. The most influential factors reducing survival rates post release were; catch condition where injured animals had higher mortality rates, handling methods that either damaged the jaw or removed part of the tail (thresher sharks only), the amount of trailing gear left on an animal, tail hooking (thresher sharks only) and wire leader material. Additional details regarding the preliminary results of this study are available in Hutchinson et al. (2021). Currently, analysis is ongoing to incorporate data from tags deployed after 2019 and final results are forthcoming.

Currently, genetic samples are being taken from large Mobulids captured in the Hawaii longline fishery to help elucidate species identification issues, interaction rates, and eventually, population structure for the giant manta ray. To date, 42 samples have been collected and 37 of those samples have been analyzed for species identification. To date, species collected include *M. mobular/japanica*, *M. thurstoni*, *M. tarapacana*; and one confirmed *M. birostris/alfredi*. More samples are needed for a larger sample size.

Previous efforts to understand the spatial relationships of loggerhead turtles and the Hawaii shallow-set longline fishery have included data generated from satellite tags deployed on both captive-reared turtles, and turtles incidentally caught in the fishery. Given captive-reared turtles may not be representative of the size or locations of turtles interacting with the modern Hawaii shallow-set longline fishery, efforts have been underway since 2020 to increase the sample size of satellite tags deployed on incidentally caught turtles. A total of 61 satellite tags were deployed between February 2020 and April 2025 on post-hooked loggerheads. The 2025 season will likely represent the final year of the current satellite tagging effort, with focus subsequently shifting to data analysis and compiling end-products.

A power-assisted deployment device (ADD), tag anchor, and pole extension that will enable longline observers (on deck) to attach satellite tags to leatherback turtles is currently in development. The prototypes of the ADD and tag anchor were recently produced and will be tested on leatherback turtles in the Atlantic during the coming years to evaluate the tagging apparatus and tag retention. The prototype of the pole extension is currently under development. If proven effective, the new device will allow observers to deploy tags on leatherback turtles bycaught in longline fisheries, generating urgently needed spatial ecology and mortality rate information on the species that can inform models and management decision making. In 2024, research efforts to deploy the novel anchor tags on leatherbacks were undertaken off the coast of Massachusetts, which is typically a leatherback foraging hotspot. However, 2024 was an anomalous year with very few leatherbacks observed and no leatherbacks were captured during fieldwork. A second effort to deploy the anchor tags is currently planned for North Carolina in May 2025.

Potential interactions between Hawaii non-longline pelagic fisheries and cetaceans have been identified and are summarized in the most recent marine mammal SARs. Available information does not identify which type of fisheries may be causing injury to cetaceans nor the extent to which the cetacean populations may be impacted by such injuries. New information on this subject published in 2016 that are not included in the current SARs are summarized below.

Potential interactions between Hawaii non-longline pelagic fisheries and cetaceans have been identified and are summarized in the most recent marine mammal SARs. Available information does not identify which type of fisheries may be causing injury to cetaceans nor the extent to which the cetacean populations may be impacted by such injuries. New information on this subject published in 2016 that are not included in the current SARs are summarized below.

Madge, L., 2016. Exploratory study of interactions between cetaceans and small-boat fishing operations in the Main Hawaiian Islands (MHI). Pacific Islands Fisheries Science Center, Administrative Report H-16-07, 37 p. doi:10.7289/V5/AR-PIFSC-H-16-07.

Summary: The exploratory study was aimed at improving the understanding of fishery-cetacean interactions in the main Hawaiian Islands through interviews with small-boat fishermen on Oahu and the Big Island. The study highlighted that there is considerable uncertainty in species identification by fishermen of false killer whales and other odontocetes categorized as blackfish, and respondents generally reported avoiding interactions by leaving the fishing area when a blackfish is observed. The results of this study cannot be used to estimate frequency or assess the distribution of interactions due to the small sample size and non-random sampling method.

Table 85 summarizes current candidate ESA species, recent listing status, and post-listing activity (critical habitat designation and recovery plan development). Impacts from FEP-managed fisheries on any new listings and critical habitat designations will be considered in future versions of this report.

Table 85. Status of ESA listing, status reviews, critical habitat and recovery plan for species occurring in the Pelagic FEP region

Species		Listing/Petition Response Process			Post-Listing Activity	
Common Name	Scientific Name	90-day Finding	12-month Finding / Proposed Rule	Final Rule	Critical Habitat/Other	Recovery Plan
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	Positive (81 FR 1376, 1/12/2016)	Warranted, threatened (81 FR 96304, 12/29/2016)	Listed as threatened (83 FR 4153, 1/30/18)	<u>Critical habitat:</u> Designation not prudent; no areas within US jurisdiction that meet definition of critical habitat (85 FR 12898, 3/5/2020) <u>Other:</u> Protective regulations under ESA 4(d) proposed (89 FR 41917, 5/14/2024)	Final Recovery Plan published July 11, 2024 (89 FR 56865)
Chambered nautilus	<i>Nautilus pompilius</i>	Positive (81 FR 58895, 8/26/2016)	Warranted, threatened (82 FR 48948, 10/23/17)	Listed as threatened (83 FR 48876, 09/28/2018)	Designation not prudent; no areas within US jurisdiction that meet definition of critical habitat (85 FR 5197, 01/29/2020)	TBA

Species		Listing/Petition Response Process			Post-Listing Activity	
Common Name	Scientific Name	90-day Finding	12-month Finding / Proposed Rule	Final Rule	Critical Habitat/Other	Recovery Plan
Giant manta ray	<i>Manta birostris</i>	Positive (81 FR 8874, 2/23/2016)	Warranted, threatened (82 FR 3694, 1/12/2017)	Listed as threatened (83 FR 2916, 1/22/18)	Designation not prudent; no areas within US jurisdiction that meet definition of critical habitat (84 FR 66652, 12/5/2019)	Draft Recovery Plan published October 15, 2024 (89 FR 82991)
Corals	N/A	Positive for 82 species (75 FR 6616, 2/10/2010)	Warranted, threatened for 66 species (77 FR 73219, 12/7/2012)	20 species listed as threatened (79 FR 53851, 9/10/2014)	Critical habitat proposed (85 FR 76262, 11/27/2021, withdrawn) Critical habitat proposed (88 FR 83644, November 30, 2023)	In development; interim recovery outline in place, recovery workshops convened in May 2021.
False killer whale (MHI Insular DPS)	<i>Pseudorca crassidens</i>	Positive (75 FR 316, 1/5/2010)	Warranted, endangered (75 FR 70169, 11/17/2010)	Listed as endangered (77 FR 70915, 11/28/2012)	Designated in waters from the 45 m depth contour to the 3,200 m depth contour around the MHI from Niihau east to Hawaii (83 FR 35062, 07/24/2018)	Final Recovery Plan published November 3, 2021 (85 FR 60615)
Green sea turtle	<i>Chelonia mydas</i>	Positive (77 FR 45571, 8/1/2012)	Identification of 11 DPSs, endangered and threatened (80 FR 15271, 3/23/2015)	11 DPSs listed as endangered and threatened (81 FR 20057, 4/6/2016)	Critical habitat proposed (88 FR 46572, 07/19/2023)	TBA
Loggerhead sea turtle (North Pacific DPS)	<i>Caretta caretta</i>	Positive (72 FR 64585, 11/16/2007)	9 DPSs listed as endangered and threatened (76 FR 15932, 03/22/2011)	9 DPSs listed as endangered and threatened (76 FR 58867, 10/24/2011)	Designated for Atlantic Ocean and Gulf of Mexico DPSs (79 FR 39855, 08/11/2014)	In development; 5-year status review published on 4/7/2020

3.3.9 IDENTIFICATION OF RESEARCH, DATA, AND ASSESSMENT NEEDS

The following research, data and assessment needs for pelagic fisheries were identified by the Council's Plan Team:

- Maintain observer coverage in the longline fisheries to facilitate data collection to identify changes in ecosystem composition, including but not limited to, trophic cascades, spatial habitat partitioning, climate-driven variability and change, and fishery-induced changes;
- Identify zones to develop a regional look at environmental and oceanographic factors for area outside of the EEZ that may focus on areas of high-interactions. Develop metrics to characterize environmental data, effort, and bycatch rates at these regional scales (e.g. leatherback, olive ridley, albatrosses, elasmobranchs);

- Generate data on the spatial ecology, as well as post-hooking behaviors and survival rates for leatherback turtles interacting with the SSL and DSL fisheries;
- Ecosystem considerations on catch and bycatch in the DSL fishery (e.g., bigeye tuna, albatrosses, leatherback, and olive ridley turtles) and SSL fishery (e.g., black-footed albatross) as they relate to environmental and ecological drivers of changing species distribution and aggregation;
- Improve data collection for oceanic whitetip shark capture data in non-longline pelagic fisheries;
- Conduct genetic and telemetry research to improve understanding of population structure and movement patterns for listed elasmobranchs;
- Estimates of post release survival for incidental protected species;
- Improve observer data collection for bite-offs; and
- Build species distribution models (SDM) for protected species using existing telemetry data to assess how a changing ocean may affect the availability of preferred habitat and how this might impact fishery vulnerability under future climate change projections.

3.4 CLIMATE AND OCEANIC INDICATORS

Over the past few years, the Council has incorporated climate change into the overall management of the fisheries over which it has jurisdiction. This 2024 annual SAFE report includes a now standard section on indicators of climate and oceanic conditions in the Western Pacific Region. These indicators reflect both global climate variability and change, as well as trends in local oceanographic conditions.

The section begins with a brief summary of the state of the ocean and climate in 2024. This is followed by a list of all selected indicators. These indicators are then examined through summaries focused on natural climate variability and on anthropogenic climate change. Information on the background of these indicators, their development over time, and ongoing research needs can be found at the end of this section.

3.4.1 INDICATORS AT A GLANCE

Based on the information provided by the indicators in this chapter, long-term climate trends persisted in the Western Pacific region in 2024. Modes of interannual climate variability were mixed with ENSO transitioning from El Niño to neutral conditions, the PDO remaining negative, and the NPGO being negative as well. Hurricane storm energy was below average in all Pacific basins. Storm counts were below average in the Eastern and Central Pacific and near average in the Western and Southern Pacific. The atmospheric concentration of carbon dioxide continued to increase, ocean acidification intensified, and sea surface temperatures continued to rise. Chlorophyll concentrations at the ocean's surface and the median size of phytoplankton has declined slightly over the past 27 years. The Subtropical Frontal Zone and the Transition Zone Chlorophyll Front were both near average across much of the longline fishing grounds. Temperatures at 200–300 m below the surface were average. Bigeye tuna were slightly larger than average and swordfish slightly smaller, though no long-term trend is evident. Neither bigeye tuna weight-per-unit-effort nor the bigeye tuna recruitment index suggest there will be a pulse of increased recruitment or catch rates in the next few years. The bigeye tuna catch rate forecast suggests that catch will be fairly steady over the next four years.

Indicator	Trend	Current Status	Description and Rationale
Atmospheric Carbon Dioxide (CO ₂)	 Increasing	 Record high	Atmospheric carbon dioxide is a measure of how human activity has already affected the climate system through burning fossil fuels.
Oceanic pH at Station ALOHA	 Decreasing	 Record low	Oceanic pH is a measure of how greenhouse gas emissions have already affected the ocean.
El Niño – Southern Oscillation (ENSO)	 No trend	 In historical range	The El Niño – Southern Oscillation (ENSO) cycle is known to affect Pacific fisheries, including tuna fisheries.
Pacific Decadal Oscillation (PDO)	 No trend	 In historical range	The Pacific Decadal Oscillation (PDO) changes phases over periods of 20–30 years, with secondary signatures for tropical fisheries.
North Pacific Gyre Oscillation (NPGO)	 No trend	 In historical range	The North Pacific Gyre Oscillation (NPGO) reflects natural basin-wide ocean change that can affect fish and fishery performance.
Tropical Cyclones	 Mixed trends	 In historical range	Storms disrupt fishing effort, endanger safety at sea, and can damage infrastructure on land.
Sea Surface Temperature (SST)	 Increasing	 Above average	SST varies naturally, is increasing due to climate change, and affects marine species.
200–300 m Ocean Temperature	 Decreasing	 Near average	These temperatures reflect habitat targeted by bigeye tuna and the deep-set fishery.
Ocean Color	 Decreasing	 Near average	This indicator measures phytoplankton which are fishes' foundational food source.
Subtropical Front (STF) and Transition Zone Chlorophyll Front (TZCF)	 Not measured	 In historical range	The STF and TZCF are targeted by the swordfish fishery, used as migration and foraging corridors by marine species, and will be displaced northwards by climate change.
Estimated Median Phytoplankton Size	 Decreasing	 Below average	Fish size and abundance can be affected by median phytoplankton size, which in turn may be affected by climate variability and change.
Fish Community Size Structure	 No trend	 In historical range	Fish community size structure can be affected by a number of factors, including the climate.
Bigeye Tuna Weight-per-Unit-Effort	 Not measured	 In historical range	Size classes are tracked as a strong indication of recruitment pulses.
Bigeye Tuna Recruitment Index	 No trend	 Record low	Catch rates of small bigeye tuna are used as an indicator of bigeye tuna recruitment.
Bigeye Tuna Catch Rate Forecast	 Not measured	 In historical range	Ocean conditions are used to forecast catch rates up to four years into the future.

Figure 156. Summary of the trends and status of the ocean and climate indicators in 2024

3.4.2 SELECTED INDICATORS

The primary goal for selecting the indicators used in this report is to provide fisheries-related communities, resource managers, and businesses with a climate-related situational awareness. In this context, indicators were selected to:

- Be fisheries relevant and informative;
- Build intuition about current conditions in light of a changing climate;
- Provide historical context; and
- Allow for recognition of patterns and trends.

In this context, this section includes the following climate and oceanic indicators:

- Atmospheric concentration of carbon dioxide (CO₂)
- Oceanic pH at Station ALOHA;
- El Niño – Southern Oscillation (ENSO);
- Pacific Decadal Oscillation (PDO);
- North Pacific Gyre Oscillation (NPGO);
- Tropical cyclones;
- Sea surface temperature (SST);
- Ocean temperature at 200–300 m depth;
- Ocean color;
- North Pacific Subtropical Front (STF) and Transition Zone Chlorophyll Front (TZCF);
- Estimated median phytoplankton size
- Fish community size structure;
- Bigeye tuna weight-per-unit-effort;
- Bigeye tuna recruitment index; and
- Bigeye tuna catch rate forecast.

3.4.2.1 NATURAL CLIMATE VARIABILITY SUMMARY

The ocean and climate indicators described here can be used to understand the effects of natural climate variability. The relationship between these indicators is illustrated in Figure 157.

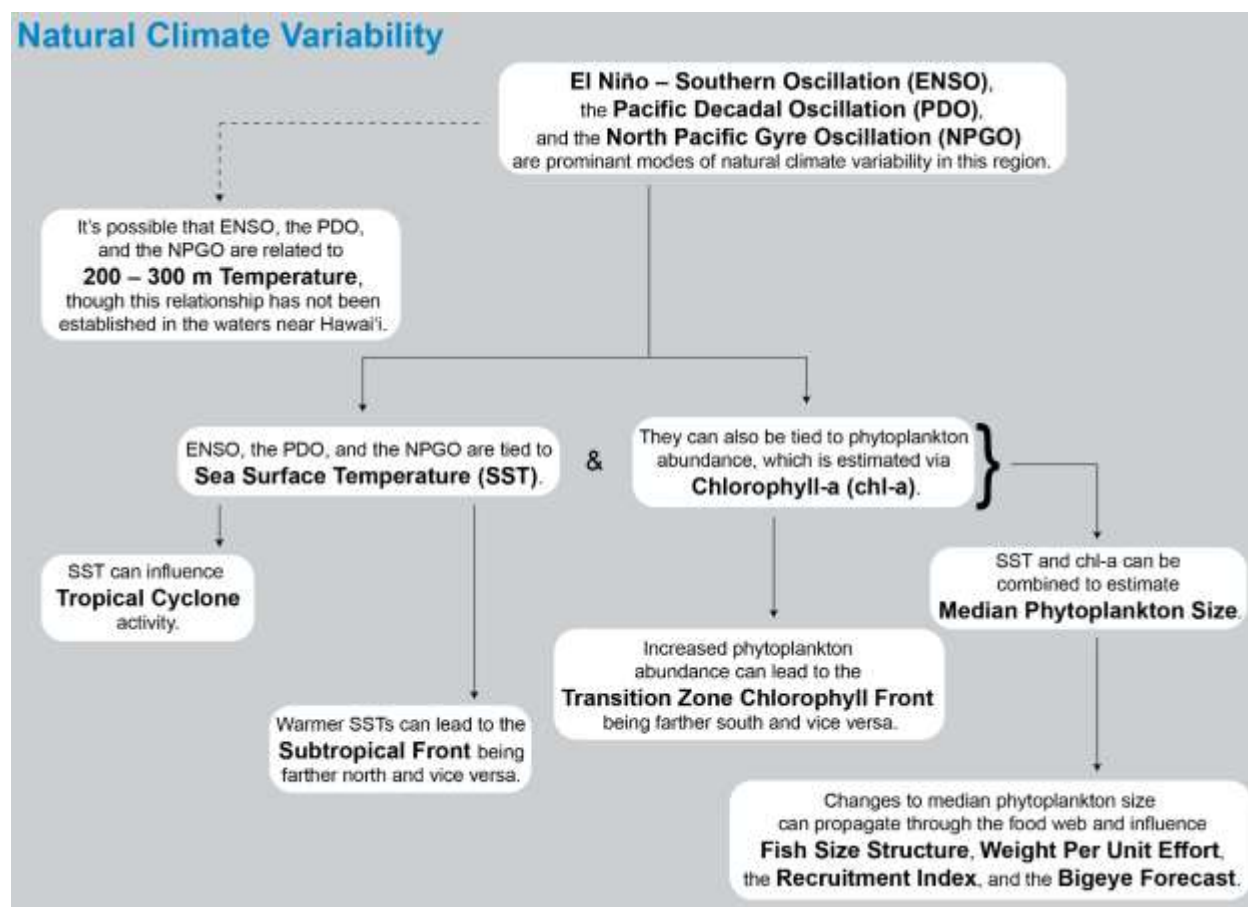


Figure 157. Schematic diagram illustrating the relationships between the ocean and climate indicators from the perspective of natural climate variability

The El Niño – Southern Oscillation (ENSO), the Pacific Decadal Oscillation (PDO), and the North Pacific Gyre Oscillation (NPGO) are prominent modes of natural climate variability in the North Pacific. ENSO cycles are known to impact Pacific fisheries including tuna fisheries. The Oceanic Niño Index (ONI) is a measure of ENSO phase that focuses on ocean temperature, which has the most direct effect on these fisheries.

ENSO, the PDO, and the NPGO are all associated with interannual changes in sea surface temperature (SST), which is one of the most directly observable existing measures for tracking ocean temperature. Natural variability in SST impacts the marine ecosystem and pelagic fisheries. For example, higher SSTs can lead to the subtropical front being farther north and vice versa, which in turn affects the distance fishers may need to travel to reach longline fishing grounds. Changes in SST can also influence the number, location, strength, and seasonal timing of tropical cyclones.

ENSO, the PDO, and the NPGO are also associated with interannual changes in phytoplankton abundance, which is observed through ocean color and estimated via chlorophyll-a (chl-a). Phytoplankton are the foundational food source for the species targeted by the region's longline fishery. Changes in phytoplankton abundance have the potential to impact fish abundance, size, and catch. Increased phytoplankton abundance can lead to the transition zone chlorophyll front

(TZCF) being farther south and vice versa, and changes in the location of this front particularly impact Hawai‘i’s swordfish fishery.

SST and chl-a can be combined to estimate median phytoplankton size. Changes to median phytoplankton can propagate through the food web and influence fish size structure, weight-per-unit-effort, and the bigeye tuna recruitment index. Furthermore, the recruitment index can be combined with median phytoplankton size to forecast bigeye tuna catch rates up to four years in advance.

It is possible that natural climate variability influences temperatures at 200–300 m below the surface where the bigeye fishery sets their hooks. However, this relationship has yet to be established.

Understanding the effects of natural climate variability, like ENSO, the PDO, and the NPGO, on the ocean, marine ecosystems, and regional fisheries is an active area of research.

3.4.2.2 ANTHROPOGENIC CLIMATE CHANGE SUMMARY

The ocean and climate indicators described in this chapter can be used to understand the effects of anthropogenic climate change. The relationship between these indicators is illustrated in Figure 158.

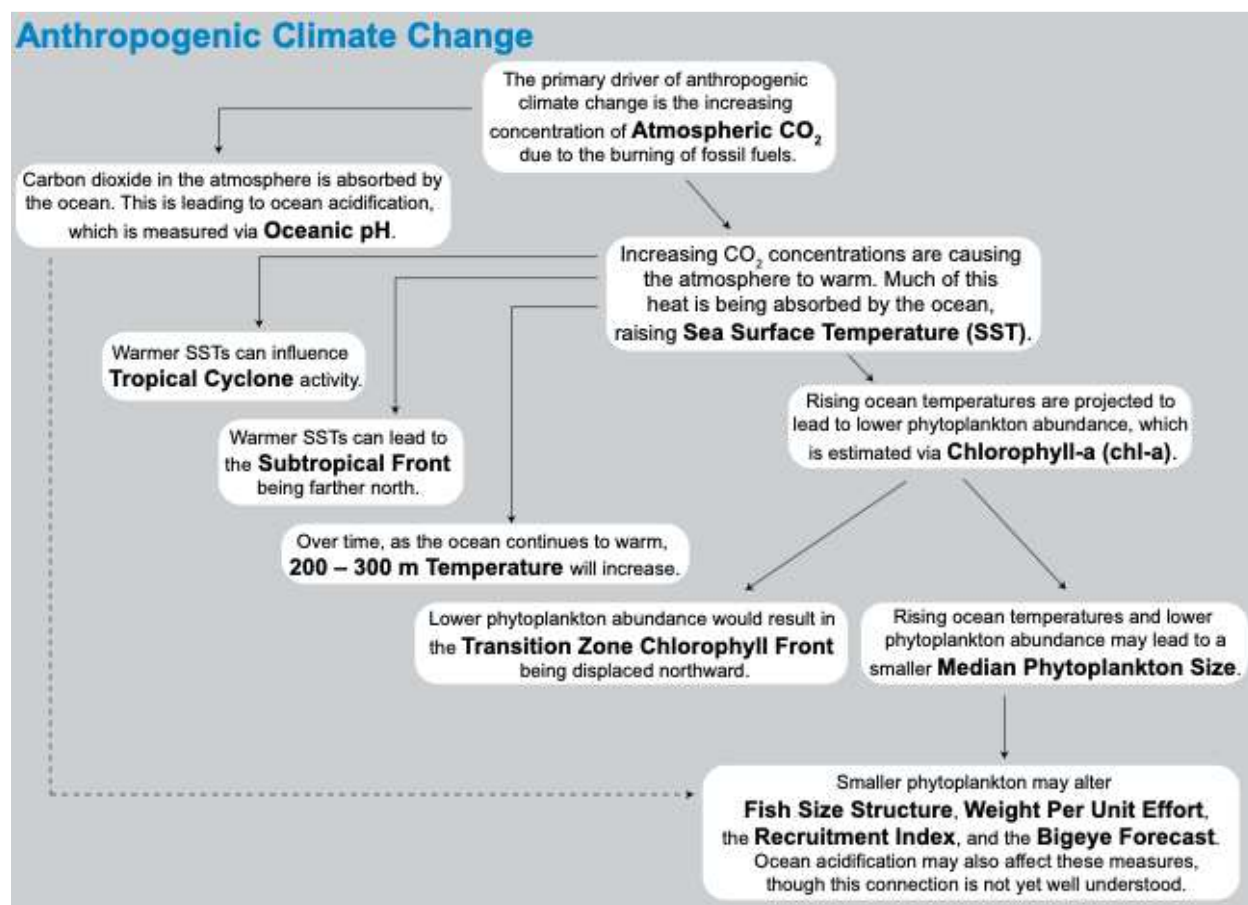


Figure 158. Schematic diagram illustrating the relationships between the ocean and climate indicators from the perspective of anthropogenic climate change

The primary driver of anthropogenic (human-caused) climate change is the increasing concentration of atmospheric carbon dioxide, CO₂, due to the burning of fossil fuels. Therefore, atmospheric CO₂ serves as a measure of what human activity has already done to affect the climate system through greenhouse gas emissions. The concentration of atmospheric CO₂, and, in turn, its warming influence, is increasing more quickly over time.

Carbon dioxide in the atmosphere is absorbed by the ocean. This leads to ocean acidification, which is measured via pH. Therefore, oceanic pH is a measure of how greenhouse gas emissions have already affected the ocean. Increasing ocean acidification limits the ability of marine organisms to build shells and other hard structures. Prey for commercially valuable fish are already being negatively affected by increasing ocean acidification.

Increasing carbon dioxide concentrations cause the atmosphere to warm. Much of this heat is then absorbed by the ocean, raising sea surface temperature (SST). SST is another measure of how greenhouse gas emissions are already affecting the ocean.

Rising sea surface temperatures may affect the number, strength, duration, track, and seasonal timing of tropical cyclones. The Accumulated Cyclone Energy index, or ACE Index, accounts for both the strength and duration of storms.

Over time, rising sea surface temperatures will warm deeper ocean waters. Changes in ocean temperature will affect tuna, and in turn, potentially their catchability. For example, fish may move to deeper waters or their habitat could be compressed geographically or vertically. Temperatures at 200–300 meters below the ocean's surface reflect those at the mid-range of depths targeted by the deep-set bigeye tuna fishery. Bigeye tuna have preferred thermal habitat, generally staying within waters between 8–14 °C while they are at depth.

Rising ocean temperatures are projected to lead to lower phytoplankton abundance, which is observed through ocean color and estimated via chlorophyll-a (chl-a). Combined, rising ocean temperatures and lower phytoplankton abundance may lead to smaller median phytoplankton sizes. Smaller phytoplankton may alter fish size structure, weight-per-unit-effort, and the bigeye tuna recruitment index. Median phytoplankton size can be combined with the bigeye recruitment index to forecast catch rates.

Understanding the effects of anthropogenic climate change on the ocean, marine ecosystems, and regional fisheries is an active area of research.

3.4.2.3 ATMOSPHERIC CONCENTRATION OF CARBON DIOXIDE AT MAUNA LOA

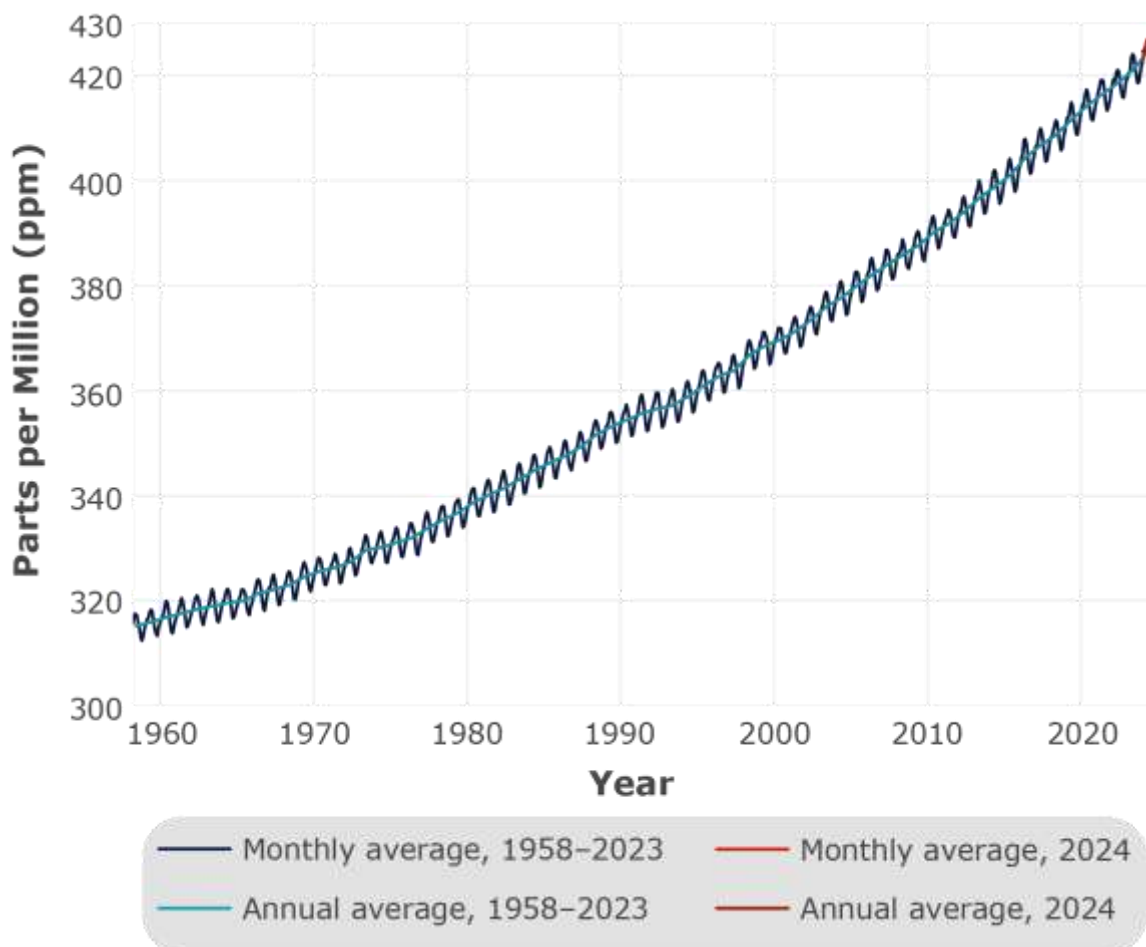


Figure 159. Concentration of atmospheric carbon dioxide at Mauna Loa Observatory on the island of Hawai‘i

Rationale: Atmospheric carbon dioxide (CO₂) is a measure of what human activity has already done to affect the climate system through greenhouse gas emissions. It provides quantitative information in a simplified, standardized format that decision makers can easily understand. This indicator demonstrates that the concentration (and, in turn, warming influence) of greenhouse gases in the atmosphere has increased substantially over the last several decades.

Status: Atmospheric CO₂ is increasing exponentially. This means that atmospheric CO₂ is increasing more quickly over time. In 2024, the annual mean concentration of CO₂ was 424.61 ppm. This is the highest annual value recorded. This year also saw the highest monthly value, which was 426.91 ppm. In 1959, the first year full of the time series, the atmospheric concentration of CO₂ was 316 ppm. The annual mean passed 350 ppm in 1988, and 400 ppm in 2015.

Description: Monthly mean atmospheric CO₂ at Mauna Loa Observatory, Hawai‘i in parts per million (ppm) from March 1958 to present. The observed increase in monthly average carbon dioxide concentration is primarily due to CO₂ emissions from fossil fuel burning. Carbon dioxide

remains in the atmosphere for a very long time, and emissions from any location mix throughout the atmosphere in approximately one year. The annual variations at Mauna Loa, Hawai‘i are due to the seasonal imbalance between the photosynthesis and respiration of terrestrial plants. During the summer growing season, photosynthesis exceeds respiration, and CO₂ is removed from the atmosphere. In the winter (outside the growing season), respiration exceeds photosynthesis, and CO₂ is returned to the atmosphere. The seasonal cycle is strongest in the northern hemisphere because of its larger land mass.

Timeframe: Annual, monthly.

Region/Location: Mauna Loa, Hawai‘i, but representative of global atmospheric carbon dioxide concentration. Note that due to the eruption of the Mauna Loa Volcano, measurements from Mauna Loa Observatory were suspended as of 29 November 2022. Observations from December 2022 to 4 July 2023 are from a site at the Maunakea Observatories, approximately 21 miles north of the Mauna Loa Observatory. Mauna Loa observations resumed in July 2023.

Measurement Platform: *In-situ* station.

Data available at: <https://gml.noaa.gov/ccgg/trends/data.html>.

Sourced from: (Keeling et al. 1976; Thoning et al. 1989; NOAA 2025a). Graphics produced in part using Stawitz and Li (2025).

3.4.2.4 OCEANIC PH

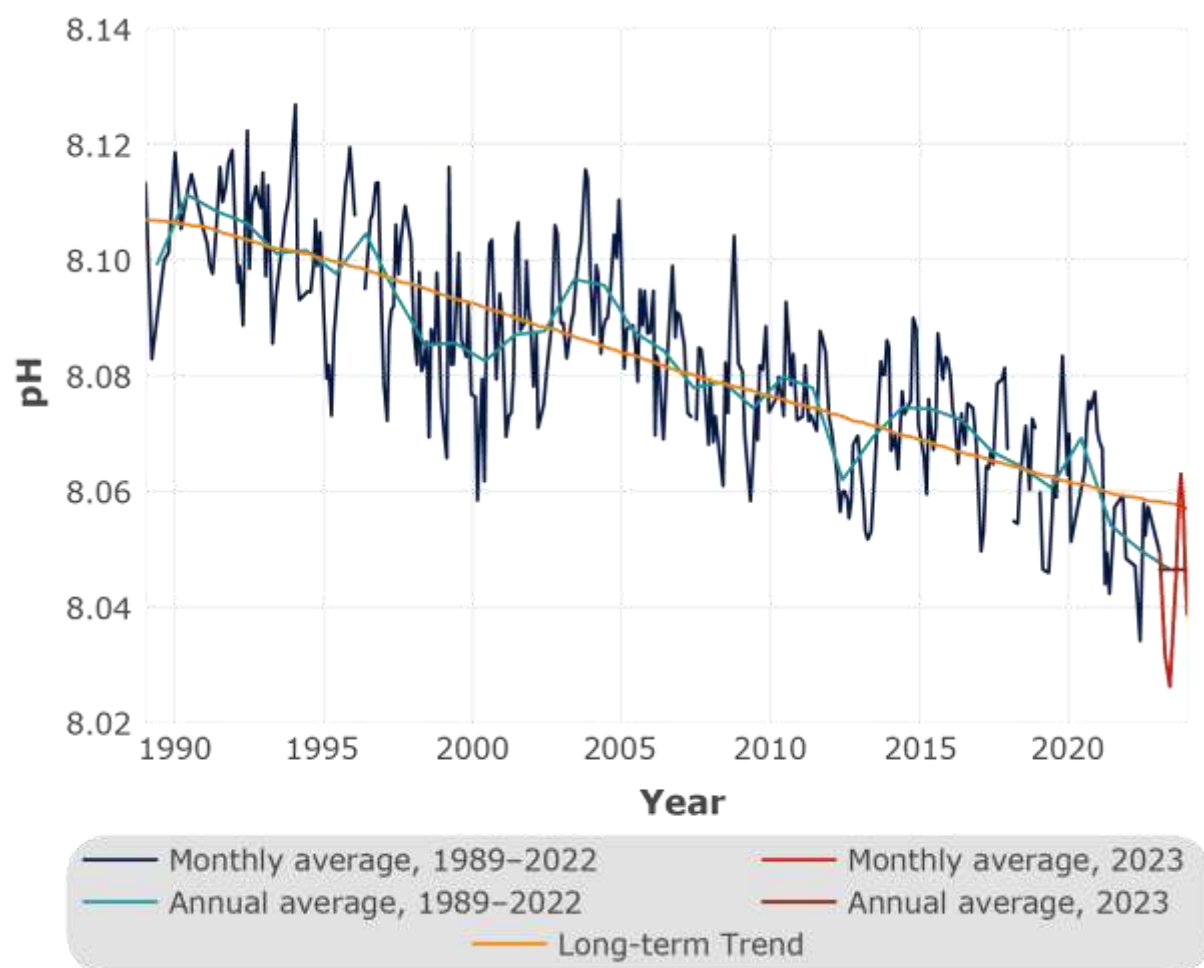


Figure 160. Time series and long-term trend of oceanic pH measured at Station ALOHA

Rationale: Oceanic pH is a measure of how greenhouse gas emissions have already affected the ocean. This indicator demonstrates that oceanic pH has decreased significantly over the past several decades (i.e., the ocean has become more acidic). Increasing ocean acidification limits the ability of marine organisms to build shells and other calcareous structures. Recent research has shown that pelagic organisms such as pteropods and other prey for commercially valuable fish species are already being negatively impacted by increasing acidification (Feely et al. 2016). The full impact of ocean acidification on the pelagic food web is an area of active research (e.g., Fabry et al. 2008).

Status: The ocean is roughly 12.2% more acidic than it was over 30 years ago at the start of this time series. Over this time, pH has declined by 0.05 at a constant rate. In 2023, the most recent year for which data are available, the average pH was 8.05. This year also saw a time series minimum of 8.026. Additionally, for the 8th year, small variations seen over the course of the year are outside the range seen in the first year of the time series. The highest pH value reported for the most recent year (8.063) is lower than the lowest pH value reported in the first year of the time series (8.083).

Description: Trends in surface (5 m) pH at Station ALOHA, north of Oahu (22.75°N, 158°W), are collected by the Hawai‘i Ocean Time-Series (HOT) from October 1988 to 2023 (2024 data are not yet available). Oceanic pH is a measure of ocean acidity, which increases as the ocean absorbs carbon dioxide from the atmosphere. Lower pH values represent greater acidity. Oceanic pH is calculated from total alkalinity (TA) and dissolved inorganic carbon (DIC). Total alkalinity represents the ocean’s capacity to resist acidification as it absorbs CO₂ and the amount of CO₂ absorbed is captured through measurements of DIC. The multi-decadal time series at Station ALOHA represents the best available documentation of the significant downward trend in oceanic pH since the time series began in 1988. Oceanic pH varies over both time and space, though the conditions at Station ALOHA are considered broadly representative of those across the Western and Central Pacific’s pelagic fishing grounds.

Timeframe: Monthly.

Region/Location: Station ALOHA: 22.75°N, 158°W.

Measurement Platform: *In-situ* station.

Data available at: <https://hahana.soest.hawaii.edu/hot/hot-dogs/bseries.html>.

Sourced from: (Karl and Lukas 1996; Zeebe and Wolf-Gladrow 2001; Fabry et al. 2008; Feely et al. 2016; HOT 2025). Graphics produced in part using Stawitz and Li (2025).

3.4.2.5 EL NIÑO – SOUTHERN OSCILLATION

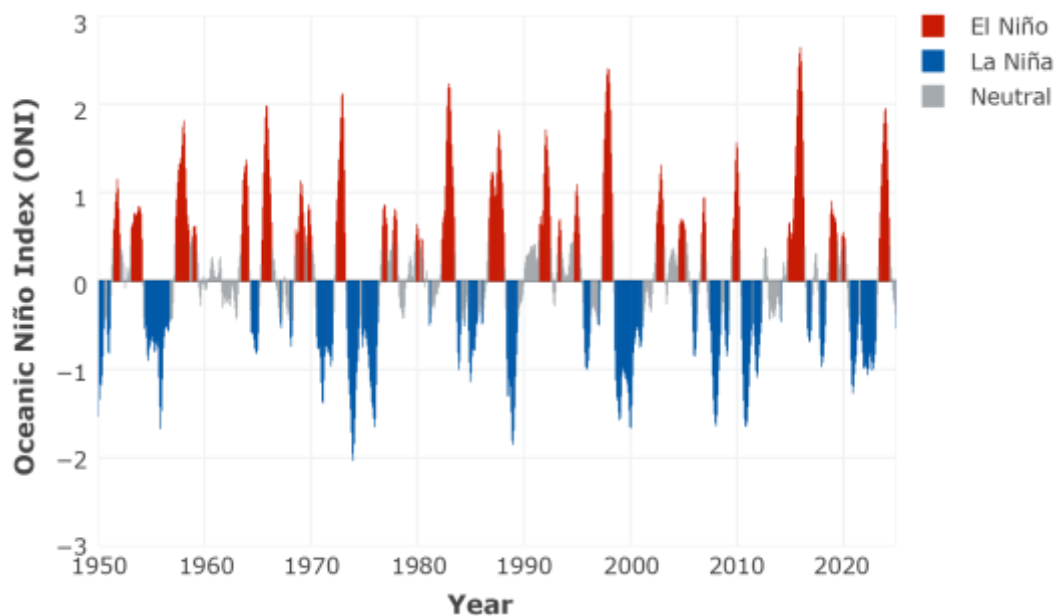


Figure 161. Oceanic Niño Index from 1950–2024 El Niño periods in red, La Niña periods in blue, and neutral periods in grey

Rationale: The El Niño – Southern Oscillation (ENSO) cycle is known to have impacts on Pacific fisheries including tuna fisheries. The Oceanic Niño Index (ONI) focuses on ocean temperature, which has the most direct effect on these fisheries.

Status: The Oceanic Niño Index (ONI) indicated a transition from El Niño to neutral conditions in 2024. In 2024, the ONI ranged from -0.53 to 1.78. This is within the range of values previously observed in the time series.

Description: The three-month running mean (referred to as a season) of satellite remotely-sensed sea surface temperature (SST) anomalies in the Niño 3.4 region (5°S – 5°N, 120° – 170°W). The ONI is a measure of the ENSO phase. Warm and cool phases, termed El Niño and La Niña respectively, are based in part on an ONI threshold of ± 0.5 °C being met for a minimum of five consecutive overlapping seasons. Additional atmospheric indices are needed to confirm an El Niño or La Niña event, as the ENSO is a coupled ocean-atmosphere phenomenon. The atmospheric half of ENSO is measured using the Southern Oscillation Index.

Timeframe: Three-month running mean.

Region/Location: Niño 3.4 region, 5°S – 5°N, 120° – 170°W.

Measurement Platform: *In-situ* station, satellite, model.

Data available at: <https://www.cpc.ncep.noaa.gov/data/indices/oni.ascii.txt>.

Sourced from: (NOAA Climate Prediction Center (CPC) 2025). Graphics produced in part using Stawitz and Li (2025).

3.4.2.6 PACIFIC DECADAL OSCILLATION

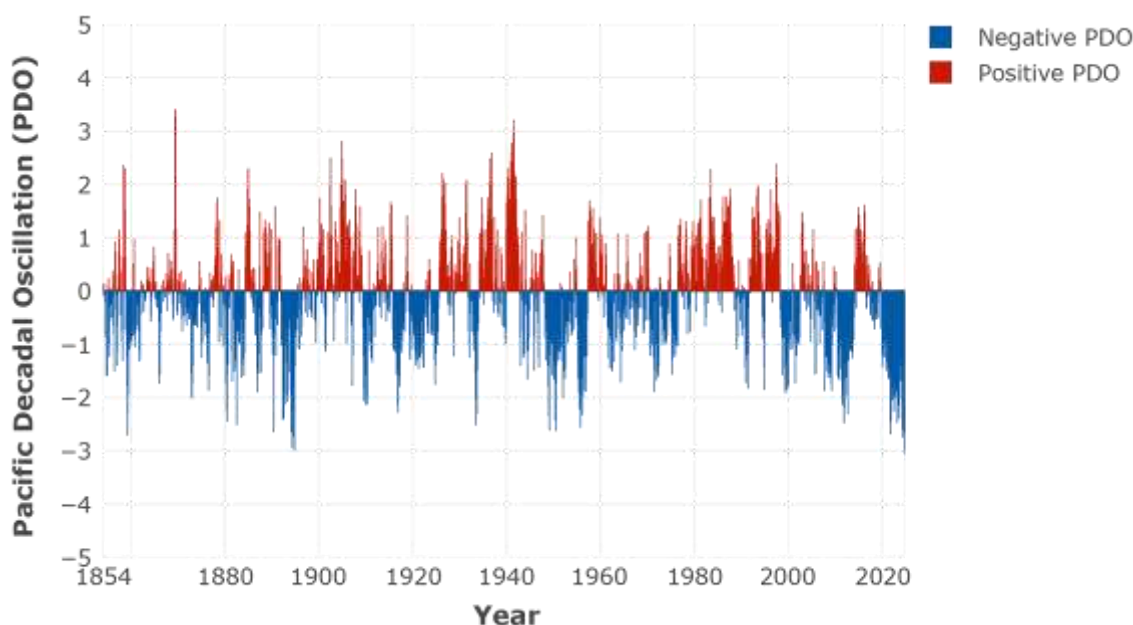


Figure 162. Pacific Decadal Oscillation from 1854–2024 with positive warm periods in red and negative cool periods in blue

Rationale: The Pacific Decadal Oscillation (PDO) was initially named by fisheries scientist Steven Hare in 1996 while researching connections between Alaska salmon production cycles and Pacific climate. Like ENSO, the PDO reflects changes between periods of persistently warm or persistently cool ocean temperatures, but over a period of 20 to 30 years (versus six to 18 months for ENSO events). The climatic fingerprints of the PDO are most visible in the Northeastern Pacific, but secondary signatures exist in the tropics. Research has shown that

during positive phases of the PDO, the Hawai‘i-based deep-set longline fishery has a greater likelihood of black-footed albatross sightings and interactions (Wren et al. 2019).

Status: The PDO was negative in 2024. The index ranged from -3.04 to -1.07 over the course of the year. This is within the range of values previously observed in the time series.

Description: The PDO is often described as a long-lived El Niño-like pattern of Pacific climate variability. As seen with the better-known ENSO, extremes in the PDO pattern are marked by widespread variations in the Pacific Basin and the North American climate. In parallel with the ENSO phenomenon, the extreme cases of the PDO have been classified as either warm or cool, as defined by ocean temperature anomalies in the northeast and tropical Pacific Ocean. When SST is below average in the [central] North Pacific and warm along the North American coast, and when sea level pressures are below average in the North Pacific, the PDO has a positive value. When the climate patterns are reversed, with warm SST anomalies in the interior and cool SST anomalies along the North American coast, or above average sea level pressures over the North Pacific, the PDO has a negative value. Description inserted from NOAA (2025b).

Timeframe: Monthly.

Region/Location: Pacific Basin north of 20°N.

Measurement Platform: *In-situ* station, satellite, model.

Data available at: <https://psl.noaa.gov/pdo/>.

Sourced from: (Mantua et al. 1997; Newman et al. 2016; Wren et al. 2019; NOAA 2025b). Graphics produced in part using Stawitz and Li (2025).

3.4.2.7 NORTH PACIFIC GYRE OSCILLATION

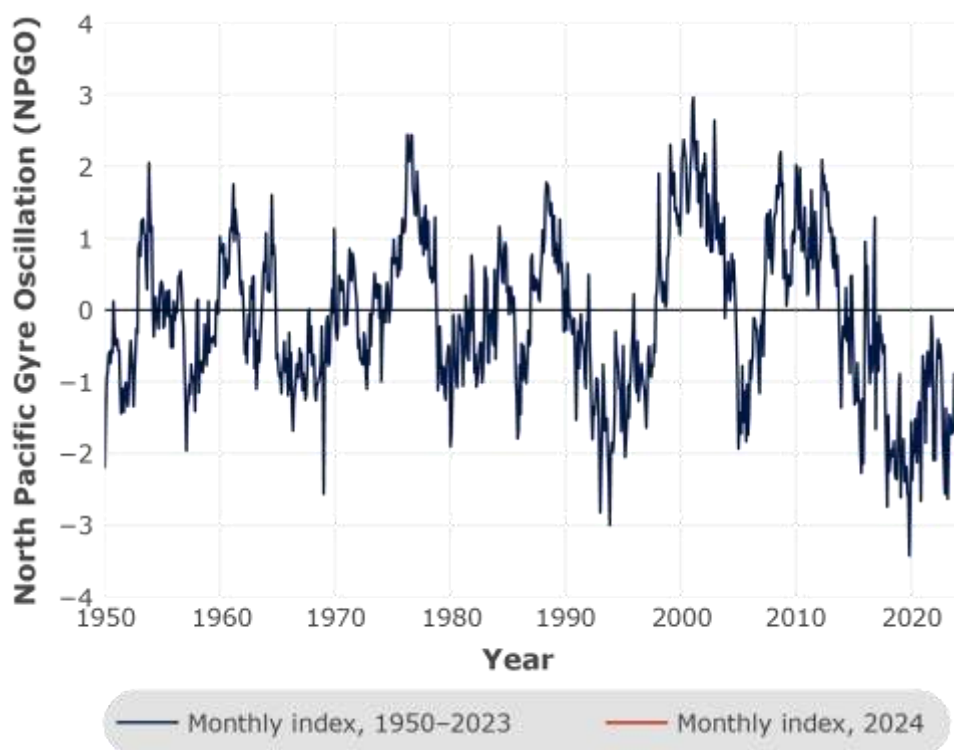


Figure 163 North Pacific Gyre Oscillation from 1950–2024

Rationale: The North Pacific Gyre Oscillation (NPGO) is related to, but distinct from, the Pacific Decadal Oscillation. It captures basin-scale processes, making it well suited to capture change across the Hawai‘i-based longline fishing grounds.

Status: The NPGO was negative in 2024. The index ranged from -2.5 to -1.44 over the course of the year. This is within the range of values previously observed in the time series.

Description: The NPGO is driven by regional and basin-scale changes in wind patterns. Changes to the wind field drive changes in ocean circulation that affect nutrients and, in turn, phytoplankton. Because phytoplankton are the foundational food source for marine ecosystems, the NPGO offers insight into potential ecosystem change. Description paraphrased from Di Lorenzo et al. (2008).

Timeframe: Monthly.

Region/Location: 180°–110°W; 25°N–62°N.

Measurement Platform: satellite, model.

Data available at: <https://www.o3d.org/npgo/data/NPGO.txt>.

Sourced from: (Di Lorenzo et al. 2008). Graphics produced in part using Stawitz and Li (2025).

3.4.2.8 TROPICAL CYCLONES

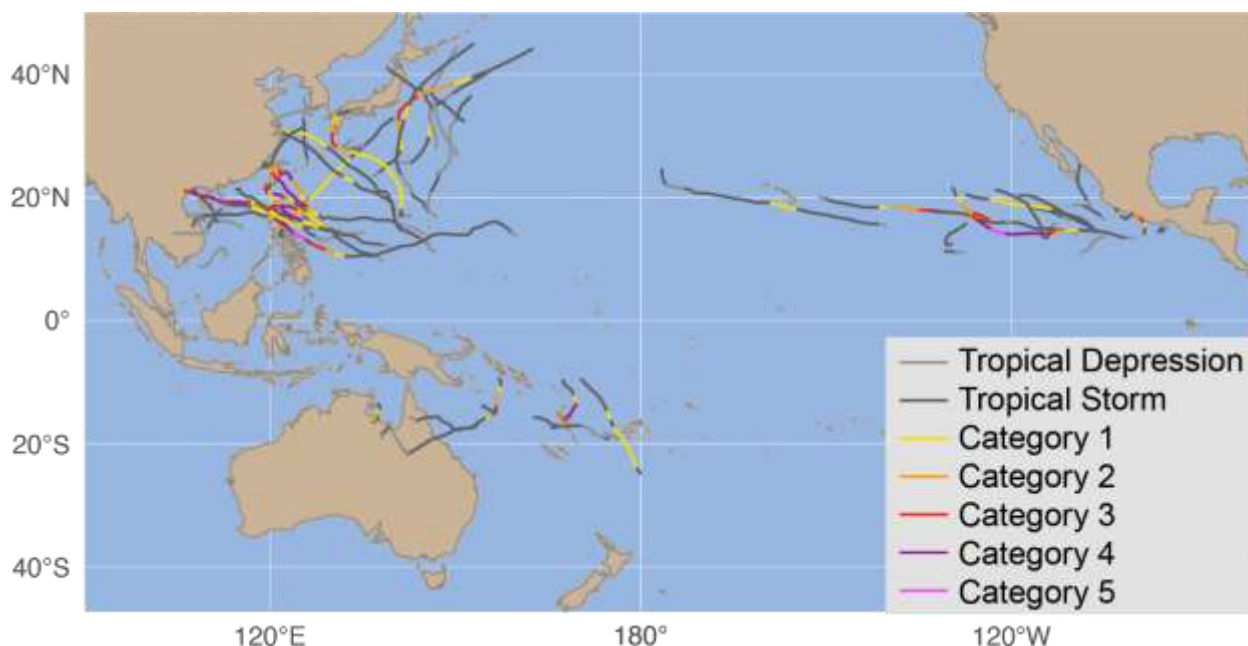


Figure 164. 2024 Pacific basin tropical cyclone tracks

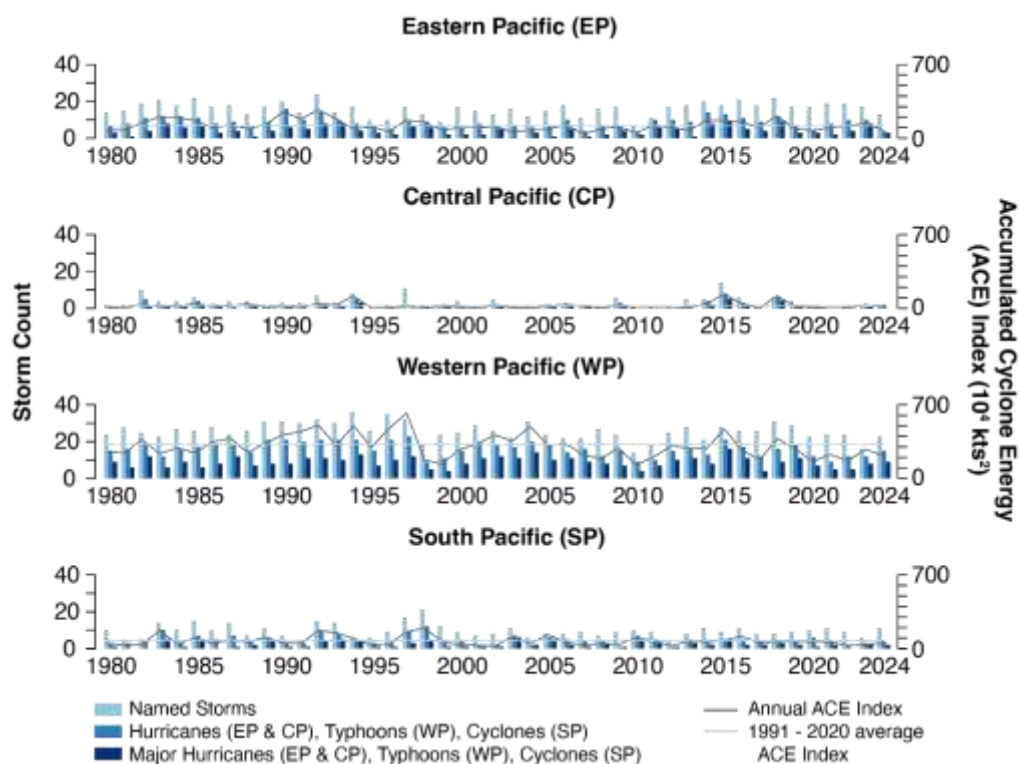


Figure 165. Storm counts (bars) and Accumulated Cyclone Energy (ACE) index values (lines) in each region of the Pacific. Both annual ACE index (black lines) and 1991–2020 average ACE index (grey lines) are shown

Rationale: The effects of tropical cyclones are numerous and well known. At sea, storms disrupt and endanger shipping traffic as well as fishing effort and safety. The Hawai‘i longline fishery, for example, has had serious problems with vessels dodging storms at sea, delayed departures, and inability to make it safely back to Honolulu because of bad weather. When cyclones encounter land, their intense rains and high winds can cause severe property damage, loss of life, soil erosion, and flooding. Associated storm surge, the large volume of ocean water pushed toward shore by cyclones’ strong winds, can cause severe flooding and destruction.

Status:

Eastern North Pacific. Tropical cyclone activity was below the 1991–2020 average in the Eastern Pacific in 2024. There were 13 named storms, 4 of which were hurricanes. There were 3 major hurricanes (category 3 or higher). Accumulated Cyclone Energy (ACE) was about 67% the 1991–2020 average in the Eastern North Pacific. In addition to season totals, early season tropical cyclone activity and ACE were at a record low in 2024, with this being only the second year in this time series with no activity in June. Portions of this summary inserted from <https://www.ncei.noaa.gov/access/monitoring/monthly-report/tropical-cyclones/202406> and <https://www.ncei.noaa.gov/access/monitoring/monthly-report/tropical-cyclones/202413>.

Central North Pacific. Early season tropical cyclone activity and ACE were at a record low in 2024 in the Central North Pacific, with this being only the second year in this time series with no activity in June. On August 19th, Hurricane Hone formed in the Central Pacific and peaked as a Category 1 hurricane with winds of 85 mph. Hone brought gusty winds and flooding rains to the Island of Hawai‘i as it passed south of the island chain. Overall, Central Pacific tropical cyclone activity was below the 1991–2020 average in 2024. There were 2 named storms, both hurricanes, though neither became a major hurricane. On average (1991–2020), the central Pacific sees four named storms, two hurricanes, and one major hurricane each year. The 2024 ACE index was well below the 1991–2020 average. Portions of this summary inserted from <https://www.ncei.noaa.gov/access/monitoring/monthly-report/tropical-cyclones/202406>, <https://www.ncei.noaa.gov/access/monitoring/monthly-report/tropical-cyclones/202407>, and <https://www.ncei.noaa.gov/access/monitoring/monthly-report/tropical-cyclones/202408>.

Western North Pacific. Early season tropical cyclone activity and ACE were at a record low in 2024. However, this changed in November, when four named storms were simultaneously active. This was the first instance of four simultaneous named storms in the West Pacific during the month of November. Overall, though, storm activity was near average. The Western Pacific saw 23 named storms in 2024. Of these storms, 15 were typhoons, and 9 became major typhoons. These counts were all close to average (1991–2020), although ACE was only about 67% the long-term average. Since 1980, the number of named storms and typhoons has decreased slightly at a rate of about 1 storm per decade and the total number of storms has decreased at a rate of about 2 storms per decade. Portions of the summary inserted from <https://www.ncei.noaa.gov/access/monitoring/monthly-report/tropical-cyclones/202406> and <https://www.ncei.noaa.gov/access/monitoring/monthly-report/tropical-cyclones/202411>.

South Pacific. South Pacific tropical cyclone activity was roughly average in 2024. There were 11 named storms, 4 of which became cyclones and 2 major cyclones. The 2024 ACE was less than the 1991–2020 average.

Description: This indicator uses historical data from the NOAA National Climate Data Center (NCDC) International Best Track Archive for Climate Stewardship to track the number of

tropical cyclones in the western, central, eastern, and southern Pacific basins. This indicator also monitors the Accumulated Cyclone Energy (ACE) Index which is a way of monitoring the frequency, strength, and duration of tropical cyclones based on wind speed measurements.

The annual frequency of storms passing through each basin is tracked and Figure 165 shows the representative breakdown of Saffir-Simpson hurricane categories.

Every cyclone has an ACE Index value, which is a number based on the maximum wind speed measured at six-hourly intervals over the entire time that the cyclone is classified as at least a tropical storm (wind speed of at least 34 knots; 39 mph). Therefore, a storm's ACE Index value accounts for both strength and duration. Figure 165 shows the ACE values for each hurricane/typhoon season and has a horizontal line representing the average annual ACE value.

Timeframe: Annual.

Region/Location:

Eastern North Pacific: east of 140° W, north of the equator.

Central North Pacific: 180° - 140° W, north of the equator.

Western North Pacific: west of 180°, north of the equator.

South Pacific: south of the equator.

Measurement Platform: Satellite.

Data available at: <https://www.ncei.noaa.gov/data/international-best-track-archive-for-climate-stewardship-ibtracs/v04r01/access/csv/>.

Sourced from: (Knapp et al. 2010, 2018; NOAA 2025c)

3.4.2.9 SEA SURFACE TEMPERATURE (SST)

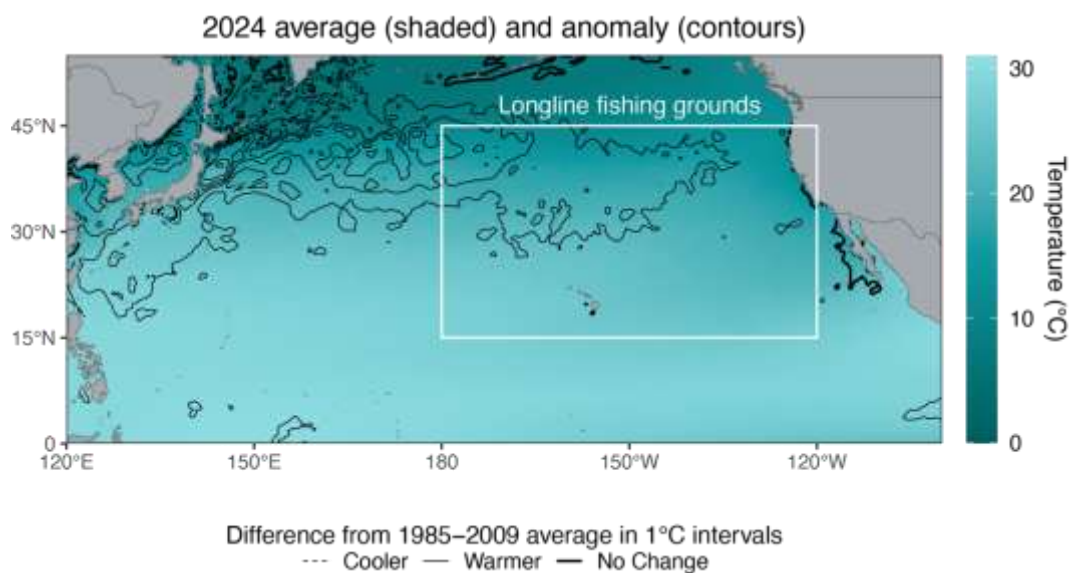


Figure 166. Average 2024 sea surface temperature (shaded) and the difference from the 1985–2009 average (contoured). The white rectangle identifies the area targeted by Hawai‘i’s longline fisheries. SST is averaged over this area for the time series shown in Figure 167 and Figure 168

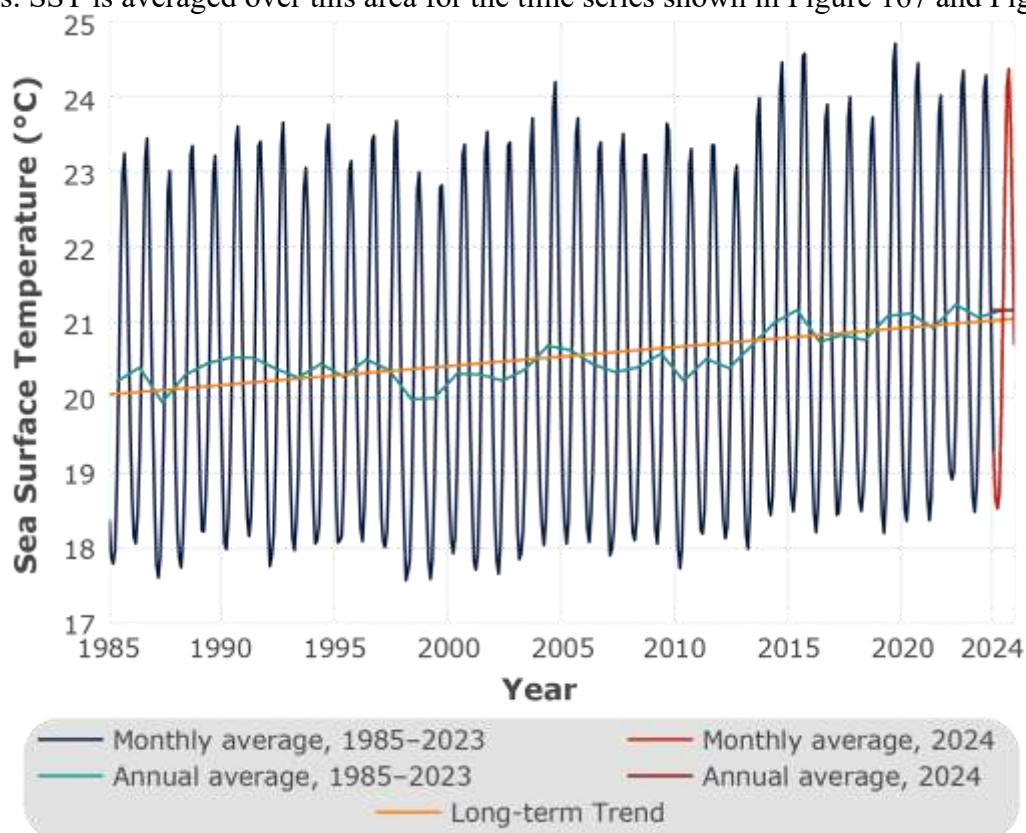


Figure 167. Time series of monthly average sea surface temperature over the longline fishing grounds outlined in Figure 166

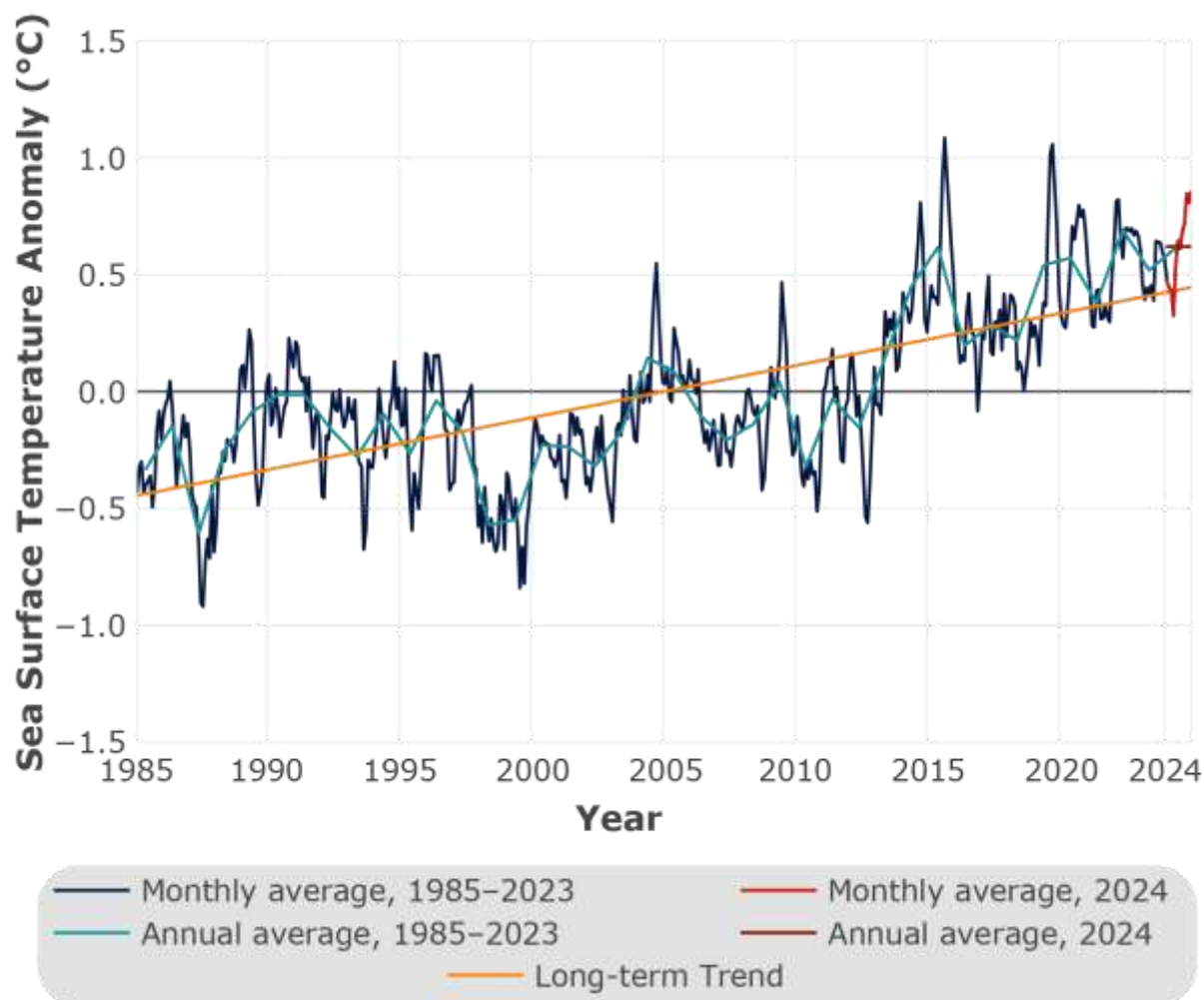


Figure 168. Time series of monthly average sea surface temperature anomaly over the longline fishing grounds outlined in Figure 166

Rationale: Sea surface temperature (SST) is one of the most directly observable existing measures for tracking increasing ocean temperatures. SST varies in response to natural climate cycles such as the El Niño – Southern Oscillation (ENSO) and is rising as a result of anthropogenic climate change. Both short-term variability and long-term trends in SST impact the marine ecosystem. Understanding the mechanisms through which organisms are impacted and the time scales of these impacts is an area of active research.

Status: Annual mean SST was 21.2 °C in 2024. Over the period of record, SST across the longline fishing grounds has increased by 1 °C and the monthly SST anomaly increased by 0.9 °C, both at a rate of roughly 0.025 °C yr⁻¹. Monthly SST values in 2024 ranged from 18.5–24.4 °C, within the range of temperatures experienced over the past several decades (17.6–24.7 °C). Overall, SST was above the long-term average across the Hawai‘i longline region in 2024.

Description: Satellite remotely sensed monthly sea surface temperature (SST) is averaged across the Hawai‘i-based longline fishing grounds (15° – 45°N, 180° – 120°W). A time series of monthly mean SST averaged over the Hawai‘i longline region is presented. Additionally, spatial climatologies and anomalies are shown. CoralTemp data are used to calculate this indicator.

Timeframe: Annual, monthly.

Region/Location: Hawai‘i longline region: 15° – 45°N, 180° – 120°W.

Measurement Platform: Satellite.

Data available at: https://oceanwatch.pifsc.noaa.gov/erddap/griddap/CRW_sst_v3_1_monthly, https://oceanwatch.pifsc.noaa.gov/erddap/griddap/CRW_sst_v3_1_1985-2009-clim, and https://oceanwatch.pifsc.noaa.gov/erddap/griddap/CRW_sst_v3_1_2024-clim.

Sourced from: (NOAA OceanWatch 2025a). Graphics produced in part using Stawitz and Li (2025).

3.4.2.10 TEMPERATURE AT 200–300 M DEPTH

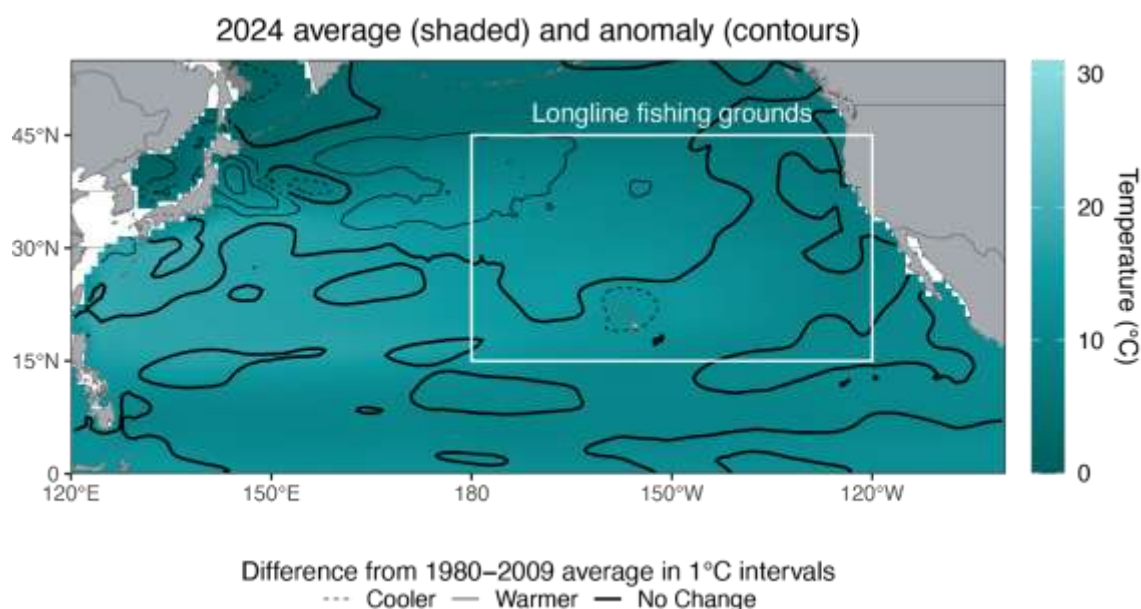


Figure 169. Average temperatures at 200–300 m depth in 2024 (shaded) and the difference from the 1980–2009 average (contoured). The white rectangle identifies the area targeted by Hawai‘i’s longline fisheries. Temperatures is averaged over this area for the time series shown in Figure

170

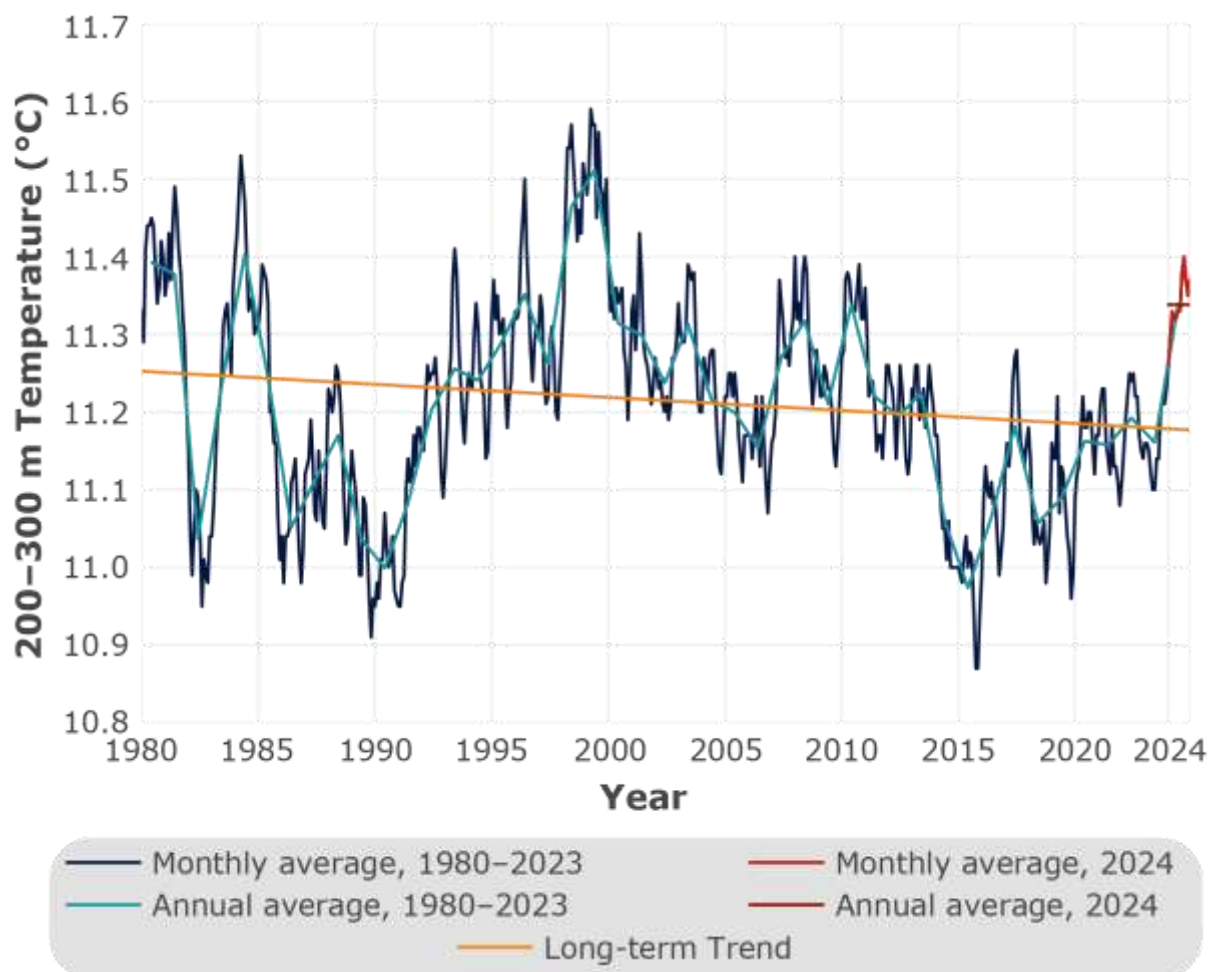


Figure 170. Time series of monthly 200–300 m temperatures over the longline fishing grounds outlined in Figure 169

Rationale: The temperature at 200–300 m reflects the temperature in the mid-range of depths targeted by the deep-set bigeye tuna fishery. Bigeye have preferred thermal habitat, generally staying within temperatures ranging from 8–14 °C while they are at depth (Howell et al. 2010). Changes in ocean temperature at depth will impact tuna, and in turn, potentially impact their catchability. Understanding the drivers of sub-surface temperature trends and their ecosystem impacts is an area of active research.

Status: In 2024, 200–300 m temperatures ranged from 11.26–11.4 °C with an average value of 11.34 °C. These temperatures are within the range of temperatures experienced over the past several decades (10.87–11.59 °C) and are within the bounds of bigeye tuna’s preferred deep daytime thermal habitat (8–14 °C). Over the period of record (1980–2024), 200–300 m temperatures have declined by 0.08 °C. The spatial pattern of temperature anomalies was mixed with temperatures at depth around the main Hawaiian Islands roughly 0.5–1.5 °C below average, and temperatures north and west of the Hawaiian Islands 0.5–1 °C above average.

Description: Ocean temperature at 200–300 m depth is averaged across the Hawai‘i-based longline fishing grounds (15° – 45°N, 180° – 120°W). Global Ocean Data Assimilation System

(GODAS) data are used. GODAS incorporates global ocean data from moorings, expendable bathythermographs (XBTs), and Argo floats.

Timeframe: Annual, monthly.

Region/Location: Hawai‘i longline region: 15° – 45°N, 180° – 120°W.

Measurement Platform: *In-situ* sensors, model.

Sourced from: (APDRC 2025; NOAA 2025d). Graphics produced in part using Stawitz and Li (2025).

3.4.2.11 OCEAN COLOR

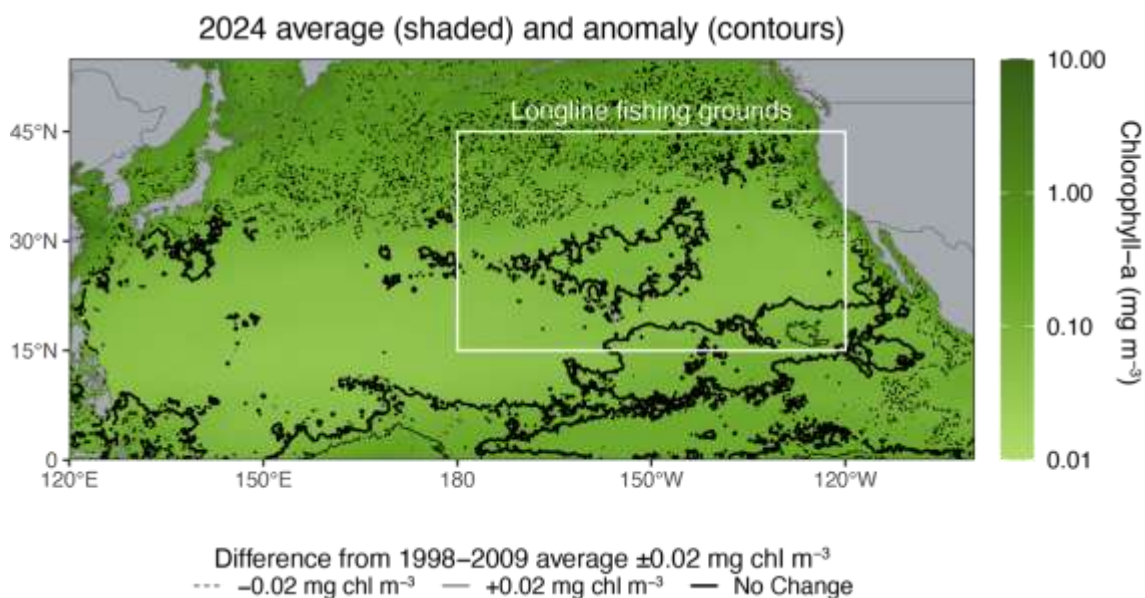


Figure 171. Average chlorophyll-a concentration in 2024 (shaded) and the difference from the 1998–2009 average (contoured). The white rectangle identifies the area targeted by Hawai‘i’s longline fisheries. Chlorophyll-a is averaged over this area for the time series shown in Figure 172 and Figure 173

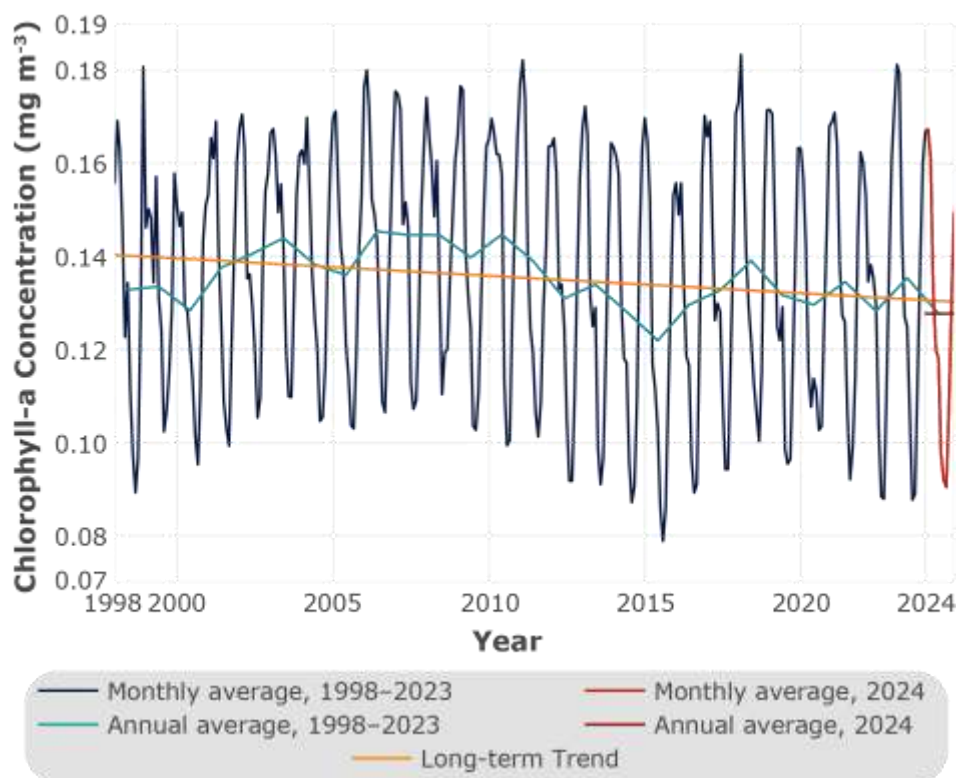


Figure 172. Time series of monthly average chlorophyll concentration over the longline fishing grounds outlined in Figure 173

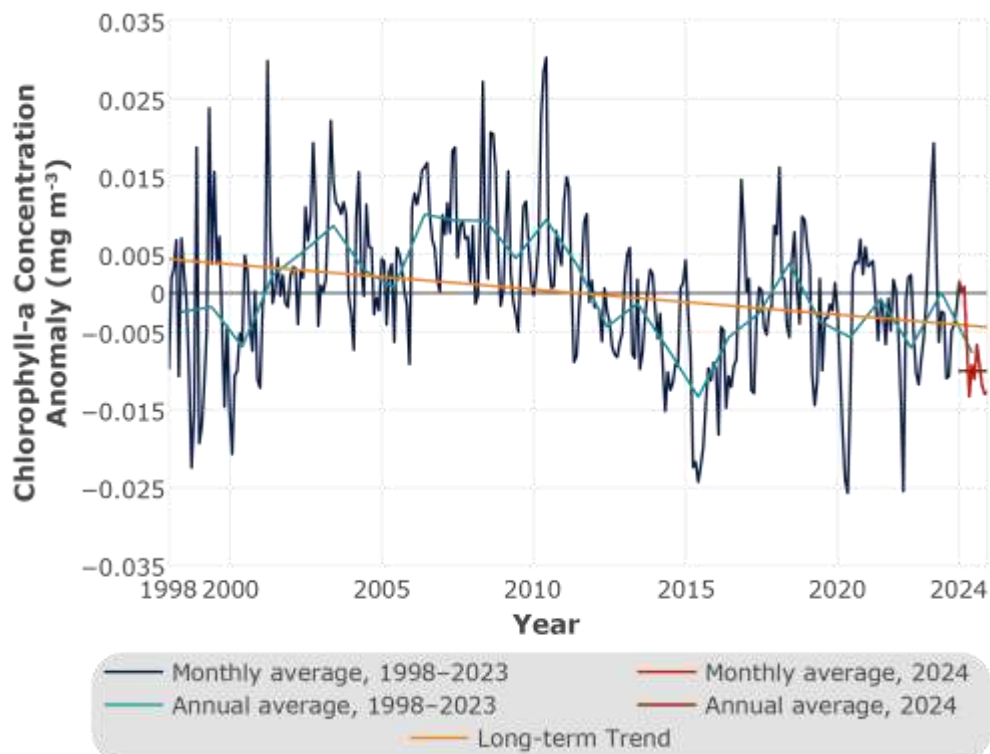


Figure 173. Time series of monthly average chlorophyll concentration anomaly over the longline fishing grounds outlined in Figure 172

Rationale: Phytoplankton are the foundational food source for the fishery. Changes in phytoplankton abundance have been linked to both natural climate variability and anthropogenic climate change. These changes have the potential to affect fish abundance, size, and catch.

Status: The mean monthly chlorophyll concentration was 0.13 mg chl m⁻³ in 2024. Monthly mean chlorophyll concentrations ranged from 0.09–0.17 mg chl m⁻³, which was within the range of values observed during the previous years of the time series (0.079–0.18 mg chl m⁻³). Both monthly average chlorophyll concentration and chlorophyll anomalies have declined by about 0.009 mg chl m⁻³ over the period of record. Chlorophyll concentrations were fairly average across the Hawai‘i-based longline fishing grounds in 2024.

Description: Satellite remotely sensed ocean color is used to determine chlorophyll concentrations in the pelagic surface ocean. A time series of mean monthly chlorophyll-a concentrations averaged over the Hawai‘i longline region is presented. Additionally, spatial climatologies and anomalies are shown. European Space Agency (ESA) Climate Change Initiative (CCI) data are used for this indicator (Sathyendranath et al. 2018).

Timeframe: Annual, monthly

Region/Location: Hawai‘i longline region: 5° – 45°N, 180° – 120°W

Measurement Platform: Satellite

Data available at: <https://oceanwatch.pifsc.noaa.gov/erddap/griddap/esa-cci-chla-monthly-v6-0>, <https://oceanwatch.pifsc.noaa.gov/erddap/griddap/esa-cci-chla-1998-2009-clim-v6-0>, and https://oceanwatch.pifsc.noaa.gov/erddap/griddap/esa-cci-chla-2024-clim_v6-0.

Sourced from: (Sathyendranath et al. 2018; NOAA OceanWatch 2025b). Graphics produced in part using Stawitz and Li (2025).

3.4.2.12 NORTH PACIFIC SUBTROPICAL FRONT (STF) AND TRANSITION ZONE CHLOROPHYLL FRONT (TZCF)

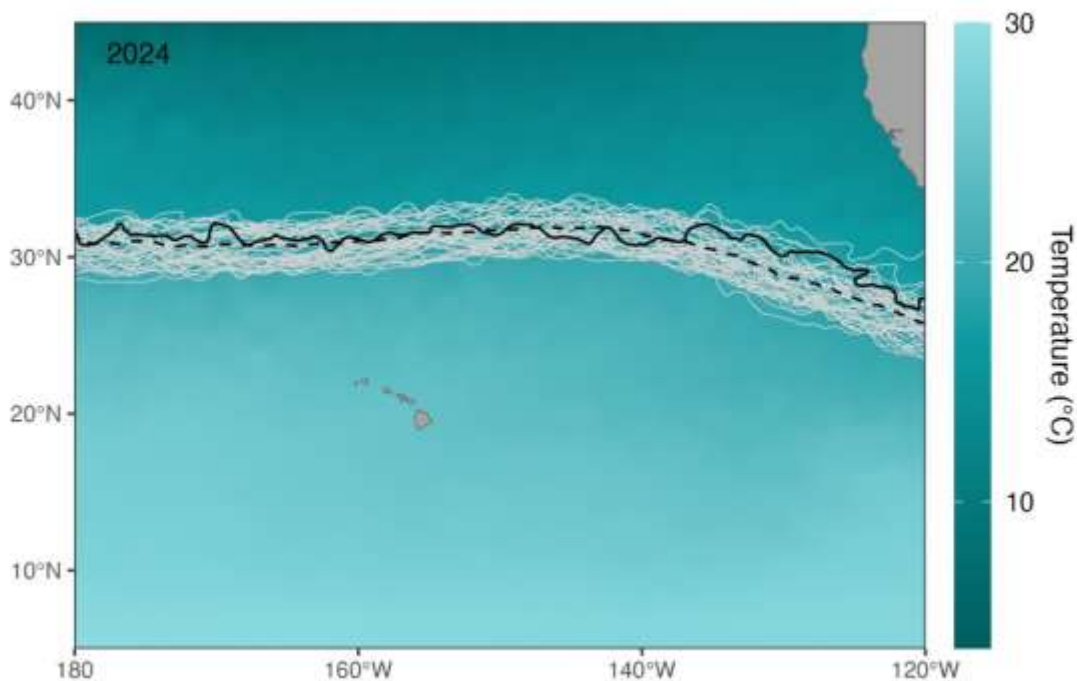


Figure 174. Average position of the subtropical front (STF) in 2024 (solid black line), over the 1985–2009 average (dotted line), locations from previous years (1985–2023; solid grey lines), and ocean temperatures for the first quarter of 2024 (shaded)

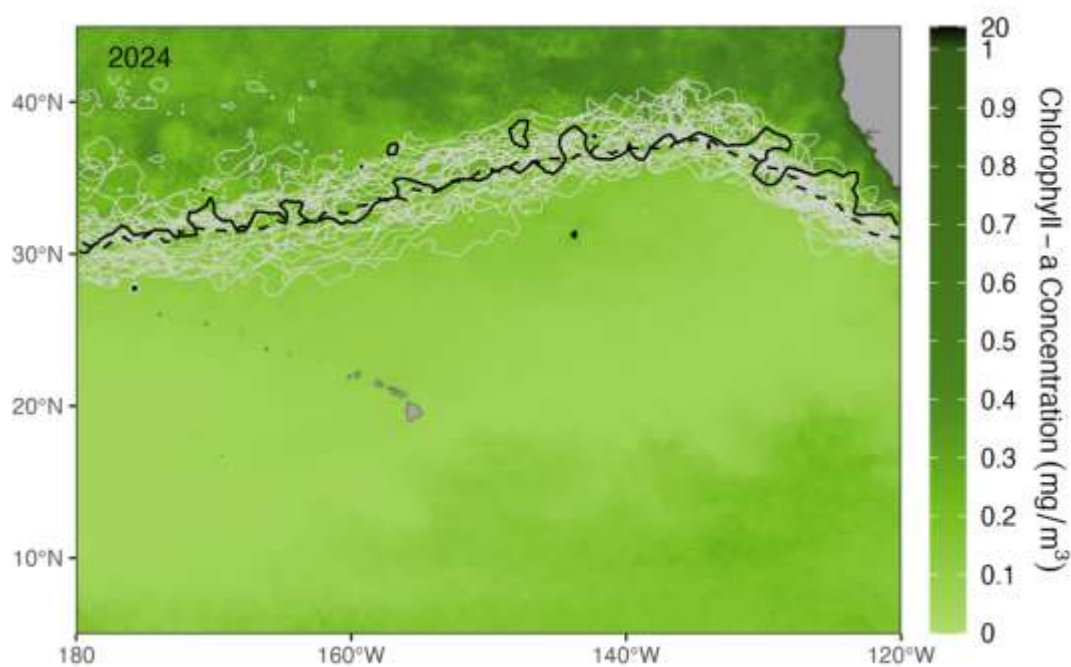


Figure 175. Average position of the transition zone chlorophyll front (TZCF) in 2024 (solid black line) over the 1998–2009 average (dotted black line), locations from previous years (1985–2023; solid grey lines), and ocean color for the first quarter of 2024 (shaded)

Rationale: The STF is targeted by the swordfish fishery. Additionally, both the STF and TZCF are used as migration and foraging corridors by both commercially valuable and protected species. Northward displacement of the frontal zone can increase the distance fishing vessels must travel to set their gear. This can, in turn, increase operational expenses. The positions of the fronts vary in response to natural climate variations. Long-term northward displacement of the frontal zone may also result from anthropogenic climate change.

Status: During the first quarter of 2023, the STF was near its 1998–2009 average location across much of the region, though slightly north of average east of 140°W. The TZCF location was bear average across much of the fishing grounds.

Description: The subtropical front (STF) is marked by the 18 °C sea surface temperature (SST) isotherm and the transition zone chlorophyll front (TZCF) by the 0.2 mg chl-a m⁻³ isopleth (Polovina et al. 2001; Bograd et al. 2004). They roughly mark the northern boundary of the North Pacific subtropical gyre as well as the northern extent of the Hawai‘i-based longline fishery. Both fronts migrate meridionally on a seasonal basis and their positions are affected by the phase of the El Niño – Southern Oscillation (ENSO). Due to significant seasonal variation, the climatology and anomaly (2024) are presented for the first quarter of the year only. The STF is determined from CoralTemp data (see SST indicator) and the TZCF is determined from ESA CCI data (see Sections 3.4.2.9 and 3.4.2.11).

Timeframe: Annual, seasonal

Region: Hawai‘i longline region: 5° – 45°N, 180° – 120°W

Measurement Platform: Satellite

Data available at: https://oceanwatch.pifsc.noaa.gov/erddap/griddap/CRW_sst_v3_1_monthly and <https://oceanwatch.pifsc.noaa.gov/erddap/griddap/esa-cci-chla-monthly-v6-0>.

Sourced from: (Polovina et al. 2001; Bograd et al. 2004; NOAA OceanWatch 2025b, 2025a).

3.4.2.13 ESTIMATED MEDIAN PHYTOPLANKTON SIZE

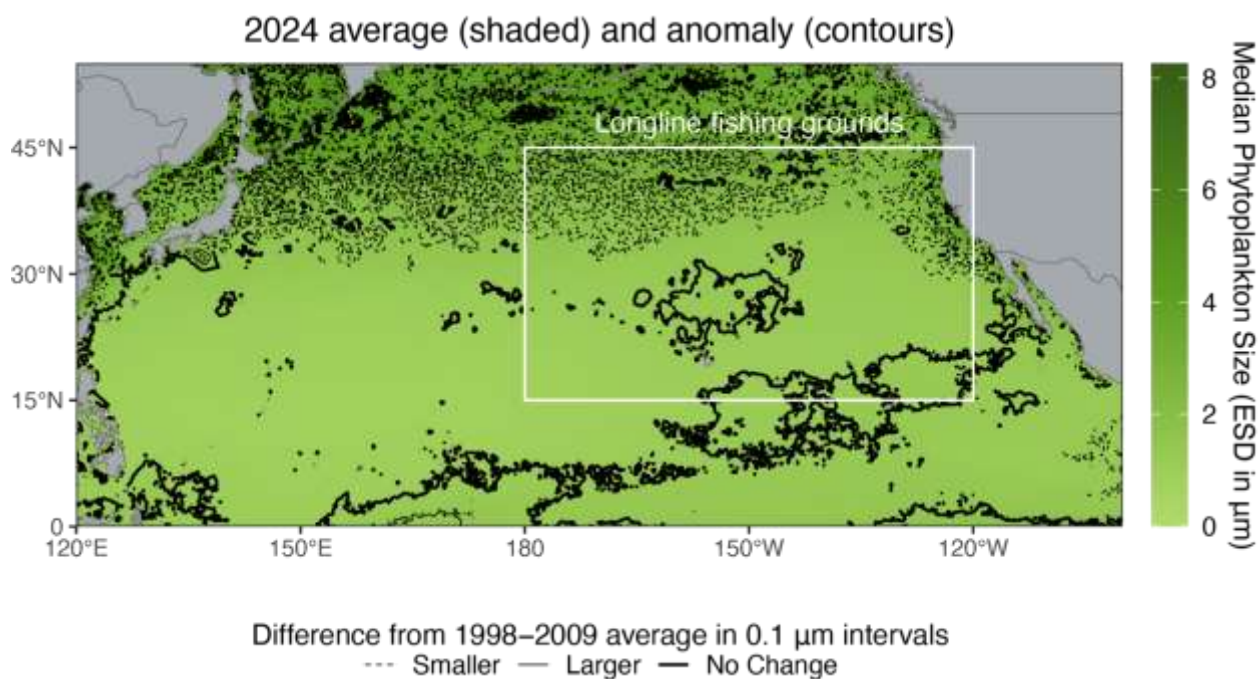


Figure 176. Average estimated median phytoplankton size in 2024 (shaded) and the difference from the 1998–2009 average (contoured) across the area targeted by Hawai‘i’s longline fisheries

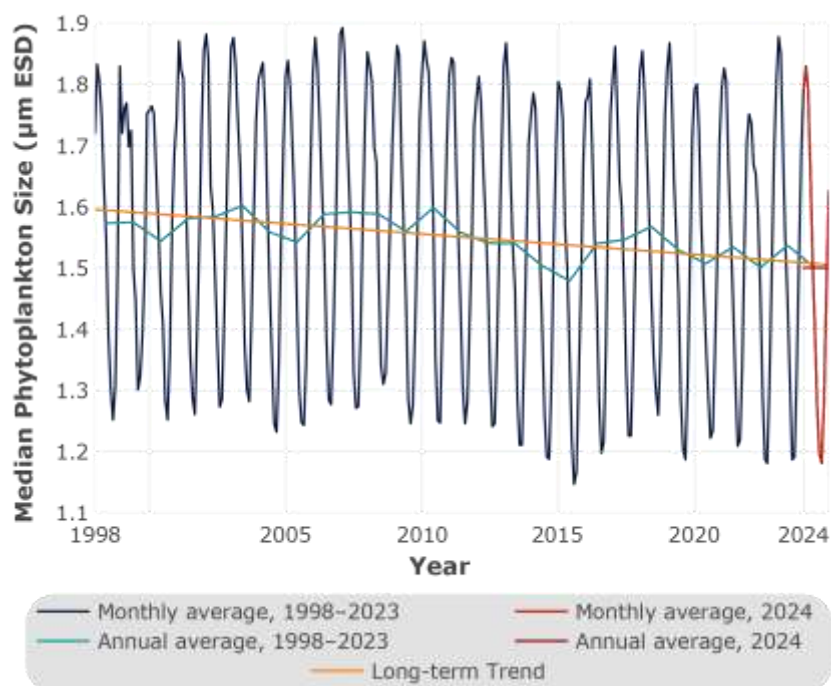


Figure 177. Time series of monthly median phytoplankton size over the longline fishing grounds shown in Figure 176

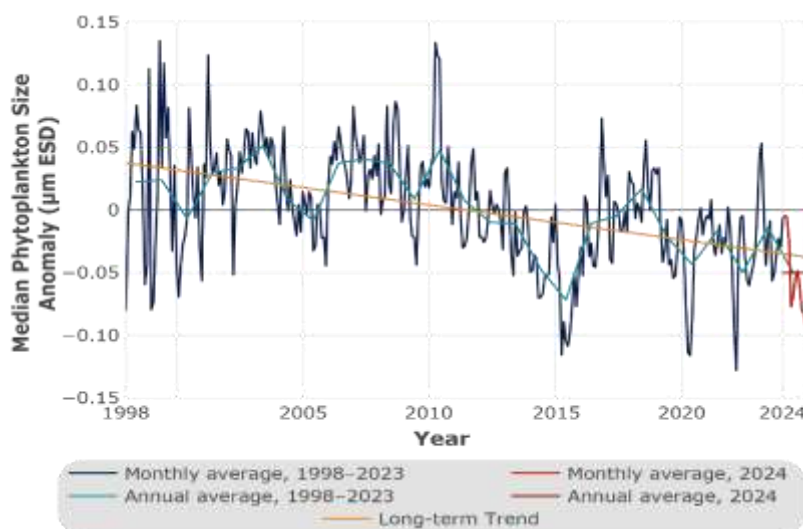


Figure 178. Time series of monthly median phytoplankton size anomaly over the longline fishing grounds shown in Figure 176

Rationale: Phytoplankton are the base of the food web and their abundance influences the food available to all higher trophic levels from zooplankton through tuna and billfish. Some studies project that climate change will result in both fewer and smaller phytoplankton. This would reduce the food available to all members of the food web. Understanding trends in phytoplankton abundance and size structure, how they are influenced by oceanographic conditions, and how they influence fish abundance and size structure are areas of active research.

Status: The mean monthly phytoplankton cell size was 1.50 µm Equivalent Spherical Diameter (ESD) in 2024. Monthly mean cell size ranged from 1.18–1.83 µm ESD during the year, within the range of values observed over the period of record (1.15–1.89 µm ESD). Over the period of record, there has been weakly significant decline in monthly median phytoplankton size. Over the time series, median phytoplankton size has declined by 0.09 µm ESD, or by 5.7%. The monthly anomaly has declined as well, by 0.075 µm ESD. Average estimated median phytoplankton size was below average across much of the fishing grounds, particularly north of about 30°N.

Description: Median phytoplankton cell size can be estimated from satellite remotely sensed SST and ocean color (Barnes et al. 2011). A time series of monthly median phytoplankton cell size averaged over the Hawai‘i longline region is presented, as well as a time series of anomalies. NOAA CoralTemp (see SST indicator) and ESA CCI data (see ocean color indicator) are used to calculate median phytoplankton cell size.

Timeframe: Monthly, annual

Region: Hawai‘i-based longline region: 15° – 45°N, 180° – 120°W

Measurement Platform: Satellite

Data available at: https://oceanwatch.pifsc.noaa.gov/erddap/griddap/md50_exp, https://oceanwatch.pifsc.noaa.gov/erddap/griddap/md50_exp-1998-2009-clim, and https://oceanwatch.pifsc.noaa.gov/erddap/griddap/md50_exp-2024-clim.

Sourced from: (Barnes et al. 2011; NOAA OceanWatch 2025c). Graphics produced in part using Stawitz and Li (2025).

3.4.2.14 FISH COMMUNITY SIZE STRUCTURE

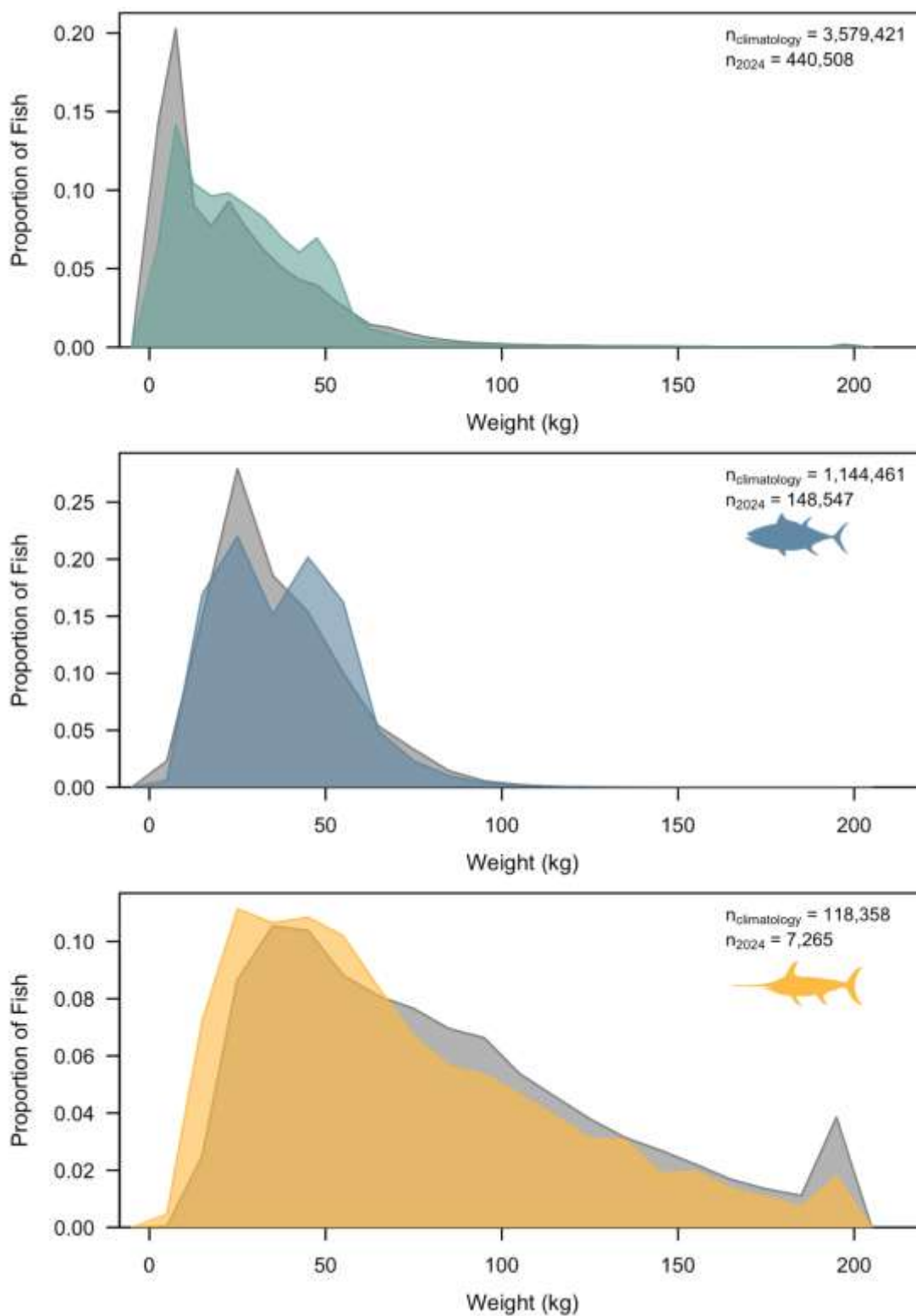


Figure 179. The climatological (2000–2009; grey) and 2024 (color) distribution of weights for all fish (top), bigeye tuna from deep sets (middle), and swordfish from shallow sets (bottom)

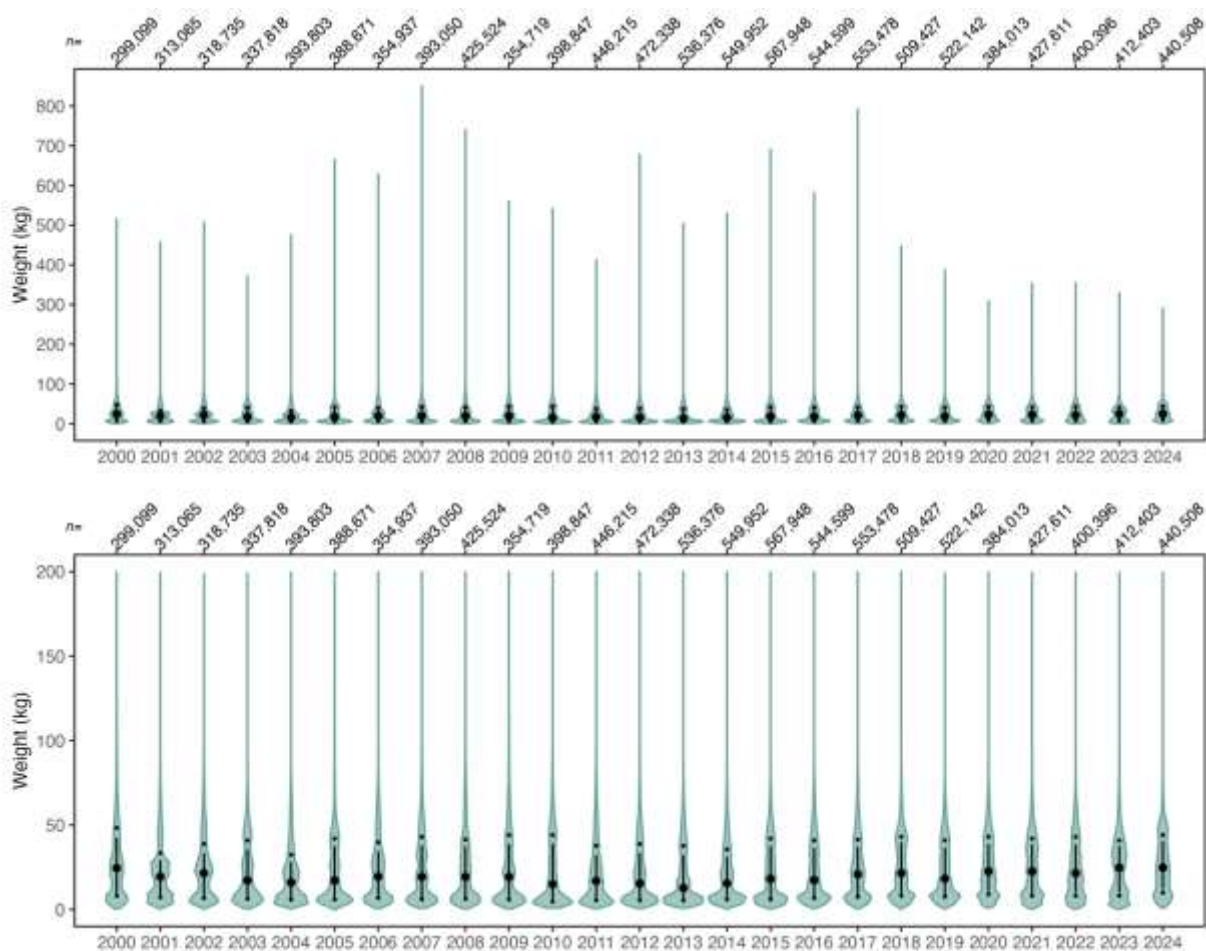


Figure 180. The annual distribution of weights of all fish, showing the full range of weights (top) and truncated to better demonstrate the distribution of the majority of weights (bottom) with large circles denoting median weight, black lines showing the range of the middle 50% of fish, small circles denoting the 20th and 80th percentiles of the weight distributions, and width of shading proportional to the number of fish of a given weight

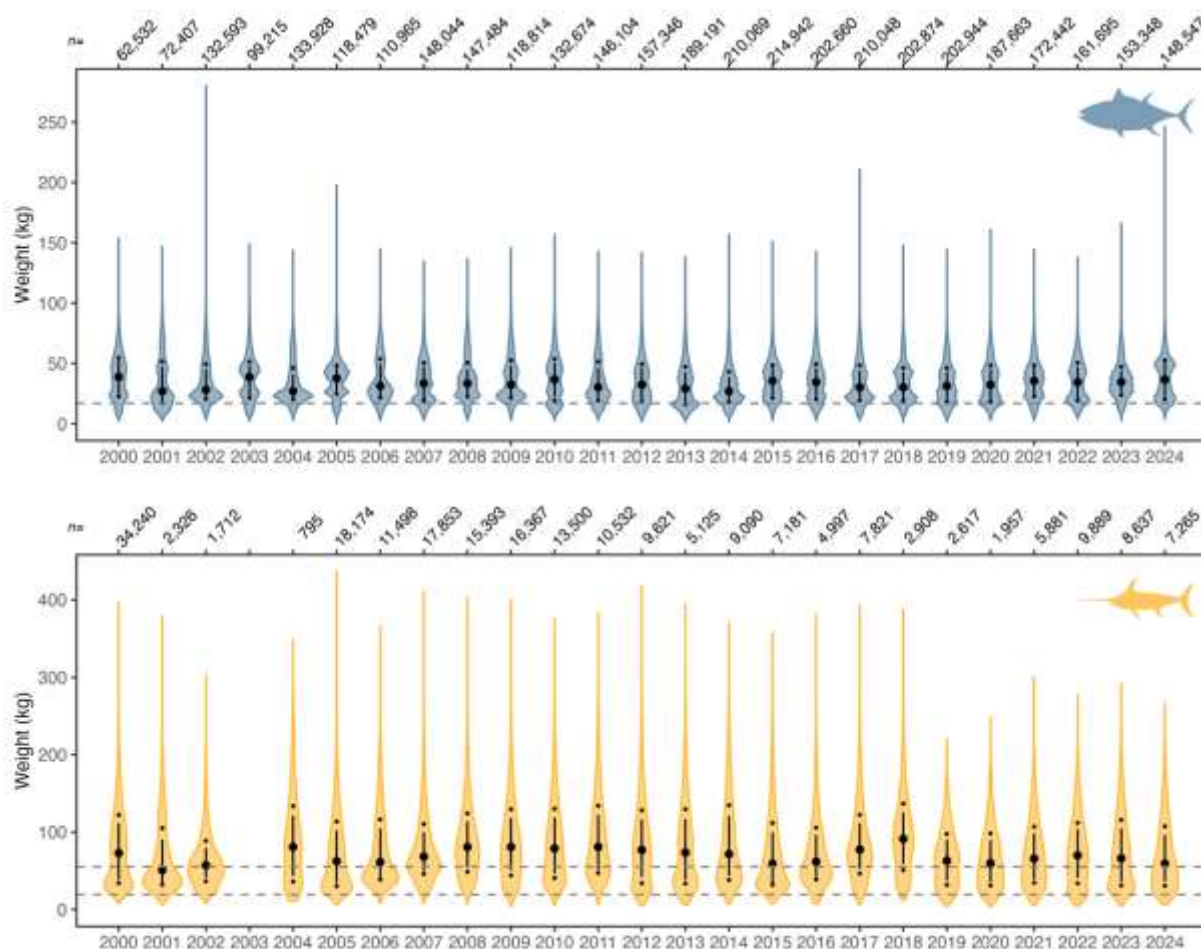


Figure 181. The annual distribution of weights of bigeye tuna from deep sets (top) and swordfish from shallow sets (bottom), with large circles denoting median weight, black lines showing the range of the middle 50% of fish, small circles denoting the 20th and 80th percentiles of the weight distributions, and width of shading proportional to the number of fish of a given weight. Horizontal dashed lines denote the weight corresponding to L_{50} for bigeye tuna (17 kg; (Farley et al. 2018)), female swordfish (55.5 kg; (Kapur et al. 2017)), and male swordfish (19.4 kg, (Kapur et al. 2017))

Rationale: Fish size can be impacted by a number of factors, including climate. Currently, the degree to which the fishery’s target species are affected by climate, and the scale at which these impacts may occur, is largely unknown. Ongoing collection of size structure data is necessary for detecting trends in community size structure and attributing causes of these trends.

Understanding trends in fish size structure and how oceanographic conditions influence these trends is an area of active research.

Status: For the longline fishery as a whole, fish were slightly larger than the 2000–2009 average in 2024, with a lower proportion of fish smaller than about 15 kg. Bigeye tuna were a bit larger than average in 2024 and swordfish were slightly smaller than the previous year on average, with a greater proportion of small swordfish.

Description: The weight of individual fish moving through the Honolulu auction is available from 2000 through the present. Using these weights, community size structure is presented. A standardized pooled climatological distribution (2000–2009) is presented, as is the 2024 distribution. Similar distributions for target species (bigeye tuna and swordfish) are also presented. Annual time series of pooled target species weights are presented as violin plots. Bigeye weights are from deep sets (≥ 15 hooks per float) only. Swordfish weights are from shallow sets (< 15 hooks per float) only. The Honolulu auction reports weights for gilled and gutted fish. A conversion factor is used to calculate the whole fish weights used for this indicator (Langley et al. 2006).

Timeframe: Annual.

Region: Hawai‘i-based longline fishing grounds.

Measurement Platform: *In-situ* measurement.

Sourced from: (Langley et al. 2006; Kapur et al. 2017; Farley et al. 2018; PIFSC 2025a, 2025b)PIFSC (2025a), PIFSC (2025b) and the Hawai‘i Division of Aquatic Resources.

3.4.2.15 BIGEYE WEIGHT-PER-UNIT-EFFORT

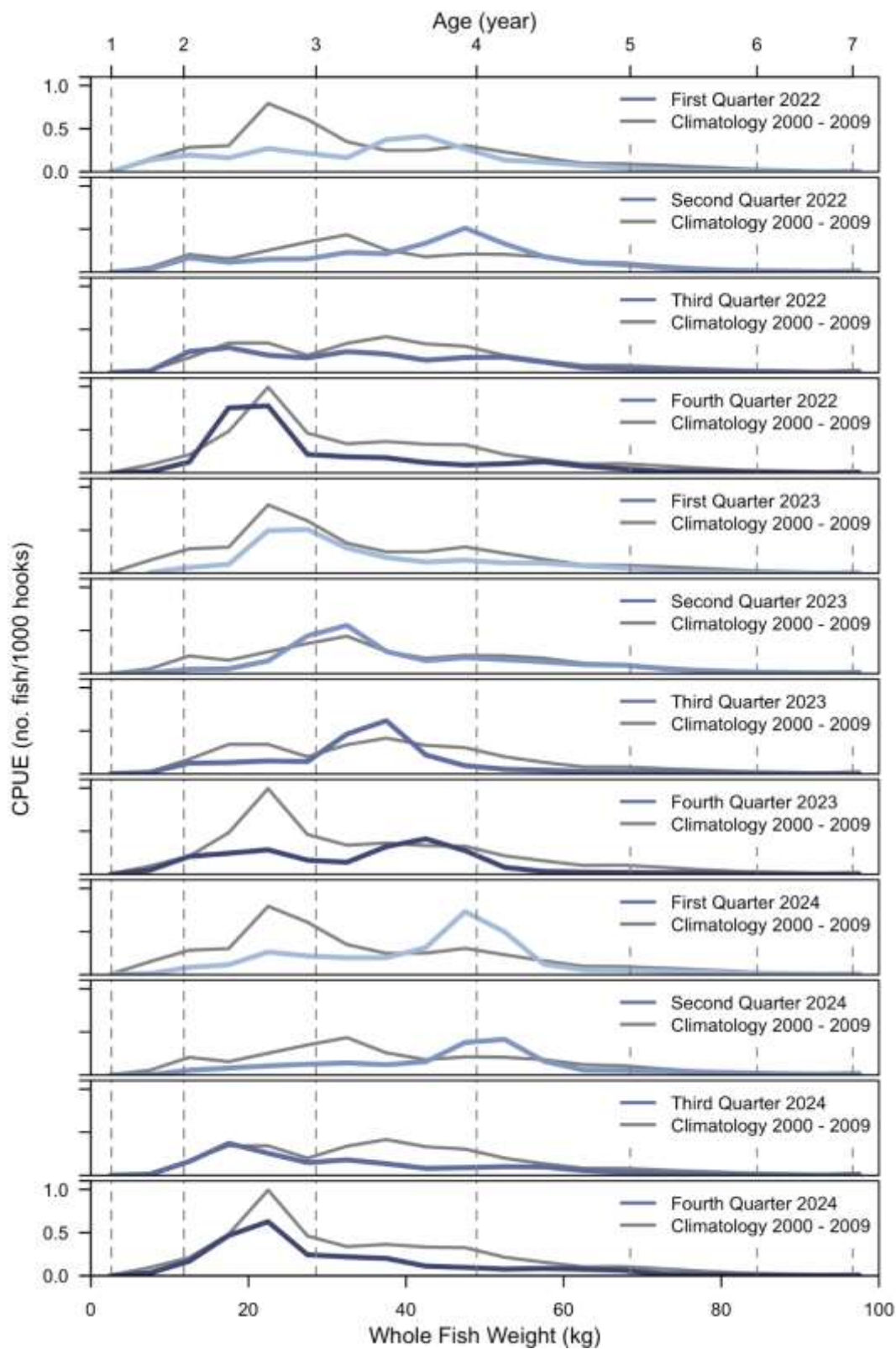


Figure 182. Quarterly deep-set bigeye tuna weight per unit effort for 2022–2024 (color) and the climatological average (2000–2009)

Rationale: Tracking the progression of growing size classes through time can provide a strong indication of recruitment pulses. The timing of these pulses is not yet well understood, particularly in terms of how they relate to climatic influences such as interannual variability. Improving this understanding could lead to the ability to project future yields and is an area of active research.

Status: No above-average peaks in two-year-old bigeye CPUE were observed in 2022–2024, suggesting that there will not be a peak in the CPUE of four- and five-year-old bigeye in 2025 or 2026.

Description: Quarterly time series of bigeye weight-per-unit-effort (WPUE) in hooks set is presented for the previous two years. Fish weights are those of bigeye tuna received at the Honolulu auction. The Honolulu auction reports weights for gilled and gutted fish. A conversion factor is used to calculate the whole fish weights used for this indicator (Langley et al. 2006). Note the quarterly (colored) and climatological (2000–2009; grey) distributions of bigeye tuna weight-per-unit-effort in Figure 182. Bigeye weights are from sets using ≥ 15 hooks per float.

Timeframe: Quarterly.

Region: Hawai‘i-based longline fishing grounds.

Measurement Platform: *In-situ* measurement.

Sourced from: (Langley et al. 2006; Aires-da-Silva et al. 2015; PIFSC 2025a, 2025b) and the Hawai‘i Division of Aquatic Resources.

3.4.2.16 BIGEYE RECRUITMENT INDEX

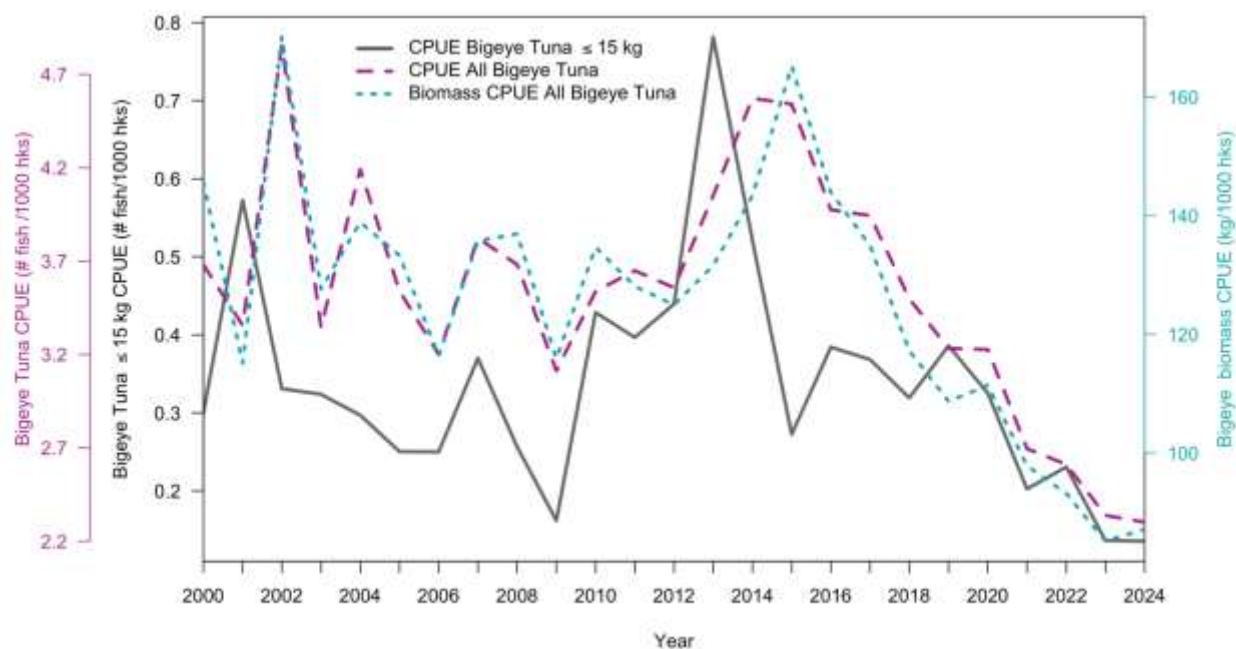


Figure 183. Annual CPUE of bigeye tuna ≤ 15 kg (grey solid line), CPUE of all bigeye tuna (pink dashed line), and biomass CPUE (blue dotted line) from 2000–2024, all from deep sets
Rationale: Catch rates of small bigeye tuna (≤ 15 kg) peak two years prior to peaks in total bigeye catch rates (CPUE) and biomass (weight-per-unit-effort), indicating a recruitment pulse

and allowing for predictions regarding increases in total catch rates of the fishery. The timing of these pulses is not yet well understood, particularly in terms of how they relate to climate impacts such as interannual variability. Improving this understanding could lead to the ability to project future yields and is an area of active research.

Status: In 2024, the CPUE of bigeye ≤ 15 kg was 0.14 fish per 1,000 hooks set. This is the tied with last year as the lowest value observed over the past 23 years and at this time does not appear indicative of a strong recruitment pulse such as was seen in 2001 or 2013.

Description: Time series of small (≤ 15 kg) and total bigeye tuna catch-per-unit-effort (hooks set) and weight-per-unit-effort (hooks set) for all deep-set-caught bigeye tuna is presented. Fish weights are those of bigeye tuna received at the Honolulu auction. The Honolulu auction reports weights for gilled and gutted fish. A conversion factor is used to calculate the whole fish weights used for this indicator (Langley et al. 2006).

Timeframe: Annual.

Region: Hawai‘i-based longline fishing grounds.

Measurement Platform: Model-derived from *in situ* data.

Sourced from: (Langley et al. 2006; PIFSC 2025a, 2025b) and the Hawai‘i Division of Aquatic Resources.

3.4.2.17 BIGEYE TUNA CATCH RATE FORECAST

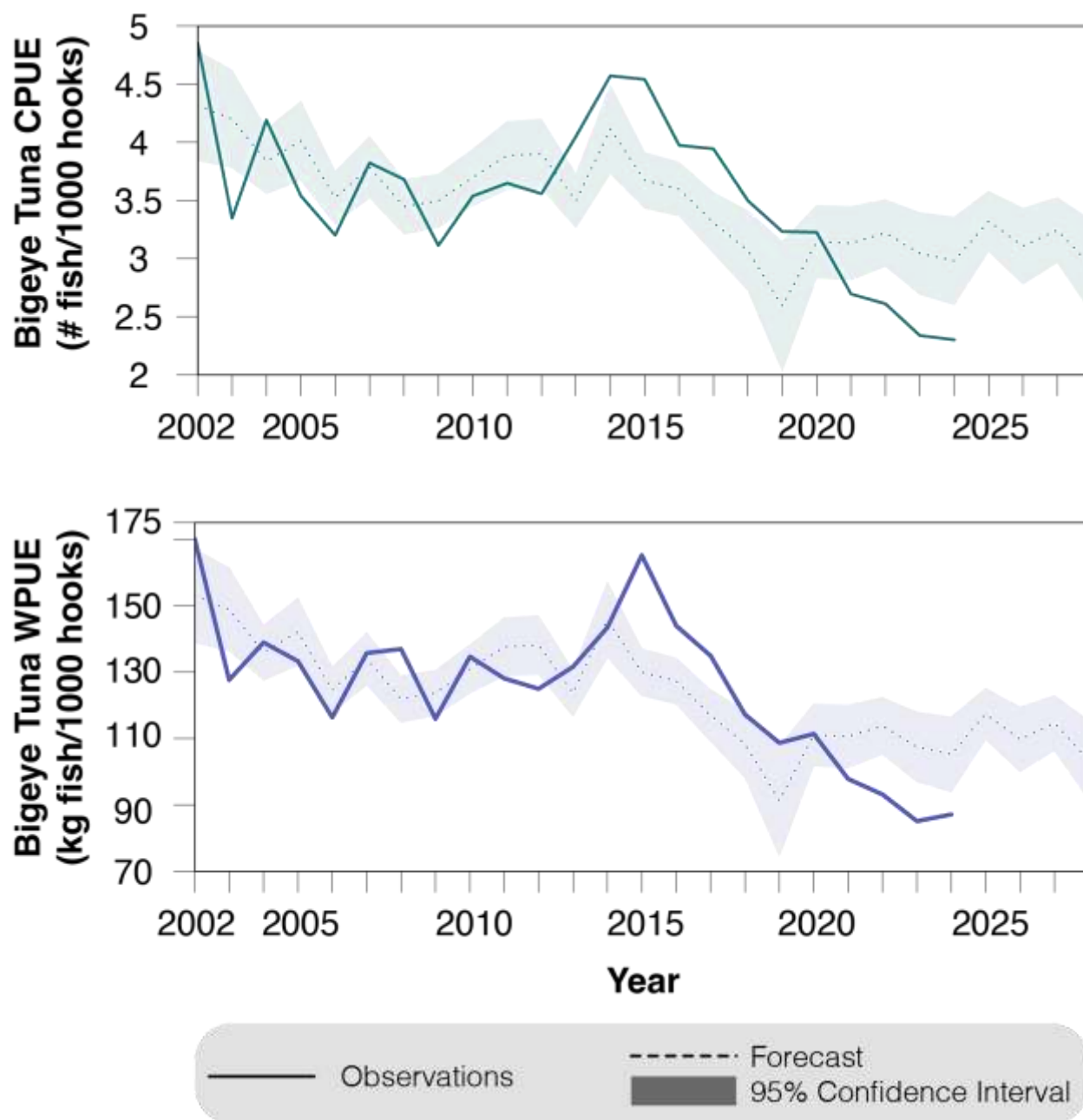


Figure 184. Annual observed (solid lines) and forecast (dotted lines) CPUE (upper panel; green) and WPUE (lower panel; purple) of bigeye tuna from deep sets. The forecasts' 95% confidence intervals are shaded

Rationale: Recent work has shown that average phytoplankton size can be used to predict bigeye tuna catch rates up to four years in advance (Woodworth-Jefcoats and Wren 2020). The hypothesized mechanism behind this relationship is that larger phytoplankton are indicative of higher quality food for the zooplankton upon which larval and juvenile bigeye tuna prey. With higher quality prey available, more bigeye tuna survive into adulthood and recruit to the fishery.

Status: The catch rate forecasts suggest that catch rates will be fairly steady over the next four years.

Description: Time series of observed bigeye tuna CPUE and WPUE are presented together with the annual forecast values and their associated 95% confidence interval. The forecast is based on a linear regression between four-year-lagged median phytoplankton size and both CPUE and WPUE (individual).

Timeframe: Annual.

Region: Hawai‘i-based longline fishing grounds (0° – 40°N, 180° – 150°W and 15° – 36°N, 150° – 125°W).

Measurement Platform: Model-derived from satellite remotely sensed and *in situ* data.

Sourced from: (Langley et al. 2006; Woodworth-Jefcoats and Wren 2020; NOAA OceanWatch 2025c). Graphics produced in part using Stawitz and Li (2025).

3.4.3 RESPONSE TO PREVIOUS COUNCIL RECOMMENDATIONS

There were no Council recommendations specific to the Climate and Oceanic Indicators module of this annual SAFE report.

3.4.4 OBSERVATIONAL AND RESEARCH NEEDS

Through preparation of this and previous pelagic annual SAFE reports, the Council has identified a number of observational and research needs that, if addressed, could improve the information content of future Climate and Oceanic Indicators section. This information could provide fishery managers, the fishing industry, and the community with better understanding and predictive capacity that is vital to sustaining a resilient and vibrant fishery in the Western Pacific. These observational and research needs are to:

- Emphasize the importance of continuing the climate and ocean indicators used in this report so that a consistent, long-term record can be maintained and interpreted;
- Develop agreements among constituents and research partners to ensure the sustainability, availability, and accessibility of climate and ocean indicators, associated datasets, and analytical methods used in this and future reports;
- Improve monitoring and understanding of the impacts of changes in ocean temperature, pH and ocean acidity, ocean oxygen content and hypoxia, and sea level rise through active collaboration by all fishery constituents and research partners;
- Develop, test, and provide access to additional climate and ocean indicators;
- Investigate the connections between climate variables and indicators to improve understanding of changes in physical, chemical, biological, and socio-economic processes and their interactions in the regional ecosystem;
- Develop predictive models that can be used for scenario planning to account for unexpected changes and uncertainties in the regional ecosystem and fisheries;
- Foster applied research in ecosystem modeling to better describe current conditions and to better anticipate the future under alternative projections of climate and ocean change including changes in expected human benefits and their variability;
- Improve understanding of the connections between the PDO and fisheries ecosystems beyond the North Pacific;

- Improve understanding of mahimahi and swordfish size in relation to the location and orientation of the TZCF;
- Explore the connections between sea surface conditions, stratification, and mixing;
- Identify the biological implications of tropical cyclones;
- Research cultural knowledge and practices for adapting to past climate changes and investigate how they might contribute to future climate adaptation; and
- Explore additional and/or alternative climate and ocean indicators that may have important effects of pelagic fisheries systems including:
 - Ocean currents and anomalies;
 - Eddy kinetic energy (EKE);
 - Near-surface wind velocity and anomalies;
 - Wave forcing and anomalies;
 - Oceanic nutrient concentration;
 - South Pacific convergence zones targeted by swordfish;
 - Standardized fish community size structure data for gear types, including the troll fishery for yellowfin and blue marlin;
 - Additional spatial coverage for the international purse seine fishery;
 - Time series of species richness and diversity from catch data that could provide insight into how the ecosystem is responding to physical climate influences; and
 - Socioeconomic indicators of climate impacts on fishing communities and businesses.

3.4.5 ACKNOWLEDGEMENTS

Phoebe Woodworth-Jefcoats led the production and compilation of this chapter. Johanna Wren contributed figures, code, and text. Emily Conklin contributed code. Hui Daisy Shi contributed data products. The NOAA Fisheries Northeast Fisheries Science Center contributed the template used for the *Indicators at a Glance* figure.

3.5 ESSENTIAL FISH HABITAT

3.5.1 INTRODUCTION

Per requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 50 CFR § 600.815), Essential Fish Habitat (EFH) information for all Pelagic Management Unit Species (MUS) is found in the Pelagic Fishery Ecosystem Plan (FEP). The EFH Final Rule requires that the Council review and revise EFH provisions periodically and report on this review as part of the annual Stock Assessment and Fishery Evaluation (SAFE) report, with a complete review conducted as recommended by the Secretary, but at least once every five years. The habitat objective of the FEP is to refine EFH and minimize impacts to EFH, with the following sub-objectives:

- Review EFH and Habitat Areas of Particular Concern (HAPC) designations every five years and update such designations based on the best available scientific information, when available.
- Identify and prioritize research to assess adverse impacts to EFH and HAPC from fishing (including aquaculture) and non-fishing activities, including, but not limited to, activities that introduce land-based pollution into the coastal environment.

Pelagic EFH information was not updated during preparation of 2022 SAFE report, except for Section 3.5.5. Non-fishing impacts to pelagic EFH were reviewed in the past as part of the Council's omnibus review of non-fishing effects on EFH. The Council's support of non-fishing activities research is monitored through the program plan and five-year research priorities, not the annual SAFE report.

3.5.2 RESPONSE TO PREVIOUS COUNCIL RECOMMENDATIONS

At its 200th meeting in 2024, the Council received updates on environmental compliance processes related to offshore wind development in the Pacific, during which NMFS confirmed that EFH consultations would be conducted for pelagic management unit species (PMUS). These consultations are intended to assess and mitigate potential impacts on pelagic habitats, particularly for migratory species that may interact with wind energy infrastructure in the U.S. Pacific EEZ. The Council emphasized the importance of incorporating updated oceanographic and fisheries interaction data in these reviews to ensure EFH protections for highly migratory pelagic species reflect the best available science.

3.5.3 HABITAT USE BY MUS AND TRENDS IN HABITAT CONDITION

The geographic extent of EFH for PMUS in the Western Pacific region is the shoreline to the edge of the exclusive economic zone (EEZ; 64 FR 19067, April 19, 1999). Egg/larval PMUS EFH is the water column to a depth of 200 m, while juvenile/adult PMUS EFH is designated to 1000 m. HAPC is designated to a depth of 1,000 m above seamounts and banks with summits shallower than 2,000 m.

Because the habitat is the water column, the Climate and Oceanic Indicators section (Section 3.4) provides data and trends relevant to pelagic EFH, including oceanic pH, the ONI PDO, tropical cyclones, North Pacific oligotrophic area, ocean color, and subtropical front/transition zone chlorophyll front indicators. Future SAFE reports may provide further interpretation of these indicators as they relate to EFH.

3.5.4 REPORT ON REVIEW OF EFH INFORMATION

As of 2024, no new formal EFH reviews for pelagic management unit species (PMUS) have been completed; however, EFH considerations for pelagic species have been incorporated into broader environmental compliance processes, including ongoing consultations related to offshore wind development. These efforts are expected to inform future EFH reviews by identifying potential habitat interactions and data gaps relevant to migratory pelagic species in the Western Pacific region.

3.5.5 NEW EFH-RELEVANT DATA STREAM: LARVAL FISH SURVEYS AND ICHTHYOPLANKTON MONITORING

A new and expanding data stream relevant to essential fish habitat (EFH) for pelagic management unit species (PMUS) comes from ongoing ichthyoplankton surveys across the Pacific Islands Region. The overarching goal of this effort is to better understand the spatial distribution, habitat use, and early life history of managed species during their larval stages. Using a 6' IKMT net system deployed during nighttime hours aboard NOAA Ship Oscar Elton Sette, the PIFSC Ecosystem Sciences Division has sampled larval stages of pelagic, reef, and bottomfish species from the upper water column. In 2023, 88 ichthyoplankton tows were conducted throughout the Hawai'i EEZ as part of the Hawaiian Islands Cetacean and Ecosystem Assessment Survey (HICEAS), spanning a broad geographic area from west of Hōlanikū (Kure

Atoll) to South Point, Hawai‘i Island—making it the most extensive ichthyoplankton survey of its kind in the region to date. These samples coincided with peak spawning periods for multiple BMUS and PMUS, including uku, tunas, marlins, ono, and deep-7 snappers. In spring 2024, an additional 24 tows were completed around Maui Nui during the BFISH R&D cruise, followed by 70 tows conducted throughout the Papahānaumokuākea Marine National Monument during the 2024 National Coral Reef Monitoring Program (NCRMP) summer survey. These efforts are expected to enhance understanding of larval dispersal, connectivity between island systems, and early habitat use, ultimately supporting EFH refinement and informing future stock assessment models for pelagic species.

3.5.6 RESEARCH NEEDS AND ONGOING PROJECTS

The Council previously identified pelagic scientific data needs to address the EFH provisions more effectively in the FEP. This section includes active research and data collection initiatives to address these needs.

Research continues at PIFSC to enhance understanding of open-ocean habitats and ecosystem processes through improved utility of climate and oceanographic information. Specific research efforts continue on determining the distribution of feeding and spawning habitats and their response to anthropogenic climate change, as well as the influence of natural climate variability (e.g., ENSO) on the distribution of suitable habitat for bigeye tuna (BET).

The BET Initiative is a collection of projects that looks to utilize telemetry data to describe BET thermal and spatial habitat, identify imminent spawners among longline catch to shed light on where in the Hawaii longline fishery spawning occurs, explore the distribution of feeding and spawning habitat and responses to anthropogenic climate change, and examine the effect of large-scale climate variability to better understand shifts in catch rates and locations.

Currently, BET research almost exclusively uses satellite and/or modeled data (with much less frequent use of sparse *in situ* observations for environmental data). Additional telemetry data would improve the models, especially with respect to species distribution. At present, commercial catch data is used exclusively for fish distribution models. There is a need for better models, and the furtherance of dynamic habitat delineation is dependent on more *in situ* data and regular scientific sampling.

PIFSC is also researching the effect of large-scale variability on longline and purse seine tuna species CPUE in the Equatorial Pacific. Results of this research would tie into the BET Initiative, as it can provide information on possible links between the North Pacific and the Equatorial Pacific CPUE and BET population structure. One of the main management questions is whether the North Pacific stock is a separate stock or individuals that spawn in the equatorial region and migrate north.

At Cross Seamount, PIFSC scientists are looking at the distribution and relative abundance of micronekton (i.e., BET forage) in the seamount environment (Domokos 2022), and the distribution and relative biomass of juvenile BET in the seamount environment. This research can lead to an assessment of how juvenile BET abundance is reflected in the North Pacific pelagic environment (i.e., fishing grounds), possibly providing a route to fisheries independent data for stock assessments. PIFSC is also characterizing micronekton at the Transition Zone Chlorophyll Front (TZCF), a critical migratory route and foraging ground for top predators (e.g., tunas, billfish, and protected species) that feed on micronekton.

PIFSC has recently developed the Protected Species Ensemble Random Forest (PSERF) model (Siders et al. 2020), which is a habitat-based framework to describe Hawaii- and American Samoa-based longline interactions with protected species, utilizing olive ridley sea turtles (*Lepidochelys olivacea*) as a case study. Ongoing work includes updating Hawaii deep-set and shallow-set longline fishery data sets for the most recent years and adding oceanographic features derived from weekly products, including eddy kinetic energy, Okubo-Weiss parameters, and Ekman pumping to define mesoscale features. Distribution models are being developed for all species in the Hawaii deep-set, Hawaii shallow-set, and American Samoa longline fisheries, and will be rerun with more recent data and features. More robust habitat delineation and possible dynamic ocean management based on models using weekly products could facilitate timely updates for areas of high protected species encounter probabilities.

Similar work is ongoing focused on understanding environmental drivers of the catch rates of the full suite of species caught in the Hawai'i shallow- and deep-set longline fisheries. These models are made with the intent of climate projections and short-term predictions covering the broadest area over which the fisheries operate. These differ from PSERF models in their generalizability for said predictions, identification of environmental sensitivities, and inclusion of catch rates for the species caught in these fisheries (compared to solely interaction probabilities).

PIFSC has collected fish larvae while piggybacking on other survey efforts throughout the Hawaiian Archipelago, totalling 112 stations ranging from west of Hōlanikū to Hawai'i Island. These data can be used to identify the spawning locations and timing for a range of management unit species, spanning from uku and *Pristipomoides* snappers (deep-7 members) to a large suite of pelagic management unit species (mahimahi, ono, marlins, and tunas). This information will be paired with the environmental characteristics during the individual tows to better refine larval and inferred spawning habitat for a number of these species.

PIFSC scientists have used recent developments in the understanding of uku early life history to parameterize a model simulating the larval dispersal of this species from Penguin Bank, their presumed primary spawning location within the main Hawaiian islands. Results have indicated that simulated uku larvae (treated as particles concentrated at the depth uku larvae have been observed in samples) released from Penguin Bank largely remain with the Maui Nui and O'ahu area, with rare connections to Hawai'i Island, Kaua'i, and Ni'ihau. Wind patterns related both to the fraction of particles reaching potential settlement areas in the model runs and to the recruitment residuals from the 2020 benchmark stock assessment for uku. The results suggest wind-forced variability in larval dispersal may influence the recruitment of this stock (Suca et al. 2025).

PIFSC scientists have been identifying the environmental and operational associations of cookie cutter bite occurrences for both the shallow- and deep-set Hawai'i longline fisheries. Preliminary results indicate soak time, lunar phase, and temperature play notable roles in the occurrence of cookie cutter shark bites on fish caught on an individual set. Further work will assess if fishing effort in both fisheries is increasingly overlapping with predicted cookie cutter shark bite occurrence throughout the fishing domain.

3.6 MARINE PLANNING

3.6.1 INTRODUCTION

Marine planning is a science-based management tool being utilized regionally, nationally, and globally to identify and address issues of multiple human uses, ecosystem health and cumulative impacts in the coastal and ocean environment. The Council's efforts to formalize incorporation of marine planning in its actions began in response to Executive Order 13547, Stewardship of the Ocean, Our Coasts, and the Great Lakes. Executive Order 13158, Marine Protected Areas (MPAs), proposes that agencies strengthen the management, protection, and conservation of existing MPAs, develop a national system of MPAs representing diverse ecosystems, and avoid causing harm to MPAs through federal activities. MPAs, or marine managed areas (MMAs) are one tool used in fisheries management and marine planning.

At its 165th meeting in March 2016, in Honolulu, Hawaii, the Council approved the following objective for the FEPs: Consider the Implications of Spatial Management Arrangements in Council Decision-making. The following sub-objectives apply:

- a. Identify and prioritize research that examines the positive and negative consequences of areas that restrict or prohibit fishing to fisheries, fishery ecosystems, and fishermen, such as the Bottomfish Fishing Restricted Areas, military installations, NWHI restrictions, and Marine Life Conservation Districts.
- b. Establish effective spatially-based fishing zones.
- c. Consider modifying or removing spatial-based fishing restrictions that are no longer necessary or effective in meeting their management objectives.
- d. As needed, periodically evaluate the management effectiveness of existing spatial-based fishing zones in federal waters.

In order to monitor implementation of this objective, this annual report includes the Council's spatially-based fishing restrictions or MMAs, the goals associated with those, and the most recent evaluation. Council research needs are identified and prioritized through the 5 Year Research Priorities and other processes and are not tracked in this report.

To meet the EFH and National Environmental Policy Act (NEPA) mandates, this annual SAFE report tracks activities that occur in the ocean that are of interest to the Council and incidents or facilities that may contribute to cumulative impact. While the Council is not responsible for NEPA compliance, monitoring the environmental effects of ocean activities for the FEP's EFH cumulative impacts section is duplicative of the agency's NEPA requirement, and therefore, this report can provide material or suggest resources to meet both mandates.

3.6.2 RESPONSE TO PREVIOUS COUNCIL RECOMMENDATIONS

There are no standing Council recommendations indicating review deadlines for Pelagic MMAs.

At its 147th meeting in March 2010, the Council recommended a no-take area from 0–12 nm around Rose Atoll Marine National Monument (MNM) with the Council to review the no-take regulations after three years. The most recent review took place in 2013, with the subsequent review previously scheduled for 2016. PIRO received no requests for non-commercial permits to fish within the Rose Atoll MNM. Further, inquiries in American Samoa showed that there was

no indication that the 12 nm closure around Rose Atoll MNM has been limiting fishing. The Pelagic Plan Team deferred decision on Rose Atoll in May 2017. At its 172nd meeting in March 2018, the Council requested that NOAA and USFWS provide a report to the Council at its following meeting to review resultant benefits to fish populations, protected species, and coral reef, deep-slope, and pelagic ecosystems from the establishment of the Rose MNM. USFWS presented this report to the Council at its 173rd meeting in June 2018, from which no Council recommendations were generated.

At its 162nd meeting in March 2015, the Council recommended a regulatory amendment for the temporary exemption to the Large Vessel Protected Area (LVPA) by American Samoa longline limited entry permitted vessels greater than 50 ft in length. The Council would review the LVPA exemption on an annual basis. In 2016, NMFS published a final rule that allowed large, federally-permitted U.S. longline vessels to fish in specific areas of the LVPA (81 FR 5619, February 3, 2016). In July 2016, American Samoa sued NMFS and the Council in the Hawaii Federal District Court, claiming that NMFS did not consider the 1900 and 1904 Deeds of Cession with respect to the protection of the cultural fishing rights of the people of American Samoa. In 2017, the Hawaii Federal District Court deemed the final rule invalid and ordered NMFS to vacate the LVPA exemption rule (82 FR 43908, September 20, 2017).

At its 173rd meeting in June 2018, regarding the LVPA applicable to the American Samoa limited entry vessels, the Council recognized the LVPA rule has led to disagreement within the American Samoa fishing community and was the subject of litigation. The Council noted that the court decision requires the consideration and protection of American Samoa cultural fishing. To this end, the Council requested PIFSC conduct research on American Samoa cultural fishing practices to facilitate understanding and potential impacts of opening some restricted fishing areas within the U.S. EEZ for American Samoa vessels that primarily target albacore. PIFSC presented the results of this research at the Council's 172nd meeting in March 2018, which indicated that all fishing in American Samoa has cultural importance because catch from all locally-based fishing sectors flows into the American Samoa community for cultural purposes. The Council also recommended a regulatory amendment to provide a four-year exemption for vessels permitted under the American Samoa longline limited entry program to fish within the LVPA seaward of 12 nm around Tutuila, 12 nm around Manua, 12 nm around Swains, and 2 nm around the offshore banks, and recommended annual monitoring of the American Samoa longline and troll catch rates, small vessel participation, and local fisheries development.

NMFS appealed Hawaii Federal District Court's 2017 decision that invalidated the 2016 LVPA reduction to the U.S. Ninth Circuit Court of Appeals. Oral arguments were in February 2020 in Honolulu, Hawaii, and the decision was reversed in a September 2020 ruling.

At its 184th meeting in December 2020, the Council directed staff to monitor the fishing operation and fishery performance of the American Samoa longline and alia fisheries and report back to the Council at its September 2021 meeting. Council staff provided this presentation to the Council as scheduled. On July 9, 2021, NMFS published a final rule reimplementing the 2016 regulations that the Council submitted to NMFS (86 FR 36239).

At its 194th meeting in March 2023, regarding the process to designate a National Marine Sanctuary in the Pacific Remote Island Areas (PRIA), the Council requested NOAA and all other involved agencies to consult with the U.S. Pacific Territories beyond the public comment opportunity on the proposed sanctuary. The Council also directed staff to invite the National

Ocean Service (NOS) to provide a presentation on the proposed Pacific Remote Island Sanctuary to get a better understanding of the Council's responsibilities and role in the process. At the same meeting, the Council also directed staff to draft a letter to NOAA requesting NMFS and NOS meet with the Governors and staff of the Territories of American Samoa, Guam, and the CNMI and that NOS describe in detail the process that will be followed for President Biden's request for a National Marine Sanctuary in the PRIA, and a review of the process with the Council as soon as possible.

At its 195th meeting in June 2023, the Council directed staff to review the Council's current fishing regulations for the PRIA and Pacific Pelagics FEPs and other applicable laws to provide the Council with a determination of whether existing regulations meet the goals and objectives, proclamations, and National Marine Sanctuaries Act. The Council further directed staff to develop a range of options for fishing regulations in the proposed sanctuary including extending existing Pacific Remote Islands Marine National Monument (PRIMNM) regulations to the full spatial extent of the EEZ for Council consideration at its next meeting.

The Council requested NOAA, in its evaluation of the proposed PRI sanctuary, evaluate the holistic impacts of prohibiting tuna fishing 50 to 200 nm of the island areas, that that sector of the U.S. purse seine fleet and possibly the Hawaii Longline fleet that has historically fished in the PRIA EEZ around Howland and Baker and Palmyra and Kingman reef be considered a "community of practice" and be given prominence as an "affected community" along with the whole larger fishing community of American Samoa, and that resuming sustainable fishing be made an objective in the designation.

The Council requested NOAA conduct an economic study that considers the individual and cumulative effects, including multiplier effects, to American Samoa-based fishery on the proposed ELAPS rulemaking, lack of acknowledgement of a distinct American Samoa fleet in international management, and effects of a proposed National Marine Sanctuary that may prohibit purse seine-based commercial fishing in the entire U.S. EEZ of the PRI.

The Council noted that, for the NWHI Monument Expansion Area (MEA), the ONMS' letter of May 31, 2023, rejecting the Council's cost-recovery provision in the permitting process simply referred to its February 22, 2023 letter for disapproval rationale. However, the latter is unclear on exactly how the Council's recommendation is inconsistent with Goal 4 and Objectives 3, 5, and 6 because sale can be denied by NMFS after consultation with monument management partners. The Council directed staff to respond to ONMS requesting they provide a more detailed explanation of how the recommendation is inconsistent with each goal and objective.

The Council directed staff to prepare a letter to the President of the United States of America (POTUS), conveying its concerns about the proposed sanctuary in the Pacific Remote Islands and potential negative consequences to U.S. Pacific Territories, and to request that ONMS and the Office of the White House respond to letters from U.S. Pacific Territorial governors on the matter.

At its 196th meeting in September 2023, regarding fishing regulations for the proposed PRIA Sanctuary, the Council recognized that a goal of the proposed sanctuary is to support cultural heritage and fishing is central to the culture of Pacific Island communities. Data presented to the Council by NMFS PIFSC showed that the impacts of the existing fisheries as managed under current fisheries regulations are well below measurable and objective thresholds established by NOAA pursuant to requirements set forth under the Magnuson Stevens Fishery Conservation and

Management Act (MSA) (i.e., no fish stocks are overfished or subject to overfishing, and no essential fish habitats are being adversely affected), Endangered Species Act (ESA) (i.e., no fisheries are jeopardizing species or destroying/adversely modifying critical habitat listed under the ESA) and other applicable laws. Further, the data also showed the importance of fishing to the culture of American Samoa and a reduction of fishing would represent a disproportionate socioeconomic burden to the Territory of American Samoa and the US longline and purse seine fleets. Therefore, the Council preliminarily found that the existing fishing regulations under the current structure may already meet the goals and objectives of the proposed sanctuary and directs staff to continue discussing the issue with NMFS and Office of National Marine Sanctuaries (ONMS) to determine if additional regulations may be necessary. The Council requested ONMS provide an opportunity for the Council to review a pre-draft Environmental Impact Statement (EIS) for the proposed Pacific Remote Islands (PRI) National Marine Sanctuary to ensure that the alternatives are aligned with the Council's fishing regulations.

The Council also directed staff to send a letter to the President to request modifying the Pacific Remote Islands Marine National Monument to allow for US commercial longline and purse seine fishing around Jarvis Island and Johnston Atoll. The Council noted that Jarvis and Johnston have been historically more important for both US longline and US purse seine fisheries and can help the US mitigate climate change while providing equity and environmental justice to US fishing communities in the Western Pacific.

At its 197th meeting in December 2023, reiterated its findings in Appendix C: Observer Program Bycatch Data of the options paper that show that the Council's existing regulations have established comprehensive protection since the 1980s and continues to provide for long-lasting conservation and management for the PRI fishery ecosystem and resources. The Council stressed the importance of the current pelagic fisheries in the PRI to the economy and culture of American Samoa and recognized that impacts to those fisheries would be devastating to *fa'a Samoa*. The fisheries provide for millions of dollars and thousands of jobs through direct and indirect contributions. The current pelagic fisheries in the PRI are conserved and managed pursuant to an adaptive, ecosystem-based approach both domestically and internationally and are neither overfished nor experiencing overfishing. Pelagic fishing occurs at or near the open ocean's surface and does not interact with benthic communities, so these activities do not jeopardize the benthic ecosystem or biodiversity. Should fishing for bottomfish, crustacean, precious coral or a coral reef ecosystem species be conducted in the PRI, Council regulations implementing the Pacific Remote Islands Fishery Ecosystem Plan would apply and continue to comprehensively conserve and manage these fisheries, the marine biodiversity, and ecosystem services they provide. This management plan has been in place for over 13 years to prevent negative impacts to fish stocks, habitat, bycatch, and protected species. Therefore, the Council determined that the existing fishing regulations under the current structure already meet the goals and objectives of the proposed sanctuary and recommends to ONMS that additional fishing regulations are not necessary to meet the proposed PRI National Marine Sanctuary goals and objectives. Further, the Council directed staff to provide the Council's recommendation to ONMS by December 20, 2023 and to include the rationale and justification for the Council's determination to ONMS by January 19, 2024.

3.6.3 MARINE MANAGED AREAS

Council-established MMAs are shown in Figure 185, and are compiled in Table 86.

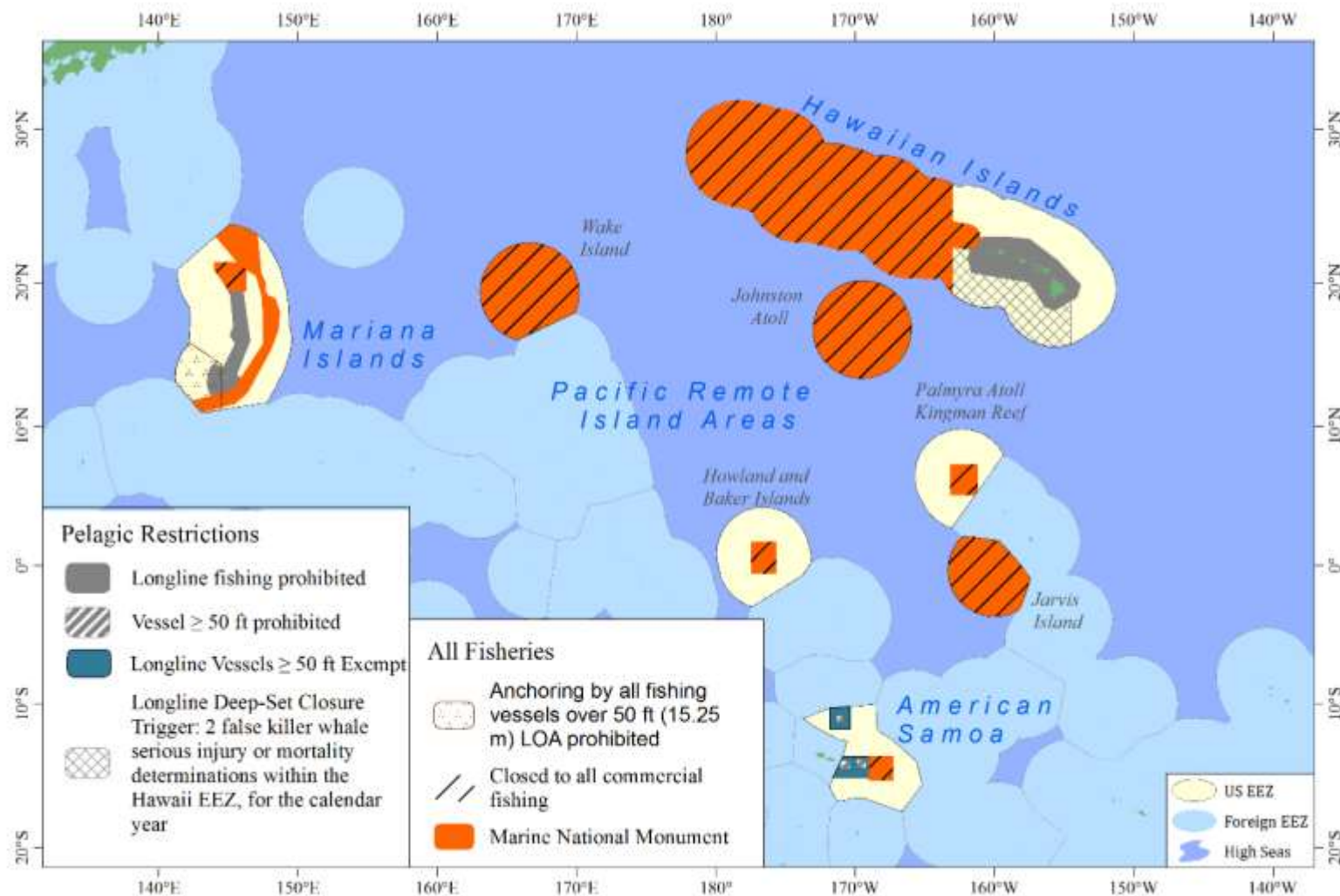


Figure 185. Regulated Fishing Areas of the Western Pacific Region

Table 86. MMAs established under FEPs from [50 CFR § 665](#)

Name	FEP	Island(s)	50 CFR /FR /Amendment Reference	Marine Area (km ²)	Fishing Restriction	Goals	Most Recent Evaluation	Review Deadline
Pelagic Restrictions								
NWHI Longline Protected Species Zone	Pelagic (Hawaii)	NWHI	665.806(a)(1) 56 FR 52214 76 FR 37287 Pelagic FMP Am. 3	351,514.00	Longline fishing prohibited	Prevent longline interaction with monk seals.	1991	-
MHI Longline Prohibited Area	Pelagic (Hawaii)	MHI	665.806(a)(2) 57 FR 7661 77 FR 71286 Pelagic FMP Am. 5	248,682.38	Longline fishing prohibited	Prevent gear conflicts between longline vessels and troll/handline vessels.	1992	-
Guam Longline Prohibited Area	Pelagic (Marianas)	Guam	665.806(a)(3) 57 FR 7661 Pelagic FMP Am. 5	50,192.88	Longline fishing prohibited	Prevent gear conflicts between longline vessels and troll/handline vessels.	1992	-
CNMI Longline Prohibited Area	Pelagic (Marianas)	Mariana Archipelago	665.806(a)(4) 76 FR 37287 Pelagic FEP Am. 3	88,112.68	Longline fishing prohibited	Reduce potential for nearshore localized fish depletion from longline fishing, and to limit catch competition and gear conflicts between the CNMI-based longline and trolling fleets.	2011	-

Name	FEP	Island(s)	50 CFR /FR /Amendment Reference	Marine Area (km²)	Fishing Restriction	Goals	Most Recent Evaluation	Review Deadline
Large Vessel Prohibited Area	Pelagic (American Samoa)	Tutuila, Manu'a, and Rose Atoll	665.806 (b)(1) 81 FR 5619 82 FR 43908	74,857.32	Vessels ≥ 50 ft. prohibited	Prevent gear conflict with smaller alia vessels; longline vessels >50 ft. exempted from 12 to 50 nm to improve the viability of the American Samoa longline fishery and achieve optimum yield from the fishery while preventing overfishing.	Jan 29, 2016	-
Large Vessel Prohibited Area	Pelagic (American Samoa)	Swains Island	665.806 (b)(1) 81 FR 5619 82 FR 43908 Pelagic FEP	28,352.17	Vessels ≥ 50 ft. prohibited	Prevent gear conflict with smaller alia vessels; longline vessels over 50 ft. exempted between 12 and 50 nm due to improve the viability of the American Samoa longline fishery and achieve optimum yield from the fishery while preventing overfishing.	Jan 29, 2016	-
Other Restrictions								
Howland Island No-Take Marine Protected Area (MPA)/PRI Marine National Monument	PRIA/ Pelagic	Howland Island	665.599 and 665.799(a)(1) 69 FR 8336 Coral Reef Ecosystem Fishery Management Plan (FMP) 78 FR 32996 PRIA FEP Am. 2	-	All Take Prohibited	Minimize adverse human impacts on coral reef resources; commercial fishing prohibited within 12 nautical miles (nm).	2013	-

Name	FEP	Island(s)	50 CFR /FR /Amendment Reference	Marine Area (km ²)	Fishing Restriction	Goals	Most Recent Evaluation	Review Deadline
Jarvis Island No-Take MPA/PRI Marine National Monument	PRIA/ Pelagic	Jarvis Island	665.599 and 665.799(a)(1) 69 FR 8336 Coral Reef Ecosystem FMP 78 FR 32996 PRIA FEP Am. 2	-	All Take Prohibited	Minimize adverse human impacts on coral reef resources; commercial fishing prohibited within 12 nmi.	2013	-
Baker Island No-Take MPA/PRI Marine National Monument	PRIA/ Pelagic	Baker Island	665.599 and 665.799(a)(1) 69 FR 8336 Coral Reef Ecosystem FMP 78 FR 32996 PRIA FEP Am. 2	-	All Take Prohibited	Minimize adverse human impacts on coral reef resources; commercial fishing prohibited within 12 nmi.	2013	-
Rose Atoll No-Take MPA/Rose Atoll Marine National Monument	American Samoa Archipelago/ Pelagic	Rose Atoll	665.99 and 665.799(a)(2) 69 FR 8336 Coral Reef Ecosystem FMP 78 FR 32996 American Samoa FEP Am. 3	-	All Take Prohibited	Minimize adverse human impacts on coral reef resources; commercial fishing prohibited within 12 nmi.	June 3, 2013	June 3, 2016
Kingman Reef No-Take MPA/PRI Marine National Monument	PRIA/Pelagic	Kingman Reef	665.599 and 665.799(a)(1) 69 FR 8336 Coral Reef Ecosystem FMP 78 FR 32996 PRIA FEP Am. 2	-	All Take Prohibited	Minimize adverse human impacts on coral reef resources; all fishing prohibited within 12 nmi.	2013	-

Name	FEP	Island(s)	50 CFR /FR /Amendment Reference	Marine Area (km ²)	Fishing Restriction	Goals	Most Recent Evaluation	Review Deadline
Guam No Anchor Zone	Mariana Archipelago	Guam	665.399 69 FR 8336 Coral Reef Ecosystem FMP	138,992.51	Anchoring by all fishing vessels ≥ 50 ft. prohibited on the offshore southern banks located in the U.S. EEZ off Guam	Minimize adverse human impacts on coral reef resources.	2004	-
Johnston Atoll Low-Use MPA/PRI Marine National Monument	PRIA/ Pelagic	Johnston Atoll	69 FR 8336 Coral Reef Ecosystem FMP 78 FR 32996 PRIA FEP Am. 2	-	Special Permit Only	Minimize adverse human impacts on coral reef resources; superseded by prohibiting fishing within 12 nm in Am. 2.	2013	-
Palmyra Atoll Low-Use MPAs/PRI Marine National Monument	PRIA/ Pelagic	Palmyra Atoll	69 FR 8336 Coral Reef Ecosystem FMP 78 FR 32996 PRIA FEP Am. 2	-	Special Permit Only	Minimize adverse human impacts on coral reef resources; superseded by prohibiting fishing within 12 nm in Am. 2.	2013	-
Wake Island Low-Use MPA/PRI Marine National Monument	PRIA/Pelagic	Wake Island	69 FR 8336 Coral Reef Ecosystem FMP 78 FR 32996 PRIA FEP Am. 2	-	Special Permit Only	Minimize adverse human impacts on coral reef resources; superseded by prohibiting fishing within 12 nm in Am. 2.	2013	-

3.6.4 ACTIVITIES AND FACILITIES OCCURRING IN THE WESTERN PACIFIC REGION

In the Western Pacific Region, fisheries compete with other activities for access to and use of fishing grounds. These activities include, but are not limited to, military bases and training activities, commercial shipping, recreational activities, and off-shore energy projects. Between the Bureau of Ocean Energy Management (BOEM), the U.S. Army Corps of Engineers (USACE), and NMFS, most permits for offshore energy and aquaculture development, dredging, or mooring projects that occur in the waters of the U.S. are captured. Department of Defense (DOD) activities are assessed in environmental impact statements (EIS) on a five-year cycle and are available through the *Federal Register*. Due to the sheer volume of ocean activities and the annual frequency of this report, only major activities on multi-year planning cycles or those permitted by NMFS Sustainable Fisheries Division are tracked in this report. Activities which are no longer reasonably foreseeable or have been replaced with another planning activity are removed from the report, though they may occur in previous reports.

3.6.4.1 AQUACULTURE FACILITIES

Hawaii had one offshore aquaculture facility recently operating in federal waters that was owned by Kampachi Farms (now known as Ocean Era) in 2016, but the associated Special Coral Reef Ecosystem Fishing Permit (SCREFP) was transferred to Forever Oceans in 2017 (see Table 87). This permit is no longer active. Additionally, the [Final Programmatic Environmental Impact Statement \(PEIS\) for an aquaculture management program in the Pacific Islands](#) was published in 2022. Relatedly, the State of Hawaii is interested in developing a pre-permitted demonstration/pilot area for offshore aquaculture technologies at their NELHA facility.

Table 87. Offshore aquaculture facilities near Hawaii

Name	Size	Location	Species	Status
Forever Oceans, transferred from Kampachi Farms (now known as Ocean Era)	Shape: Cylindrical Height: 33 ft. Diameter: 39 ft. Volume: 36,600 ft ³	5.5 nautical miles (nm) west of Keauhou Bay and 7 nm south-southwest of Kailua Bay, off the west coast of Hawaii Island (19°33' N, 156° 04' W). Mooring scope is 10,400-foot radius.	<i>Seriola rivoliana</i>	On July 6, 2016, NMFS authorized SCREFP for culture and harvest of 30,000 kampachi over two years on July 6, 2016. Array broke loose from mooring and empty net pen sank in 12,000 feet of water on Dec. 12, 2016. The mooring was redeployed under guidance from the U.S. Army Corps of Engineers (USACE) in late 2018 and stocked with the first cohort of 10,000 fish in early 2019. On March 30, 2017, NMFS authorized transfer of the two-year SCREFP from Ocean Era to Forever Oceans and the permit was renewed in 2019. Forever Oceans' most recent SCREFP expired in December 2021, and there are currently no ongoing, in-water operations.

3.6.4.2 ALTERNATIVE ENERGY FACILITIES

There are no alternative energy facilities in territorial or federal waters, proposed or existing, in American Samoa, Guam, the CNMI, or the PRIA.

Hawaii previously had four proposed wind energy facilities in federal waters through BOEM. On June 24, 2016, BOEM published a “Call for Information and Nominations” to seek additional nominations from companies interested in commercial wind energy leases within the Call Area offshore Hawaii, and pursued public comment on site conditions, resources, and existing uses of the area associated with BOEM’s wind energy development authorization process (BOEM 2017). However, these projects were disengaged in 2018. In December 2020, BOEM put out a new call for recommendations on environmental studies regarding offshore wind facilities, and the Hawaii State Energy Office is facilitating and providing input on studies that could be conducted to mitigate impacts on various resources, including aquatic. In October 2021, the National Renewable Energy Laboratory published a study providing estimates of the Levelized Cost of Energy of offshore wind in the region surrounding Oahu and investigates related topics relevant to planning for offshore wind (Shields et al. 2021). In December 2022, the Pacific Northwest National Laboratory deployed a floating scientific research buoy stationed approximately 15 miles east of Oahu to collect accurate offshore wind resource, meteorological, and oceanographic data in Hawaii. There are several alternative energy projects also being tracked in this report (Table 88).

Table 88. Alternative Energy Facilities and Development in the Western Pacific region

Name	Type	Location	Impact to Fisheries	Stage of Development	Source
Makai Ocean Engineering, Inc., Natural Energy Laboratory of Hawaii Authority (NELHA)	120 kW Ocean Thermal Energy Conversion (OTEC) Test Site/ 1 MW OTEC Test Site	Ke’ahole, North Kona, West Hawaii	Intake	120 kW OTEC operational; Final EA for 1 MW OTEC Site using existing infrastructure submitted July 2012 and lease negotiations being finalized; HEPA Exemption List memo Dec. 27, 2016.	NELHA Energy Projects Final Environmental Assessment, NELHA, July 2012
Honolulu Sea Water Air Conditioning (SWAC)	SWAC	4 miles S of Kaka’ako, Oahu	Benthic impacts; intake	USACE Record of Decision (ROD) signed in 2015. In 2018, HSWAC and the State of Hawaii finalized an agreement to provide seawater air conditioning for eight State buildings. Construction was planned to start in late	Honolulu SWAC Press Room Final Environmental Assessment, June 2014

Name	Type	Location	Impact to Fisheries	Stage of Development	Source
				2019 or, but the operation was shut down in late 2020 due to increasing costs.	
Marine Corps Base Hawaii Wave Energy Test Site (WETS)	Shallow- and Deep-Water Wave Energy	1, 2 and 2.5 km N of Mokapu, Oahu	Hazard to navigation	Shallow and deepwater wave energy units operational in mid-2015. In 2021, deployments were planned for the C-Power 2 kW SeaRay, the Oscilla Triton-C, and the Ocean Energy 500 kW OE35.	Final Environmental Assessment, NAVFAC PAC, January 2014 Tethys The Maritime Executive

3.6.4.3 MILITARY TRAINING AND TESTING ACTIVITIES AND IMPACTS

Major activities occurring in waters of the Western Pacific region by the DOD are summarized in Table 89.

Table 89. DOD major activities in the Western Pacific region

Action	Description	Phase	Impacts
Guam and CNMI Military Relocation SEIS	Relocate Marines to Guam and build a cantonment/family housing unit on Finegayan/Andersen Air Force Base, a live-fire individual training range complex at the Ritidian Unit of the Guam National Wildlife Refuge.	Record of Decision (ROD) published August 29, 2015 after release of Final SEIS on July 18, 2015 (80 FR 55838). Lawsuit filed for segmentation and range of reasonable alternatives under NEPA. The case was lost in 2018 when a judge from the District Court of CNMI stated that the Guam buildup and proposed training in the CNMI are not connected actions. The case was appealed, and the US Court of Appeals for the Ninth Circuit affirmed the District Court's dismissal in 2020. Marine Corps Base Camp Blaz was activated on October 1, 2020. The US Army Corps of Engineers published a final rule on Oct. 8, 2021, amending regulations to establish a danger zone in the Pacific Ocean adjacent to the Mason Live-Fire Training Range Complex at Camp Blaz.	Surface danger zone established at Ritidian – access restricted during training. Northern District Wastewater Treatment Plant will significantly impact nearshore water quality until it is upgraded.
Mariana Islands Training and Testing – Supplemental	The supplement to the 2015 Final EIS/OEIS was prepared to support ongoing and future activities conducted at sea and on Farallon de Medinilla (FDM) beyond 2020. New information, including an updated acoustic effects model, updated marine mammal density data, and evolving and emergent BSIA, were used to update the MITT.	The MITT Final Supplemental EIS/OEIS was released in June 2020. ROD published on August 7, 2020 to continue training and testing activities in the study area (85 FR 47952). Meetings are ongoing to discuss FDM research activities and exercises. Meetings were previously held to discuss the	Access and habitat impact similar to previously analyzed activities in the 2015 EIS/OEIS (80 FR 46525).

Action	Description	Phase	Impacts
		Integrated Natural Resources Management Plan and plans for future surveys around FDM. In July 2020, NMFS implemented regulations regarding to the incidental take of marine mammals in the MITT area (85 FR 46302).	
Rim of the Pacific (RIMPAC) Exercise	Multinational, sea control/power projection fleet exercise that has been performed biennially for currently headquartered in Pearl Harbor, Hawaii. RIMPAC exercise locations are present throughout the State of Hawaii.	RIMPAC Programmatic EA developed in 2002 and a Supplemental Programmatic EA was finalized in 2006 (71 FR 31170). Biennial exercises continue through the present, with the most recent occurring in August 2020 as an at-sea-only event. RIMPAC occurred again in Summer 2022 more traditionally.	Programmatic Environmental Assessment, June 2002 U.S. Pacific Fleet
Hawaii-Southern California Training and Testing (HSTT)	Increase naval testing and training activities, including the use of active sonar and explosives.	Record of Decision available in December 2018 to conduct training and testing activities as identified in Alternative 1 of the HSTT Final EIS/OEIS published in October 2018 (83 FR 66255). NMFS implemented regulations regarding to the incidental take of marine mammals in the HSTT area in July 2020 (85 FR 41780).	The 2018 HSTT EIS/OEIS predicts impacts to access and habitat impact similar to previous analysis in the 2013 HSTT EIS/OEIS .
Long Range Strike Weapon Systems Evaluation Program (WSEP)	Conduct operational evaluations of Long Range Strike weapons and other munitions as part of Long Range Strike WSEP operations at the Pacific Missile Range Facility at Kauai, Hawaii.	Comment period closed Feb. 6, 2017, and final rule on Aug. 22, 2017, for NMFS authorization to take marine mammals incidental to conducting munitions testing for their Long-Range Strike Weapons Systems Evaluation Program (LRS WSEP) over the course of five years, from August 21, 2017 through August 22, 2022 (82 FR 1702 ; 82 FR 39684).	Access – closures during training. Final Environmental Assessment, October 2016 NMFS Biological Opinion, August 2017
Naval Special Operations Training in the State of Hawaii	Small-unit maritime training activities for naval special operations personnel.	Draft EA released in October 2018. Public comment period through Dec. 10, 2018 was extended to Jan. 7, 2019. Final EA released May 2021.	Access. Draft Environmental Assessment, 2018
CNMI Joint Military Training	Establish unit and combined level training ranges on Tinian and Pagan.	Revised Draft EIS was expected in late 2018 or early 2019, but there is no new information on the EIS status. Lawsuit filed for segmentation and range of reasonable alternatives under NEPA. DOJ asked U.S. District Court for the NMI to dismiss the plaintiff's complaint with prejudice to prevent refiling. The case was lost in 2018 after a judge from the district court of CNMI agreed with the military that the Guam buildup and proposed training in the CNMI are not connected actions. The case was appealed, and the U.S. Court of Appeals for the Ninth Circuit affirmed the District Court's dismissal in 2020. Several meetings have been held with DFW and military officials to discuss relevant natural resource, land use, and social concerns regarding the proposed activities and prompted the reconsideration of proposed alternatives.	Significant access and habitat impacts around Tinian and Pagan.

Action	Description	Phase	Impacts
Garapan Anchorage	Military Pre-Positioned Ships anchor and transit.	Expired Memorandum of Understanding with the CNMI Government. As of 2021, a new MOU had not been signed.	Access, invasive species, unmitigated damage to reefs.
Farallon de Medinilla	Restricted airspace covering the island to 12 nm radius to conduct military training scenarios using air-to-ground ordnance delivery, naval gunfire, lasers, and special operations training.	Final rule published March 13, 2017, effective June 22, 2017, designating a new area, R-2701A, that surrounds existing R-2701, encompassing airspace between a 3 nm radius and 12 nm radius of FDM (82 FR 13389). Proposed surface danger zone to 12 nmi. Meetings with military officials established that the 12 nm radius is closed when exercises are being conducted, but a 3 nm closure would instead be in effect year-round when exercises are not being conducted. Damage to submerged lands and fisheries to be included within consultation establishing continued US interest in the island and compensation to the CNMI (Report to the President on 902 Consultations 2017)	Access – to fishing grounds and transit to fishing grounds – and damage to submerged lands.
Tinian Divert Infrastructure Improvements, Marianas	Improvements to airport and seaport (improving roads, installing fuel line) in CNMI for expanding mission requirements in Western Pacific.	ROD for Tinian Divert Infrastructure Improvements published in 2016 (81 FR 92791). The USAF has published a NOI to prepare a SEIS for the proposed Tinian Divert Infrastructure Improvements. The NOI began the public scoping process for the SEIS, which ended on May 31, 2018. Substantive comments received during the public scoping period were taken into consideration during preparation of the Draft SEIS. The USAF published a Notice of Availability (NOA) for the Draft SEIS on May 17, 2019. The NOA began the public review period for the Draft SEIS, which ended on July 1, 2019. Substantive comments received during the public review period were taken into consideration during preparation of the Final SEIS, which had an NOA published in July 2020 (85 FR 43580). Ground was broken on the Tinian Divert airfield on Feb. 22, 2022, which is expected to be completed by Oct. 9, 2025.	Adverse impacts to EFH minimal; access near Port of Tinian fuel transfer facility affected. Access and transit to fishing grounds.

In addition to the DOD activities detailed in Table 89, the U.S. military proposed the development of a small arms firing range near the shoreline in northwest Tinian. Several concerns were brought to the military regarding the proposed firing range, including issues with fishing access in the associated spatial closure area, issues with access to dive sites in the area, issues with the increased distance that boaters would have to travel to transit between Tinian and Saipan, and issues regarding boater safety due to having to travel further west from Tinian and losing access to the calmer waters nearshore (Tenorio, pers. comm., April 4, 2022).

In early 2010, the U.S. military began exercises in an area south and southeast of Guam designated W-517. W-517 is a special use airspace (approximately 14,000 nm²) that overlays deep open ocean approximately 50 miles south-southwest of Guam. Exercises in W-517 generally involve live fire and/or pyrotechnics. When an offshore area such as W-517 is in use for training or testing exercises by the U.S. military, a notice to mariners (NTM) is issued, and vessels attempting to use the area are advised to be cautious of objects in the water and other small vessels. This discourages access to virtually all banks south of Guam, including Galvez, Santa Rosa, White Tuna, and other popular fishing areas. NTMs from the military regarding these exercises and the number of days affected for Guam and the CNMI are included in Table 90. The warning areas for which NTMs are issued are presented in Figure 186.

Table 90. Notices to mariners for military exercises in the Mariana Archipelago from 2013-2024

Year	Location	Number of Notices to Mariners Issued	Number of Days Affected
2013	FDM	45	159
	W-517	24	54
2014	FDM	38	145
	W-517	24	49
2015	FDM	37	164
	W-517	33	87
2016	FDM	35	142
	W-517	50	139
	W-11	N/A	N/A
	W-12	N/A	N/A
2017	FDM	56	191
	W-517	46	119
	W-12	2	5
	W-11	N/A	N/A
2018	FDM	38	150
	W-517	49	107
	W-12	6	13
	W-11	1	1
2019	FDM	39	165
	W-517	27	65
	W-12	3	22
	W-11	6	27
	W-13	15	37
2020	FDM	27	87
	W-517	26	60
	W-12	2	3

Year	Location	Number of Notices to Mariners Issued	Number of Days Affected
	W-11	4	5
	W-13	31	106
2021	FDM	22	76
	W-517	26	72
	W-12	9	16
	W-11	6	24
	W-13	28	109
2022	FDM	14	49
	W-517	31	71
	W-12	9	26
	W-11	4	14
	W-13	23	65
	OROTE	73	266
2023	FDM	33	134
	W-517	34	72
	W-12	13	26
	W-11	6	24
	W-13	35	105
	OROTE	74	301
	MASON	11	44
	FINEGAYAN	2	16
2024	FDM	20	61
	W-517	33	52
	W-12	6	17
	W-13	5	16
	OROTE	64	245
	MASON	10	32

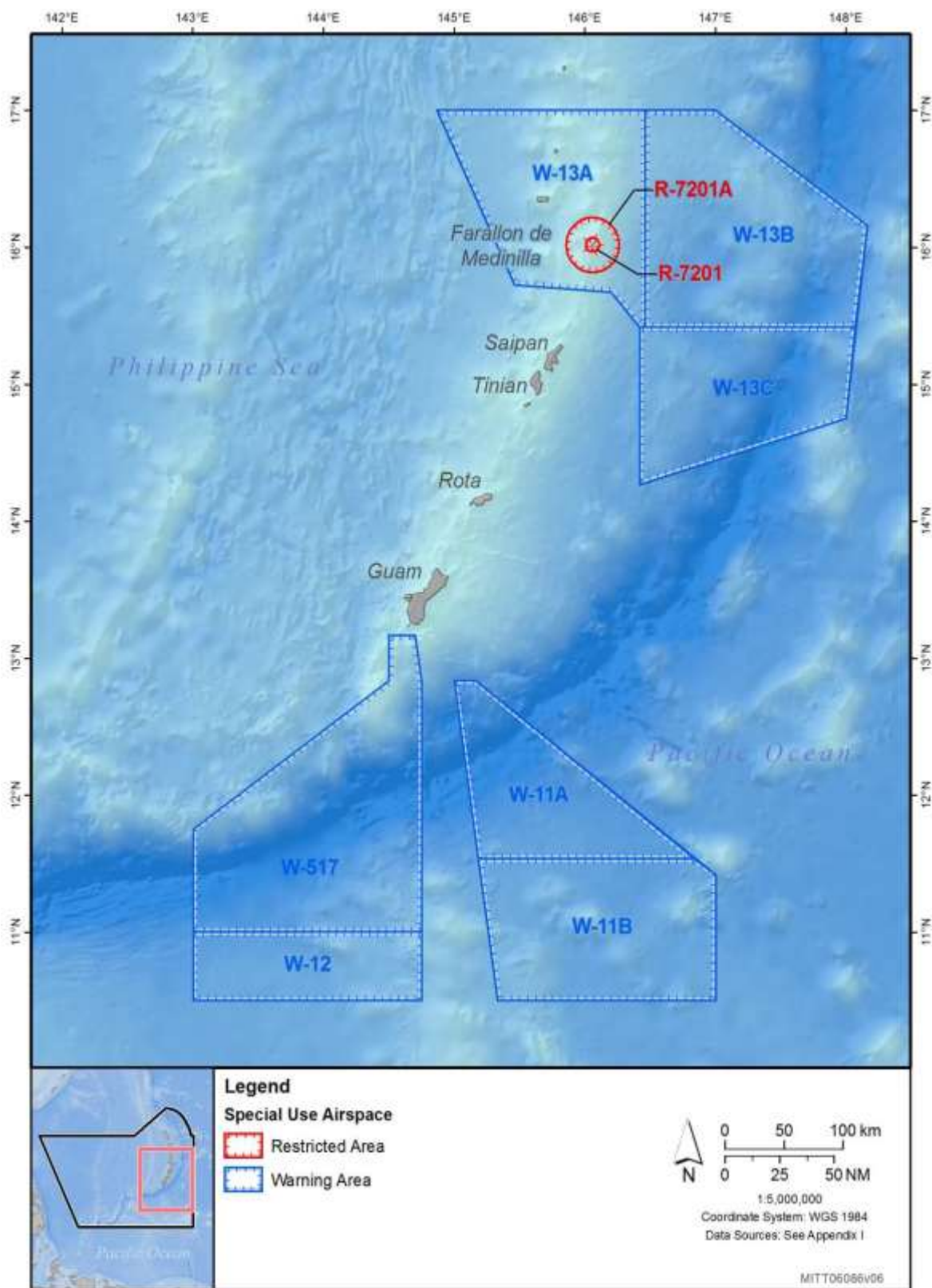


Figure 186. Map showing Warning Areas around the Mariana Archipelago

3.6.5 ADDITIONAL CONSIDERATIONS

3.6.5.1 AMERICAN SAMOA

3.6.5.1.1 Spatial planning Tools

In June 2018, President Trump signed the EO 13840 *Regarding the Ocean Policy to Advance Economic, Security, and Environmental Interests of the United States*, which established a policy focused on public access to marine data and information and requires federal agencies to 1) coordinate activities regarding ocean-related matters and 2) facilitate the coordination and collaboration of ocean-related matters with governments and ocean stakeholders. To that end, the [American Samoa Coastal and Marine Spatial Planning Data Portal](#) was created by [Marine Cadastre](#) to share information and data for coastal and marine spatial planning in American Samoa.

3.6.5.1.2 Fish Aggregating Devices (FADs)

There are usually five FADs active in the waters around American Samoa in recent years: four around Tutuila and one near Manua. In 2024, all five fish aggregating devices (FADs) were active, FADs A, B, C, D, and E (Figure 187).

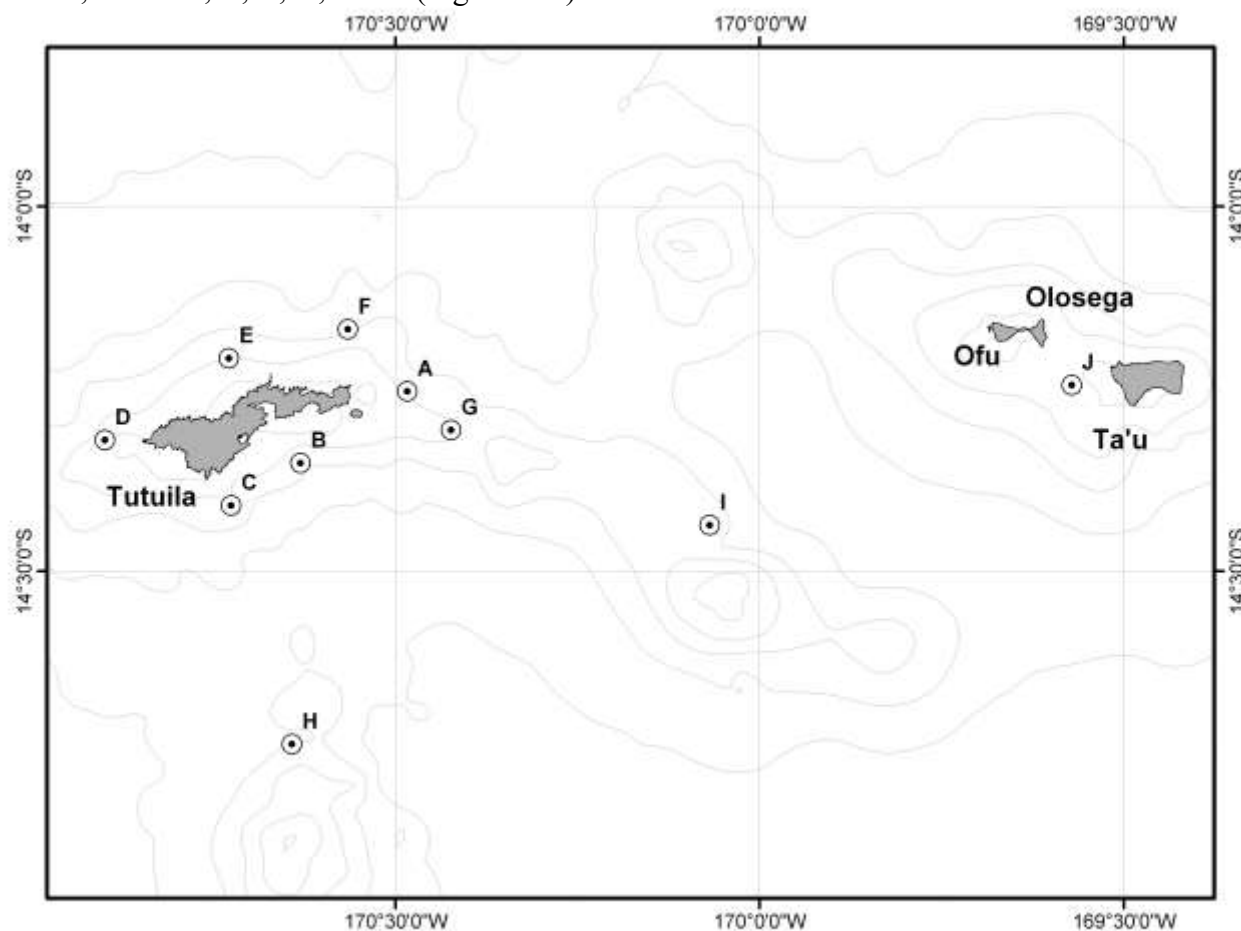


Figure 187. Present or planned locations of FADs in deep water around American Samoa in 2020 (Source: DMWR)

There are plans to deploy FADs C, G, and J in the near future. The American Samoa DMWR also resurveyed three potential FAD sites around Tutuila, noting some discrepancies in the depth.

3.6.5.2 CNMI

3.6.5.2.1 Spatial Planning Initiatives

Spatial planning has occurred in CNMI in Saipan Lagoon. CNMI Division of Coastal Resources Management developed the [Saipan Lagoon Use Management Plan](#), which was updated in 2017 and has an associated [mapping tool](#).

3.6.5.2.2 FADs

As of May 2025, there are three active FAD systems within waters of the CNMI: GG, KK and LL. The CNMI DFW is planning on conducting additional FAD deployments in the near future around the islands of Tinian and Rota. Additionally, DFW plans to acquire materials including ropes, shackles, swivels, chains, anchors, navigational lights and buoys. Once the materials have been obtained, staff will begin rigging the new systems in preparation for future deployment. The DFW FAD program is working to improve FAD capabilities with the installation of a smart buoy onto one of our FAD systems. This will enable users to track the position of the FAD as well as obtain fish presences information beneath the buoy. A map of the FADs is provided in Figure 188.

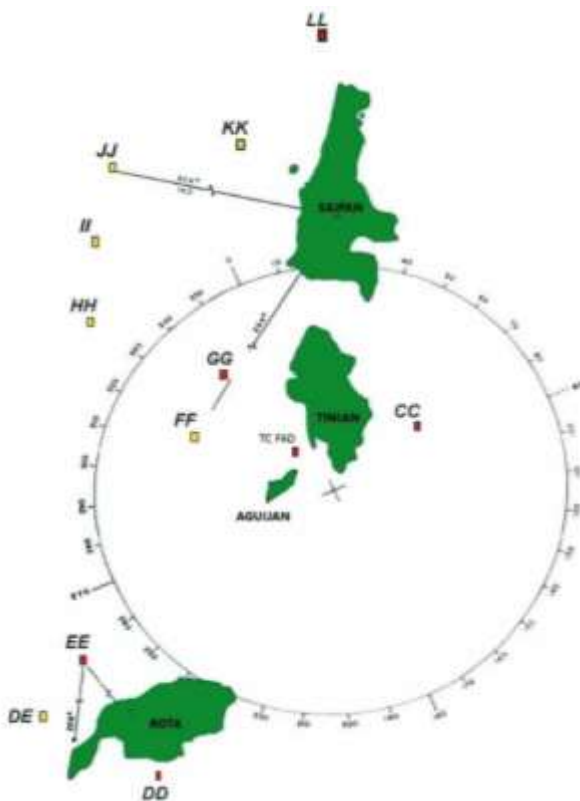


Figure 188. Map of FAD locations around the CNMI. Yellow depicts present FADs, and red depicts missing FADs as of the beginning of April 2022 (Source: DFW)

3.6.5.2.3 Mariana Trench National Marine Sanctuary Nomination – Five-Year Review

On January 21, 2022, the NOAA Office of National Marine Sanctuaries (ONMS) began facilitation of a review of the nomination for the Mariana Trench National Marine Sanctuary (NMS) at the five-year interval by requesting written and oral comments (87 FR 3284). On March 10, 2022, the NOAA OMNS extended the public comment period by an additional 45 days through April 25, 2022 (87 FR13709). ONMS will review information to its 11 evaluation criteria for inclusion in the inventory of nominations, emphasizing any new information about the significance of the area's natural or cultural resources, changes to any threats to these resources, and any updates to the management framework of the area. The original nominating parties for the NMS were Pew Charitable Trusts and Friends of the Marianas Trench, which will also have an opportunity to provide input on relevant information. Following information gathering and internal analysis, NOAA will make a final determination on whether or not the Mariana Trench NMS nomination will remain in the inventory for another five-year period.

The potential development of an NMS for the Mariana Trench is an issue of debate for residents of the Mariana Archipelago. The Marianas Trench Marine National Monument (MTMNM) already exists in the area, and the creation of an NMS would have the potential to further restrict fishing access or limit the potential for fisheries development within the EEZ around the CNMI. Regarding the nomination of the Mariana Trench NMS, concerns have been raised about the potential to expand the NMS beyond the boundaries of the MTMNM, the expansion of fishing restrictions to the water column within the Trench Unit of the MTMNM, and the current lack of community support and public confusion surrounding the nomination letter submitted by Friends of the Marianas Trench (Tenorio, pers. comm., April 4, 2022).

On August 21, 2023, the Friends of the Mariana Trench withdrew their nomination for a Mariana Trench national marine sanctuary and requested NOAA remove the Mariana Trench from the sanctuary inventory. Due to circumstances in their community, they have changed their stance and saw the need for more dialogue and education to protect ocean resources.

3.6.5.3 GUAM

3.6.5.3.1 FADs

In Guam, as of December 2024, there were five active FADs: Number 3, Ledge, Agat, 9 Mile, and Cocos (Figure 189). DAWR is also in possession of three other FADs to be deployed in the near future in addition to a community-based FAD via the GFCA. These FADs will be deployed once the deployment contract is finalized. DAWR is also planning to experiment with two new FAD designs as well as procure three FADs under the existing design pending a purchase order from the Guam Department of Agriculture.

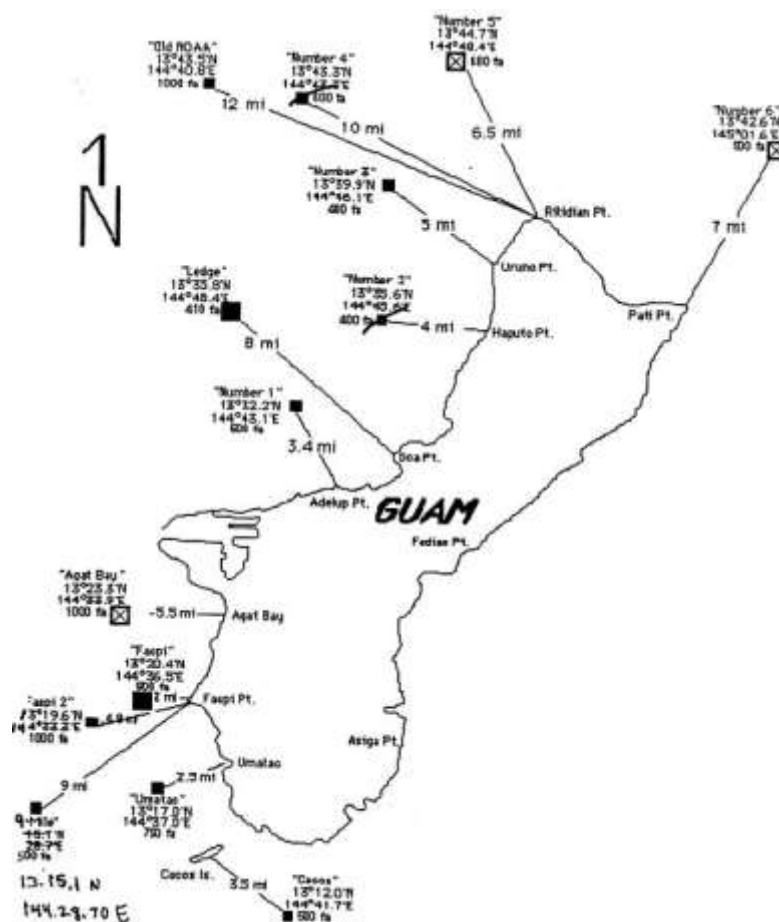


Figure 189. Map of FAD locations around Guam (Source: DAWR)

3.6.5.4 HAWAII

3.6.5.4.1 Spatial Planning Initiatives

The State of Hawaii has several initiatives ongoing, including its [30x30 Initiative](#) and its [Ocean Resource Management Plan](#), which was most recently updated in 2020 (Hawaii Office of Planning 2020). Interested parties are encouraged to provide input to and track the progress of these plans.

3.6.5.4.2 Bottomfish Restricted Fishing Areas (BRFAs)

In 1997, in response to a federal stock assessment indicating that certain species of the MHI bottomfish stock complex were in danger of being overfished, DAR developed a bottomfish management plan, which included the creation of 19 bottomfish restricted fishing areas (BRFAs) where bottomfish fishing was prohibited. These BRFAs were enacted in 1998. The MHI BRFAs are situated in both State and federal waters. Upon review in 2005, it was determined that the BRFA system did not protect an adequate amount of preferred habitat for bottomfish, so a new system was created in 2007 with 12 BRFAs (Figure 190) with the objective of reducing fishing mortality of MHI bottomfish stocks, rebuilding bottomfish populations on habitats within the BRFAs, and improving bottomfish populations in adjacent fishing areas (Drazen et al. 2014). In

2019, four of the 12 BRFAs were opened: BRFA C (Poipu, Kauai), BRFA F (Penguin Banks), BRFA J (Hana, Maui), and BRFA L (Leleiwi, Hawaii Island) (Figure 190).

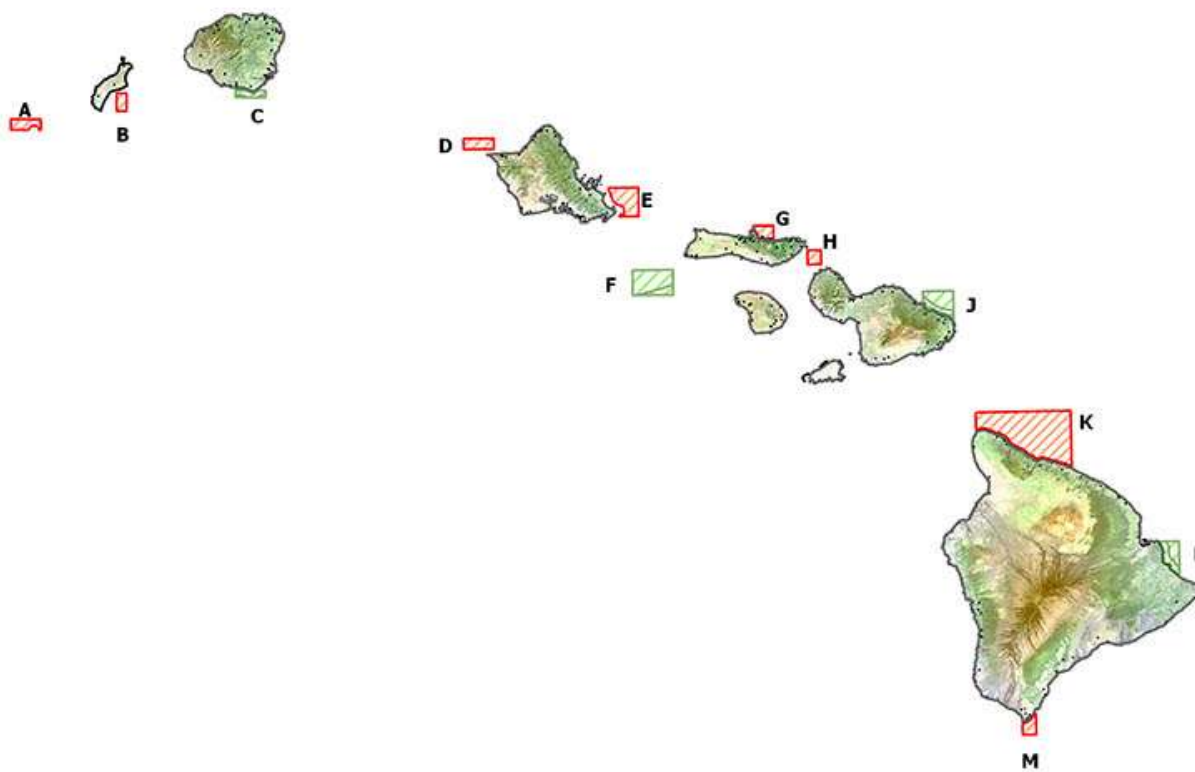


Figure 190. Map of the 12 BRFAs around the MHI; green boxes indicate those areas were opened to bottomfish fishing in 2019 and red boxes indicate areas that remained closed to bottomfish fishing at this time. All BRFAs are now open (DAR 2021).

On February 25, 2022, the Hawaii Board of Land and Natural Resources (BLNR) approved the reopening of all BRFAs such that registered bottomfish vessels are now allowed to fish for Deep-7 bottomfish in all previously closed BRFAs. During deliberations, representatives from DAR suggested that, because the Deep-7 bottomfish complex is being fished at sustainable levels according to the 2021 stock assessment update (Syslo et al. 2021), DAR is comfortable in taking an adaptive management approach to co-management of the Hawaii bottomfish fishery by opening the BRFAs and relying on other existing conservation and management measures to sustain the fishery.

3.6.5.4.3 NWHI National Marine Sanctuary Nomination

On November 19, 2021, NOAA published a Notice of Intent (NOI) to initiate the sanctuary designation process for the Northwestern Hawaiian Island National Marine Sanctuary. On December 8, 2021, the State of Hawaii published its EIS preparation notice. In November 2022, the Council held public meetings on the islands of Kaua'i, Maui, Hawaii (Hilo and Kona), Moloka'i, and Oahu to solicit input from the community on alternatives for allowing non-commercial fishing and Native Hawaiian practices in the MEA, including a definition for subsistence fishing and options for including customary exchange. In general, participants commented that fishing should be allowed in the NWHI and that the opportunity for Native

Hawaiians to fish should be provided. Participants commented that due to the distance and expense that fishing in the MEA would entail, the only person likely to fish in that area would be rich people with large boards that could afford to go there. There was support to allow for commercial fishing, non-commercial fishing, and Native Hawaiian subsistence fishing. Cost recovery was also support by most participants as a means for providing the ability for fishermen to access the area.

At its March 2023 meeting, the Council finalized its recommended fishing regulations for the Monument Expansion Area from 50-200 miles around the NWHI. The regulations would allow for federal permitting and reporting of non-commercial fishing and Native Hawaiian subsistence fishing practices and prohibit commercial fishing. The Council stressed the importance of allowing limited cost recovery for Native Hawaiian subsistence fishing practices in the MEA in order for the community to participate in regulated fishing practices under Proclamation 9478.

On March 1, 2024, NOAA published a request for public comment on the proposed rule, notification of availability of the draft environmental impact statement (EIS) and draft management plan for the proposed Papahānūmokuākea Marine National Sanctuary (89 FR 42, March 1, 2024). The alternatives analyzed in the EIS include 1) No Action do not establish a sanctuary; 2) non-commercial fishing would be permitted under NMFS and the sanctuary boundary would extend to 200 nm; 3) Sanctuary boundary would be limited to the existing monument, non-commercial fishing is permitted if it meets the scope of the sanctuary; and 4) the sanctuary boundary is extended from 0-200 nm but does not include the USFWS National Wildlife Refuges; noncommercial fishing would be permitted under NMFS. In April 2024, NOAA held public meetings virtually and in-person on O'ahu (Honolulu, Kaneohe, and Waianae), Kaua'i (Waimea and Hanalei), Hawai'i Island (Hilo and Kona), Maui, and Moloka'i to solicit comments on the draft EIS. In response to the request for public comment, the Council provided that the No Action alternative for the proposed rule was appropriate for the area and that the designation of a national marine sanctuary is unwarranted.

3.6.5.4.4 FADs

The State of Hawaii FAD program is run by the Hawaii Institute of Marine Biology, SOEST, University of Hawaii in cooperation with DAR. FADs attract schools of tuna, mahimahi, ono, billfish, and other pelagic fishes so that fisher can easily locate and catch these species, as it is known that pelagic fish tend to aggregate around floating objects (Hawaii Sea Grant). The FADs utilized around the MHI are typically surface FADs anchored using a catenary mooring method and have an average life expectancy of three to four years (Figure 191; Hawaii Sea Grant). There are currently 54 FADs monitored and maintained throughout the MHI, with 17 around the Big Island (Figure 192), 14 around Maui (Figure 193), 14 around Oahu (Figure 194), and nine around Kauai (Figure 195). Over the course 2024, there were 15 FADs reported as missing, three FADs recovered, and 19 deployed. As of January 9, 2025, six of the 17 FADs around the Big Island, three of the 14 FADs around Maui, none of the 14 FADs around Oahu, and none of the nine FADs around Kauai were not active (Figure 192 through Figure 195). Additionally, there were two FADs, one near Maui and the other near the Big Island, that were discontinued.

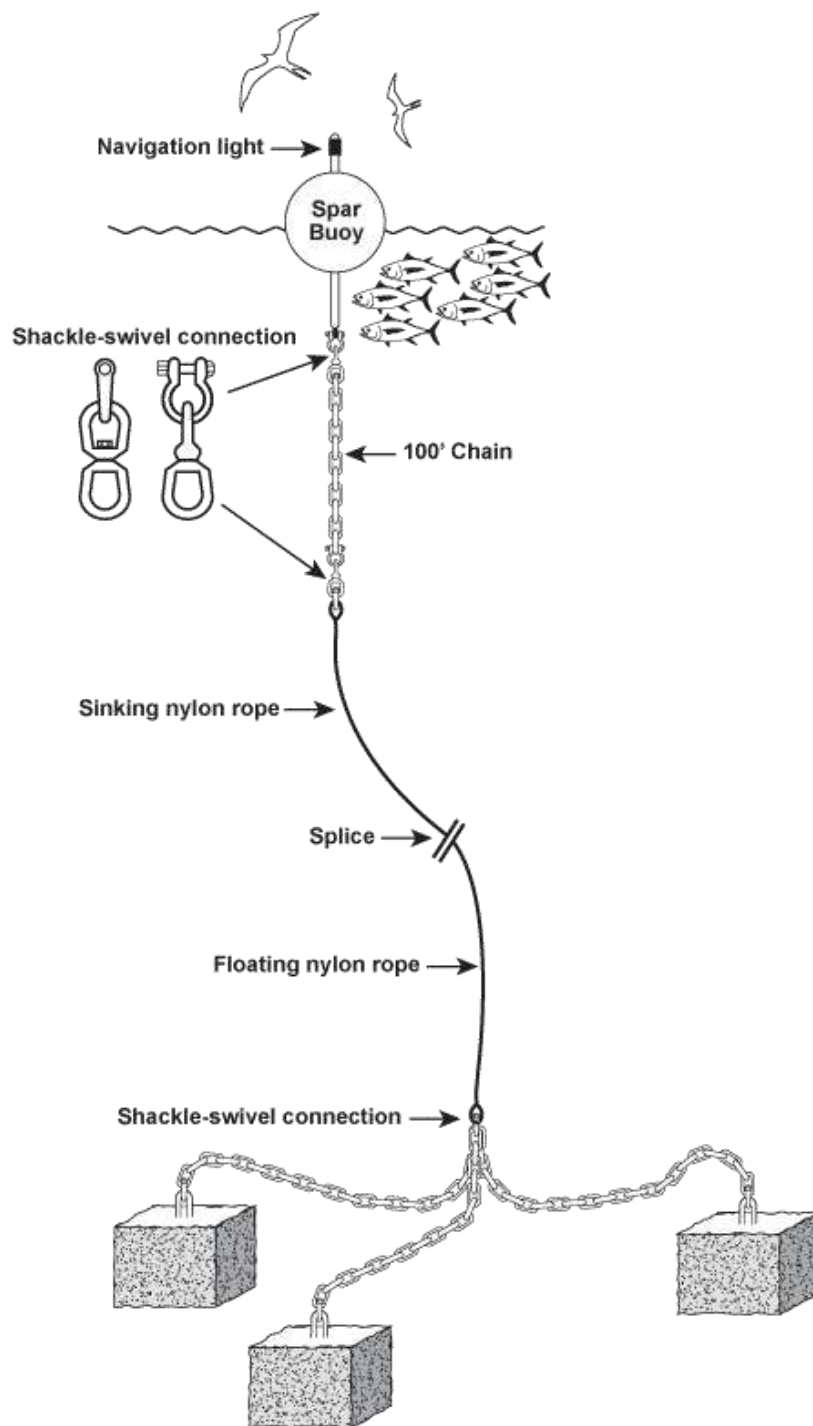


Figure 191. Diagram of the typical arrangement of FADs around the MHI (from Hawaii Sea Grant)

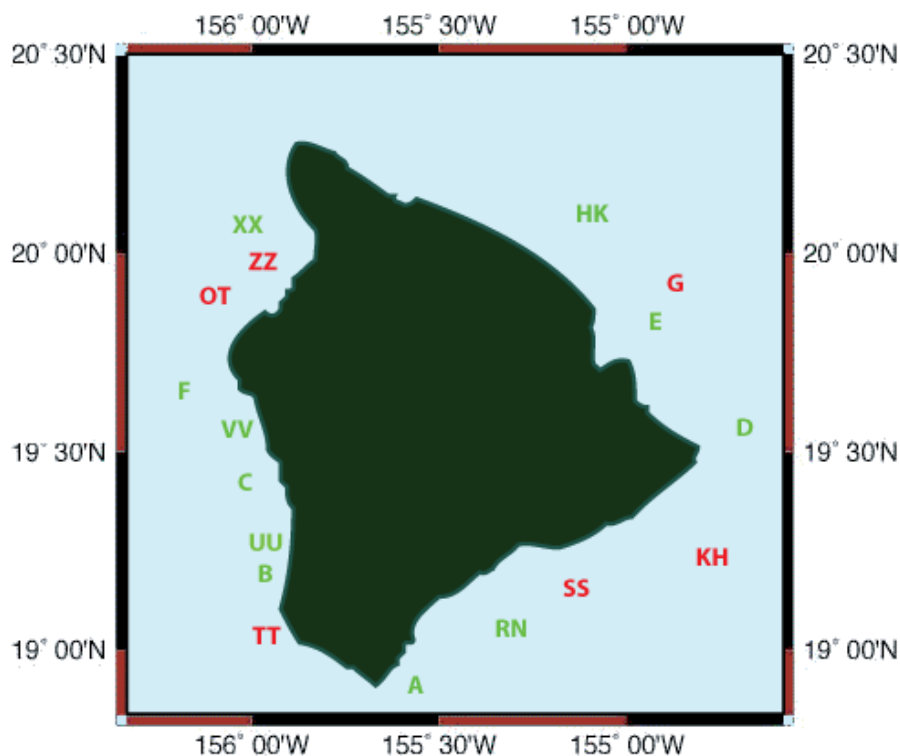


Figure 192. Map of FADs in the waters around the Big Island; red letters indicate a FAD that is known to be missing, and green letters indicate an active FAD (as of January 9, 2025, from Hawaii Sea Grant)

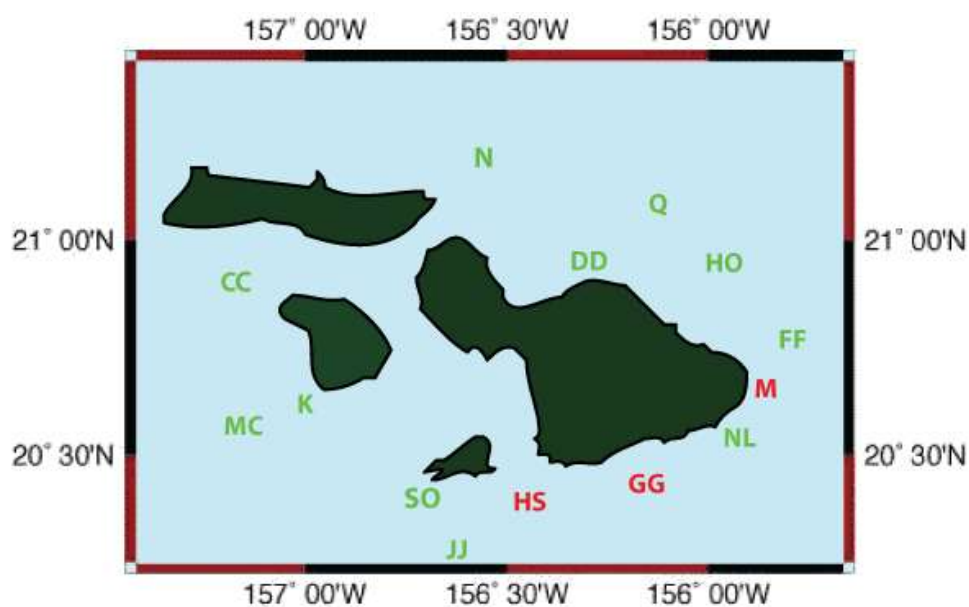


Figure 193. Map of FADs in the waters around Maui; red letters indicate a FAD that is known to be missing, and green letters indicate an active FAD (as of January 9, 2025, from Hawaii Sea Grant)

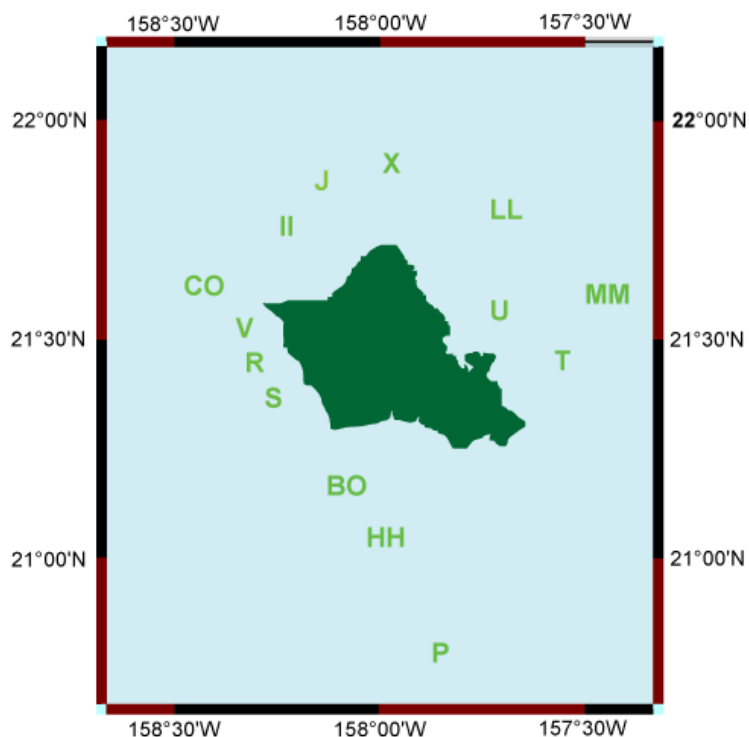


Figure 194. Map of FADs in the waters around Oahu; red letters indicate a FAD that is known to be missing, and green letters indicate an active FAD (as of January 9, 2025, from Hawaii Sea Grant)

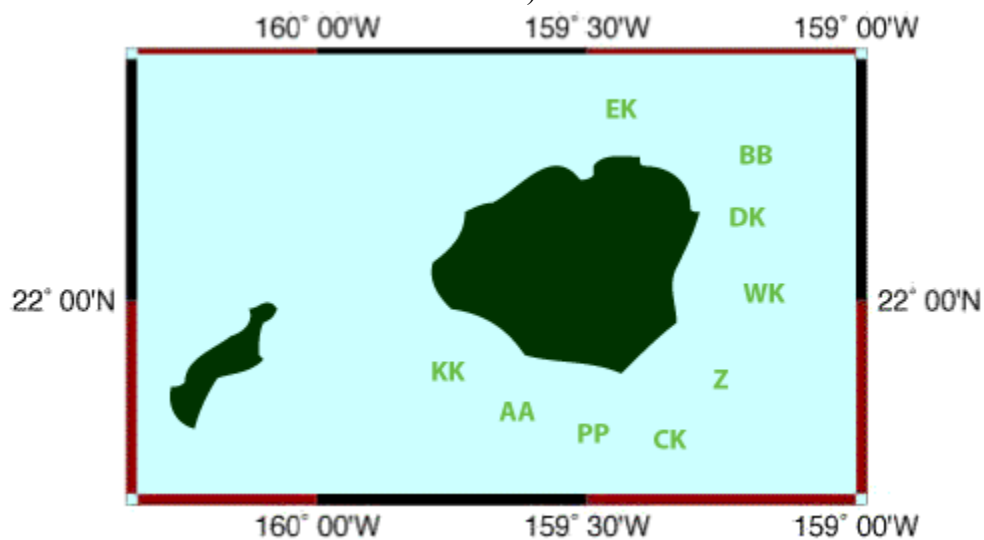


Figure 195. Map of FADs in the waters around Kauai; red letters indicate a FAD that is known to be missing, and green letters indicate an active FAD that has been recently deployed (as of January 9, 2025, from Hawaii Sea Grant)

4 DATA INTEGRATION

This chapter intends to advance ecosystem-based fishery management of Western Pacific pelagic fisheries by examining the fisheries in the context of marine ecosystems. The Council convened a two-day workshop on November 30 to December 1, 2016, to identify content for this chapter. The pelagic fisheries group suggested this chapter focus on three topical issues: 1) bycatch (with a focus on protected species factors that may influence interaction rates; 2) a socioeconomics section examining fishery performance in two areas: attrition in American Samoa longline fleet and the decline of shallow-set longline swordfish fishery; and 3) the projected decrease in oceanic productivity with implications for management issues, including a discussion of factors influencing significant changes in the CPUE of target species. The chapter used to include a section on influences of black-footed albatross interaction rates in the Hawaii longline fishery, but this has since been moved to the Protected Species section of the report and replaced with a summary of the Ecosystem-Based Fisheries Management project for impact assessments of protected species. As of the 2019 report, abstracts from recent publications relevant to data integration for pelagic fisheries are included in this chapter.

In 2019, the Pelagic Fishery Ecosystem Plan Team recommended work items for this chapter, such as directing Council staff and PIRO Sustainable Fisheries Division (SFD) to update the SAFE report data integration section with regularity and to include notable changes or issues pertinent to the FEP as a guide for adaptive management. The Plan Team also noted that Council staff should work with PIRO SFD to review thematic priorities that were previously identified in the Data Integration Workshop going forward. These work items were briefly discussed at the 2020 Pelagic Fishery Ecosystem Plan Team meeting to better determine a path forward, but at the 2021 Plan Team meeting, the efforts were discontinued. This section will continue to be updated by Council staff as resources and information allow.

4.1 ECOSYSTEM-BASED FISHERIES MANAGEMENT PROJECT FOR PROTECTED SPECIES IMPACTS ASSESSMENT FOR HAWAII AND AMERICAN SAMOA LONGLINE FISHERIES

In response to olive ridley turtle interaction trends observed in the Hawaii deep-set longline fishery (see Section 3.3.2.3) the Council's Protected Species Advisory Committee at its March 2017 meeting recommended evaluation of the increasing trend in conjunction with the previously recommended effort to evaluate ecosystem factors influencing bycatch in the longline fishery. Following this recommendation, the Council and NMFS implemented the ecosystem-based fisheries management (EBFM) project for protected species impacts assessment for the Hawaii and American Samoa longline fishery. The project is a collaboration between PIFSC, Council, PIRO and University of Florida.

In the first year of the initiative, the team developed methodologies to associate the spatiotemporal patterns of olive ridley turtle interactions with the Hawaii deep-set fishery primarily targeting bigeye tuna with static and dynamic environmental characteristics. However, the project quickly expanded looking not only across marine turtle species within the fisheries but across taxa as well. The project resulted in the development of a data compilation workflow linking the observer dataset with NOAA and other related oceanographic data products for the Hawaii deep-set observer data set as well as the shallow-set observer data. The resulting data sets were used to develop an Ensemble Random Forest model (Siders et al. 2020) to (i) predict the

probability of fishery interactions with protected species including target and non-target catch; (ii) defining critical areas of interaction using quantile contouring over a range of temporal time frames; (iii) assessed the number of sets and interactions within the contours; and (iv) developing covariate response curves using Accumulated Local Effects.

The team summarized the first year's effort into a publication in the Endangered Species Research journal. The primary purposes of this publication were to test the model performance of the developed Ensemble Random Forests model against other existing approaches to handle rare events (e.g., bycatch), to demonstrate its performance on case studies of ESA-listed and protected species, and to Ensemble Random Forests as an intuitive extension of the Random Forest algorithm to handle rare event bias. Through simulation, the team showed Ensemble Random Forests outperforms Random Forest with and without down-sampling as well as the synthetic minority over-sampling technique from highly class imbalanced to balanced datasets. The team found spatial covariance greatly impacts Ensemble Random Forests perceived performance as shown through simulation and case studies. For cases studies from the Hawaii deep-set longline fishery, giant manta ray (*Mobula birostris* syn. *Manta birostris*) and scalloped hammerhead (*Sphyrna lewini*) had high spatial covariance in their presences and high model test performance while false killer whale (*Pseudorca crassidens*) had low spatial covariance and low model test performance. Overall, the team found Ensemble Random Forests have four advantages: 1) reduced successive partitioning effects; 2) prediction uncertainty propagation; 3) better accounting of interacting variables through balancing; and 4) minimization of false positives as the majority of Random Forest within the ensemble vote correctly. Regarding the ESA-listed and protected species case studies, the team found the giant manta ray's highest probability of interaction with the Hawaii deep-set fishery was concentrated around the main Hawaiian islands as well as between 170-160°W and 10-15°N, the scalloped hammerhead's probability of interaction was more diffuse but still concentrated around the main Hawaiian islands as well as throughout 170-155°W and 10-17°N, and the false killer whale's probability of interaction was the most diffuse but highest northeast of the main Hawaiian islands.

In 2020, the team conducted an evaluation of the experimental oceanographic TurtleWatch product (Siders et al. 2023). The team focused on the 1°C band originally set by Howell et al. (2008) and five aspects of the TurtleWatch product: (i) does the TurtleWatch 17.5-18.5°C band hold up with additional satellite telemetry information on loggerhead sea turtle locations; (ii) when are loggerhead sea turtles in the TurtleWatch 17.5-18.5°C band over the course of a year; (iii) when do the Hawaii shallow-set longline fishery (SSLL) locations and the loggerhead sea turtle locations overlap; (iv) do fisher avoid the band as the hard cap of loggerhead sea turtle fishery interactions is approached. To answer these questions, the team used an expanded set of the satellite telemetry locations of tagged loggerhead sea turtles from the original analysis and PIRO Observer Program fisheries-dependent monitoring SSLL set locations. Using the oceanographic extraction subroutine developed in previous EBFM activities, the team matched sea surface temperature (SST) with the tag and fishery locations.

The team found that the original band holds up well with additional data for locations of fishery interactions in quarter 1 (January–March) and quarter 4 (October–December) (Figure 196). In quarter 1, tagged turtles were in colder water than the TurtleWatch band (SST < 17.5°C). In quarter 2, tagged turtles were in the TurtleWatch band while quarter 3 they were warmer than the band (SST > 18.5°C). In quarter 4, the tagged turtles, fishing locations, and interactions all strongly overlapped with the TurtleWatch band (Figure 196).

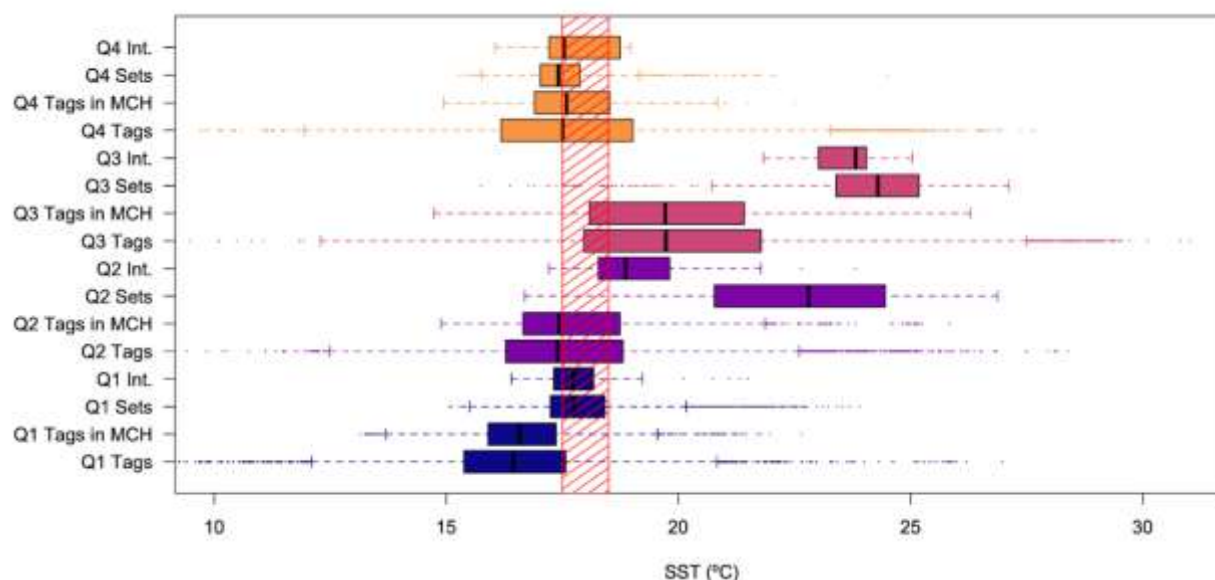


Figure 196. Quarterly sea surface temperature distribution of telemetered sea turtles (Tags), of telemetered sea turtles in the minimum convex hull of the Hawaii shallow-set longline sets (Tags in MCH), the shallow-set fishery sets (Sets), and the interactions between loggerheads and the shallow-set fishery (Interactions) relative to the 1° TurtleWatch band (17.5-18.5°C), the red hash.

(iii) As the vast majority of these turtles were released in the western Pacific, the number of telemetry locations in the area of the shallow-set fishery peaked at about a third of all locations in a given quarter. For each quarter, we visualized and calculated the overlap between the turtle location for each quarter (Figure 196). The team showed that in the quarters with more loggerhead interactions (quarters 1 and 4), there is little avoidance of the TurtleWatch band and many of the interactions come from within the band. Interestingly, sets in quarter 4 are likely to get more turtles per set than quarter 1. Sets with interactions in quarter 2 come from early in the quarter before the fishery has pushed to warmer SST. Overall, the team found that the overlap between the fishery and the turtles is driven by changing in latitudes over the course of the year (Figure 197). In quarter 1 and quarter 4, both the turtles and the fishery are in the same latitudinal band. In quarter 2, the fishery moves farther south (lower latitudes) while the turtles move farther north over quarter 2 and 3. In quarter 3, the fishery pushes north again and by quarter 4 ends up overlapping with the turtle locations again.

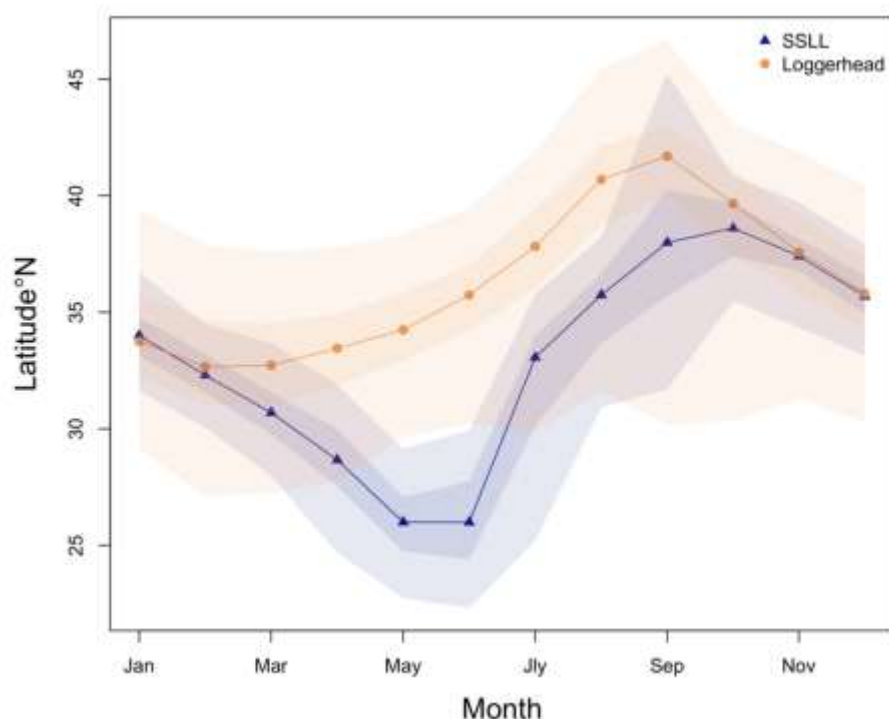


Figure 197. Latitudinal overlap between the Hawaii shallow-set longline fishery (blue triangles) and the loggerhead locations (orange circles). The line is the mean, the darker shading is the 50%, and the lighter shading is the 95%.

(iv) The team evaluated some aspects of fisher behavior garnered from the fishery locations only. The mean distance to the TurtleWatch band was calculated and whether fishers were avoiding the band as the percent of the loggerhead hard cap was filled was assessed. The team saw no indication of avoidance behavior except in 2018, when the hard cap was reached in early quarter 2, rather than in late quarter 1 as in other years, and the majority of the fishery had moved to warmer SSTs than the turtles frequent.

Overall, the team concluded that the TurtleWatch experimental product was still valid for quarters 1 and 4 for the location of shallow-set fishery interactions with loggerhead sea turtles. The location of tagged sea turtles in quarter 1 suggests that if fishers were to set in cooler waters than they do now, more interactions could occur as the overlap with the distribution of loggerhead sea turtles increases. Additionally, quarter 4 had the highest interaction rates but some of the lowest fishing effort. The team noted that if effort were to increase in quarter 4, there is likely to be an increase in loggerhead sea turtle interactions. Quarter 2 and 3 offer the least chance of encountering loggerhead sea turtles. From the historic fishing location information, fishers did not appear to use the TurtleWatch product to avoid loggerhead sea turtle interactions. Further analysis following the 2019 regulatory change from the fishery hard cap to trip interaction limits (see Section 3.3.1.3.2) will offer an opportunity to explore the change in fisher behavior.

In November 2022, the Council, PIFSC and the University of Florida convened a workshop with representatives from the Hawaii Longline Association (HLA), Hawaii SSLL fishery, and PIRO to discuss a case study evaluating the effects of spatial decision making by fishery participants

on the protected species interactions and catch of target species.¹⁰ The case study focused on scenarios of SSL fishers avoiding loggerhead sea turtles in the first or fourth quarter of the year either by using the TurtleWatch product (based on 17.5–18.5°C sea surface temperature band) or areas identified by the Protected Species Ensemble Random Forests (PSERF) model based on the probability of loggerhead interactions. The workshop provided an overview of the spatial tool developed to do the evaluation, highlighted where industry feedback from an initial session with HLA/SSL participants was used in the model, and presented the evaluation results.

The spatial tool consisted of four submodels: 1) PSERF models of the probability of interactions with loggerhead and leatherback sea turtles with the SSL fishery; 2) a spatiotemporal model of fishery effort; 3) a spatiotemporal model of fishery Swordfish catch-per-unit-effort (CPUE); 4) an avoidance area design model using the TurtleWatch product or the PSERF models' outputs. These were then used to predict the fishery effort, CPUE, protected species interaction distribution, and avoidance areas for the months in quarters 1 and 4 in 2019–2021. A fifth submodel redistributed fishing effort out of avoidance areas.

The model results were summarized as the amount of effort that would need to avoid one of the spatial avoidance areas, the percent change in swordfish catch, the change in the number of loggerhead sea turtle interactions, and the change in the number of leatherback sea turtle interactions from avoidance. The tool identified that no matter how the avoidance area was defined, there was a strong chance that avoiding loggerhead interactions by the SSL fishery would result in increasing the leatherback interactions in at least one of the months in quarters 1 and 4. The TurtleWatch-defined avoidance area resulted in the highest increase in leatherback interactions per loggerhead interaction avoided.

Workshop participants discussed the results of the submodels of the spatial tool and concluded that most of the submodels did a decent job of capturing the environmental covariates important for determining where fishing effort, CPUE, and protected species interactions occurred. As the models did not account for size of swordfish in the catch and other market drivers (secondary species, spatial variation in catch quality, competition), participants discussed at length how market forces influence the decision making of SSL fishers. As the spatial tool identified a strong inverse tradeoff between avoiding loggerhead interactions and increasing leatherback interactions, participants discussed alternative solutions to avoiding protected species interactions. These encompassed discussions on vessel-to-vessel communication and information sharing amongst the fleet on interaction hotspots, training of new fishery participants on best practices to avoid protected species, and dissemination of avoidance areas or model-generated protected species hotspots to vessels at sea. Further discussions centered on what incentivizes fishers with a focus on how the market and market forces interact with swordfish behavior to constrain fishers' spatial and temporal decision making. The rest of the discussions considered applications of the spatial tool to the Hawaii deep-set longline (DSL) fishery, the time and information needed to apply the tool, and potential species or spatial scenarios to test.

¹⁰ Report of the Ecosystem Based Fishery Management Workshop: Exploring the effect of spatial decision making by fishers in the Hawaii shallow-set longline fishery. Available online at: <https://www.wpcouncil.org/wp-content/uploads/2021/10/09.A1-EBFM-SSL-Turtle-Model-Workshop-Report.pdf>.

4.2 ATTRITION IN LONGLINE FLEETS

4.2.1 AMERICAN SAMOA LONGLINE

A downward trend of economic returns to the American Samoa longline fishery for the period of 2007 to 2013 has been observed in a recent economic study (Pan et al. 2017). This decline continues based on results from ongoing Pacific Islands Fisheries Science Center (PIFSC) Socioeconomics Program economic data collection and performance indicator monitoring programs. Based on data from a 2009 cost-earnings study on the fishery researchers found that the economic performance of the American Samoa longline fleet is highly sensitive to changes in albacore price, fuel prices, and the CPUE of albacore (Pan et al. 2017). The fishery was hit hard in 2013, when all three of these elements trended in the wrong direction, resulting in negative impacts to profit (Pan 2015). In early 2014, the majority of vessels in the American Samoa longline fleet were tied up at the docks in Pago Pago, and according to the *Samoa News*, “For Sale” signs had been posted on close to 20 (of the 22) active vessels¹¹.

Based on the analyses, the situation in 2013 was clearly associated with poor economic performance resulting from: (a) a continuous decline in albacore CPUE, (b) increasing fuel price, (c) a sharp drop in market prices for albacore, and (d) a baseline of limited profit margins resulting from a long term downward trend of net return since 2007 (Pan 2015). The previous cost-earnings study indicated that the fleet in 2009 operations was barely profitable where the albacore CPUE was at 14.8 fish per 1,000 hooks, the fuel price was at \$2.53 (adjusted to 2013 value), and the market price for the albacore species was \$1.00/lb. (\$2,200 per mt). However, in 2013, the CPUE for albacore fell to 11.9 fish per 1,000 hooks (versus 14.8 in 2009) and the fuel price increased to \$3.20 per gallon (versus \$2.53 in 2009, adjusted to 2013 value). The albacore price in 2013 was similar to the 2009 level but it was a sharp drop compared to the price of \$1.47/lb. in the previous year (2012). Thus, these changes yielded extensive losses across the fleet in 2013.

It is worth noting that the continuing decline of the American Samoa longline fishery during this period was not an isolated event but was a part of a region-wide economic collapse of the South Pacific albacore fishery. According to a report of the SPC Fisheries Newsletter #142 (September to December 2013), domestic fishing fleets targeting primarily albacore in Pacific Island Countries and Territories (PICTs) had reported difficulties in maintaining profitability in recent years, probably facing the challenges in fuel price rise, and albacore CPUE and price decline¹². Ongoing PIFSC Socioeconomics Program economic monitoring programs will allow researchers to provide timely updates on future changes in economic performance for the American Samoa longline fishery.

4.2.2 HAWAII LONGLINE: SHALLOW-SET FISHERY

Gear configuration for Hawaii longline vessels is rather flexible as operations can easily be adjusted to change target species between swordfish or tuna fishing trips. Tuna fishing (deep-set fishery) has shown steady increases in both effort (hooks) and catch over the past two decades, while swordfish fishing (shallow-set fishery) has experienced a steady downward trend during

¹¹ <http://www.samoanews.com/tri-marine-says-local-longline-fleet-vital-economy>

¹² <http://www.spc.int/coastfish/publications/bulletins/419-spc-fisheries-newsletter-142.html>

the same period (Pan 2014). Since its closure and reopening in the early 2000s, the shallow set fishery has yet to recover even halfway to levels during its historical peak in the early 1990s.

Diminishing economic performance of shallow-set fishing may have contributed to the overall decline of the shallow set fishery, in addition to regulatory measures in controlling sea turtle interactions within the fishery. The Pacific Islands Fisheries Science Center (PIFSC) Socioeconomics Program economic data collection has documented declining net returns to the fishery during the period of 2005-2016, while the average net revenue for tuna trips has generally increased over the same period of time (Pan 2018).

Trends in swordfish and tuna trip costs have been similar over the years; however, swordfish trip revenues have fluctuated widely over the years unlike the relatively steady increase in tuna trip revenue over time (see Chapter 2). As a result, the average net revenue of swordfish trips moved up and down during 2005 to 2014. Prior to 2008, the average net revenue of a tuna trip was less than 50% of the average net revenue of a swordfish trip. In 2014, the level of the average tuna trip net revenue, \$32,100, was much closer to the level of the average swordfish trip net revenue, \$33,446. Yet, a swordfish trip usually lasts longer than a tuna trip, so the average net returns per day at sea for a swordfish trip are lower than for a tuna trip. Thus, tuna fishing seems to have an increasing comparative advantage over swordfish fishing in terms of trip-level economic returns. Without improved economic performance for swordfish fishing, there may not be much economic incentive to increase fishing effort for swordfish in the future.

Economic performance of longline fishing is the combined effect of many factors, but the key factors that determine the net revenue of Hawaii longline fishing may include: a) prices of target species, b) CPUE of the target species, c) fuel prices, and d) regulatory effects.

4.2.2.1 WEAKENED SWORDFISH MARKET

The weakened swordfish market has been a disincentive for Hawaii fishermen to re-engage in the swordfish fishery in recent years. Unlike bigeye tuna, which is mainly consumed in Hawaii's local market, the majority of the swordfish landed in Hawaii and used to be exported to the U.S. mainland where it competed with imports from other nations and the Atlantic. Concern over mercury contamination could have possibly contributed to decreased demand as well. In early 1990, bigeye and swordfish ex-vessel prices in the Hawaii market were similar at around \$4.50 per pound. From 1994 to 2009, swordfish prices declined while bigeye prices have held relatively stable. In recent years, the price differential between these two species has increased. For example, in 2008 the ex-vessel price of bigeye tuna was \$4.12 per pound while the ex-vessel price of swordfish was only \$2.08 per pound.

4.2.2.2 CPUE DECLINES FOR SWORDFISH TRIPS

Swordfish CPUE was high at the beginning of the time series, being above 15 fish per 1,000 hooks in the years of 2005, 2006, and 2007. It has decreased since 2007, dropping to its lowest in 2010 with only 10 fish per 1,000 hooks. The swordfish CPUE has slightly increased and then remained unchanged in recent years. Bigeye CPUE, on the other hand, shows a different trend; it was quite steady from 2005 to 2012, and has increased continuously in the last four years from 3.8 fish per 1,000 hooks in 2012 to approximately 4.5 fish per 1,000 hooks in 2015.

4.2.2.3 FUEL PRICES

While the two types of fisheries face the same fuel market, trip costs, revenues, and subsequent net revenues can vary across the deep-set and shallow-set fisheries. As previously stated, PIFSC

Socioeconomics Program economic data collection programs have documented declining net returns to the swordfish fishery during the period from 2005 to 2014, while the average net revenue for tuna trips has generally increased over the same period of time (Pan 2018).

4.2.2.4 SUDDEN CLOSURES DURING FISHING SEASON

Due to hitting the sea turtle caps, the fishery experienced closures in 2006 and 2011, respectively. The sudden closures had interrupted the normal fishing trip cycle and might have resulted in economic loss to the fishermen as a fishing trip had to be ended no matter if the catch was fully loaded as planned. In the case of 2006, the closure brought back all the swordfish fishing vessels to port, flooding the swordfish market, which in turn constrained air shipping capacity and limited local consumption.

4.2.3 FACTORS AFFECTING CPUE OF TARGET SPECIES

The work of PIFSC researchers in spatial and temporal changes in Hawaii longline fishery catch and their potential for forecasting future fishery performance are excerpted below from the briefing document provided for the 124th meeting of the Council's Scientific and Statistical Committee (SSC). Authors include Phoebe Woodworth-Jefcoats, Johanna Wren, Jeff Drazen and Jeff Polovina¹³. Additional explanatory text was provided by Phoebe Woodworth-Jefcoats (pers. comm.)

A comprehensive examination of the spatial and temporal trends in the Hawaii-based longline fishery over the past 20 years was conducted using three fisheries-dependent data sets: logbook (1995-2016), observer (2006-2016), and dealer (2000-2016) data. Logbook data completed by fishermen provides catch, effort, and catch location data of landed species for all vessels in the fleet, while observer data provides lengths of every third fish caught, including discards, but only ~20% of vessels have an observer on board. Dealer data provides weight of all fish sold at the Honolulu Fish Auction and can be matched with logbook data for each vessel trip.

¹³ Factors behind the recent rise in bigeye CPUE in the Hawaii longline fishery. Documented submitted for Western Pacific Fishery Regional Management Council 124th Scientific and Statistical Committee Meeting, October 4 to October 6, 2016, Honolulu, Hawaii, 4 p.

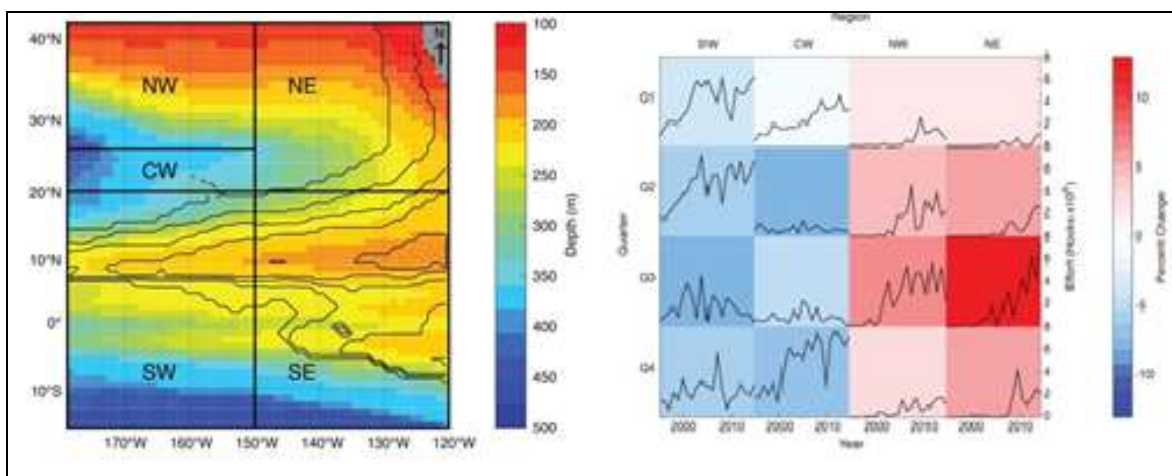


Figure 198. Left: Map depicting the five regions by which the fishery is examined overlaid on the climatological (1995-2015) median depth of preferred thermal habitat Note: (8 – 14 °C, shaded) and the depth of the 1 mL/L oxygen threshold (contoured every 100 m from 100 to 500 m, with stippling where the depth is less than 100 m). Right: The difference between the proportion of total annual effort set in each region and quarter from the beginning (1995 – 1997 mean) to the end (2013 – 2015 mean) of the time series is shaded. Total annual effort in each region and quarter is plotted in black. Note: nearly no effort is deployed in the SE region.

The deep-set longline fishery, which targets bigeye tuna, has expanded considerably over the past two decades. Not only has total effort increased from nearly 8.4 million hooks set in 1995 to over 47 million hooks set in 2015, but the spatial footprint of the fishery has expanded as well. At the beginning of the time series, nearly all (97%) of Hawaii’s deep-set effort was set in the fishery’s core operating area south of 26°N and west of 150°W, whereas in 2015 over 40% of the deep-set effort was set either north or east of these bounds. This expansion is most prominent in the third quarter of the year (Figure 198).

The marked northeastward expansion of the fishery appears to have several drivers. First, it is possible that waters closer to Hawaii were unable to support an increase in effort due to both Hawaii-based and international effort. Waters northeast of Hawaii had little to no international competition. Second, bigeye catch rates within the fishery’s core operating area are lowest in the third quarter of the year. However, during this quarter catch rates are still high in waters to the northeast of Hawaii. Finally, preferred bigeye thermal habitat and oxygen levels overlap most completely with deep-set gear in waters to the northeast of Hawaii (Figure 198). This overlap could act to increase bigeye’s catchability, and in turn catch rates, in northeastern waters. The fishery expanded spatially in the third quarter in response to low target catch rates. In waters to the northeast of Hawaii the fleet faced little competition and found a particularly efficient fishing ground due to its local oceanography.

One consequence of the fishery’s spatiotemporal expansion has been an increase in the amount of lancetfish caught. Lancetfish have no commercial value and all catches are discarded. Lancetfish catch rates are highest north of 26°N and in the third quarter. Thus, the fishery is deploying more effort both in the region where lancetfish are most commonly caught and at the time when catch rates are highest. This has resulted in lancetfish catches exceeding bigeye catches for the past decade (Figure 199).

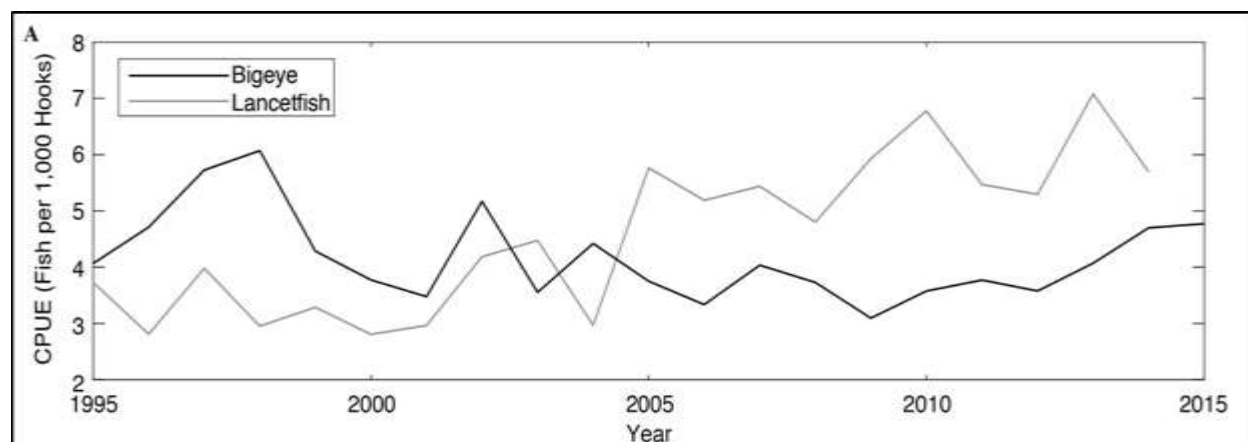


Figure 199. Annual deep-set bigeye tuna (black) and lancetfish (gray) CPUE

Trends in productivity and catch rates in the fishery over the past decades may be caused by spatiotemporal changes in the fishery itself, changes in the stock, or both. In order to better understand these trends A General Additive Models (GAM) was built to analyze time series of mean weight, catch per unit effort (CPUE, in number of fish caught per 1000 hooks) and weight per unit effort (WPUE, in kg caught per 1000 hooks). The GAM allowed researchers to tease apart trends caused by changes in the stock from those caused by changes in seasonality and geographic location of the fishery. Over the past 16 years, mean weights of commercially important fish in the Hawaii-based longline fishery have declined 10%.

This is in part due to a decline in mean weight by five out of the eleven most commonly caught species, and partly due to a change in species composition of the catch. Smaller fishes, such as pomfrets and walu, are becoming more common while larger fishes, such as opah and striped marlin, make up a lesser proportion of the total catch (Figure 200A). Because more small fish, and more small fish species are caught, the productivity of the fishery (WPUE) declined by 53% since 2000, but the shift in area and seasonality of fishing effort helped maintain productivity in the fishery (Figure 200C).

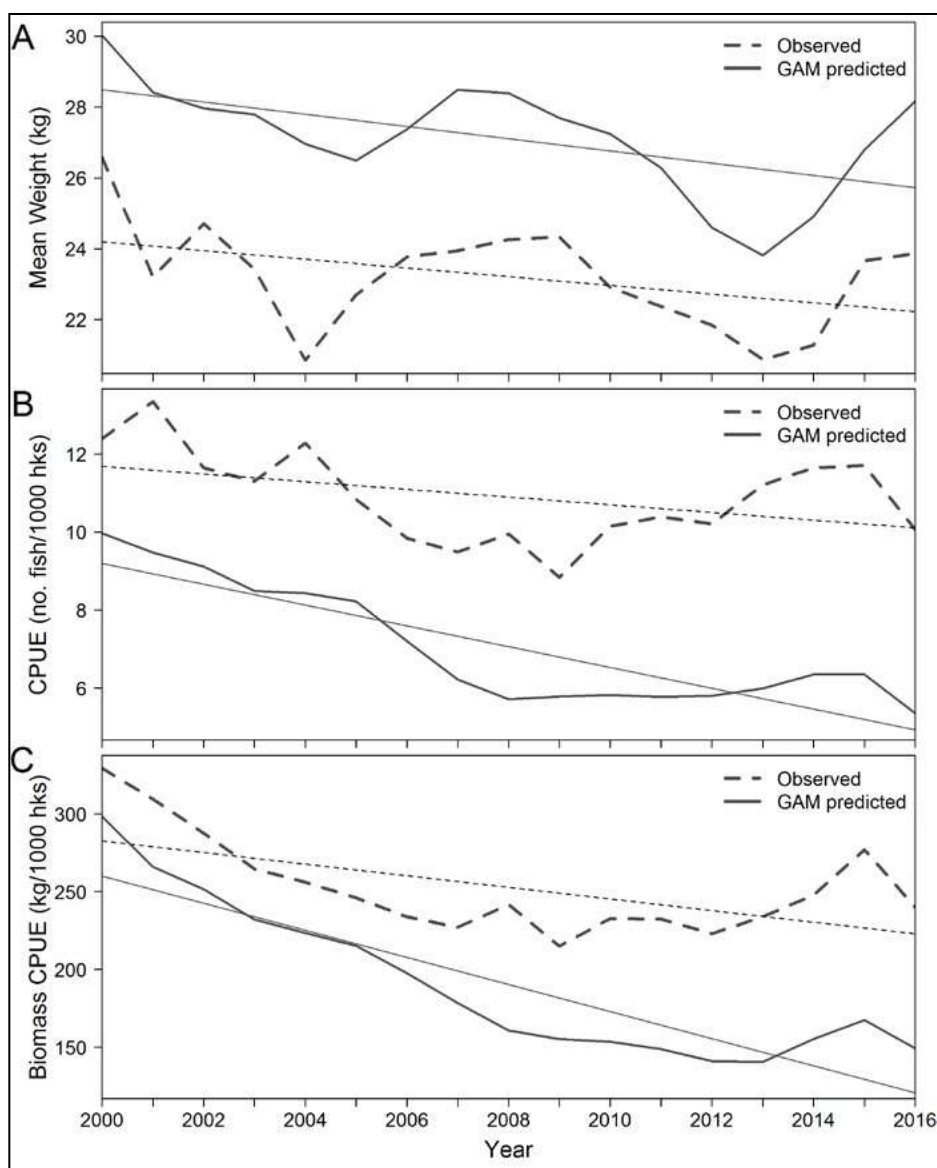


Figure 200. Mean weight (A), catch per unit effort (B), and weight per unit effort (WPUE) for all fish in the Hawaii-based longline fishery from dealer provided data.

Note: The dashed lines show the annual values from the dealer data with a linear trend line, and the solid line shows the GAM predicted annual values with linear trend lines.

CPUE has increased slowly since 2008, but when accounting for the increase in effort and geographic shift of the fishery, CPUE has remained stable. The recent peaks in both CPUE and WPUE are largely due to a strong recruitment pulse of bigeye tuna entering the fishery in the third quarter of 2013. This recruitment pulse in the fishery can be followed through 2016, where it provides an increase in first CPUE then WPUE. A recruitment index could be generated for bigeye tuna that provides a forecast of fishery performance. A peak in small bigeye tuna ($\leq 15\text{kg}$) is an indication that there will be an increase in CPUE and WPUE in the following two years (Figure 201).

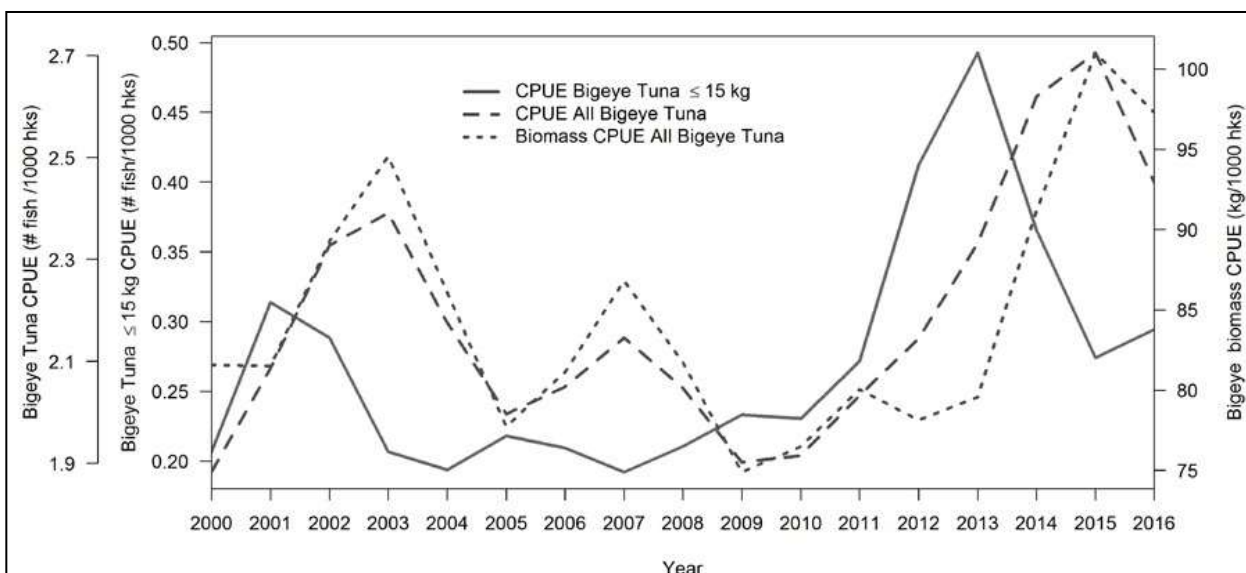


Figure 201. Temporally- and spatially-adjusted annual catch per 1000 hooks

Note: (CPUE; dashed line), and biomass per 1000 hooks (WPUE) for all bigeye tuna and bigeye tuna 15 kg or less (solid line) from the GAM from 2000-2016.

Additional reading on the influence of environmental impacts on tuna populations can be found in Lehodey et al. (2010) and Lehodey et al. (2013).

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TABLES FOR SECTION 2.1: AMERICAN SAMOA

Table A-1. Summary of creel survey boat-based sampling effort

Year	Sample Days	Trolling Interviews	Troll Trips Sampled	Expanded # of Trips	Percent of Trolling Trips Surveyed
2015	220	51	53	103	51.5
2016	196	46	82	87	94.3
2017	199	41	43	132	32.6
2018	207	59	59	162	36.4
2019	211	49	98	133	73.7
2020	228	43	43	79	54.4
2021	201	27	53	138	38.4
2022	167	15	23	103	22.3
2023	182	10	16	30	53.3
2024	159	11	21	43	48.8

Table A-2. Supporting Data for Figure 2

Year	Boats Landing Pelagics (All Methods)	Boats Landing Pelagics (Longline)	Boats Landing Pelagics (Troll)
2015	40	21	10
2016	38	20	12
2017	27	15	8
2018	25	14	7
2019	29	18	5
2020	22	11	8
2021	19	12	5
2022	20	11	9
2023	23	10	9
2024	22	9	10
Average	27	14	8
Standard Deviation	7	4	2

Table A-3. Supporting Data for Figure 3

Year	All Pelagic Species Troll Trips	All Pelagic Species Longline Sets
2015	162	2,786
2016	129	2,451
2017	166	2,488
2018	194	2,213
2019	160	1,882
2020	132	1,322
2021	155	1,552
2022	105	1,336
2023	339	1,224
2024	72	1,359
Average	161	1,861
Standard Deviation	71	581

Table A-4. Supporting Data for Figure 4

Year	Total Pounds Landed - Tuna	Total Pounds Landed - Non-Tuna PMUS
2015	5,418,306	229,237
2016	4,603,031	217,274
2017	4,852,460	269,620
2018	4,279,764	185,005
2019	2,969,511	135,216
2020	1,916,301	125,657
2021	2,515,538	133,326
2022	3,007,508	174,124
2023	2,622,416	131,923
2024	3,189,533	211,896
Average	3,537,437	181,328
Standard Deviation	1,163,688	49,837

Table A-5. Supporting Data for Figure 5

Year	Commercial Landings (lb) - Tuna	Commercial Landings (lb) - Non-Tuna PMUS
2015	5,396,948	114,576
2016	4,595,374	96,818
2017	4,843,753	104,755
2018	4,273,424	63,680
2019	2,966,396	39,094
2020	1,912,848	36,557
2021	2,512,376	33,820
2022	3,005,556	24,131
2023	2,618,759	23,651
2024	3,183,070	34,887
Average	3,530,850	57,197
Standard Deviation	1,159,180	35,249

Table A-6. Supporting Data for Figure 6

Year	Estimated Yellowfin Longline Landings (lb)	Estimated Yellowfin Trolling Landings (lb)
2015	1,015,725	4,189
2016	848,926	9,287
2017	1,233,124	14,993
2018	575,768	8,439
2019	417,429	2,878
2020	494,579	3,482
2021	470,671	6,013
2022	340,719	127
2023	487,350	237
2024	458,942	1,249
Average	634,323	5,089
Standard Deviation	295,415	4,702

Table A-7. Supporting Data for Figure 7

Year	Estimated Skipjack Longline Landings (lb)	Estimated Skipjack Trolling Landings (lb)
2015	251,276	7,543
2016	210,451	9,542
2017	155,788	7,294
2018	168,457	7,134
2019	151,417	11,975
2020	143,434	6,379
2021	116,410	21,025
2022	99,624	8,053
2023	105,395	3,887
2024	352,044	2,414
Average	175,430	8,525
Standard Deviation	77,704	5,135

Table A-8. Supporting Data for Figure 8

Year	Estimated Wahoo Longline Landings (lb)	Estimated Wahoo Trolling Landings (lb)
2015	119,783	567
2016	101,693	1,781
2017	110,322	1,065
2018	67,510	688
2019	40,116	638
2020	38,480	105
2021	35,291	431
2022	25,278	0
2023	25,987	160
2024	38,356	213
Average	60,282	565
Standard Deviation	36,818	536

Table A-9. Supporting Data for Figure 9

Year	Estimated Mahimahi Longline Landings (lb)	Estimated Mahimahi Trolling Landings (lb)
2015	11,822	430
2016	8,969	1,103
2017	30,883	1,692
2018	10,007	829
2019	4,163	663
2020	10,494	995
2021	1,819	639
2022	12,824	1,174
2023	3,023	81
2024	2,597	0
Average	9,660	761
Standard Deviation	8,512	515

Table A-10. Supporting Data for Figure 10

Year	Blue Marlin Longline Landings (lb)	Blue Marlin Trolling Landings (lb)
2015	55,836	1,561
2016	66,073	449
2017	87,684	847
2018	70,536	1,026
2019	64,672	755
2020	62,800	0
2021	76,001	0
2022	117,517	0
2023	86,555	0
2024	147,574	0
Average	83,525	464
Standard Deviation	28,608	560

Table A-11. Supporting Data for Figure 11

Year	Sailfish Longline Landings (lb)	Sailfish Trolling Landings (lb)
2015	5,106	57
2016	5,106	0
2017	3,262	0
2018	1,702	0
2019	4,184	164
2020	1,276	286
2021	1,915	0
2022	1,702	124
2023	3,049	330
2024	7,516	0
Average	3,482	96
Standard Deviation	1,998	126

Table A-12. Supporting Data for Figure 13

Year	Longline Hooks Set
2015	7,806
2016	6,909
2017	7,009
2018	6,010
2019	5,104
2020	3,646
2021	4,474
2022	3,997
2023	3,793
2024	4,063
Average	5,281
Standard Deviation	1,536

Table A-13. Supporting Data for Figure 14

Year	Bigeye Tuna Longline Landings (lb)
2015	184,586
2016	155,842
2017	139,424
2018	117,516
2019	68,420
2020	52,989
2021	66,147
2022	47,916
2023	82,624
2024	116,332
Average	103,180
Standard Deviation	46,747

Table A-14. Supporting Data for Figure 15

Year	Albacore Longline Landings (lb)
2015	3,941,321
2016	3,367,685
2017	3,296,463
2018	3,400,628
2019	2,316,642
2020	1,214,747
2021	1,834,637
2022	2,511,041
2023	1,942,582
2024	2,258,160
Average	2,608,391
Standard Deviation	859,962

Table A-15. Supporting Data for Figure 16

Year	Swordfish Longline Landings (lb)
2015	14,615
2016	12,194
2017	13,438
2018	13,561
2019	8,210
2020	5,529
2021	6,127
2022	7,062
2023	6,965
2024	9,054
Average	9,676
Standard Deviation	3,440

Table A-16. Supporting Data for Figure 17

Year	Releases - Tunas	Releases - Non-Tuna PMUS	Releases - Other Pelagics	Releases - Sharks
2015	1,722	8,025	156	6,043
2016	996	5,116	33	5,131
2017	767	3,170	49	4,282
2018	910	2,120	5	4,642
2019	962	1,893	16	3,234
2020	727	1,541	27	2,077
2021	577	1,544	4	2,718
2022	608	1,148	1	1,511
2023	2,567	2,338	83	2,112
2024	1,987	2,215	257	2,585
Average	1,182	2,911	63	3,434
Standard Deviation	674	2,119	83	1,506

Table A-17. Supporting Data for Figure 18

Year	Alia Catch (Individuals) per 1,000 Hooks	Monohull Catch (Individuals) per 1,000 Hooks
2015	3.8	12.7
2016	0.0	11.9
2017	0.0	11.6
2018	0.0	13.5
2019	8.1	11.3
2020	0.0	8.5
2021	0.0	9.3
2022	0.0	14.6
2023	0.0	12.6
2024	0.0	13.0
Average	1.2	11.9
Standard Deviation	2.7	1.9

Table A-18. Supporting Data for Figure 19

Year	Troll Catch (lb) Per Hour	Effective Troll Hours
2015	18	976
2016	45	602
2017	16	1,999
2018	19	1,124
2019	25	761
2020	22	592
2021	34	863
2022	23	433
2023	3	1,577
2024	22	247
Average	23	917
Standard Deviation	11	534

Table A-19. Supporting Data for Figure 20

Year	Troll Catch Rate (lb/hr) - Skipjack	Troll Catch Rate (lb/hr) - Yellowfin
2015	8.08	5.79
2016	17.92	17.46
2017	4.00	8.12
2018	6.35	8.18
2019	16.87	4.49
2020	12.46	6.65
2021	26.28	6.04
2022	18.81	0.05
2023	0.44	1.33
2024	13.65	6.13
Average	12.49	6.42
Standard Deviation	7.85	4.70

Table A-20. Supporting Data for Figure 21

Year	Troll Catch Rate (lb/hr) – Blue Marlin	Troll Catch Rate (lb/hr) - Mahimahi	Troll Catch Rate (lb/hr) - Wahoo
2015	2.52	0.47	0.39
2016	1.11	1.94	3.89
2017	0.53	0.91	0.28
2018	1.10	0.72	0.73
2019	1.19	0.94	0.51
2020	0.00	1.43	0.05
2021	0.00	0.16	0.56
2022	0.00	2.67	0.00
2023	0.00	0.58	0.14
2024	0.00	0.00	0.72
Average	0.65	0.98	0.73
Standard Deviation	0.84	0.82	1.14

**TABLES FOR SECTION 2.2: COMMONWEALTH OF THE NORTHERN
MARIANA ISLANDS**

Table A-21. Boat-based Survey Statistics (raw data), CNMI

Year	Survey Days	Boat Log Total Trips	Charter Trips	Non-Charter Trips	Total Interviews	Charter Interviews	Non-Charter Interviews
2015	57	110	1	109	102	2	100
2016	65	115	4	111	100	4	96
2017	66	116	6	110	104	5	99
2018	54	124	3	121	108	4	104
2019	33	65	1	64	58	4	54
2020	58	112	1	111	119	5	114
2021	71	145	0	145	135	0	135
2022	52	109	0	109	84	0	84
2023	42	80	0	80	63	0	63
2024	18	18	0	18	15	0	15

Table A-22. Supporting Data for Figure 22

Year	Number of Fishers Landing Pelagic Species from Commercial Receipt Invoices
2015	13
2016	74
2017	48
2018	56
2019	53
2020	76
2021	85
2022	95
2023	87
2024	34
Average	62
Standard Deviation	26

Table A-23. Supporting Data for Figure 23

Year	Number of Trips Catching Pelagic Fish from Commercial Receipt Invoices
2015	583
2016	1,205
2017	1,540
2018	2,173
2019	2,422
2020	1,332
2021	2,138
2022	1,781
2023	1,444
2024	873
Average	1,549
Standard Deviation	589

Table A-24. Supporting Data for Figure 24

Year	Estimated Total Troll Trips	Estimated Troll Trips - Non- Charter	Estimated Troll Trips - Charter
2015	3,369	3,352	17
2016	4,787	4,768	18
2017	3,904	3,904	0
2018	4,821	4,801	20
2019	3,462	3,417	44
2020	4,265	4,265	0
2021	3,348	3,348	0
2022	3,253	3,253	0
2023	2,369	2,369	0
2024	1,668	1,668	0
Average	3,525	3,515	10
Standard Deviation	993	989	15

Table A-25. Supporting Data for Figure 25

Year	Estimated Troll Hours - Total	Estimated Troll Hours - Non-Charter	Estimated Troll Hours -Charter
2015	17,083	17,038	44
2016	25,679	25,591	88
2017	22,338	22,338	0
2018	24,549	24,468	80
2019	18,214	18,026	188
2020	20,851	20,851	0
2021	18,850	18,850	0
2022	15,824	15,824	0
2023	12,323	12,323	0
2024	6,898	6,898	0
Average	18,261	18,221	40
Standard Deviation	5,676	5,655	63

Table A-26. Supporting Data for Figure 26

Year	Estimated Troll Hours per Trip	Estimated Troll Hours per Trip - Non- Charter	Estimated Troll Hours per Trip - Charter
2015	5.1	5.1	2.6
2016	5.4	5.4	4.9
2017	5.7	5.7	0.0
2018	5.1	5.1	4.0
2019	5.3	5.3	4.3
2020	4.9	4.9	0.0
2021	5.6	5.6	0.0
2022	4.9	4.9	0.0
2023	5.2	5.2	0.0
2024	4.1	4.1	0.0
Average	5.1	5.1	1.6
Standard Deviation	0.4	0.4	2.1

Table A-27. Supporting Data for Figure 27

Year	Estimated Total Landings (lb) - All Pelagics	Estimated Total Landings (lb) - Tuna PMUS	Estimated Total Landings (lb) - Non-Tuna PMUS
2015	537,652	437,849	98,282
2016	457,502	311,403	132,833
2017	572,558	481,012	87,236
2018	539,037	455,315	82,129
2019	498,381	406,979	84,483
2020	309,445	266,563	34,916
2021	407,993	350,480	44,611
2022	261,952	164,462	90,736
2023	126,557	98,355	25,314
2024	84,333	41,996	39,950
Average	379,541	301,441	72,049
Standard Deviation	175,940	155,173	34,262

Table A-28. Supporting Data for Figure 28

Year	Estimated Total Landings (lb) - All Pelagics	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	537,652	537,182	471
2016	457,502	455,945	1,557
2017	572,558	572,558	0
2018	539,037	537,570	1,468
2019	498,381	495,014	3,368
2020	309,445	309,445	0
2021	407,993	407,993	0
2022	261,952	261,952	0
2023	126,557	126,557	0
2024	84,333	84,333	0
Average	379,541	378,855	686
Standard Deviation	175,940	175,419	1,127

Table A-29. Supporting Data for Figure 29

Year	Estimated Landings (lb) - Tuna PMUS	Estimated Landings (lb) - Non-Charter	Estimated Landings (lb) - Charter
2015	437,849	437,731	119
2016	311,403	309,846	1,557
2017	481,012	481,012	0
2018	455,315	454,326	989
2019	406,979	404,026	2,954
2020	266,563	266,563	0
2021	350,480	350,480	0
2022	164,462	164,462	0
2023	98,355	98,355	0
2024	41,996	41,996	0
Average	301,441	300,880	562
Standard Deviation	155,173	154,821	999

Table A-30. Supporting Data for Figure 30

Year	Estimated Landings (lb) - Non-Tuna PMUS	Estimated Landings (lb) - Non-Charter	Estimated Landings (lb) - Charter
2015	98,282	97,930	352
2016	132,833	132,833	0
2017	87,236	87,236	0
2018	82,129	81,670	459
2019	84,483	84,483	0
2020	34,916	34,916	0
2021	44,611	44,611	0
2022	90,736	90,736	0
2023	25,314	25,314	0
2024	39,950	39,950	0
Average	72,049	71,968	81
Standard Deviation	34,262	34,218	173

Table A-31. Supporting Data for Figure 31

Year	Estimated Total Landings (lb) - Skipjack	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	416,000	415,882	119
2016	280,388	278,831	1,557
2017	394,618	394,618	0
2018	438,328	437,339	989
2019	367,606	364,653	2,954
2020	241,438	241,438	0
2021	320,366	320,366	0
2022	145,854	145,854	0
2023	76,218	76,218	0
2024	39,853	39,853	0
Average	272,067	271,505	562
Standard Deviation	143,006	142,639	999

Table A-32. Supporting Data for Figure 32

Year	Estimated Total Landings (lb) - Yellowfin	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	21,618	21,618	0
2016	28,404	28,404	0
2017	45,818	45,818	0
2018	13,207	13,207	0
2019	39,373	39,373	0
2020	25,064	25,064	0
2021	27,299	27,299	0
2022	15,739	15,739	0
2023	19,393	19,393	0
2024	2,143	2,143	0
Average	23,806	23,806	0
Standard Deviation	12,617	12,617	0

Table A-33. Supporting Data for Figure 33

Year	Estimated Total Landings (lb) - Mahimahi	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	93,809	93,457	352
2016	108,270	108,270	0
2017	68,311	68,311	0
2018	72,238	72,074	164
2019	77,545	77,545	0
2020	31,578	31,578	0
2021	31,313	31,313	0
2022	64,180	64,180	0
2023	11,427	11,427	0
2024	0	0	0
Average	55,867	55,816	52
Standard Deviation	35,647	35,597	117

Table A-34. Supporting Data for Figure 34

Year	Estimated Total Landings (lb) - Wahoo	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	4,350	4,350	0
2016	24,491	24,491	0
2017	10,949	10,949	0
2018	7,002	6,707	295
2019	2,642	2,642	0
2020	3,338	3,338	0
2021	7,735	7,735	0
2022	22,743	22,743	0
2023	13,887	13,887	0
2024	875	875	0
Average	9,801	9,772	30
Standard Deviation	8,272	8,283	93

Table A-35. Supporting Data for Figure 35

Year	Estimated Total Landings (lb) - Blue Marlin	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	0	0	0
2016	0	0	0
2017	7,976	7,976	0
2018	2,889	2,889	0
2019	4,160	4,160	0
2020	0	0	0
2021	4,493	4,493	0
2022	0	0	0
2023	0	0	0
2024	39,075	39,075	0
Average	5,859	5,859	0
Standard Deviation	11,986	11,986	0

Table A-36. Supporting Data for Figure 36

Year	Estimated Total Landings (lb) - All Pelagics	Estimated Total Landings (lb) - Tuna PMUS	Estimated Total Landings (lb) - Non-Tuna PMUS
2015	188,623	154,982	30,893
2016	223,004	199,620	17,387
2017	224,531	201,111	18,392
2018	221,341	193,130	18,294
2019	176,633	138,795	22,655
2020	153,606	134,259	14,841
2021	307,079	263,884	35,755
2022	234,141	185,980	42,857
2023	148,682	116,781	19,060
2024	99,423	77,967	8,732
Average	197,706	166,651	22,887
Standard Deviation	57,487	52,827	10,434

Table A-37. Supporting Data for Figure 37

Year	Commercial Purchase Landings (lb) - Skipjack	Commercial Purchase Landings (lb) - Yellowfin
2015	139,873	14,959
2016	178,815	18,725
2017	164,196	36,500
2018	171,856	16,345
2019	125,879	12,509
2020	119,710	14,534
2021	238,376	25,033
2022	172,059	11,217
2023	97,691	18,961
2024	65,076	12,394
Average	147,353	18,118
Standard Deviation	48,633	7,635

Table A-38. Supporting Data for Figure 38

Year	Commercial Purchase Landings (lb) - Mahimahi	Commercial Purchase Landings (lb) - Wahoo	Commercial Purchase Landings (lb) - Blue Marlin
2015	30,465	428	0
2016	12,582	1,603	2,198
2017	14,715	2,894	440
2018	16,839	943	374
2019	21,216	336	724
2020	12,627	1,114	94
2021	26,526	2,869	4,071
2022	33,151	7,356	1,638
2023	13,953	3,776	774
2024	7,566	573	446
Average	18,964	2,189	1,076
Standard Deviation	8,526	2,170	1,255

Table A-39. Supporting Data for Figure 39

Year	Troll Overall Average Catch Rate (lb/hr)	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	31.3	31.3	10.7
2016	17.8	17.8	17.7
2017	25.5	25.5	0.0
2018	22.0	22.0	18.3
2019	27.6	27.7	17.9
2020	14.6	14.6	0.0
2021	21.4	21.4	0.0
2022	16.0	16.0	0.0
2023	10.3	10.3	0.0
2024	12.3	12.3	0.0
Average	19.9	19.9	6.5
Standard Deviation	6.9	6.9	8.6

Table A-40. Supporting Data for Figure 40

Year	Troll Overall Average Catch Rate (lb/hr) - Skipjack	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	24.4	24.4	2.7
2016	10.9	10.8	17.7
2017	17.7	17.7	0.0
2018	17.8	17.8	12.4
2019	20.2	20.2	15.7
2020	11.5	11.5	0.0
2021	16.9	16.9	0.0
2022	9.2	9.2	0.0
2023	6.2	6.2	0.0
2024	5.8	5.8	0.0
Average	14.1	14.1	4.9
Standard Deviation	6.2	6.2	7.3

Table A-41. Supporting Data for Figure 41

Year	Troll Overall Average Catch Rate (lb/hr) - Yellowfin	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	1.3	1.3	0.0
2016	1.1	1.1	0.0
2017	2.1	2.1	0.0
2018	0.5	0.5	0.0
2019	2.2	2.2	0.0
2020	1.2	1.2	0.0
2021	1.4	1.4	0.0
2022	1.0	1.0	0.0
2023	1.5	1.5	0.0
2024	0.3	0.3	0.0
Average	1.3	1.3	0.0
Standard Deviation	0.6	0.6	0.0

Table A-42. Supporting Data for Figure 42

Year	Troll Overall Average Catch Rate (lb/hr) - Mahimahi	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	5.3	5.3	8.0
2016	4.2	4.2	0.0
2017	2.9	2.9	0.0
2018	2.9	2.9	2.1
2019	4.2	4.2	0.0
2020	1.5	1.5	0.0
2021	1.6	1.6	0.0
2022	4.0	4.0	0.0
2023	0.9	0.9	0.0
2024	0.0	0.0	0.0
Average	3.1	3.1	1.1
Standard Deviation	1.5	1.5	2.7

Table A-43. Supporting Data for Figure 43

Year	Troll Overall Average Catch Rate (lb/hr) - Wahoo	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	0.3	0.3	0.0
2016	1.0	1.0	0.0
2017	0.5	0.5	0.0
2018	0.3	0.3	3.7
2019	0.1	0.1	0.0
2020	0.2	0.2	0.0
2021	0.4	0.4	0.0
2022	1.2	1.2	0.0
2023	1.1	1.1	0.0
2024	0.1	0.1	0.0
Average	0.5	0.5	0.4
Standard Deviation	0.4	0.4	1.2

Table A-44. Supporting Data for Figure 44

Year	Troll Overall Average Catch Rate (lb/hr) – Blue Marlin	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	0.0	0.0	0.0
2016	0.0	0.0	0.0
2017	0.4	0.4	0.0
2018	0.1	0.1	0.0
2019	0.2	0.2	0.0
2020	0.0	0.0	0.0
2021	0.2	0.2	0.0
2022	0.0	0.0	0.0
2023	0.0	0.0	0.0
2024	5.7	5.7	0.0
Average	0.7	0.7	0.0
Standard Deviation	1.8	1.8	0.0

Table A-45. Supporting Data for Figure 45

Year	Troll Catch Rate (lb/trip) - Mahimahi	Troll Catch Rate (lb/trip) -Wahoo	Troll Catch Rate (lb/trip) - Blue Marlin
2015	52.3	0.7	0.0
2016	10.4	1.3	1.8
2017	9.6	1.9	0.3
2018	7.8	0.4	0.2
2019	8.8	0.1	0.3
2020	9.5	0.8	0.1
2021	12.4	1.3	1.9
2022	18.6	4.1	0.9
2023	9.7	2.6	0.5
2024	8.7	0.7	0.5
Average	14.8	1.4	0.7
Standard Deviation	13.5	1.2	0.7

Table A-46. Supporting Data for Figure 46

Year	Troll Catch Rate (lb/trip) -Skipjack	Troll Catch Rate (lb/trip) - Yellowfin	Troll Catch Rate (lb/trip) -Skipjack (Creel)
2015	240	26	118
2016	148	16	57
2017	107	24	104
2018	79	8	89
2019	52	5	106
2020	90	11	54
2021	112	12	94
2022	97	6	47
2023	68	13	30
2024	75	14	24
Average	107	13	72
Standard Deviation	54	7	34

TABLES FOR SECTION 2.3: GUAM

Table A-47. Numbers of Trips and Interviews for Creel Trolling Method, Guam

DATA MODULES

Year	Survey Days	Trips in Boat Log	Interviews
2015	97	906	540
2016	93	1,147	728
2017	92	1,018	643
2018	89	979	653
2019	93	930	620
2020	96	981	244
2021	96	1,101	676
2022	97	949	571
2023	96	837	457
2024	96	813	506

Table A-48. Supporting Data for Figure 47

Year	Estimated Trolling Boats	Upper 95 Percent	Lower 95 Percent
2015	372	460.0	326.0
2016	428	505.0	386.0
2017	408	473.0	366.0
2018	398	495.0	349.0
2019	465	624.0	392.0
2020	459	685.0	382.0
2021	546	635.0	493.0
2022	449	513.0	410.0
2023	466	553.0	416.0
2024	447	529.0	398.0
Average	444	547	392
Standard Deviation	48	76	45

DATA MODULES

Table A-49. Supporting Data for Figure 48

Year	Estimated Total Landings (lb) All Pelagic	Estimated Total Landings (lb) Tuna PMUS	Estimated Total Landings (lb) Non Tuna PMUS
2015	968,471	718,736	227,489
2016	890,936	604,957	267,230
2017	597,842	460,153	123,093
2018	857,135	637,391	206,328
2019	808,549	570,445	224,464
2020	624,254	407,805	198,934
2021	858,357	758,639	88,534
2022	623,888	452,110	161,569
2023	714,028	586,062	114,684
2024	699,120	456,156	237,048
Average	764,258	565,245	184,937
Standard Deviation	129,511	119,599	59,735

Table A-50. Supporting Data for Figure 49

Year	Estimated Total Landings Pelagic	Estimated Total Landings Non Charter	Estimated Total Landings Charter
2015	968,471	908,487	59,983
2016	890,936	851,572	39,362
2017	597,842	568,673	29,169
2018	857,135	807,813	49,323
2019	808,549	766,628	41,925
2020	624,254	620,599	3,655
2021	858,357	837,396	20,961
2022	623,888	606,491	17,399
2023	714,028	700,316	13,710
2024	699,120	671,741	27,378
Average	764,258	733,972	30,287
Standard Deviation	129,511	116,873	17,349

DATA MODULES

Table A-51. Supporting Data for Figure 50

Year	Estimated Landings Tuna PMUS	Estimated Landings Non Charter	Estimated Landings Charter
2015	718,736	713,353	5,382
2016	604,957	595,894	9,063
2017	460,153	453,027	7,126
2018	637,391	629,288	8,103
2019	570,445	558,851	11,594
2020	407,805	407,063	742
2021	758,639	751,561	7,077
2022	452,110	447,473	4,637
2023	586,062	581,193	4,868
2024	456,156	453,493	2,662
Average	565,245	559,120	6,125
Standard Deviation	119,599	118,126	3,157

Table A-52. Supporting Data for Figure 51

Year	Estimated Total Landings Skipjack	Estimated Total Landings Non Charter	Estimated Total Landings Charter
2015	607,246	602,666	4,580
2016	468,429	462,796	5,632
2017	399,994	394,044	5,950
2018	585,489	578,468	7,022
2019	500,960	490,919	10,041
2020	349,733	349,292	441
2021	665,439	660,090	5,348
2022	418,351	413,856	4,496
2023	488,775	484,979	3,796
2024	407,346	404,785	2,560
Average	489,176	484,190	4,987
Standard Deviation	102,179	101,075	2,572

DATA MODULES

Table A-53. Supporting Data for Figure 52

Year	Estimated Total Landings (lb) - Yellowfin	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	110,979	110,190	789
2016	136,457	133,098	3,360
2017	60,011	58,862	1,149
2018	51,369	50,294	1,075
2019	69,436	67,883	1,553
2020	58,060	57,771	289
2021	93,110	91,381	1,729
2022	33,371	33,229	141
2023	96,832	95,759	1,072
2024	48,700	48,598	102
Average	75,833	74,707	1,126
Standard Deviation	32,309	31,574	965

Table A-54. Supporting Data for Figure 53

Year	Estimated Total Landings Non-Tuna (lb) - PMUS	Estimated Total Landings (lb) - Non-Charter	Estimated Total Landings (lb) - Charter
2015	227,489	173,436	54,052
2016	267,230	237,471	29,758
2017	123,093	101,692	21,401
2018	206,328	165,692	40,636
2019	224,464	194,364	30,103
2020	198,934	196,033	2,900
2021	88,534	74,922	13,612
2022	161,569	149,914	11,655
2023	114,684	106,007	8,676
2024	237,048	212,440	24,608
Average	184,937	161,197	23,740
Standard Deviation	59,735	52,794	15,624

DATA MODULES

Table A-55. Supporting Data for Figure 54

Year	Estimated Total Landings (lb) - Mahimahi	Estimated Total Landings (lb) - Non- Charter	Estimated Total Landings (lb) - Charter
2015	157,174	121,246	35,927
2016	184,351	167,566	16,785
2017	44,421	34,356	10,065
2018	86,043	75,021	11,022
2019	145,563	126,797	18,767
2020	98,794	96,696	2,097
2021	31,229	29,111	2,118
2022	93,981	86,141	7,840
2023	52,410	51,334	1,075
2024	168,668	150,631	18,037
Average	106,263	93,890	12,373
Standard Deviation	54,872	47,673	10,611

Table A-56. Supporting Data for Figure 55

Year	Estimated Total Landings (lb) - Wahoo	Estimated Total Landings (lb) - Non- Charter	Estimated Total Landings (lb) - Charter
2015	157,174	121,246	35,927
2016	184,351	167,566	16,785
2017	44,421	34,356	10,065
2018	86,043	75,021	11,022
2019	145,563	126,797	18,767
2020	98,794	96,696	2,097
2021	31,229	29,111	2,118
2022	93,981	86,141	7,840
2023	52,410	51,334	1,075
2024	168,668	150,631	18,037
Average	106,263	93,890	12,373
Standard Deviation	54,872	47,673	10,611

DATA MODULES

Table A-57. Supporting Data for Figure 56

Year	Estimated Total Landings (lb) - Blue Marlin	Estimated Total Landings (lb) - Non- Charter	Estimated Total Landings (lb) - Charter
2015	36,849	26,869	9,980
2016	45,686	37,824	7,862
2017	31,024	23,991	7,033
2018	23,741	12,484	11,257
2019	52,533	43,727	8,807
2020	50,698	50,698	0
2021	30,967	22,896	8,071
2022	8,645	6,763	1,882
2023	14,163	10,971	3,192
2024	40,279	38,671	1,608
Average	33,459	27,489	5,969
Standard Deviation	14,769	14,890	3,948

Table A-58. Supporting Data for Figure 57

Year	Estimated Commercial Landings (lb) - All Pelagic	Estimated Commercial Landings (lb) - Tuna PMUS	Estimated Commercial Landings (lb) Non-Tuna PMUS
2015	109,403	63,685	42,794
2016	100,551	37,560	58,031
2017	118,457	56,455	55,434
2018	97,019	54,112	38,655
2019	141,756	52,020	82,100
2020	74,756	23,355	46,382
2021	51,033	25,997	22,905
2022	n.d.	n.d.	n.d.
2023	n.d.	n.d.	n.d.
2024	n.d.	n.d.	n.d.
Average	98,996	44,741	49,472
Standard Deviation	29,467	15,796	18,486

DATA MODULES

Table A-59. Supporting Data for Figure 58

Year	Estimated Troll Trips	Estimated Troll Trips - Non-Charter	Estimated Troll Trips - Charter
2015	9,167	7,954	1,213
2016	11,942	10,574	1,368
2017	10,267	9,005	1,262
2018	10,489	9,111	1,377
2019	9,936	8,601	1,335
2020	9,631	9,402	230
2021	10,719	10,106	614
2022	9,758	8,970	788
2023	8,347	7,804	543
2024	8,386	7,699	687
Average	9,864	8,923	942
Standard Deviation	1,088	954	417

Table A-60. Supporting Data for Figure 59

Year	Estimated Troll Hours - Total	Estimated Troll Hours - Non- Charter	Estimated Troll Hours -Charter
2015	50,464	45,836	4,628
2016	65,158	60,479	4,679
2017	49,588	45,085	4,503
2018	52,623	48,477	4,146
2019	50,055	45,704	4,351
2020	49,350	48,509	841
2021	56,373	54,125	2,248
2022	47,962	45,126	2,836
2023	38,270	36,755	1,515
2024	38,655	36,389	2,266
Average	49,850	46,649	3,201
Standard Deviation	7,805	7,176	1,432

DATA MODULES

Table A-61. Supporting Data for Figure 60

Year	Estimated Troll Hours per Trip – Overall Average	Estimated Troll Hours per Trip - Non-Charter	Estimated Troll Hours per Trip - Charter
2015	5.5	5.8	3.8
2016	5.5	5.7	3.4
2017	4.8	5.0	3.6
2018	5.0	5.3	3.0
2019	5.0	5.3	3.3
2020	5.1	5.2	3.7
2021	5.3	5.4	3.7
2022	4.9	5.0	3.6
2023	4.6	4.7	2.8
2024	4.6	4.7	3.3
Average	5.0	5.2	3.4
Standard Deviation	0.3	0.4	0.3

Table A-62. Supporting Data for Figure 61

Year	Troll Catch Rate (lb/hr) - Overall Average	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	19.2	19.8	12.9
2016	13.6	14.0	8.4
2017	12.0	12.6	6.3
2018	16.2	16.6	11.9
2019	16.0	16.7	9.6
2020	12.6	12.7	4.3
2021	15.1	15.3	9.0
2022	12.9	13.3	6.1
2023	18.5	18.9	9.0
2024	18.0	18.4	12.0
Average	15.4	15.8	9.0

DATA MODULES

Standard Deviation	2.6	2.7	2.8

Table A-63. Supporting Data for Figure 62

Year	Troll Catch Rate (lb/hr) - Skipjack	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	12.0	13.1	1.0
2016	7.2	7.6	1.2
2017	8.1	8.7	1.3
2018	11.1	11.9	1.7
2019	10.0	10.7	2.3
2020	7.1	7.2	0.5
2021	11.8	12.2	2.4
2022	8.7	9.2	1.6
2023	12.8	13.2	2.5
2024	10.5	11.1	1.1
Average	9.9	10.5	1.6
Standard Deviation	2.1	2.2	0.7

Table A-64. Supporting Data for Figure 63

Year	Troll Catch Rate (lb/hr) - Yellowfin Tuna	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	2.2	2.4	0.2
2016	2.1	2.2	0.7
2017	1.2	1.3	0.3
2018	1.0	1.0	0.3
2019	1.4	1.5	0.4
2020	1.2	1.2	0.3
2021	1.7	1.7	0.8
2022	0.7	0.7	0.0
2023	2.5	2.6	0.7
2024	1.3	1.3	0.0

DATA MODULES

Average	1.5	1.6	0.4
Standard Deviation	0.6	0.6	0.3

Table A-65. Supporting Data for Figure 64

Year	Troll Catch Rate (lb/hr) - Mahimahi	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	3.1	2.6	7.8
2016	2.8	2.8	3.6
2017	0.9	0.8	2.2
2018	1.6	1.5	2.7
2019	2.9	2.8	4.3
2020	2.0	2.0	2.5
2021	0.6	0.5	0.9
2022	2.0	1.9	2.8
2023	1.4	1.4	0.7
2024	4.4	4.1	8.0
Average	2.2	2.0	3.6
Standard Deviation	1.1	1.1	2.5

Table A-66. Supporting Data for Figure 65

Year	Troll Catch Rate (lb/hr) - Wahoo	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	0.6	0.5	1.6
2016	0.5	0.5	1.1
2017	0.9	1.0	0.8
2018	1.7	1.6	3.4
2019	0.5	0.5	0.5
2020	0.9	0.9	0.9
2021	0.4	0.3	1.2
2022	1.2	1.2	0.6
2023	1.1	1.1	2.4
2024	0.6	0.5	2.2

DATA MODULES

Average	0.8	0.8	1.5
Standard Deviation	0.4	0.4	0.9

Table A-67. Supporting Data for Figure 66

Year	Troll Catch Rate (lb/hr) - Blue Marlin	Troll Catch Rate (lb/hr) - Non-Charter	Troll Catch Rate (lb/hr) - Charter
2015	0.7	0.6	2.2
2016	0.7	0.6	1.7
2017	0.6	0.5	1.6
2018	0.5	0.3	2.7
2019	1.0	1.0	2.0
2020	1.0	1.0	0.0
2021	0.5	0.4	3.6
2022	0.2	0.1	0.7
2023	0.4	0.3	2.1
2024	1.0	1.1	0.7
Average	0.7	0.6	1.7
Standard Deviation	0.3	0.3	1.1

DATA MODULES

5.1 TABLES FOR SECTION 2.4: HAWAII

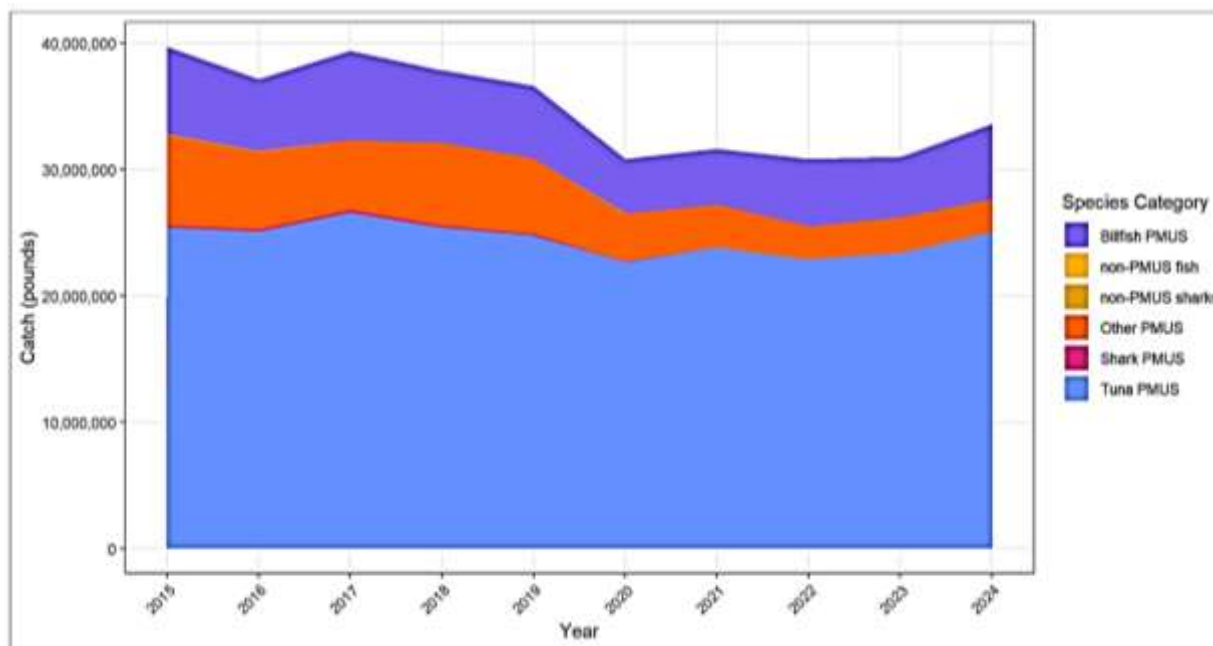


Figure 67. Hawaii commercial tuna, billfish, other PMUS and PMUS shark catch

Year	Hawaii pelagic catch (1,000 pounds)					Total
	Tunas	Billfish	Other PMUS	PMUS Sharks	non-PMUS	
2015	25,431	6,910	7,195	149	24	39,710
2016	25,102	5,708	6,172	168	25	37,174
2017	26,618	7,063	5,549	167	12	39,408
2018	25,436	5,735	6,526	139	13	37,850
2019	24,778	5,713	6,015	114	6	36,627
2020	22,700	4,327	3,774	43	5	30,849
2021	23,857	4,388	3,361	17	6	31,629
2022	22,896	5,348	2,587	10	4	30,844
2023	23,415	4,759	2,802	8	3	30,988
2024	25,059	5,965	2,588	5	3	33,621
Average	24,529.3	5,591.5	4,656.9	82.0	10.2	34,869.9
SD	1,263.8	936.4	1,805.6	71.2	8.2	3,663.7

DATA MODULES

Table A-69. Supporting Data for

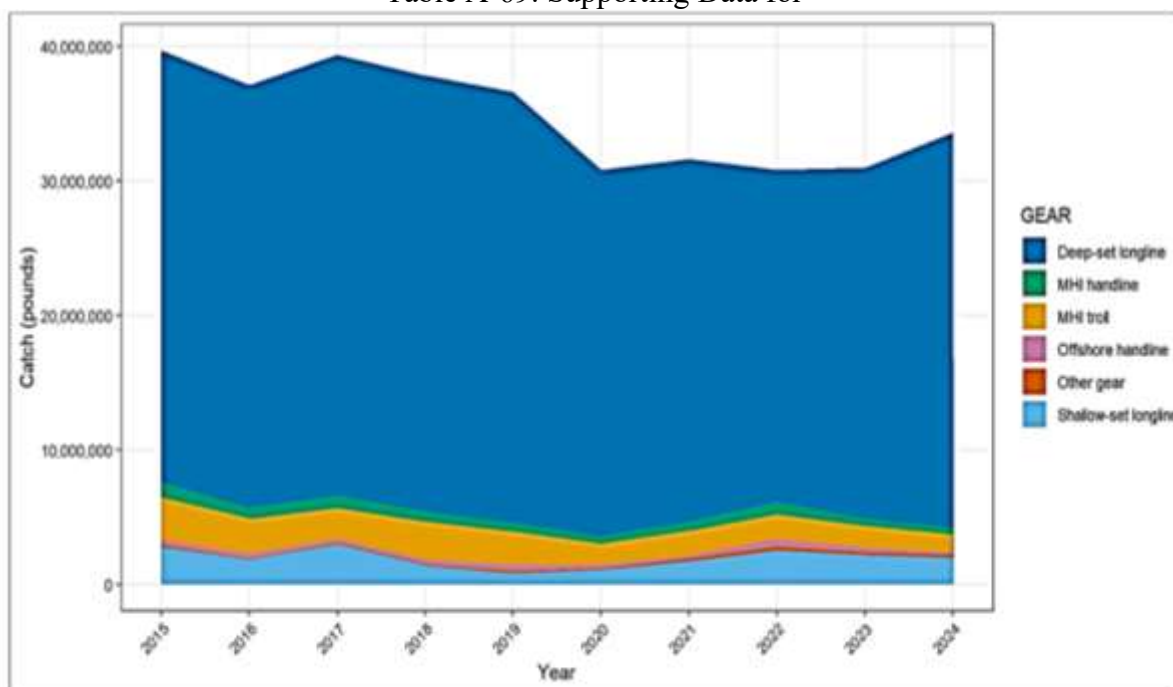


Figure 68. Total commercial pelagic catch by gear type

Hawaii pelagic total catch (1,000 pounds)							
Year	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	Total
2015	32,045	2,777	3,098	1,199	407	183	39,710
2016	31,476	1,850	2,599	796	386	67	37,174
2017	32,759	3,009	2,234	990	324	91	39,408
2018	32,407	1,438	2,765	787	350	104	37,850
2019	32,018	834	2,481	686	477	131	36,627
2020	27,255	1,070	1,500	583	328	113	30,849
2021	26,941	1,736	1,830	685	257	180	31,629
2022	24,685	2,537	1,774	967	571	311	30,844
2023	26,057	2,215	1,603	573	348	191	30,988
2024	29,400	1,979	1,323	508	180	230	33,621
Average	29,504.4	1,944.4	2,120.8	777.3	362.9	160.1	34,869.9
SD	3,026.5	711.7	599.6	218.1	108.8	73.9	3,663.7

DATA MODULES

Table A-70. Supporting Data for Figure 69. Hawai'i commercial tuna catch by gear type, 2015-2024.

Hawaii tuna catch by gear type (1,000 pounds)							
Year	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	Total
2015	22,168	122	1,482	1,105	399	156	25,431
2016	22,473	107	1,379	713	382	48	25,102
2017	23,767	276	1,270	913	310	82	26,618
2018	22,584	188	1,502	725	342	94	25,436
2019	22,249	93	1,223	624	469	120	24,778
2020	20,717	140	865	552	324	102	22,700
2021	21,649	225	915	650	252	166	23,857
2022	19,858	237	1,022	933	564	283	22,896
2023	21,373	170	826	537	334	174	23,415
2024	23,411	212	579	476	176	206	25,059
Average	22,024.9	177.0	1,106.4	722.8	355.3	143.1	24,529.3
SD	1,179.1	60.9	311.1	201.7	108.4	68.8	1,263.8

Table A-71. Supporting Data for Figure 70. Species composition of tuna catch

Hawaii tuna catch (1,000 pounds)							
Year	Bigeye tuna	Yellowfin tuna	Skipjack tuna	Albacore	Bluefin tuna	Other tunas	Total
2015	19,922	4,069	728	676	0	36	25,431
2016	18,694	4,988	802	602	1	14	25,102
2017	17,964	7,619	732	288	3	11	26,618
2018	17,073	7,583	531	238	1	10	25,436
2019	17,685	5,990	834	256	4	10	24,778
2020	16,834	4,971	555	332	3	5	22,700
2021	15,916	6,922	499	513	2	5	23,857
2022	14,784	7,189	460	457	3	3	22,896
2023	14,526	7,358	396	1,127	4	4	23,415
2024	13,776	10,117	548	608	6	4	25,059
Average	16,717.4	6,680.7	608.5	509.6	2.9	10.3	24,529.0
SD	1,962.0	1,743.7	152.6	268.4	1.8	9.8	1,264.0

DATA MODULES

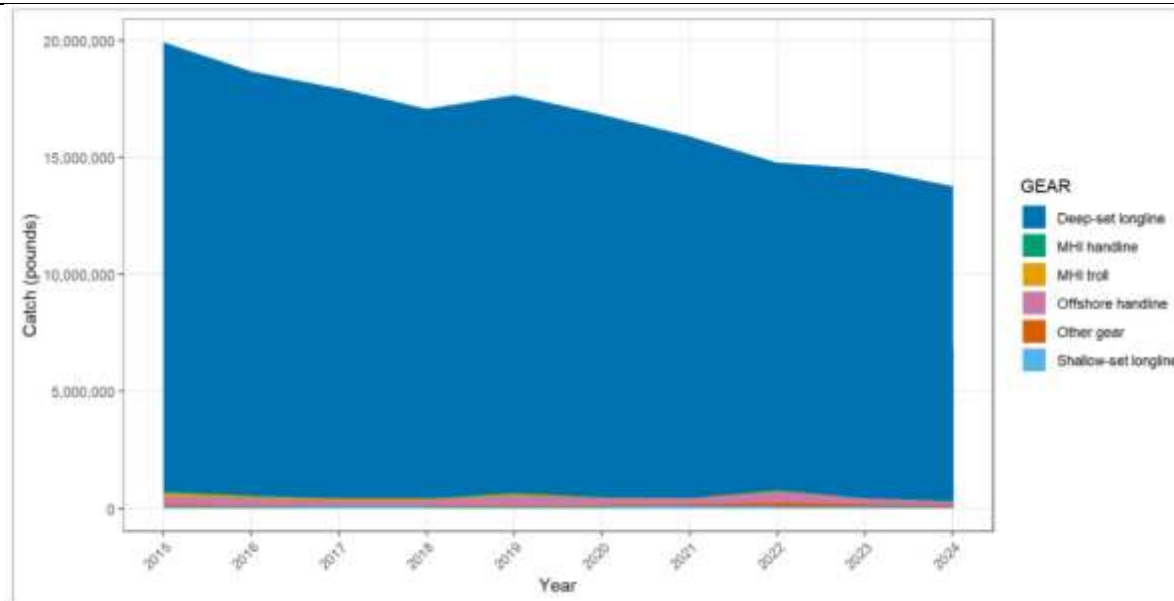


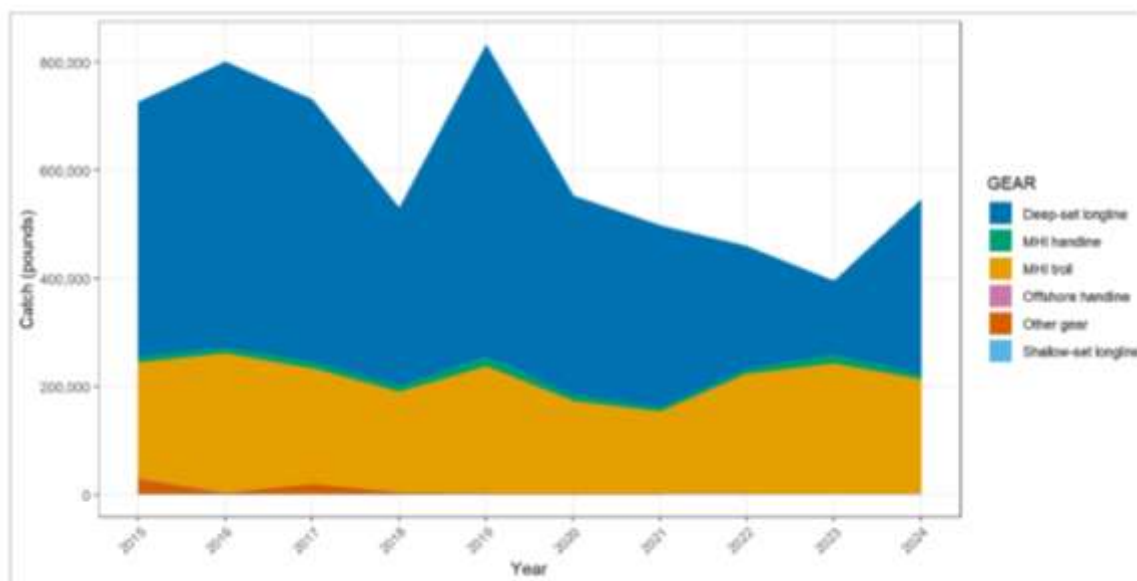
Figure 71. Hawaii bigeye tuna catch by gear type

Hawaii bigeye tuna catch (1,000 pounds)							
Year	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	Total
2015	19,162	98	129	74	371	87	19,922
2016	18,085	75	75	93	325	40	18,694
2017	17,497	128	88	49	185	17	17,964
2018	16,630	108	60	31	227	17	17,073
2019	16,989	60	77	63	435	62	17,685
2020	16,318	95	41	40	279	61	16,834
2021	15,440	88	28	31	240	89	15,916
2022	13,966	100	28	46	481	163	14,784
2023	14,059	61	11	18	273	105	14,526
2024	13,440	75	14	22	144	80	13,776
Average	16,158.6	89.0	54.9	46.7	296.1	72.0	16,717.4
SD	1,902.9	21.6	37.6	24.0	107.5	43.7	1,962.0

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Table A-73. Supporting Data for Figure 72. Hawaii yellowfin tuna catch by gear type

Year	Hawaii yellowfin tuna catch (1,000 pounds)						Total
	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	2,008	16	1,103	877	25	40	4,069
2016	3,313	29	1,034	551	56	5	4,988
2017	5,582	137	960	770	124	46	7,619
2018	5,438	75	1,247	636	114	73	7,583
2019	4,453	30	903	516	32	56	5,990
2020	3,711	35	648	492	44	41	4,971
2021	5,390	114	731	599	11	77	6,922
2022	5,257	97	768	865	82	119	7,189
2023	6,087	81	571	490	61	69	7,358
2024	9,113	123	346	379	31	125	10,117
Average	5,035.1	73.8	831.1	617.5	58.1	65.1	6,680.7
SD	1,903.2	44.0	270.9	168.6	38.0	36.5	1,743.7



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Figure 73. Hawaii skipjack tuna catch by gear type

Year	Hawaii skipjack tuna catch (1,000 pounds)						Total
	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	472	1	214	11	2	28	728
2016	530	0	258	11	0	3	802
2017	485	1	215	13	0	18	732
2018	329	0	186	11	0	4	531
2019	577	0	234	19	2	1	834
2020	370	0	172	11	1	0	555
2021	337	1	152	8	0	1	499
2022	226	1	222	9	1	0	460
2023	137	0	242	17	1	0	396
2024	325	1	211	9	0	1	548
Average	378.8	0.6	210.6	11.9	0.8	5.6	608.5
SD	137.9	0.5	32.5	3.4	0.7	9.6	152.6

Table A-75. Supporting Data for Figure 74. Hawaii albacore catch by gear type

Year	Hawaii albacore catch (1,000 pounds)						Total
	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	525	6	4	139	0	0	676
2016	545	2	2	53	0	0	602
2017	200	9	1	77	1	0	288
2018	186	5	3	44	0	0	238
2019	227	3	2	22	1	0	256
2020	316	9	1	7	0	0	332
2021	480	20	2	11	0	0	513
2022	406	38	2	11	0	0	457
2023	1,088	27	1	11	0	0	1,127
2024	531	8	5	64	0	1	608
Average	450.3	12.7	2.1	44.0	0.2	0.2	509.6
SD	264.6	11.9	1.5	41.9	0.4	0.2	268.4

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Table A-76. Supporting Data for Figure 75. Hawaii commercial billfish catch by gear type

Year	Hawaii billfish catch (1,000 lbs)						Total
	Deep-set longline	Shallow- set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	3,885	2,539	457	16	4	9	6,910
2016	3,627	1,677	385	16	1	3	5,708
2017	4,059	2,625	351	20	4	3	7,063
2018	4,106	1,216	396	13	1	4	5,735
2019	4,585	719	385	15	3	6	5,713
2020	3,217	870	225	9	2	4	4,327
2021	2,602	1,487	282	7	3	6	4,388
2022	2,766	2,279	284	8	2	9	5,348
2023	2,495	2,020	226	6	3	9	4,759
2024	3,894	1,734	311	11	1	14	5,965
Average	3,523.7	1,716.4	330.1	12.3	2.3	6.7	5,591.5
SD	715.4	660.6	77.3	4.4	1.1	3.4	936.4

Table A-77. Supporting Data for Figure 76. Species composition of billfish catch

Year	Hawaii billfish catch (1,000 lbs)					Total
	Swordfish	Blue marlin	Striped marlin	Spearfish	Other marlins	
2015	3,356	1,794	1,105	605	51	6,910
2016	2,418	1,563	888	784	55	5,708
2017	3,582	1,835	910	689	47	7,063
2018	2,329	1,813	1,051	504	39	5,735
2019	1,613	2,353	1,239	455	53	5,713
2020	1,610	1,565	860	264	28	4,327
2021	2,167	1,236	634	306	43	4,388
2022	2,885	1,403	728	298	33	5,348
2023	2,691	1,069	503	445	50	4,759
2024	2,248	1,839	1,420	400	58	5,965
Average	2,489.9	1,647.0	933.9	475.1	45.7	5,591.5
SD	656.4	364.5	278.6	173.1	9.8	936.4

Supporting data shown in Table A-77.

DATA MODULES

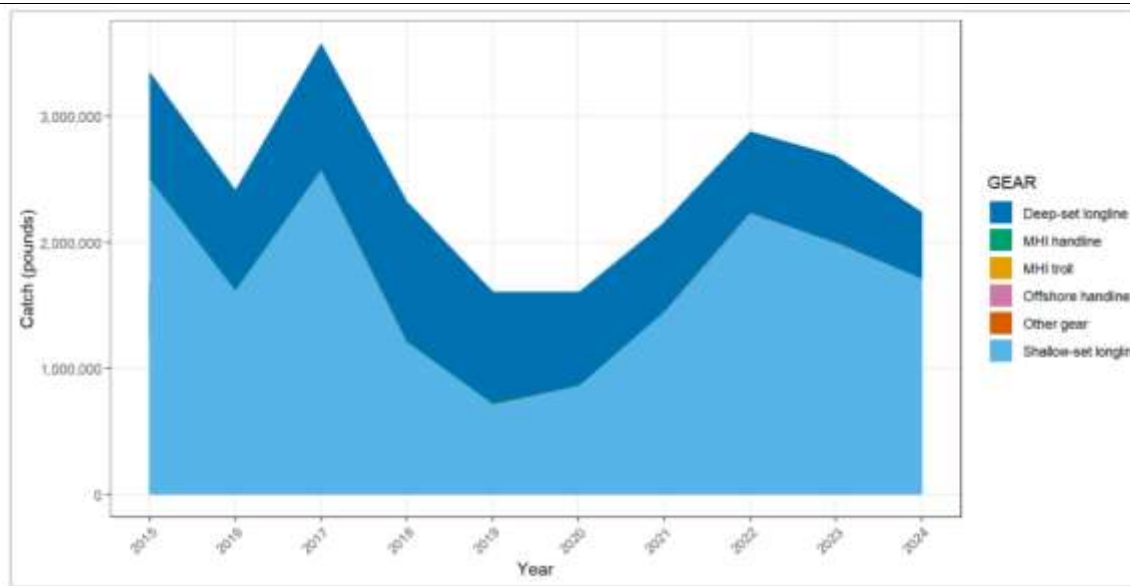


Figure 77. Hawaii swordfish catch by gear type

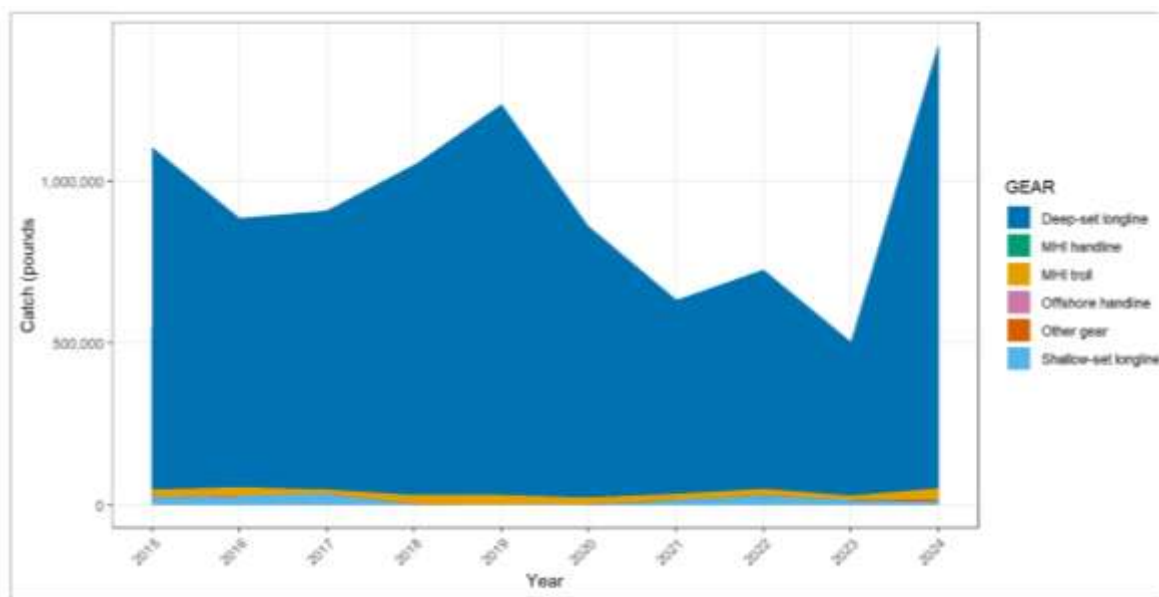
Swordfish catch (1,000 lbs)							
Year	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	Total
2015	842	2,500	2	11	0	1	3,356
2016	794	1,615	0	9	0	1	2,418
2017	998	2,570	1	13	1	0	3,582
2018	1,110	1,210	1	6	0	1	2,329
2019	888	717	1	7	0	1	1,613
2020	741	864	0	4	0	1	1,610
2021	711	1,452	1	3	0	1	2,167
2022	645	2,236	1	2	0	1	2,885
2023	689	1,998	0	2	0	1	2,691
2024	531	1,714	0	2	0	1	2,248
Average	794.9	1,687.4	0.7	5.8	0.3	0.7	2,489.9
SD	171.5	645.2	0.5	4.0	0.3	0.3	656.4

DATA MODULES

Table A-79. Supporting Data for Figure 78. Hawaii blue marlin catch by gear type

Year	Blue marlin catch (1,000 lbs)						Total
	Deep-set longline	Shallow-set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	1,375	12	394	5	3	6	1,794
2016	1,212	28	315	5	1	2	1,563
2017	1,502	14	308	6	2	3	1,835
2018	1,464	1	339	6	0	2	1,813
2019	2,003	0	334	8	2	5	2,353
2020	1,359	4	194	4	2	2	1,565
2021	961	17	247	5	2	4	1,236
2022	1,130	11	249	6	1	7	1,403
2023	858	6	193	3	2	7	1,069
2024	1,566	5	251	8	1	8	1,839
Average	1,343.0	9.6	282.4	5.7	1.8	4.6	1,647.0
SD	328.3	8.5	66.0	1.6	0.9	2.2	364.5

Supporting data shown in Table A-79.



DATA MODULES

Figure 79. Hawaii striped marlin catch by gear type

Year	Striped marlin catch (1,000 lbs)						Total
	Deep-set longline	Shallow- set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	1,056	24	23	0	0	1	1,105
2016	831	29	27	1	0	0	888
2017	861	34	14	0	0	0	910
2018	1,021	4	26	0	0	1	1,051
2019	1,208	1	29	0	0	1	1,239
2020	836	2	21	0	0	1	860
2021	599	16	19	0	0	1	634
2022	677	30	20	0	0	1	728
2023	473	15	14	0	0	1	503
2024	1,368	12	36	1	0	4	1,420
Average	893.1	16.6	22.8	0.2	0.1	1.0	933.9
SD	275.9	12.1	6.9	0.3	0.1	1.2	278.6

Table A-81. Supporting Data for Figure 80. Hawaii commercial catch of other PMUS by gear type

Year	Catch of other PMUS by gear type (1,000 lbs)						Total
	Deep-set longline	Shallow- set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	5,973	116	1,155	78	4	18	7,345
2016	5,356	67	831	67	3	16	6,339
2017	4,926	107	609	57	10	7	5,716
2018	5,706	34	864	49	7	6	6,665
2019	5,179	22	872	46	5	5	6,129
2020	3,318	60	409	21	2	7	3,817
2021	2,684	24	632	27	2	8	3,378
2022	2,058	21	469	25	5	19	2,597
2023	2,186	25	551	29	11	8	2,810
2024	2,093	34	432	21	3	10	2,593
Average	3,947.9	51.0	682.5	42.0	5.3	10.3	4,738.9
SD	1,624.8	35.8	241.0	20.4	3.0	5.3	1,872.8

DATA MODULES

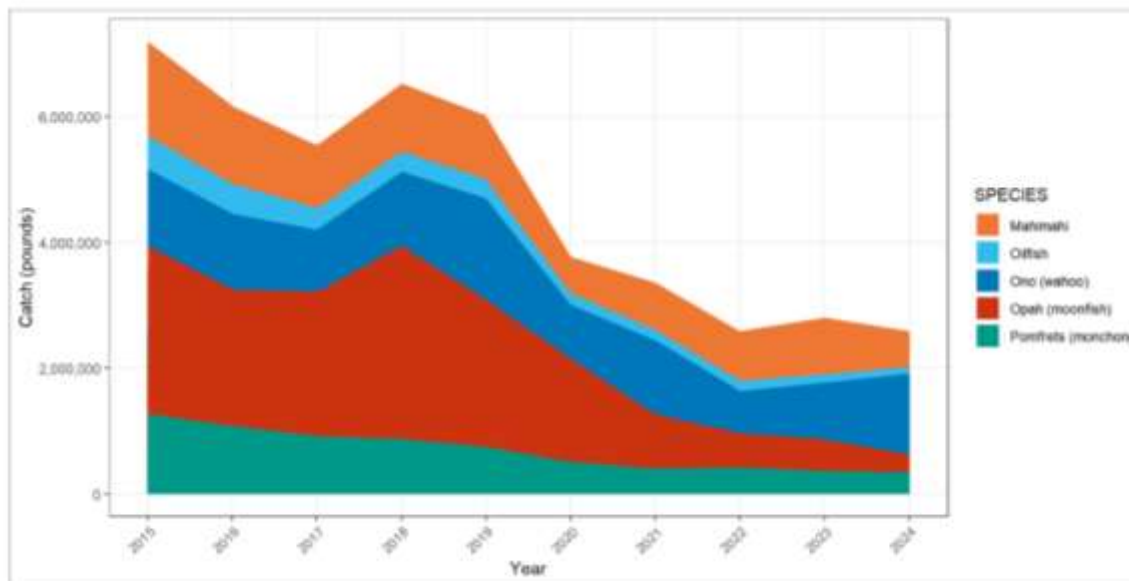


Figure 81. Species composition of other PMUS catch

Catch of other PMUS by species (1,000 lbs)							Total
Year	Mahimahi	Moonfish	Oilfish	Ono	Pomfret	PMUS shark	
2015	1,502	2,670	528	1,217	1,278	149	7,345
2016	1,234	2,166	481	1,206	1,084	168	6,339
2017	1,007	2,293	338	986	925	167	5,716
2018	1,085	3,071	315	1,176	879	139	6,665
2019	1,005	2,341	309	1,610	750	114	6,129
2020	583	1,648	184	851	509	43	3,817
2021	749	863	164	1,177	408	17	3,378
2022	782	541	165	671	429	10	2,597
2023	897	505	131	903	366	8	2,810
2024	571	290	104	1,276	346	5	2,593
Average	941.5	1,638.9	271.7	1,107.4	697.5	82.0	4,738.9
SD	290.7	1,012.3	147.5	263.7	333.1	71.2	1,872.8

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Table A-83. Supporting Data for Figure 82. Hawaii moonfish catch by gear type

Year	Moonfish catch (1,000 lbs)			Total
	Deep-set longline	Shallow- set longline	Other gear	
2015	2,630	39	1	2,670
2016	2,148	19	0	2,166
2017	2,261	32	0	2,293
2018	3,058	13	0	3,071
2019	2,338	3	0	2,341
2020	1,624	23	0	1,648
2021	861	2	0	863
2022	539	2	0	541
2023	504	1	0	505
2024	288	2	0	290
Average	1,625.2	13.6	0.1	1,638.9
SD	1,003.1	14.1	0.2	1,012.3

Figure 83. Hawaii mahimahi catch by gear type

Year	Mahimahi catch (1,000 lbs)						Total
	Deep-set longline	Shallow- set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	698	31	735	27	2	9	1,502
2016	635	16	560	19	1	3	1,234
2017	548	15	420	19	1	3	1,007
2018	495	6	561	18	1	3	1,085
2019	434	2	549	17	2	1	1,005
2020	260	3	305	12	1	2	583
2021	354	12	365	14	1	3	749
2022	380	13	358	16	4	10	782
2023	473	21	370	19	9	4	897
2024	298	28	230	7	2	6	571
Average	457.4	14.7	445.3	17.0	2.5	4.5	941.5
SD	142.0	9.7	151.9	5.1	2.5	3.0	290.7

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Table A-85. Supporting Data for Figure 84. Hawaii ono (wahoo) catch by gear type

Year	Ono catch (1,000 lbs)						Total
	Deep-set longline	Shallow- set longline	MHI troll	MHI handline	Offshore handline	Other gear	
2015	775	1	420	17	1	3	1,217
2016	921	1	270	11	0	2	1,206
2017	784	3	188	9	1	2	986
2018	858	1	302	13	0	1	1,176
2019	1,270	0	323	14	2	2	1,610
2020	739	0	104	7	1	1	851
2021	897	2	267	8	1	2	1,177
2022	552	1	110	5	0	1	671
2023	710	1	181	8	1	2	903
2024	1,057	1	203	11	1	3	1,276
Average	856.3	1.2	236.8	10.3	0.8	1.9	1,107.4
SD	199.0	0.7	98.6	3.7	0.5	0.7	263.7

Table A-86. Supporting Data for Figure 85. Hawaii pomfret catch by gear type

Year	Pomfret catch (1,000 lbs)					Total
	Deep-set longline	Shallow- set longline	MHI handline	Offshore handline	Other gear	
2015	1,242	1	31	1	4	1,278
2016	1,038	0	34	2	10	1,084
2017	888	0	28	7	1	925
2018	857	0	16	5	1	879
2019	731	0	15	2	1	750
2020	502	0	3	0	4	509
2021	400	1	5	0	3	408
2022	417	0	3	1	7	429
2023	362	0	2	1	2	366
2024	342	0	2	0	1	346
Average	677.9	0.3	14.0	1.8	3.4	697.5
SD	319.0	0.3	13.0	2.4	2.9	333.1

DATA MODULES

Table A-87. Supporting Data for Figure 86. Hawaii PMUS shark catch by gear type

Year	PMUS shark catch (1,000 lbs)			Total
	Deep-set longline	Shallow- set longline	Non- longline	
2015	120	25	4	149
2016	140	24	4	168
2017	115	49	2	167
2018	126	12	1	139
2019	98	16	0	114
2020	11	31	0	43
2021	12	5	0	17
2022	9	1	0	10
2023	8	0	0	8
2024	5	0	0	5
Average	64.5	16.2	1.2	82.0
SD	59.1	16.1	629.6	71.2

Table A-88. Supporting Data for Figure 87. Number of Hawaii-permitted deep-set longline vessels and trips

Year	Deep-set longline		
	Vessels	Trips	Sets
2015	143	1,452	18,519
2016	142	1,480	19,391
2017	145	1,539	19,674
2018	143	1,643	21,012
2019	149	1,727	22,318
2020	146	1,643	20,766
2021	146	1,689	22,175
2022	147	1,534	21,327
2023	150	1,594	22,114
2024	150	1,635	21,832
Average	146.1	1,593.6	20,912.8
SD	2.9	90.0	1318.2

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Table A-89. Supporting Data for Figure 88. Number of hooks set by the Hawaii-permitted deep-set longline fishery

Year	Number of deep-set hooks by area (millions)			Total
	Outside EEZ	Hawaii EEZ	PRIA EEZ	
2015	33.0	14.3	0.3	47.6
2016	38.6	12.5	0.1	51.1
2017	40.5	13.0	0.0	53.6
2018	43.1	15.4	0.0	58.6
2019	49.1	14.3	0.0	63.4
2020	44.8	14.9	0.0	59.7
2021	41.6	23.8	0.0	65.4
2022	46.8	16.6	0.0	63.4
2023	52.3	14.0	0.0	66.4
2024	49.5	16.5	0.0	65.9
Average	43.94	15.53	0.05	59.51
SD	5.80	3.19	0.10	6.67

Table A-90. Supporting Data for Figure 89. Catch and revenue for the Hawai'i-permitted deep-set longline fishery, 2015-2024.

Year	Catch (1,000 lbs)	Nominal revenue (\$1,000)
2015	32,045	\$91,329
2016	31,476	\$99,191
2017	32,759	\$96,230
2018	32,407	\$101,343
2019	32,018	\$92,430
2020	27,255	\$71,442
2021	26,941	\$109,358
2022	24,685	\$105,608
2023	26,057	\$101,310
2024	29,400	\$98,379
Average	29,504.4	\$96,661.9
SD	3,026.5	\$10,417.2

Table A-91. Supporting Data for

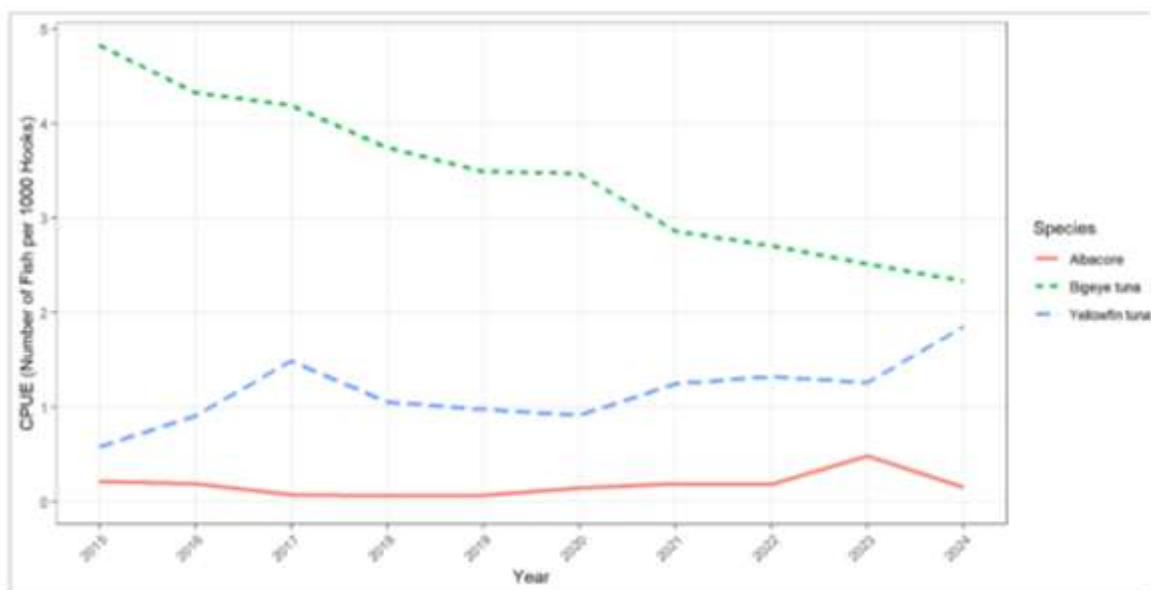


Figure 90. Tuna CPUE for the Hawaii-permitted deep-set longline fishery

Year	Deep-set longline CPUE (fish per 1,000 hooks)		
	Bigeye tuna	Yellowfin tuna	Albacore
2015	4.8	0.6	0.2
2016	4.3	0.9	0.2
2017	4.2	1.5	0.1
2018	3.7	1.1	0.1
2019	3.5	1.0	0.1
2020	3.5	0.9	0.1
2021	2.9	1.2	0.2
2022	2.7	1.3	0.2
2023	2.5	1.3	0.5
2024	2.3	1.9	0.2
Average	3.45	1.16	0.18
SD	0.84	0.36	0.12

Table A-92. Supporting Data for Figure 91. Billfish CPUE for the Hawai'i-permitted deep-set longline fishery, 2015-2024.

Year	Deep-set longline CPUE (fish per 1,000 hooks)		
	Swordfish	Striped marlin	Blue marlin
2015	0.1	0.3	0.2
2016	0.1	0.2	0.1
2017	0.1	0.2	0.1
2018	0.1	0.3	0.1
2019	0.1	0.3	0.2
2020	0.1	0.2	0.1
2021	0.1	0.1	0.1
2022	0.1	0.2	0.1
2023	0.1	0.1	0.1
2024	0.1	0.4	0.2
Average	0.08	0.24	0.14
SD	0.02	0.08	0.04

Table A-93. Supporting Data for Figure 92. Blue shark CPUE for the Hawaii-permitted deep-set longline fishery

Year	Deep-set CPUE (fish per 1000 hooks)
	Blue shark
2015	1.4
2016	1.4
2017	1.6
2018	1.6
2019	1.8
2020	1.7
2021	1.5
2022	1.2
2023	1.1
2024	1.2
Average	1.46
SD	0.22

Table A-94. Supporting Data for Figure 93. Number of Hawaii-permitted shallow-set longline vessels and trips

Year	Shallow-set longline		
	Vessels	Trips	Sets
2015	22	69	1,130
2016	13	46	727
2017	20	70	994
2018	11	30	420
2019	14	25	284
2020	14	36	461
2021	17	57	703
2022	22	69	857
2023	23	71	853
2024	21	54	874
Average	17.7	52.7	730.3
SD	4.4	17.6	268.7

Table A-95. Supporting Data for Figure 94. Number of hooks set by the Hawai`i-permitted shallow-set longline fishery, 2015-2024.

Year	Number of hooks set by area (millions)			Total
	Outside EEZ	Hawaii EEZ	PRIA EEZ	
2015	1.1	0.1	0.0	1.3
2016	0.7	0.0	0.0	0.8
2017	1.0	0.1	0.0	1.1
2018	0.5	0.0	0.0	0.5
2019	0.4	0.0	0.0	0.4
2020	0.5	0.0	0.0	0.6
2021	0.8	0.1	0.0	0.9
2022	1.0	0.0	0.0	1.1
2023	1.1	0.0	0.0	1.1
2024	1.2	0.0	0.0	1.2
Average	0.82	0.04	0.00	0.88
SD	0.29	0.04	0.00	0.31

Table A-96. Supporting Data for Figure 95. Catch and revenue for the Hawaii-permitted shallow-set longline fishery

Year	Catch (1,000 lbs)	Nominal revenue (\$1,000)
2015	2,777	\$2,810
2016	1,850	\$2,486
2017	3,009	\$4,230
2018	1,438	\$1,538
2019	834	\$1,941
2020	1,070	\$1,294
2021	1,736	\$4,818
2022	2,537	\$9,851
2023	2,215	\$6,834
2024	1,979	\$4,536
Average	1,944.4	\$4,033.8
SD	711.7	\$2,679.2

Table A-97. Supporting Data for

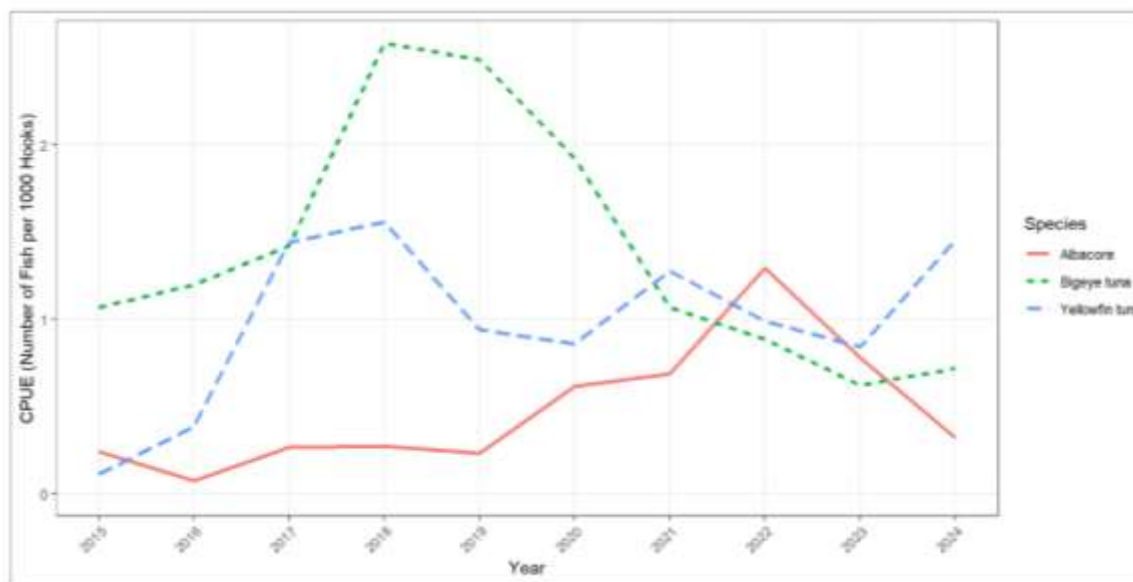


Figure 96. Tuna CPUE for the Hawaii-permitted shallow-set longline fishery

Year	Shallow-set longline CPUE (fish per 1,000 hooks)		
	Bigeye tuna	Yellowfin tuna	Albacore
2015	1.1	0.1	0.2
2016	1.2	0.4	0.1
2017	1.4	1.4	0.3
2018	2.6	1.6	0.3
2019	2.5	0.9	0.2
2020	1.9	0.9	0.6
2021	1.1	1.3	0.7
2022	0.9	1.0	1.3
2023	0.6	0.8	0.8
2024	0.7	1.5	0.3
Average	1.40	0.99	0.48
SD	0.70	0.47	0.37

Table A-98. Supporting Data for Figure 97. Billfish CPUE for the Hawaii-permitted shallow-set longline fishery

Year	Shallow-set longline CPUE (fish per 1,000 hooks)		
	Swordfish	Striped marlin	Blue marlin
2015	11.9	0.2	0.0
2016	12.4	0.4	0.1
2017	12.9	0.4	0.1
2018	12.2	0.1	0.0
2019	9.8	0.0	0.0
2020	7.9	0.1	0.0
2021	7.1	0.2	0.1
2022	8.9	0.4	0.0
2023	7.9	0.2	0.0
2024	7.2	0.1	0.0
Average	9.83	0.21	0.05
SD	2.32	0.14	0.04

Table A-99. Supporting Data for Figure 98. Blue shark CPUE for the Hawaii-permitted shallow-set longline fishery

Year	Shallow-set CPUE (fish per 1000 hooks)
	Blue shark
2015	10.0
2016	13.8
2017	9.0
2018	5.1
2019	8.5
2020	10.4
2021	5.9
2022	5.9
2023	6.3
2024	8.1
Average	8.30
SD	2.67

Table A-100. Supporting Data for Figure 99. Number of MHI troll fishers and days fished

Year	Fishers	Days fished
2015	1,624	26,070
2016	1,485	23,299
2017	1,418	21,507
2018	1,387	22,014
2019	1,294	20,489
2020	1,126	12,201
2021	1,187	16,409
2022	1,171	15,574
2023	1,156	14,579
2024	1,042	12,396
Average	1,289.0	18,453.8
SD	184.5	4,840.9

Table A-101. Supporting Data for Figure 100. Catch and revenue for the MHI troll fishery, 2015-2024.

Year	Catch (1,000 lbs)	Nominal revenue (\$1,000)
2015	3,099	\$7,703
2016	2,599	\$7,551
2017	2,234	\$6,371
2018	2,765	\$7,994
2019	2,482	\$7,363
2020	1,500	\$4,261
2021	1,830	\$6,633
2022	1,774	\$7,012
2023	1,603	\$6,093
2024	1,323	\$4,263
Average	2,121.0	\$6,524.4
SD	599.7	\$1,333.4

Table A-102. Supporting Data for Figure 101. Tuna CPUE for the MHI troll fishery

MHI troll tuna CPUE (pounds per day fished)				
Year	Albacore	Bigeye tuna	Skipjack tuna	Yellowfin tuna
2015	0.2	4.9	8.2	42.3
2016	0.1	3.2	11.1	44.4
2017	0.1	4.1	10.0	44.6
2018	0.1	2.7	8.4	56.7
2019	0.1	3.8	11.4	44.1
2020	0.1	3.3	14.1	53.1
2021	0.1	1.7	9.3	44.5
2022	0.1	1.8	14.3	49.3
2023	0.0	0.7	16.6	39.2
2024	0.4	1.1	17.1	27.9
Average	0.12	2.74	12.04	44.61
SD	0.11	1.37	3.27	7.85

Figure 102. Marlin CPUE for the MHI troll fishery

MHI troll marlin CPUE (pounds per day fished)		
Year	Blue marlin	Striped marlin
2015	15.1	0.9
2016	13.5	1.2
2017	14.3	0.6
2018	15.4	1.2
2019	16.3	1.4
2020	15.9	1.7
2021	15.1	1.1
2022	16.0	1.3
2023	13.2	0.9
2024	20.3	2.9
Average	15.51	1.32
SD	1.96	0.62

Table A-104. Supporting Data for Figure 103. Mahimahi and Ono CPUE for the MHI troll fishery

MHI troll mahimahi and ono CPUE (pounds per day fished)		
Year	Mahimahi	Ono (wahoo)
2015	28.2	16.1
2016	24.1	11.6
2017	19.5	8.8
2018	25.5	13.7
2019	26.8	15.8
2020	25.0	8.5
2021	22.2	16.3
2022	23.0	7.1
2023	25.4	12.4
2024	18.5	16.3
Average	23.82	12.66
SD	3.06	3.56

Table A-105. Supporting Data for Figure 104. Number of MHI handline fishers and days fished

Year	Fishers	Days fished
2015	528	4,859
2016	470	3,996
2017	491	4,735
2018	426	4,047
2019	439	3,677
2020	396	3,053
2021	383	3,388
2022	430	3,815
2023	371	2,847
2024	327	2,632
Average	426.1	3,704.9
SD	59.9	746.9

Table A-106. Supporting Data for Figure 105. Catch and revenue for the MHI handline fishery

Year	Catch (1,000 lbs)	Nominal revenue (\$1,000)
2015	1,202	\$2,910
2016	797	\$2,367
2017	992	\$2,897
2018	788	\$2,404
2019	686	\$2,292
2020	584	\$1,886
2021	686	\$2,837
2022	967	\$4,200
2023	573	\$2,713
2024	508	\$2,187
Average	778.3	\$2,669.2
SD	218.8	\$635.3

Table A-107. Supporting Data for Figure 106. Tuna CPUE for the MHI handline fishery

Year	MHI handline CPUE (pounds per day fished)			
	Albacore	Bigeye tuna	Skipjack tuna	Yellowfin tuna
2015	28.7	15.3	2.3	180.4
2016	13.3	23.4	2.7	137.8
2017	16.3	10.3	2.7	162.6
2018	11.0	7.5	2.8	157.2
2019	6.0	17.2	5.2	140.4
2020	2.2	13.1	3.6	161.2
2021	3.3	9.0	2.3	176.7
2022	3.0	12.1	2.5	226.7
2023	3.8	6.3	5.9	172.3
2024	24.2	8.5	3.6	144.0
Average	11.18	12.28	3.35	165.93
SD	9.42	5.20	1.25	26.01

Table A-108. Supporting Data for Figure 107. Number of offshore handline fishers and days fished

Year	Fishers	Days fished
2015	9	255
2016	6	182
2017	6	230
2018	5	217
2019	7	274
2020	5	258
2021	7	196
2022	6	255
2023	6	252
2024	5	140
Average	6.2	225.9
SD	1.2	42.2

Table A-109. Supporting Data for Figure 108. Catch and revenue for the offshore tuna handline fishery

Year	Catch (1,000 lbs)	Nominal revenue (\$1,000)
2015	407	\$792
2016	386	\$956
2017	324	\$873
2018	350	\$941
2019	477	\$1,131
2020	328	\$970
2021	257	\$833
2022	571	\$2,149
2023	348	\$1,573
2024	180	\$517
Average	362.9	\$1,073.5
SD	108.8	\$464.2

Table A-110. Supporting Data for Figure 109. Tuna CPUE for the offshore tuna handline fishery

Year	Offshore handline CPUE (pounds per day fished)			Total
	Bigeye tuna	Yellowfin tuna	Mahimahi	
2015	1,457	99	9	1,564
2016	1,788	309	3	2,100
2017	805	540	6	1,351
2018	1,048	527	7	1,582
2019	1,586	116	6	1,708
2020	1,083	170	5	1,257
2021	1,225	57	4	1,286
2022	1,886	321	16	2,224
2023	1,082	241	36	1,360
2024	1,031	222	14	1,267
Average	1,299.0	260.3	10.7	15,698.9
SD	360.5	167.9	9.9	348.1

TABLES FOR SECTION 3.3: SOCIOECONOMICS

Table A-111. Supporting Data for Figure 121

Labor force status	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total Employment	14,806	16,089	17,565	17,853	17,930	16,408	16,472	16,783	16,399	17,018	16,925
Total Government	5,258	6,198	6,556	6,804	6,585	5,849	5,498	6,195	6,614	6,877	7,224
Canneries	1,827	2,108	2,500	2,759	2,843	2,312	2,573	2,533	2,361	2,631	2,275
Other/Private Sector	7,721	7,783	8,509	8,290	8,502	8,247	8,401	8,055	7,424	7,510	7,426

Table A-112. Data for Figure 122

Year	Estimated total landings (million lb)	Estimated total value (million lb)	Revenue adjusted (millions)	Price-all species (\$/lb.)	Price-all species adjusted (\$/lb.)	CPI adjustor
2005	8.9	8.7	15.7	0.98	1.77	1.81
2006	12.7	12.2	21.4	0.96	1.68	1.76
2007	15.7	15.1	25.6	0.96	1.63	1.70
2008	10.0	9.6	14.7	0.96	1.47	1.54
2009	11.5	10.9	16.3	0.96	1.42	1.49

Year	Estimated total landings (million lb)	Estimated total value (million lb)	Revenue adjusted (millions)	Price-all species (\$/lb.)	Price-all species adjusted (\$/lb.)	CPI adjustor
2010	11.3	11.0	15.6	0.97	1.38	1.42
2011	7.9	9.0	11.7	1.13	1.49	1.31
2012	9.8	10.2	13.0	1.05	1.33	1.27
2013	6.1	6.4	8.0	1.04	1.30	1.25
2014	5.2	5.2	6.5	1.01	1.25	1.24
2015	5.6	5.7	7.1	1.02	1.27	1.25
2016	4.8	4.8	6.0	1.00	1.24	1.25
2017	5.1	5.4	6.6	1.06	1.29	1.22
2018	4.4	5.6	6.7	1.25	1.51	1.20
2019	3.1	4.2	5.0	1.35	1.62	1.20
2020	2.0	2.3	2.8	1.14	1.37	1.20
2021	2.6	3.2	3.5	1.21	1.33	1.10
2022	3.2	4.2	4.2	1.31	1.31	1.00
2023	2.8	3.2	3.2	1.17	1.17	1.00
2024	3.4	2.9	2.9	0.86	0.86	1.00

Data source: PIFSC Fishery Economic Performance Measures (Tier 1 indicators).

Table A-113. Supporting Data for Figure 123

Year	Albacore Price (\$/MT)	Albacore Price (\$/lb)	Yellowfin Price (\$/lb)	Wahoo Price (\$/lb)	Bigeye Price (\$/lb)	Skipjack Price (\$/lb)	Albacore Price (\$/MT adj)	Albacore Price (\$/lb adj)	CPI Adj.
2012	3,193	1.45	0.80	0.36	0.79	0.76	4,051	1.84	1.27
2013	2,254	1.02	0.88	0.43	0.74	0.81	2,806	1.27	1.25
2014	2,707	1.23	0.60	0.53	0.51	0.51	3,345	1.52	1.24
2015	2,651	1.20	0.62	0.54	0.57	0.53	3,306	1.50	1.25
2016	2,498	1.13	0.66	0.55	0.57	0.55	3,118	1.41	1.25
2017	2,559	1.16	0.88	0.80	0.79	0.79	3,130	1.42	1.22
2018	3,086	1.40	0.72	0.82	0.63	0.63	3,712	1.68	1.20
2019	3,542	1.61	0.61	0.53	0.52	1.09	4,254	1.93	1.20
2020	3,306	1.50	0.59	0.50	0.50	1.36	3,977	1.80	1.20
2021	3,212	1.46	0.64	0.54	0.54	1.36	3,524	1.60	1.10
2022	3,305	1.50	0.73	0.64	0.64	1.36	3,305	1.50	1.00
2023	3,057	1.39	0.80	0.71	0.71	1.36	3,057	1.39	1.00
2024	2,534	1.15	0.67	0.59	0.59	1.62	2,534	1.15	1

Table A-114. Supporting Data for Figure 124, Figure 125, and Figure 126

Year	Total Cost per Trip (\$)	Cost per Set (\$)	Cost per Set (\$ adj)	Rev. per set (\$)	Rev. per set (\$ adj)	Net rev. per set (\$)	Net rev. per set (\$ adj)	CPI Adjuster
2006	31,468	1,353	2,379	2,442	4,293	1,088	1,913	1.76
2007	45,253	963	1,633	2,564	4,348	1,601	2,716	1.70
2008	43,881	1,138	1,747	2,065	3,170	927	1,423	1.54
2009	32,942	848	1,260	2,325	3,455	1,477	2,195	1.49
2010	29,815	1,065	1,510	2,429	3,444	1,364	1,934	1.42
2011	30,916	1,189	1,559	2,388	3,131	1,199	1,572	1.31
2012	46,832	1,403	1,780	2,442	3,098	1,039	1,318	1.27
2013	50,792	1,448	1,801	1,999	2,486	551	685	1.24
2014	43,106	1,181	1,460	1,882	2,326	701	866	1.24
2015	42,468	1,034	1,289	2,148	2,678	1,114	1,389	1.25
2016	34,148	967	1,207	2,090	2,609	1,123	1,402	1.25
2017	34,223	913	1,116	2,195	2,684	1,282	1,568	1.22
2018	30,515	1,034	1,244	2,547	3,064	1,512	1,819	1.20
2019	44,728	1,246	1,496	2,482	2,981	1,236	1,484	1.20
2020	35,944	1,112	1,337	1,813	2,181	701	844	1.20
2021	38,803	964	1,058	2,092	2,295	1,128	1,237	1.10
2022	45,879	1,942	1,942	3,329	3,329	1,387	1,387	1.00
2023	45,341	1,719	1,719	2,838	2,838	1,119	1,119	1.00
2024	44,460	1,514	1,514	2,561	2,561	1,047	1,047	1.00

Table A-115. Supporting Data for Figure 127 and Figure 128

Year	Total Revenue per Day at Sea (\$/day)	Total Revenue per Day at Sea (\$/day adj)	Total Revenue per Vessel (\$/vessel)	Total Revenue per Vessel (\$/vessel adj)	Gini Coefficient	CPI Adjuster
2005	1,260	2,282	241,076	436,589	0.47	1.81
2006	1,768	3,107	434,627	764,074	0.29	1.76
2007	1,833	3,108	521,282	884,095	0.23	1.70
2008	1,325	2,034	329,312	505,494	0.35	1.54
2009	1,579	2,346	420,715	625,183	0.26	1.49
2010	1,691	2,397	423,488	600,505	0.28	1.42
2011	1,483	1,944	373,219	489,290	0.29	1.31
2012	1,671	2,120	392,702	498,339	0.34	1.27
2013	1,283	1,597	290,555	361,741	0.27	1.25
2014	1,283	1,585	227,031	280,611	0.42	1.24
2015	1,317	1,642	272,441	339,734	0.42	1.25

Year	Total Revenue per Day at Sea (\$/day)	Total Revenue per Day at Sea (\$/day adj)	Total Revenue per Vessel (\$/vessel)	Total Revenue per Vessel (\$/vessel adj)	Gini Coefficient	CPI Adjuster
2016	1,309	1,634	239,035	298,316	0.49	1.25
2017	1,501	1,835	358,431	438,361	0.33	1.22
2018	1,749	2,104	398,418	479,297	0.33	1.20
2019	1,329	1,596	232,018	278,653	0.60	1.20
2020	1,057	1,271	209,788	252,375	0.43	1.20
2021	1,520	1,668	264,664	290,337	0.41	1.10
2022	2,179	2,179	378,126	378,126	0.37	1.00
2023	1,682	1,682	323,164	323,164	0.51	1.00
2024	1,414	1,414	326,199	326,199	0.36	1.00

Table A-116. Supporting Data for Figure 129 and Figure 130

Year	Est. Pounds Caught (lb)	Est. Pounds Sold (lb)	% Sold	Est. Revenue (\$)	Est. Revenue (\$ adj)	Fish Price (\$/lb)	Fish Price (\$/lb adj)	CPI Adjuster
2005	43,134	850	2%	991	1,795	1.17	2.11	1.81
2006	58,095	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.76
2007	44,644	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.70
2008	84,262	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.54
2009	25,685	3,044	12%	3,069	4,561	1.01	1.50	1.49
2010	17,293	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.42
2011	76,961	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.31
2012	54,051	9,800	18%	13,294	16,870	1.36	1.73	1.27
2013	47,251	6,827	14%	9,936	12,360	1.46	1.82	1.24
2014	60,067	6,946	12%	10,128	12,518	1.46	1.80	1.24
2015	34,827	6,240	18%	12,577	15,684	2.02	2.52	1.25
2016	44,932	2,919	6%	6,670	8,324	2.29	2.86	1.25
2017	36,658	9,098	25%	25,047	30,632	2.75	3.36	1.22
2018	21,214	16,314	77%	49,597	59,665	3.04	3.66	1.20
2019	20,928	13,892	66%	38,246	45,933	2.75	3.30	1.20
2020	21,521	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.20
2021	29,106	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.10
2022	14,345	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.00
2023	5,695	5,010	88%	n.d.	10,469	2.09	2.09	1.00
2024	5,530	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.00

Table A-117. Supporting Data for Figure 131

Year	Total Trip Cost (\$)	Total Trip Cost (\$ adj)	Fuel Cost (\$ adj)	Ice Cost (\$ adj)	Bait Cost (\$ adj)	Gear Lost (\$ adj)	Fuel Price adj. (\$/gal)	CPI Adjuster
2011	85	112	106	-	0	5.74	5.63	1.311
2012	91	116	88	15	0	13.05	5.43	1.269
2013	86	107	82	17	0	7.54	5.26	1.245
2014	68	84	73	6	2	2.75	2.65	1.236
2015	78	98	78	17	0	2.70	2.73	1.247
2016	75	94	60	23	1	9.95	2.88	1.248
2017	98	120	91	25	1	3.26	2.87	1.223
2018	115	138	113	19	1	5.82	3.64	1.203
2019	120	144	103	26	1	13.78	3.67	1.201
2020	99	120	98	18	0	4.14	3.77	1.203
2021	140	154	127	20	0	6.97	3.78	1.097
2022	84	84	73	11	0	0.00	4.15	1
2023	39	39	32	5	0	3.20	4.35	1
2024	107	107	84	14	1.67	6.67	4.36	1

Table A-118. Supporting Data for Figure 132 and Figure 133

Year	Est. Pounds Caught (lb)	Est. Pounds Sold (lb)	Est. Revenue (\$)	Est. Revenue (\$ adj)	% of Pounds Sold	Fish Price (\$)	Fish Price (\$ adj)	CPI Adjuster
2005	538,419	372,375	678,773	1,052,098	69%	1.82	2.83	1.55
2006	596,369	356,706	568,872	777,648	60%	1.59	2.18	1.367
2007	656,501	312,554	439,953	582,498	48%	1.41	1.86	1.324
2008	609,075	219,187	359,427	470,130	36%	1.64	2.14	1.308
2009	405,750	190,796	323,778	397,600	47%	1.7	2.08	1.228
2010	587,427	188,906	335,518	388,530	32%	1.78	2.06	1.158
2011	385,737	121,118	234,444	262,343	31%	1.94	2.17	1.119
2012	489,687	160,883	324,934	348,654	33%	2.02	2.17	1.073
2013	484,318	263,556	555,803	599,711	54%	2.11	2.28	1.079
2014	421,812	235,104	542,205	590,461	56%	2.31	2.51	1.089
2015	537,652	188,623	431,847	484,532	35%	2.29	2.57	1.122
2016	457,501	223,004	497,524	560,212	49%	2.23	2.51	1.126
2017	572,556	224,531	524,317	561,543	39%	2.34	2.5	1.071
2018	539,037	221,341	534,415	584,116	41%	2.41	2.64	1.093
2019	498,379	176,633	460,324	489,324	35%	2.61	2.77	1.063

Year	Est. Pounds Caught (lb)	Est. Pounds Sold (lb)	Est. Revenue (\$)	Est. Revenue (\$ adj)	% of Pounds Sold	Fish Price (\$)	Fish Price (\$ adj)	CPI Adjuster
2020	309,444	153,547	354,815	381,781	50%	2.31	2.49	1.076
2021	407,990	306,952	748,886	805,801	75%	2.44	2.63	1.076
2022	261,952	234,105	721,584	753,334	89%	3.08	3.22	1.044
2023	126,556	148,664	448,968	448,968	117%	3.02	3.02	1
2024	84,333	99,415	267,191	267,191	118%	2.69	2.69	1

Table A-119. Supporting Data for Figure 134

Year	Total Trip Cost (\$)	Total Trip Cost (\$ adj)	Fuel Cost (\$ adj)	Ice Cost (\$ adj)	Bait Cost (\$ adj)	Gear Lost (\$ adj)	Fuel Price adj. (\$/gal)	CPI Adjuster
2009	73	80	70	9	-	0.85	3.66	1.095
2010	73	76	67	9	0.00	0.00	3.99	1.038
2011	81	82	74	7	0.00	1.19	4.68	1.014
2012	91	92	82	8	0.00	2.32	5.03	1.003
2013	96	99	91	8	0.08	0.00	5.13	1.029
2014	94	95	86	10	0.06	0.00	5.04	1.018
2015	79	84	74	10	0.00	0.00	4.31	1.061
2016	69	72	63	9	0.00	0.00	3.71	1.040
2017	73	74	65	8	0.00	0.19	3.98	1.010
2018	77	77	67	10	0.00	0.00	4.11	0.992
2019	76	76	66	9	0.00	0.00	3.95	1.002
2020	73	74	67	8	0.00	0.00	3.70	1.011
2021	94	95	84	11	0.00	0.00	4.71	1.001
2022	101	97	88	9	0.00	0.00	5.29	0.963
2023	88	88	79	8	0.00	0.00	5.41	1

*no update for 2024

Table A-120. Supporting Data for Figure 135 and Figure 136

Year	Est. Pounds Caught (lb)	Est. Pounds Sold (lb)	Est. Revenue (\$)	Est. Revenue (\$ adj)	% of Pounds Sold	Fish Price (\$)	Fish Price (\$ adj)	CPI Adjuster
2005	304,245	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	2.05
2006	520,866	199,352	310,625	571,238	0.38	1.56	2.87	1.84
2007	557,842	261,063	422,143	726,931	0.47	1.62	2.78	1.72
2008	512,266	139,670	246,769	400,012	0.27	1.77	2.86	1.62

Year	Est. Pounds Caught (lb)	Est. Pounds Sold (lb)	Est. Revenue (\$)	Est. Revenue (\$ adj)	% of Pounds Sold	Fish Price (\$)	Fish Price (\$ adj)	CPI Adjuster
2009	720,495	134,044	273,618	436,147	0.19	2.04	3.25	1.59
2010	743,415	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.55
2011	593,059	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.50
2012	502,306	118,038	244,382	355,087	0.23	2.07	3.01	1.45
2013	793,689	176,108	398,716	579,334	0.22	2.26	3.29	1.45
2014	807,936	121,632	242,719	350,001	0.15	2.00	2.88	1.44
2015	968,468	109,403	214,560	312,185	0.11	1.96	2.85	1.46
2016	890,934	100,551	216,029	296,392	0.11	2.15	2.95	1.37
2017	597,842	118,457	265,559	355,583	0.20	2.24	3.00	1.34
2018	857,132	97,019	231,632	302,279	0.11	2.39	3.12	1.31
2019	808,549	141,756	318,008	407,686	0.18	2.24	2.88	1.28
2020	624,253	74,756	180,840	227,858	0.12	2.42	3.05	1.26
2021	858,356	51,033	120,945	146,827	0.06	2.37	2.88	1.21
2022	623,889	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.13
2023	714,026	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.04
2024	699,118	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1.00

Table A-121. Supporting Data for Figure 137

Year	Total Trip Cost (\$)	Total Trip Cost (\$ adj)	Fuel Cost (\$ adj)	Ice Cost (\$ adj)	Bait Cost (\$ adj)	Gear Lost (\$ adj)	Fuel Price adj. (\$/gal)	CPI Adjuster
2011	96	143	107	15	6	15	6.84	1.496
2012	112	163	104	16	7	36	6.97	1.451
2013	92	134	92	17	1	25	6.93	1.451
2014	100	144	91	16	5	32	6.73	1.440
2015	91	133	69	16	10	38	5.56	1.454
2016	76	105	58	14	5	28	4.89	1.372
2017	99	133	62	27	13	31	5.12	1.339
2018	109	143	79	24	16	23	5.38	1.305
2019	94	121	68	21	2	30	5.24	1.283
2020	83	105	64	17	1	24	4.71	1.261
2021	101	123	79	20	1	22	5.32	1.214
2022	92	104	93	11	0	0	5.78	1.126
2023	77	80	69	7	0	3	5.39	1.036
2024	79	79	73	6	0	0	5.12	1

Table A-122. Supporting Data for Figure 135

Year	Estimated total landings (million lb)	Estimated total value (\$ million)	Pounds sold in Hawaii markets (million lb)	Revenue from Hawaii markets (\$ million)	Revenue from Hawaii markets (\$ million adj)	Price (\$/lb)	Price adjusted (\$/lb)	CPI Adjuster
2005	23.4	60.6	19.0	58.4	100.4	3.08	5.29	1.72
2006	21.5	55.9	17.6	53.8	87.4	3.06	4.98	1.625
2007	24.7	65.8	20.3	64.1	99.4	3.16	4.90	1.55
2008	26.9	74.5	21.8	72.0	107.0	3.31	4.92	1.486
2009	22.1	59.1	18.4	58.1	85.9	3.16	4.67	1.479
2010	23.8	72.1	19.5	69.6	100.7	3.57	5.17	1.448
2011	26.5	83.3	21.2	78.5	109.6	3.71	5.18	1.396
2012	26.1	96.5	21.3	92.4	126.1	4.33	5.91	1.364
2013	27.3	92.6	22.7	88.4	118.5	3.90	5.23	1.34
2014	29.8	87.3	23.9	82.8	109.4	3.46	4.57	1.321
2015	34.4	102.4	27.1	94.0	123.0	3.47	4.53	1.308
2016	33.1	110.7	26.3	102.1	130.9	3.88	4.98	1.282
2017	35.6	108.5	28.4	101.0	126.4	3.56	4.46	1.251
2018	33.6	109.5	26.6	101.5	124.6	3.81	4.68	1.228
2019	32.3	99.0	26.0	93.3	112.7	3.59	4.33	1.208
2020	27.5	80.1	21.1	72.2	85.9	3.42	4.07	1.189
2021	28.0	119.8	22.8	114.9	131.6	5.03	5.77	1.146
2022	26.6	117.9	21.6	113.8	122.5	5.26	5.66	1.076
2023	27.5	109.7	22.3	106.6	111.3	4.77	4.98	1.044
2024	31.0	104.5	25.3	102.9	102.9	4.07	4.07	1

Data source: PIFSC Fishery Economic Performance Measures (Tier 1 indicators).

Table A-123. Supporting Data for Figure 139

Year	Bigeye Price (\$/lb)	Bigeye Price (\$/lb adj)	Yellowfin Price (\$/lb)	Yellowfin Price (\$/lb adj)	Swordfish Price (\$/lb)	Swordfish Price (\$/lb adj)
2005	3.36	5.78	2.58	4.44	2.24	3.84
2006	3.48	5.65	2.74	4.46	1.97	3.21
2007	3.32	5.15	2.28	3.54	2.17	3.36
2008	3.82	5.67	2.83	4.21	1.78	2.64
2009	3.75	5.55	2.85	4.22	1.95	2.88
2010	4.08	5.91	3.21	4.65	2.43	3.51
2011	4.26	5.94	3.03	4.23	2.63	3.68

Year	Bigeye Price (\$/lb)	Bigeye Price (\$/lb adj)	Yellowfin Price (\$/lb)	Yellowfin Price (\$/lb adj)	Swordfish Price (\$/lb)	Swordfish Price (\$/lb adj)
2012	4.82	6.57	3.96	5.41	2.89	3.94
2013	4.43	5.93	4.25	5.70	3.07	4.11
2014	3.85	5.09	3.76	4.97	2.12	2.81
2015	3.85	5.03	2.99	3.91	2.46	3.22
2016	4.18	5.36	2.92	3.74	2.96	3.79
2017	3.86	4.83	2.79	3.49	2.38	2.97
2018	4.20	5.15	3.63	4.45	2.09	2.57
2019	3.89	4.69	3.43	4.14	2.65	3.21
2020	3.43	4.08	3.05	3.63	2.55	3.04
2021	5.08	5.82	4.11	4.71	2.93	3.36
2022	5.24	5.64	4.19	4.50	3.41	3.67
2023	4.95	5.17	3.78	3.94	2.92	3.05
2024	4.18	4.18	3.65	3.65	2.42	2.42

Table A-124. Supporting Data for Figure 140

Year	Est. Kept Value (\$)	Est. Bigeye Kept Value (\$)	Est. Yellowfin Kept Value (\$)	Est. Swordfish Kept Value (\$)	Est. Others Kept Value (\$)	% bigeye	% yellowfin	% swordfish	% others
2005	60,624,497	37,166,905	4,120,645	7,877,437	11,459,510	61%	7%	13%	19%
2006	55,853,762	33,857,353	5,731,074	5,084,768	11,180,568	61%	10%	9%	20%
2007	65,836,040	42,208,056	4,272,917	8,298,317	11,056,750	64%	6%	13%	17%
2008	74,537,597	49,877,959	5,479,032	7,792,301	11,388,305	67%	7%	10%	15%
2009	59,096,104	38,515,167	3,001,797	7,840,792	9,738,348	65%	5%	13%	16%
2010	72,122,962	48,635,042	3,923,402	8,948,693	10,615,825	67%	5%	12%	15%
2011	83,338,231	53,366,379	6,271,548	9,265,500	14,434,805	64%	8%	11%	17%
2012	96,463,778	62,223,867	7,731,132	9,049,944	17,458,836	65%	8%	9%	18%
2013	92,600,987	62,979,020	6,793,581	8,574,965	14,253,421	68%	7%	9%	15%
2014	87,317,440	60,271,041	5,388,558	7,796,655	13,861,186	69%	6%	9%	16%
2015	102,444,972	73,242,543	5,850,355	8,216,373	15,135,701	71%	6%	8%	15%
2016	110,681,078	75,641,255	9,542,693	7,118,299	18,378,831	68%	9%	6%	17%
2017	108,485,554	67,678,779	15,901,494	8,476,775	16,428,506	62%	15%	8%	15%
2018	109,466,804	69,552,302	19,835,293	4,856,715	15,222,494	64%	18%	4%	14%
2019	98,979,629	65,041,301	15,237,151	4,235,261	14,465,916	66%	15%	4%	15%
2020	80,072,024	55,092,012	11,023,903	4,060,707	9,895,404	69%	14%	5%	12%
2021	119,811,233	76,824,245	22,259,726	6,253,326	14,473,936	64%	19%	5%	12%
2022	117,910,116	72,175,969	21,683,156	9,804,036	14,246,956	61%	18%	8%	12%
2023	109,695,062	67,533,059	22,708,083	7,840,216	11,613,704	62%	21%	7%	11%
2024	104,489,590	56,001,838	33,275,251	5,418,096	9,794,405	54%	32%	5%	9%

Table A-125. Supporting Data for Figure 143

Year	Total Trip Cost (\$ adj)	Fuel Cost (\$ adj)	Other Costs (\$ adj)	Trip Days	CPI Adjuster
2005	14,330	14,259	28,589	18.5	210
2006	15,703	14,418	30,121	20.3	189
2007	16,077	13,943	30,020	20.5	182
2008	23,616	14,480	38,097	21.6	174
2009	15,462	15,711	31,202	23.6	141
2010	18,092	15,262	33,691	23.5	134
2011	22,880	16,424	39,315	23.2	148
2012	23,878	17,050	40,928	23.2	148
2013	22,088	17,006	39,214	22.9	149
2014	22,000	17,398	39,398	23.4	162
2015	16,208	17,558	33,841	21.7	147
2016	13,804	17,365	31,170	22.3	141
2017	13,202	16,559	29,762	20.9	152
2018	15,796	15,914	31,709	20.8	165
2019	16,527	16,367	32,894	21.5	182
2020	12,777	17,159	29,951	20.8	120
2021	15,955	16,232	28,843	21	145
2022	21,245	16,156	37,401	23.3	144
2023	19,098	15,924	35,022	22.6	116
2024	17,576	14,785	32,361	21.8	110

Table A-126. Supporting Data for Figure 144

Year	Total Trip Cost (\$ adj)	Fuel Cost (\$ adj)	Other Costs (\$ adj)	Trip Days	CPI Adjuster
2005	28,626	30,832	59,459	28	57
2006	29,754	30,483	60,237	31	44
2007	32,472	29,498	61,970	33	62
2008	45,404	30,037	75,441	33	67
2009	27,373	28,814	56,187	32	68
2010	33,828	26,654	60,483	33	85
2011	49,631	29,326	78,957	33	65
2012	48,220	30,403	78,623	35	51
2013	38,619	28,031	66,650	31	35
2014	39,394	29,136	68,530	32	53

Year	Total Trip Cost (\$ adj)	Fuel Cost (\$ adj)	Other Costs (\$ adj)	Trip Days	CPI Adjuster
2015	27,088	27,785	54,872	33	55
2016	21,962	29,309	51,271	31	21
2017	21,592	25,638	47,230	27	34
2018	26,912	28,851	55,763	33	19
2019	21,853	21,752	43,605	27	17
2020	25,740	25,366	51,106	28	15
2021	20,639	21,533	42,172	25	30
2022	28,230	21,576	49,807	26	42
2023	28,651	22,907	51,558	28	37
2024	29,638	24,734	54,371	31	31

Table A-127. Supporting Data for Figure 145

Year	Trip Cost (\$)	Trip Revenue (\$)	Trip Revenue (\$ adj)	Trip Net Revenue (\$)	Trip Net Revenue (\$ adj)	CPI Adjuster
2005	16,621	28,589	38,162	65,638	21,540	37,050
2006	18,536	30,121	38,443	62,470	19,907	32,349
2007	19,368	30,020	41,099	63,704	21,732	33,684
2008	25,637	38,097	51,084	75,910	25,446	37,813
2009	21,077	31,173	43,216	63,917	22,139	32,714
2010	23,034	33,354	56,194	81,369	33,159	47,677
2011	28,142	39,315	58,598	81,861	30,455	42,546
2012	30,006	40,928	68,629	93,610	38,623	52,681
2013	29,175	39,094	64,165	85,981	34,990	46,767
2014	29,824	39,398	61,565	81,327	31,741	41,929
2015	25,824	33,753	67,022	87,598	41,198	53,757
2016	24,313	31,170	77,368	99,186	53,055	68,016
2017	23,790	29,762	67,065	83,898	43,274	54,136
2018	25,822	31,709	66,676	81,878	40,854	50,168
2019	27,230	32,894	58,959	71,223	31,729	38,329
2020	25,169	29,951	50,190	59,726	25,021	29,775
2021	28,093	32,195	71,297	81,706	43,204	44,569
2022	34,759	37,401	75,416	81,148	40,657	43,747
2023	33,546	35,022	68,841	71,870	35,295	36,848
2024	32,361	32,361	63,810	63,810	31,449	31,449

Table A-128. Supporting Data for Figure 146

Year	Trip costs (\$)	Total trip rev	Trip costs adjusted (\$)	Revenue adjusted (\$)	Net revenue adjusted (\$)	CPI Adjustor
2005	34,569	76,272	59,459	131,188	71,729	1.72
2006	37,069	78,840	60,237	128,115	67,878	1.625
2007	39,980	88,847	61,970	137,713	75,743	1.55
2008	50,768	86,709	75,441	128,849	53,408	1.486
2009	37,990	69,182	56,187	102,320	46,133	1.479
2010	41,770	72,601	60,483	105,126	44,643	1.448
2011	56,519	103,466	78,957	144,542	65,585	1.397
2012	57,641	102,568	78,623	139,903	61,280	1.364
2013	49,739	106,305	66,650	142,448	75,798	1.34
2014	51,878	86,970	68,530	114,888	46,357	1.321
2015	41,983	78,048	54,872	102,008	47,136	1.307
2016	39,993	112,978	51,271	144,837	93,566	1.282
2017	37,754	108,788	47,230	136,093	88,864	1.251
2018	45,409	109,863	55,763	134,912	79,150	1.228
2019	36,097	107,843	43,605	130,274	86,669	1.208
2020	42,946	86,264	51,106	102,654	51,548	1.19
2021	36,799	96,623	42,172	110,730	68,558	1.146
2022	46,289	168,059	49,807	180,832	131,025	1.076
2023	49,385	105,327	51,558	109,962	58,403	1.044
2024	54,371	91,041	54,371	91,041	36,670	1

Table A-129. Supporting Data for Figure 147 and Figure 148

Year	Revenue per-trip (\$/trip)	Revenue per-trip adjusted (\$/trip)	Revenue per-day (\$/day)	Revenue per-day adjusted (\$/day)	Annual revenue per vessel (\$)	Annual revenue per vessel adjusted (\$)	Gini coefficient	CPI adjustor
2005	39,062	67,187	2,096	3,604	484,996	834,193	0.218	1.720
2006	38,680	62,855	1,964	3,191	439,793	714,664	0.235	1.625
2007	43,456	67,357	2,045	3,170	510,357	791,053	0.202	1.550
2008	50,568	75,144	2,313	3,437	577,811	858,627	0.215	1.486
2009	43,294	64,032	1,866	2,760	465,324	688,214	0.226	1.479
2010	54,597	79,057	2,287	3,311	581,637	842,210	0.221	1.448
2011	59,956	83,698	2,652	3,702	646,033	901,862	0.218	1.396
2012	66,849	91,183	2,943	4,015	747,781	1,019,974	0.193	1.364
2013	64,262	86,111	2,792	3,741	685,933	919,151	0.220	1.340
2014	61,018	80,605	2,624	3,466	623,696	823,902	0.225	1.321

Year	Revenue per-trip (\$/trip)	Revenue per-trip adjusted (\$/trip)	Revenue per-day (\$/day)	Revenue per-day adjusted (\$/day)	Annual revenue per vessel (\$)	Annual revenue per vessel adjusted (\$)	Gini coefficient	CPI adjustor
2015	67,710	88,564	3,056	3,997	726,560	950,341	0.219	1.308
2016	72,721	93,228	3,269	4,191	784,972	1,006,334	0.211	1.282
2017	67,634	84,611	3,147	3,937	753,372	942,468	0.200	1.251
2018	65,706	80,687	3,092	3,798	770,893	946,657	0.199	1.228
2019	57,148	69,034	2,678	3,234	677,943	818,955	0.180	1.208
2020	48,440	57,596	2,321	2,759	556,056	661,150	0.219	1.189
2021	69,658	79,828	3,342	3,830	837,841	960,166	0.203	1.146
2022	74,769	80,451	3,385	3,643	818,820	881,051	0.215	1.076
2023	66,887	69,830	2,949	3,079	746,225	779,059	0.167	1.044
2024	62,531	62,531	2,843	2,843	710,814	710,814	0.171	1

Table A-130. Supporting Data for Figure 149, Figure 150, Figure 154, Figure 155, Figure 156, and Figure 157

Year	Troll lb Kept	MHI Handline lb Kept	Offshore Handline lb Kept	Others lb Kept	Aku Boat lb Kept	Troll lb Sold	MHI Handline lb Sold	Offshore Handline lb Sold	Others lb Sold	Aku Boat lb Sold
2005	2,605,415	1,223,122	424,210	189,940	904,729	2,041,832	1,122,405	222,738	115,143	921,759
2006	2,590,949	801,476	502,765	273,090	630,590	1,942,636	660,135	280,554	173,778	655,735
2007	2,838,518	949,837	598,687	279,449	643,029	2,003,353	740,916	331,025	179,696	640,107
2008	2,976,988	686,237	325,433	293,628	702,193	2,037,864	522,670	232,856	222,178	696,977
2009	2,962,381	1,063,594	306,922	156,145	506,695	2,032,030	801,006	221,498	114,848	509,769
2010	2,857,486	929,717	615,316	235,169	114,320	1,985,285	738,725	537,959	201,618	113,525
2011	2,984,978	1,119,883	614,733	247,663	358,187	2,017,973	841,634	461,697	187,089	369,687
2012	3,671,896	1,609,266	590,123	322,838	109,563	2,612,737	1,320,317	472,479	257,354	109,364
2013	3,201,290	1,309,552	835,410	308,294	233,275	2,395,280	1,081,399	743,874	272,190	233,292
2014	3,490,512	1,167,585	417,010	132,028	47,648	2,720,280	981,747	327,058	108,530	56,390
2015	3,094,132	1,198,665	407,075	151,028	31,517	2,394,176	1,004,297	328,964	122,208	25,607
2016	2,594,727	795,355	386,290	65,349	1,521	2,125,350	707,698	361,983	61,195	478
2017	2,230,479	989,701	323,700	74,969	16,434	1,799,828	858,984	286,686	64,174	15,593
2018	2,762,223	786,965	349,723	99,810	4,019	2,204,570	666,786	295,634	83,337	3,922
2019	2,480,164	685,164	476,898	130,650	NULL	2,029,026	622,607	397,623	112,548	NULL
2020	1,498,570	582,749	328,425	112,691	NULL	1,208,821	524,232	344,679	112,443	NULL
2021	1,829,638	684,962	256,969	179,848	NULL	1,497,223	639,340	267,994	176,631	NULL
2022	1,773,911	966,318	571,035	310,765	NULL	1,505,832	897,297	599,949	314,482	NULL
2023	1,602,922	572,820	347,945	191,298	NULL	1,290,519	529,693	378,862	197,301	NULL
2024	1,322,627	508,007	180,289	230,390	NULL	986,529	474,329	142,899	196,377	NULL

Table A-131. Supporting Data for Figure 151, Figure 154, Figure 155, Figure 156, and Figure 157

Year	Troll Revenue	MHI Handline Revenue	Offshore Handline Revenue	Others Revenue	Aku Boat Revenue	Troll Adjusted Revenue	MHI Handline Adjusted Revenue	Offshore Handline Adjusted Revenue	Others Adjusted Revenue	Aku Boat Adjusted Revenue	CPI adjustor
2005	4,942,069	2,111,779	481,306	249,625	1,073,828	8,465,765	3,617,477	824,477	427,607	1,839,468	1.713
2006	4,995,694	1,425,268	539,240	383,182	878,864	8,282,861	2,363,095	894,060	635,315	1,457,157	1.658
2007	5,310,730	1,506,553	630,916	371,466	671,832	8,486,547	2,407,471	1,008,203	593,603	1,073,588	1.598
2008	5,234,010	1,348,929	527,932	518,735	866,873	7,898,122	2,035,533	796,649	782,771	1,308,112	1.509
2009	5,023,406	1,714,376	424,674	241,325	681,289	7,233,705	2,468,702	611,530	347,508	981,057	1.44
2010	5,465,395	1,876,576	1,191,546	464,922	210,682	7,547,710	2,591,551	1,645,524	642,058	290,951	1.381
2011	6,063,878	2,189,553	1,167,044	493,311	607,295	8,331,768	3,008,446	1,603,519	677,810	834,424	1.374
2012	9,000,654	3,510,982	1,441,714	802,119	230,235	12,114,881	4,725,782	1,940,546	1,079,653	309,897	1.346
2013	7,423,961	3,241,943	1,816,264	692,705	456,267	9,628,877	4,204,800	2,355,695	898,438	591,778	1.297
2014	8,342,685	2,950,764	826,835	298,684	102,352	10,570,182	3,738,618	1,047,599	378,432	129,680	1.267
2015	7,701,217	2,904,962	791,461	329,319	71,569	9,588,015	3,616,678	985,369	410,003	89,103	1.245
2016	7,550,275	2,364,724	956,080	181,293	1,035	9,264,188	2,901,517	1,173,111	222,446	1,270	1.227
2017	6,369,541	2,893,301	873,230	215,332	32,035	7,738,993	3,515,361	1,060,974	261,628	38,923	1.215
2018	7,993,273	2,403,032	940,736	298,207	12,768	9,519,989	2,862,011	1,120,417	355,165	15,207	1.191
2019	7,362,112	2,290,337	1,130,572	368,598	n.d.	8,554,775	2,661,372	1,313,724	428,311	n.d.	1.162
2020	4,260,295	1,882,455	970,035	348,794	n.d.	4,860,996	2,147,881	1,106,810	397,974	n.d.	1.141
2021	6,633,070	2,835,354	833,273	658,091	n.d.	7,442,305	3,181,267	934,932	738,378	n.d.	1.122
2022	7,011,499	4,197,905	2,149,380	1,274,318	n.d.	7,747,706	4,638,685	2,375,065	1,408,122	n.d.	1.105
2023	6,092,718	2,712,202	1,573,219	869,586	n.d.	6,488,744	2,888,496	1,675,478	926,109	n.d.	1.065
2024	4,262,465	2,186,376	517,066	869,392	n.d.	4,262,465	2,186,376	517,066	869,392	n.d.	1

Table A-132. Supporting Data for Figure 152

Year	MHI troll price (\$/lb), adjusted	MHI handline price (\$/lb), adjusted	Offshore price (\$/lb), adjusted	Other gears price (\$/lb), adjusted
2004	3.70	3.11	3.01	3.02
2005	3.99	3.10	3.56	3.57
2006	4.00	3.36	2.99	3.43
2007	3.94	3.02	2.83	3.07
2008	3.66	3.68	3.23	3.32
2009	3.50	3.03	2.72	2.98
2010	3.82	3.53	3.07	3.20
2011	4.02	3.48	3.38	3.53
2012	4.50	3.48	3.99	4.07
2013	3.98	3.85	3.14	3.27
2014	3.88	3.80	3.20	3.48

2015	4.03	3.62	3.01	3.38
2016	4.37	4.11	3.25	3.64
2017	4.24	4.04	3.65	4.02
2018	4.26	4.24	3.74	4.21
2019	4.22	4.26	3.15	3.74
2020	4.02	4.09	3.21	3.54
2021	4.86	4.87	3.41	4.09
2022	4.83	4.81	3.31	3.94
2023	4.74	5.14	3.87	4.23

*no update for 2024

APPENDIX B: LIST OF PROTECTED SPECIES AND DESIGNATED CRITICAL HABITAT

Table B-1. Protected species found or reasonably believed to be found near or in Hawaii shallow-set longline waters

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Seabirds					
Laysan Albatross	<i>Phoebastria immutabilis</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Black-Footed Albatross	<i>Phoebastria nigripes</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Short-Tailed Albatross	<i>Phoebastria albatrus</i>	Endangered	N/A	Breeding visitor in the NWHI	35 FR 8495, 65 FR 46643, Pyle & Pyle 2009
Northern Fulmar	<i>Fulmarus glacialis</i>	Not Listed	N/A	Winter resident	Pyle & Pyle 2009
Kermadec Petrel	<i>Pterodroma neglecta</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Herald Petrel	<i>Pterodroma arminjoniana</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Murphy's Petrel	<i>Pterodroma ultima</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Mottled Petrel	<i>Pterodroma inexpectata</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Juan Fernandez Petrel	<i>Pterodroma externa</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Hawaiian Petrel	<i>Pterodroma sandwichensis</i> (<i>Pterodroma phaeopygia sandwichensis</i>)	Endangered	N/A	Breeding visitor in the MHI	32 FR 4001, Pyle & Pyle 2009
White-Necked Petrel	<i>Pterodroma cervicalis</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Bonin Petrel	<i>Pterodroma hypoleuca</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
Black-Winged Petrel	<i>Pterodroma nigripennis</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Cook Petrel	<i>Pterodroma cookii</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Stejneger Petrel	<i>Pterodroma longirostris</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Pycroft Petrel	<i>Pterodroma pycrofti</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Bulwer Petrel	<i>Bulweria bulwerii</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Flesh-Footed Shearwater	<i>Ardenna carneipes</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Wedge-Tailed Shearwater	<i>Ardenna pacifica</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Buller's Shearwater	<i>Ardenna bulleri</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Sooty Shearwater	<i>Ardenna grisea</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Short-Tailed Shearwater	<i>Ardenna tenuirostris</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Christmas Shearwater	<i>Puffinus nativitatis</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Newell's Shearwater	<i>Puffinus newelli</i> (<i>Puffinus auricularis newelli</i>)	Threatened	N/A	Breeding visitor	40 FR 44149, Pyle & Pyle 2009
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>	Not Listed	N/A	Winter resident	Pyle & Pyle 2009
Band-Rumped Storm-Petrel	<i>Oceanodroma castro</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Tristram Storm-Petrel	<i>Oceanodroma tristrami</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
White-Tailed Tropicbird	<i>Phaethon lepturus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Red-Tailed Tropicbird	<i>Phaethon rubricauda</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Masked Booby	<i>Sula dactylatra</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Brown Booby	<i>Sula leucogaster</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Red-Footed Booby	<i>Sula sula</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Great Frigatebird	<i>Fregata minor</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Lesser Frigatebird	<i>Fregata ariel</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Laughing Gull	<i>Leucophaeus atricilla</i>	Not Listed	N/A	Winter resident in the MHI	Pyle & Pyle 2009
Franklin Gull	<i>Leucophaeus pipixcan</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Ring-Billed Gull	<i>Larus delawarensis</i>	Not Listed	N/A	Winter resident in the MHI	Pyle & Pyle 2009
Herring Gull	<i>Larus argentatus</i>	Not Listed	N/A	Winter resident in the NWHI	Pyle & Pyle 2009
Slaty-Backed Gull	<i>Larus schistisagus</i>	Not Listed	N/A	Winter resident in the NWHI	Pyle & Pyle 2009
Glaucous-Winged Gull	<i>Larus glaucescens</i>	Not Listed	N/A	Winter resident	Pyle & Pyle 2009
Brown Noddy	<i>Anous stolidus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Black Noddy	<i>Anous minutus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Blue-Gray Noddy	<i>Procelsterna cerulea</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
White Tern	<i>Gygis alba</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Sooty Tern	<i>Onychoprion fuscatus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Gray-Backed Tern	<i>Onychoprion lunatus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Little Tern	<i>Sternula albifrons</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
Least Tern	<i>Sternula antillarum</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
Arctic Tern	<i>Sterna paradisaea</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
South Polar Skua	<i>Stercorarius maccormicki</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	Not Listed	N/A	Winter resident in the MHI	Pyle & Pyle 2009
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Long-Tailed Jaeger	<i>Stercorarius longicaudus</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Sea turtles					
Green Sea Turtle	<i>Chelonia mydas</i>	Threatened (Central North Pacific DPS)	N/A	Most common turtle in the Hawaiian Islands, much more common in nearshore State waters (foraging grounds) than offshore federal waters. Most nesting occurs on French Frigate Shoals in the NWHI. Foraging and haul out in the MHI.	43 FR 32800, 81 FR 20057, Balazs et al. 1992, Kolinski et al. 2001
Green Sea Turtle	<i>Chelonia mydas</i>	Threatened (East Pacific DPS)	N/A	Nest primarily in Mexico and the Galapagos Islands. Little known about their pelagic range west of 90°W but may range as far as the Marshall Islands. Genetic testing confirmed that they are incidentally taken in the HI DSLF fishery.	43 FR 32800, 81 FR 20057, WPRFMC 2009, Clifton et al. 1982, Karl & Bowen 1999
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	Endangered ^a	N/A	Small population foraging around Hawaii and low level nesting on Maui and Hawaii Islands. Occur worldwide in tropical and subtropical waters.	35 FR 8491, NMFS & USFWS 2007, Balazs et al. 1992, Katahira et al. 1994
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered ^a	N/A	Regularly sighted in offshore waters, especially at the southeastern end of the archipelago.	35 FR 8491, NMFS & USFWS 1997

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Loggerhead Sea Turtle	<i>Caretta caretta</i>	Endangered (North Pacific DPS)	N/A	Rare in Hawaii. Found worldwide along continental shelves, bays, estuaries, and lagoons of tropical, subtropical, and temperate waters.	43 FR 32800, 76 FR 58868, Dodd 1990, Balazs 1979
Olive Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	Threatened (Entire species, except for the breeding population on the Pacific coast of Mexico, which is listed as endangered)	N/A	Rare in Hawaii. Occurs worldwide in tropical and warm temperate ocean waters.	43 FR 32800, Pitman 1990, Balacz 1982
Marine mammals					
Blainville's Beaked Whale	<i>Mesoplodon densirostris</i>	Not Listed	Non-strategic	Found worldwide in tropical and temperate waters	Mead 1989
Blue Whale	<i>Balaenoptera musculus</i>	Endangered	Strategic	Acoustically recorded off of Oahu and Midway Atoll, small number of sightings around Hawaii. Considered extremely rare, generally occur in winter and summer.	35 FR 18319, Bradford et al. 2013, Northrop et al. 1971, Thompson & Friedl 1982, Stafford et al. 2001
Bottlenose Dolphin	<i>Tursiops truncatus</i>	Not Listed	Non-strategic	Distributed worldwide in tropical and warm-temperate waters. Pelagic stock distinct from island-associated stocks.	Perrin et al. 2009, Martien et al. 2012
Bryde's Whale	<i>Balaenoptera edeni</i>	Not Listed	Unknown	Distributed widely across tropical and warm-temperate Pacific Ocean.	Leatherwood et al. 1982
Common Dolphin	<i>Delphinus delphis</i>	Not Listed	N/A	Found worldwide in temperate and subtropical seas.	Perrin et al. 2009
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	Not Listed	Non-strategic	Occur year round in Hawaiian waters.	McSweeney et al. 2007
Dall's Porpoise	<i>Phocoenoides dalli</i>	Not Listed	Non-strategic	Range across the entire north Pacific Ocean.	Hall 1979
Dwarf Sperm Whale	<i>Kogia sima</i>	Not Listed	Non-strategic	Most common in waters between 500 m and 1,000 m in depth. Found worldwide in tropical and warm-temperate waters.	Nagorsen 1985, Baird et al. 2013
False Killer Whale	<i>Pseudorca crassidens</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters. Pelagic stock tracked to within 11 km of Hawaiian Islands.	Stacey et al. 1994, Baird et al. 2012, Bradford et al. 2015

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Fin Whale	<i>Balaenoptera physalus</i>	Endangered	Strategic	Infrequent sightings in Hawaii waters. Considered rare in Hawaii, though may migrate into Hawaiian waters during fall/winter based on acoustic recordings.	35 FR 18319, Hamilton et al. 2009, Thompson & Friedl 1982
Fraser's Dolphin	<i>Lagenodelphis hosei</i>	Not Listed	Non-strategic	Found worldwide in tropical waters.	Perrin et al. 2009
Guadalupe Fur Seal	<i>Arctocephalus townsendi</i>	Threatened	Strategic	Extremely rare sightings. Little known about their pelagic distribution. Breed mainly on Isla Guadalupe, Mexico.	50 FR 51252, Gallo-Reynoso et al. 2008, Fleischer 1987
Hawaiian Monk Seal	<i>Neomonachus schauinslandi</i>	Endangered ^a	Strategic	Endemic tropical seal. Occurs throughout the archipelago. MHI population spends some time foraging in federal waters during the day.	41 FR 51611, Baker et al. 2011
Humpback Whale	<i>Megaptera novaeangliae</i>	Delisted Due to Recovery (Hawaii DPS)	Strategic	Migrate through the archipelago and breed during the winter. Common during winter months when they are generally found within the 100 m isobath.	35 FR 18319, 81 FR 62259, Childerhouse et al. 2008, Wolman & Jurasz 1976, Herman & Antinaja 1977, Rice & Wolman 1978
Killer Whale	<i>Orcinus orca</i>	Not Listed	Non-strategic	Rare in Hawaii. Prefer colder waters within 800 km of continents.	Mitchell 1975, Baird et al. 2006
Longman's Beaked Whale	<i>Indopacetus pacificus</i>	Not Listed	Non-strategic	Found in tropical waters from the eastern Pacific westward through the Indian Ocean to the eastern coast of Africa. Rare in Hawaii.	Dalebout 2003, Baird et al. 2013
Melon-Headed Whale	<i>Peponocephala electra</i>	Not Listed	Non-strategic	Found in tropical and warm-temperate waters worldwide, found primarily in equatorial waters. Uncommon in Hawaii.	Perryman et al. 1994, Barlow 2006, Bradford et al. 2013
Minke Whale	<i>Balaenoptera acutorostrata</i>	Not Listed	Non-strategic	Occur seasonally around Hawaii	Barlow 2003, Rankin & Barlow 2005
North Pacific Right Whale	<i>Eubalaena japonica</i>	Endangered ^a	Strategic	Extremely rare in Hawaii waters	35 FR 18319, 73 FR 12024, Rowntree et al. 1980, Herman et al. 1980

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Northern Elephant Seal	<i>Mirounga angustirostris</i>	Not Listed	Non-strategic	Females migrate to central North Pacific to feed on pelagic prey.	Le Beouf et al. 2000
Northern Fur Seal	<i>Callorhinus ursinus</i>	Not Listed	Non-strategic	Occur throughout the North Pacific Ocean.	Gelatt et al. 2015
Pacific White-Sided Dolphin	<i>Lagenorhynchus obliquidens</i>	Not Listed	Non-strategic	Endemic to temperate waters of North Pacific Ocean. Occur both on the high seas and along continental margins.	Brownell et al. 1999
Pantropical Spotted Dolphin	<i>Stenella attenuata</i>	Not Listed	Non-strategic	Common and abundant throughout the Hawaiian archipelago. Pelagic stock occurs outside of insular stock areas (20 km for Oahu and 4-island stocks, 65 km for Hawaii Island stock).	Baird et al. 2013, Oleson et al. 2013
Pygmy Killer Whale	<i>Feresa attenuata</i>	Not Listed	Non-strategic	Small resident population in Hawaiian waters. Found worldwide in tropical and subtropical waters.	McSweeney et al. 2009, Ross & Leatherwood 1994
Pygmy Sperm Whale	<i>Kogia breviceps</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters.	Caldwell & Caldwell 1989
Risso's Dolphin	<i>Grampus griseus</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide.	Perrin et al. 2009
Rough-Toothed Dolphin	<i>Steno bredanensis</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide. Occasionally found offshore of Hawaii.	Perrin et al. 2009, Baird et al. 2013, Barlow 2006, Bradford et al. 2013
Sei Whale	<i>Balaenoptera borealis</i>	Endangered	Strategic	Rare in Hawaii. Generally found in offshore temperate waters.	35 FR 18319, Barlow 2003, Bradford et al. 2013
Short-Finned Pilot Whale	<i>Globicephala macrorhynchus</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide. Commonly observed around MHI and present around NWHI.	Shallenberger 1981, Baird et al. 2013, Bradford et al. 2013
Sperm Whale	<i>Physeter macrocephalus</i>	Endangered	Strategic	Found in tropical to polar waters worldwide, most abundant cetaceans in the region. Sighted off the NWHI and the MHI.	35 FR 18319, Rice 1960, Lee 1993, Barlow 2006, Mobley et al. 2000, Shallenberger 1981

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Spinner Dolphin	<i>Stenella longirostris</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters. Pelagic stock found outside of island-associated boundaries (10 nm).	Perrin et al. 2009
Striped Dolphin	<i>Stenella coeruleoalba</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters throughout the world.	Perrin et al. 2009
Elasmobranchs					
Giant manta ray	<i>Manta birostris</i>	Threatened	N/A	Found worldwide in tropical, subtropical, and temperate waters. Commonly found in upwelling zones, oceanic island groups, offshore pinnacles and seamounts, and on shallow reefs.	Dewar et al. 2008, Marshall et al. 2009, Marshall et al. 2011.
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	Threatened	N/A	Found worldwide in open ocean waters from the surface to 152 m depth. It is most commonly found in waters > 20°C	Bonfil et al. 2008, Backus et al. 1956, Strasburg 1958, Compagno 1984
Scalloped hammerhead shark	<i>Sphyrna lewini</i>	Endangered (Eastern Pacific DPS)	N/A	Found in coastal areas from southern California to Peru.	Compagno 1984, Baum et al. 2007, Bester 2011
Scalloped hammerhead	<i>Sphyrna lewini</i>	Threatened (Indo-West Pacific DPS)	N/A	Occur over continental and insular shelves, and adjacent deep waters, but rarely found in waters < 22°C. Range from the intertidal and surface to depths up to 450–512 m.	Compagno 1984, Schulze-Haugen & Kohler 2003, Sanches 1991, Klimley 1993
Corals					
N/A	<i>Acropora globiceps</i>	Threatened	N/A	Not confirmed in Hawaii waters. Occur on upper reef slopes, reef flats, and adjacent habitats in depths ranging from 0 to 8 m	Veron 2014
N/A	<i>Acropora jacquelineae</i>	Threatened	N/A	Not confirmed in Hawaii waters. Found in numerous subtidal reef slope and back-reef habitats, including but not limited to, lower reef slopes, walls and ledges, mid-slopes, and upper reef slopes protected from wave action, and depth range is 10 to 35 m.	Veron 2014

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
N/A	<i>Acropora retusa</i>	Threatened	N/A	Not confirmed in Hawaii waters. Occur in shallow reef slope and back-reef areas, such as upper reef slopes, reef flats, and shallow lagoons, and depth range is 1 to 5 m.	Veron 2014
N/A	<i>Acropora speciosa</i>	Threatened	N/A	Not confirmed in Hawaii waters. Found in protected environments with clear water and high diversity of <i>Acropora</i> and steep slopes or deep, shaded waters. Depth range is 12 to 40 meters and have been found in mesophotic habitat (40-150 m).	Veron 2014
N/A	<i>Euphyllia paradivisa</i>	Threatened	N/A	Not confirmed in Hawaii waters. Found in environments protected from wave action on at least upper reef slopes, mid-slope terraces, and lagoons in depths ranging from 2 to 25 m depth.	Veron 2014
N/A	<i>Isopora crateriformis</i>	Threatened	N/A	Not confirmed in Hawaii waters. Found in shallow, high-wave energy environments, from low tide to at least 12 meters deep, and have been reported from mesophotic depths (less than 50 m depth).	Veron 2014
N/A	<i>Seriatopora aculeata</i>	Threatened	N/A	Not confirmed in Hawaii waters. Found in broad range of habitats including, but not limited to, upper reef slopes, mid-slope terraces, lower reef slopes, reef flats, and lagoons, and depth ranges from 3 to 40 m.	Veron 2014
Invertebrates					
Chambered nautilus	<i>Nautilus pompilius</i>	Threatened	N/A	Found in small, isolated populations throughout the Indo-Pacific on steep-sloped forereefs with sandy, silty, or muddy bottom substrates from depths of 100 m to 500 m.	83 FR 48948, CITES 2016

^a These species have critical habitat designated under the ESA. See Table B-4.

Table B-2. Protected species found or reasonably believed to be found near or in Hawaii deep-set longline waters

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Seabirds					
Laysan Albatross	<i>Phoebastria immutabilis</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Black-Footed Albatross	<i>Phoebastria nigripes</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Short-Tailed Albatross	<i>Phoebastria albatrus</i>	Endangered	N/A	Breeding visitor in the NWHI	35 FR 8495, 65 FR 46643, Pyle & Pyle 2009
Northern Fulmar	<i>Fulmarus glacialis</i>	Not Listed	N/A	Winter resident	Pyle & Pyle 2009
Kermadec Petrel	<i>Pterodroma neglecta</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Herald Petrel	<i>Pterodroma arminjoniana</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Murphy's Petrel	<i>Pterodroma ultima</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Mottled Petrel	<i>Pterodroma inexpectata</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Juan Fernandez Petrel	<i>Pterodroma externa</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Hawaiian Petrel	<i>Pterodroma sandwichensis</i> (<i>Pterodroma phaeopygia sandwichensis</i>)	Endangered	N/A	Breeding visitor in the MHI	32 FR 4001, Pyle & Pyle 2009
White-Necked Petrel	<i>Pterodroma cervicalis</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Bonin Petrel	<i>Pterodroma hypoleuca</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
Black-Winged Petrel	<i>Pterodroma nigripennis</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Cook Petrel	<i>Pterodroma cookii</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Stejneger Petrel	<i>Pterodroma longirostris</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Pycroft Petrel	<i>Pterodroma pycrofti</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Bulwer Petrel	<i>Bulweria bulwerii</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Wedge-Tailed Shearwater	<i>Ardenna pacifica</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Buller's Shearwater	<i>Ardenna bulleri</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Sooty Shearwater	<i>Ardenna grisea</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Short-Tailed Shearwater	<i>Ardenna tenuirostris</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Christmas Shearwater	<i>Puffinus nativitatis</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Newell's Shearwater	<i>Puffinus newelli</i> (<i>Puffinus auricularis newelli</i>)	Threatened	N/A	Breeding visitor	40 FR 44149, Pyle & Pyle 2009
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>	Not Listed	N/A	Winter resident	Pyle & Pyle 2009
Band-Rumped Storm-Petrel	<i>Oceanodroma castro</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Tristram Storm-Petrel	<i>Oceanodroma tristrami</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
White-Tailed Tropicbird	<i>Phaethon lepturus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Red-Tailed Tropicbird	<i>Phaethon rubricauda</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Masked Booby	<i>Sula dactylatra</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Nazca Booby	<i>Sula granti</i>	Not Listed	N/A	Vagrant	Pyle & Pyle 2009
Brown Booby	<i>Sula leucogaster</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Red-Footed Booby	<i>Sula</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Great Frigatebird	<i>Fregata minor</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Lesser Frigatebird	<i>Fregata ariel</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Laughing Gull	<i>Leucophaeus atricilla</i>	Not Listed	N/A	Winter resident in the MHI	Pyle & Pyle 2009
Franklin Gull	<i>Leucophaeus pipixcan</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Ring-Billed Gull	<i>Larus delawarensis</i>	Not Listed	N/A	Winter resident in the MHI	Pyle & Pyle 2009
Herring Gull	<i>Larus argentatus</i>	Not Listed	N/A	Winter resident in the NWHI	Pyle & Pyle 2009
Slaty-Backed Gull	<i>Larus schistisagus</i>	Not Listed	N/A	Winter resident in the NWHI	Pyle & Pyle 2009
Glaucous-Winged Gull	<i>Larus glaucescens</i>	Not Listed	N/A	Winter resident	Pyle & Pyle 2009
Brown Noddy	<i>Anous stolidus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Black Noddy	<i>Anous minutus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Blue-Gray Noddy	<i>Procelsterna cerulea</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
White Tern	<i>Gygis alba</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Sooty Tern	<i>Onychoprion fuscatus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009
Gray-Backed Tern	<i>Onychoprion lunatus</i>	Not Listed	N/A	Breeding visitor	Pyle & Pyle 2009

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Little Tern	<i>Sternula albifrons</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
Least Tern	<i>Sternula antillarum</i>	Not Listed	N/A	Breeding visitor in the NWHI	Pyle & Pyle 2009
Arctic Tern	<i>Sterna paradisaea</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
South Polar Skua	<i>Stercorarius maccormicki</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	Not Listed	N/A	Winter resident in the MHI	Pyle & Pyle 2009
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Long-Tailed Jaeger	<i>Stercorarius longicaudus</i>	Not Listed	N/A	Migrant	Pyle & Pyle 2009
Sea turtles					
Green Sea Turtle	<i>Chelonia mydas</i>	Threatened (Central North Pacific DPS)	N/A	Most common turtle in the Hawaiian Islands, much more common in nearshore State waters (foraging grounds) than offshore federal waters. Most nesting occurs on French Frigate Shoals in the NWHI. Foraging and haulout in the MHI.	43 FR 32800, 81 FR 20057, Balazs et al. 1992, Kolinski et al. 2001
Green Sea Turtle	<i>Chelonia mydas</i>	Threatened (East Pacific DPS)	N/A	Nest primarily in Mexico and the Galapagos Islands. Little known about their pelagic range west of 90°W but may range as far as the Marshall Islands. Genetic testing confirmed that they are incidentally taken in the HI DSLF fishery.	43 FR 32800, 81 FR 20057, WPRFMC 2009, Clifton et al. 1982, Karl & Bowen 1999
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	Endangered ^a	N/A	Small population foraging around Hawaii and low level nesting on Maui and Hawaii Islands. Occur worldwide in tropical and subtropical waters.	35 FR 8491, NMFS & USFWS 2007, Balazs et al. 1992, Katahira et al. 1994
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered ^a	N/A	Regularly sighted in offshore waters, especially at the southeastern end of the archipelago.	35 FR 8491, NMFS & USFWS 1997
Loggerhead Sea Turtle	<i>Caretta</i>	Endangered (North Pacific DPS)	N/A	Rare in Hawaii. Found worldwide along continental shelves, bays, estuaries, and lagoons of tropical, subtropical, and temperate waters.	43 FR 32800, 76 FR 58868, Dodd 1990, Balazs 1979

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Olive Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	Threatened (Entire species, except for the breeding population on the Pacific coast of Mexico, which is listed as endangered)	N/A	Rare in Hawaii. Occurs worldwide in tropical and warm temperate ocean waters.	43 FR 32800, Pitman 1990, Balacz 1982
Marine mammals					
Blainville's Beaked Whale	<i>Mesoplodon densirostris</i>	Not Listed	Non-strategic	Found worldwide in tropical and temperate waters	Mead 1989
Blue Whale	<i>Balaenoptera musculus</i>	Endangered	Strategic	Acoustically recorded off of Oahu and Midway Atoll, small number of sightings around Hawaii. Considered extremely rare, generally occur in winter and summer.	35 FR 18319, Bradford et al. 2013, Northrop et al. 1971, Thompson & Friedl 1982, Stafford et al. 2001
Bottlenose Dolphin	<i>Tursiops truncatus</i>	Not Listed	Non-strategic	Distributed worldwide in tropical and warm-temperate waters. Pelagic stock distinct from island-associated stocks.	Perrin et al. 2009, Martien et al. 2012
Bryde's Whale	<i>Balaenoptera edeni</i>	Not Listed	Unknown	Distributed widely across tropical and warm-temperate Pacific Ocean.	Leatherwood et al. 1982
Common Dolphin	<i>Delphinus delphis</i>	Not Listed	N/A	Found worldwide in temperate and subtropical seas.	Perrin et al. 2009
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	Not Listed	Non-strategic	Occur year round in Hawaiian waters.	McSweeney et al. 2007
Dall's Porpoise	<i>Phocoenoides dalli</i>	Not Listed	Non-strategic	Range across the entire north Pacific Ocean.	Hall 1979
Dwarf Sperm Whale	<i>Kogia sima</i>	Not Listed	Non-strategic	Most common in waters between 500 m and 1,000 m in depth. Found worldwide in tropical and warm-temperate waters.	Nagorsen 1985, Baird et al. 2013
False Killer Whale	<i>Pseudorca crassidens</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters. Pelagic stock tracked to within 11 km of Hawaiian Islands.	Stacey et al. 1994, Baird et al. 2012, Bradford et al. 2015

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Fin Whale	<i>Balaenoptera physalus</i>	Endangered	Strategic	Infrequent sightings in Hawaii waters. Considered rare in Hawaii, though may migrate into Hawaiian waters during fall/winter based on acoustic recordings.	35 FR 18319, Hamilton et al. 2009, Thompson & Friedl 1982
Fraser's Dolphin	<i>Lagenodelphis hosei</i>	Not Listed	Non-strategic	Found worldwide in tropical waters.	Perrin et al. 2009
Guadalupe Fur Seal	<i>Arctocephalus townsendi</i>	Threatened	Strategic	Rare sightings. Little known about their pelagic distribution. Breed mainly on Isla Guadalupe, Mexico.	50 FR 51252, Gallo-Reynoso et al. 2008, Fleischer 1987
Hawaiian Monk Seal	<i>Neomonachus schauinslandi</i>	Endangered ^a	Strategic	Endemic tropical seal. Occurs throughout the archipelago. MHI population spends some time foraging in federal waters during the day.	41 FR 51611, Baker et al. 2011
Humpback Whale	<i>Megaptera novaeangliae</i>	Delisted Due to Recovery (Hawaii DPS)	Strategic	Migrate through the archipelago and breed during the winter. Common during winter months when they are generally found within the 100 m isobath.	35 FR 18319, 81 FR 62259, Childerhouse et al. 2008, Wolman & Jurasz 1976, Herman & Antinaja 1977, Rice & Wolman 1978
Killer Whale	<i>Orcinus orca</i>	Not Listed	Non-strategic	Rare in Hawaii. Prefer colder waters within 800 km of continents.	Mitchell 1975, Baird et al. 2006
Longman's Beaked Whale	<i>Indopacetus pacificus</i>	Not Listed	Non-strategic	Found in tropical waters from the eastern Pacific westward through the Indian Ocean to the eastern coast of Africa. Rare in Hawaii.	Dalebout 2003, Baird et al. 2013
Melon-Headed Whale	<i>Peponocephala electra</i>	Not Listed	Non-strategic	Found in tropical and warm-temperate waters worldwide, found primarily in equatorial waters. Uncommon in Hawaii.	Perryman et al. 1994, Barlow 2006, Bradford et al. 2013
Minke Whale	<i>Balaenoptera acutorostrata</i>	Not Listed	Non-strategic	Occur seasonally around Hawaii	Barlow 2003, Rankin & Barlow 2005
North Pacific Right Whale	<i>Eubalaena japonica</i>	Endangered ^a	Strategic	Extremely rare in Hawaii waters	35 FR 18319, 73 FR 12024, Rowntree et al. 1980, Herman et al. 1980

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Northern Elephant Seal	<i>Mirounga angustirostris</i>	Not Listed	Non-strategic	Females migrate to central North Pacific to feed on pelagic prey	Le Beouf et al. 2000
Northern Fur Seal	<i>Callorhinus ursinus</i>	Not Listed	Non-strategic	Range across the north Pacific Ocean.	Gelatt et al. 2015
Pacific White-Sided Dolphin	<i>Lagenorhynchus obliquidens</i>	Not Listed	Non-strategic	Endemic to temperate waters of North Pacific Ocean. Occur both on the high seas and along continental margins.	Brownell et al. 1999
Pantropical Spotted Dolphin	<i>Stenella attenuata</i>	Not Listed	Non-strategic	Common and abundant throughout the Hawaiian archipelago. Pelagic stock occurs outside of insular stock areas (20 km for Oahu and 4-island stocks, 65 km for Hawaii Island stock)	Baird et al. 2013, Oleson et al. 2013
Pygmy Killer Whale	<i>Feresa attenuata</i>	Not Listed	Non-strategic	Small resident population in Hawaiian waters. Found worldwide in tropical and subtropical waters.	McSweeney et al. 2009, Ross & Leatherwood 1994
Pygmy Sperm Whale	<i>Kogia breviceps</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters.	Caldwell & Caldwell 1989
Risso's Dolphin	<i>Grampus griseus</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide.	Perrin et al. 2009
Rough-Toothed Dolphin	<i>Steno bredanensis</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide. Occasionally found offshore of Hawaii.	Perrin et al. 2009, Bradford et al. 2013, Barlow 2006, Baird et al. 2013
Sei Whale	<i>Balaenoptera borealis</i>	Endangered	Strategic	Rare in Hawaii. Generally found in offshore temperate waters.	35 FR 18319, Barlow 2003, Bradford et al. 2013
Short-Finned Pilot Whale	<i>Globicephala macrorhynchus</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide. Commonly observed around MHI and present around NWHI.	Shallenberger 1981, Baird et al. 2013, Bradford et al. 2013
Sperm Whale	<i>Physeter macrocephalus</i>	Endangered	Strategic	Found in tropical to polar waters worldwide, most abundant cetaceans in the region. Sighted off the NWHI and the MHI.	35 FR 18319, Rice 1960, Lee 1993, Barlow 2006, Mobley et al. 2000, Shallenberger 1981

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Spinner Dolphin	<i>Stenella longirostris</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters. Pelagic stock found outside of island-associated boundaries (10 nm)	Perrin et al. 2009
Striped Dolphin	<i>Stenella coeruleoalba</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters throughout the world	Perrin et al. 2009
Elasmobranchs					
Giant manta ray	<i>Manta birostris</i>	Threatened	N/A	Found worldwide in tropical, subtropical, and temperate waters. Commonly found in upwelling zones, oceanic island groups, offshore pinnacles and seamounts, and on shallow reefs.	Dewar et al. 2008, Marshall et al. 2009, Marshall et al. 2011.
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	Threatened	N/A	Found worldwide in open ocean waters from the surface to 152 m depth. It is most commonly found in waters > 20°C	Bonfil et al. 2008, Backus et al. 1956, Strasburg 1958, Compagno 1984
Scalloped hammerhead shark	<i>Sphyrna lewini</i>	Endangered (Eastern Pacific DPS)	N/A	Found in coastal areas from southern California to Peru.	Compagno 1984, Baum et al. 2007, Bester 2011
Scalloped hammerhead shark	<i>Sphyrna lewini</i>	Threatened (Indo-West Pacific DPS)	N/A	Occur over continental and insular shelves, and adjacent deep waters, but rarely found in waters < 22°C. Range from the intertidal and surface to depths up to 450–512 m.	Compagno 1984, Schulze-Haugen & Kohler 2003, Sanches 1991, Klimley 1993
Corals					
N/A	<i>Acropora globiceps</i>	Threatened	N/A	Occur on upper reef slopes, reef flats, and adjacent habitats in depths ranging from 0 to 8 m.	Veron 2014
N/A	<i>Acropora jacquelineae</i>	Threatened	N/A	Found in numerous subtidal reef slope and back-reef habitats, including but not limited to, lower reef slopes, walls and ledges, mid-slopes, and upper reef slopes protected from wave action, and depth range is 10 to 35 m.	Veron 2014

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
N/A	<i>Acropora retusa</i>	Threatened	N/A	Occur in shallow reef slope and back-reef areas, such as upper reef slopes, reef flats, and shallow lagoons, and depth range is 1 to 5 m.	Veron 2014
N/A	<i>Acropora speciosa</i>	Threatened	N/A	Found in protected environments with clear water and high diversity of <i>Acropora</i> and steep slopes or deep, shaded waters. Depth range is 12 to 40 meters, and it has been found in mesophotic habitat (40-150 m).	Veron 2014
N/A	<i>Euphyllia paradivisa</i>	Threatened	N/A	Found in environments protected from wave action on at least upper reef slopes, mid-slope terraces, and lagoons in depths ranging from 2 to 25 m depth.	Veron 2014
N/A	<i>Isopora crateriformis</i>	Threatened	N/A	Found in shallow, high-wave energy environments, from low tide to at least 12 m deep, and have been reported from mesophotic depths (less than 50 m depth).	Veron 2014
N/A	<i>Seriatopora aculeata</i>	Threatened	N/A	Found in broad range of habitats including, but not limited to, upper reef slopes, mid-slope terraces, lower reef slopes, reef flats, and lagoons, and depth ranges from 3 to 40 m.	Veron 2014
Invertebrates					
Chambered nautilus	<i>Nautilus pompilius</i>	Threatened	N/A	Found in small, isolated populations throughout the Indo-Pacific on steep-sloped forereefs with sandy, silty, or muddy bottom substrates from depths of 100 m to 500 m.	83 FR 48948, CITES 2016

^a These species have critical habitat designated under the ESA. See Table B-4.

Table B-3. Protected species found or reasonably believed to be found near or in American Samoa longline waters

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Seabirds					

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Audubon's Shearwater	<i>Puffinus lherminieri</i>	Not Listed	N/A	Resident	Craig 2005
Black Noddy	<i>Anous minutus</i>	Not Listed	N/A	Resident	Craig 2005
Black-Naped Tern	<i>Sterna sumatrana</i>	Not Listed	N/A	Visitor	Craig 2005
Blue-Gray Noddy	<i>Procelsterna cerulea</i>	Not Listed	N/A	Resident	Craig 2005
Bridled Tern	<i>Onychoprion anaethetus</i>	Not Listed	N/A	Visitor	Craig 2005
Brown Booby	<i>Sula leucogaster</i>	Not Listed	N/A	Resident	Craig 2005
Brown Noddy	<i>Anous stolidus</i>	Not Listed	N/A	Resident	Craig 2005
Christmas Shearwater	<i>Puffinus nativitatis</i>	Not Listed	N/A	Resident?	Craig 2005
Collared Petrel	<i>Pterodroma brevipes</i>	Not Listed	N/A	Resident?	Craig 2005
White Tern	<i>Gygis alba</i>	Not Listed	N/A	Resident	Craig 2005
Greater Crested Tern	<i>Thalasseus bergii</i>	Not Listed	N/A	Visitor	Craig 2005
Gray-Backed Tern	<i>Onychoprion lunatus</i>	Not Listed	N/A	Resident	Craig 2005
Great Frigatebird	<i>Fregata minor</i>	Not Listed	N/A	Resident	Craig 2005
Herald Petrel	<i>Pterodroma heraldica</i>	Not Listed	N/A	Resident	Craig 2005
Laughing Gull	<i>Leucophaeus atricilla</i>	Not Listed	N/A	Visitor	Craig 2005
Lesser Frigatebird	<i>Fregata ariel</i>	Not Listed	N/A	Resident	Craig 2005
Masked Booby	<i>Sula dactylatra</i>	Not Listed	N/A	Resident	Craig 2005
Newell's Shearwater	<i>Puffinus auricularis newelli</i>	Threatened	N/A	Visitor	40 FR 44149, Craig 2005
Red-Footed Booby	<i>Sula</i>	Not Listed	N/A	Resident	Craig 2005
Red-Tailed Tropicbird	<i>Phaethon rubricauda</i>	Not Listed	N/A	Resident	Craig 2005
Short-Tailed Shearwater	<i>Ardenna tenuirostris</i>	Not Listed	N/A	Visitor	Craig 2005
Sooty Shearwater	<i>Ardenna grisea</i>	Not Listed	N/A	Visitor	Craig 2005
Sooty Tern	<i>Sterna fuscata</i>	Not Listed	N/A	Resident	Craig 2005
Tahiti Petrel	<i>Pterodroma rostrata</i>	Not Listed	N/A	Resident	Craig 2005
Wedge-Tailed Shearwater	<i>Ardenna pacifica</i>	Not Listed	N/A	Resident?	Craig 2005
White-Necked Petrel	<i>Pterodroma cervicalis</i>	Not Listed	N/A	Visitor	Craig 2005
White-Faced Storm-Petrel	<i>Pelagodroma marina</i>	Not Listed	N/A	Visitor	Craig 2005
White-Tailed Tropicbird	<i>Phaethon lepturus</i>	Not Listed	N/A	Resident	Craig 2005
White-Throated Storm-Petrel	<i>Nesofregatta fuliginosa</i>	Not Listed	N/A	Resident?	Craig 2005

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Laysan Albatross	<i>Phoebastria immutabilis</i>	Not Listed	N/A	Breed mainly in Hawaii, and range across the North Pacific Ocean.	Causey 2008
Hawaiian Petrel	<i>Pterodroma sandwichensis</i> (<i>Pterodroma phaeopygia sandwichensis</i>)	Endangered	N/A	Breed in MHI, and range across the central Pacific Ocean.	32 FR 4001, Simons & Hodges 1998
Laysan Albatross	<i>Phoebastria immutabilis</i>	Not Listed	N/A	Breed mainly in Hawaii, and range across the North Pacific Ocean.	Causey 2009
Northern Fulmar	<i>Fulmarus glacialis</i>	Not Listed	N/A	Breed and range across North Pacific Ocean.	Hatch & Nettleship 2012
Short-Tailed Albatross	<i>Phoebastria albatrus</i>	Endangered	N/A	Breed in Japan and NWHI, and range across the North Pacific Ocean.	35 FR 8495, 65 FR 46643, BirdLife International 2017
Sea turtles					
Green Sea Turtle	<i>Chelonia mydas</i>	Endangered (Central South Pacific DPS)	N/A	Frequently seen. Nest at Rose Atoll in small numbers.	43 FR 32800, 81 FR 20057, Balacz 1994
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	Endangered ^a	N/A	Frequently seen. Nest at Rose Atoll, Swain's Island, and Tutuila.	35 FR 8491, NMFS & USFWS 2013, Tuato'o-Bartley et al. 1993
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered ^a	N/A	Very rare. One juvenile recovered dead in experimental longline fishing.	35 FR 8491, Grant 1994
Loggerhead Sea Turtle	<i>Caretta caretta</i>	Endangered (South Pacific DPS)	N/A	No known sightings. Found worldwide along continental shelves, bays, estuaries, and lagoons of tropical, subtropical, and temperate waters.	43 FR 32800, 76 FR 58868, Utzurum 2002, Dodd 1990
Olive Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	Threatened (Entire species, except for the endangered breeding population on the Pacific coast of Mexico)	N/A	Rare. Three known sightings.	43 FR 32800, Utzurum 2002
Marine mammals					
Blainville's Beaked Whale	<i>Mesoplodon densirostris</i>	Not Listed	Non-strategic	Found worldwide in tropical and temperate waters	Mead 1989

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Blue Whale	<i>Balaenoptera musculus</i>	Endangered	Strategic	No known sightings. Occur worldwide and are known to be found in the western South Pacific.	35 FR 18319, Olson et al. 2015
Bottlenose Dolphin	<i>Tursiops truncatus</i>	Not Listed	Non-strategic	Distributed worldwide in tropical and warm-temperate waters. Pelagic stock distinct from island-associated stocks.	Perrin et al. 2009, Martien et al. 2012
Bryde's Whale	<i>Balaenoptera edeni</i>	Not Listed	Unknown	Distributed widely across tropical and warm-temperate Pacific Ocean.	Leatherwood et al. 1982
Common Dolphin	<i>Delphinus delphis</i>	Not Listed	N/A	Found worldwide in temperate and subtropical seas.	Perrin et al. 2009
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	Not Listed	Non-strategic	Occur worldwide.	Heyning 1989
Dwarf Sperm Whale	<i>Kogia sima</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters.	Nagorsen 1985
False Killer Whale	<i>Pseudorca crassidens</i>	Not Listed	Unknown	Found in waters within the U.S. EEZ of A. Samoa	Bradford et al. 2015
Fin Whale	<i>Balaenoptera physalus</i>	Endangered	Strategic	No known sightings but reasonably expected to occur in A. Samoa. Found worldwide.	35 FR 18319, Hamilton et al. 2009
Fraser's Dolphin	<i>Lagenodelphis hosei</i>	Not Listed	Non-strategic	Found worldwide in tropical waters.	Perrin et al. 2009
Guadalupe Fur Seal	<i>Arctocephalus townsendi</i>	Threatened	Strategic	No known sightings. Little known about their pelagic distribution. Breed mainly on Isla Guadalupe, Mexico.	50 FR 51252, Gallo-Reynoso et al. 2008, Fleischer 1987
Humpback Whale	<i>Megaptera novaeangliae</i>	Delisted Due to Recovery (Oceania DPS)	Strategic	Migrate through the archipelago and breed during the winter in American Samoan waters.	35 FR 18319, 81 FR 62259, Garrigue et al. 2007, SPWRC 2008
Killer Whale	<i>Orcinus orca</i>	Not Listed	Non-strategic	Found worldwide. Prefer colder waters within 800 km of continents.	Leatherwood & Dalheim 1978, Mitchell 1975, Baird et al. 2006
Longman's Beaked Whale	<i>Indopacetus pacificus</i>	Not Listed	Non-strategic	Found in tropical waters from the eastern Pacific westward through the Indian Ocean to the eastern coast of Africa.	Dalebout 2003
Melon-Headed Whale	<i>Peponocephala electra</i>	Not Listed	Non-strategic	Found in tropical and warm-temperate waters worldwide, primarily found in equatorial waters.	Perryman et al. 1994

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Minke Whale	<i>Balaenoptera acutorostrata</i>	Not Listed	Non-strategic	Uncommon in this region, usually seen over continental shelves in the Pacific Ocean.	Brueggeman et al. 1990
North Pacific Right Whale	<i>Eubalaena japonica</i>	Endangered ^a	Strategic	Extremely rare.	35 FR 18319, 73 FR 12024, Childerhouse et al. 2008, Wolman & Jurasz 1976, Herman & Antinaja 1977, Rice & Wolman 1978
Northern Elephant Seal	<i>Mirounga angustirostris</i>	Not Listed	Non-strategic	Females migrate to central North Pacific to feed on pelagic prey	Le Beouf et al. 2000
Pantropical Spotted Dolphin	<i>Stenella attenuata</i>	Not Listed	Non-strategic	Found in tropical and subtropical waters worldwide.	Perrin et al. 2009
Pygmy Killer Whale	<i>Feresa attenuata</i>	Not Listed	Non-strategic	Found in tropical and subtropical waters worldwide.	Ross & Leatherwood 1994
Pygmy Sperm Whale	<i>Kogia breviceps</i>	Not Listed	Non-strategic	Found worldwide in tropical and warm-temperate waters.	Caldwell & Caldwell 1989
Risso's Dolphin	<i>Grampus griseus</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide.	Perrin et al. 2009
Rough-Toothed Dolphin	<i>Steno bredanensis</i>	Not Listed	Unknown	Found in tropical to warm-temperate waters worldwide. Common in A. Samoa waters.	Perrin et al. 2009, Craig 2005
Sei Whale	<i>Balaenoptera borealis</i>	Endangered	Strategic	Generally found in offshore temperate waters.	35 FR 18319, Barlow 2003, Bradford et al. 2013
Short-Finned Pilot Whale	<i>Globicephala macrorhynchus</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters worldwide	Shallenberger 1981, Baird et al. 2013, Bradford et al. 2013
Sperm Whale	<i>Physeter macrocephalus</i>	Endangered	Strategic	Found in tropical to polar waters worldwide, most abundant cetaceans in the region.	35 FR 18319, Rice 1960, Barlow 2006, Lee 1993, Mobley et al. 2000, Shallenberger 1981
Spinner Dolphin	<i>Stenella longirostris</i>	Not Listed	Unknown	Common in American Samoa, found in waters with mean depth of 44 m.	Reeves et al. 1999, Johnston et al. 2008

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
Striped Dolphin	<i>Stenella coeruleoalba</i>	Not Listed	Non-strategic	Found in tropical to warm-temperate waters throughout the world	Perrin et al. 2009
Elasmobranchs					
Giant manta ray	<i>Manta birostris</i>	Threatened	N/A	Found worldwide in tropical, subtropical, and temperate waters. Commonly found in upwelling zones, oceanic island groups, offshore pinnacles and seamounts, and on shallow reefs.	Dewar et al. 2008, Marshall et al. 2009, Marshall et al. 2011.
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	Threatened	N/A	Found worldwide in open ocean waters from the surface to 152 m depth. It is most commonly found in waters > 20°C.	Bonfil et al. 2008, Backus et al. 1956, Strasburg 1958, Compagno 1984
Scalloped hammerhead shark	<i>Sphyrna lewini</i>	Threatened (Indo-West Pacific DPS)	N/A	Occur over continental and insular shelves, and adjacent deep waters, but rarely found in waters < 22°C. Range from the intertidal and surface to depths up to 450–512 m.	Compagno 1984, Schulze-Haugen & Kohler 2003, Sanches 1991, Klimley 1993
Corals					
N/A	<i>Acropora globiceps</i>	Threatened	N/A	Occur on upper reef slopes, reef flats, and adjacent habitats in depths from 0 to 8 m	Veron 2014
N/A	<i>Acropora jacquelineae</i>	Threatened	N/A	Found in numerous subtidal reef slope and back-reef habitats, including but not limited to, lower reef slopes, walls and ledges, mid-slopes, and upper reef slopes protected from wave action, and its depth range is 10 to 35 m.	Veron 2014
N/A	<i>Acropora retusa</i>	Threatened	N/A	Occur in shallow reef slope and back-reef areas, such as upper reef slopes, reef flats, and shallow lagoons. Depth range is 1 to 5 m.	Veron 2014
N/A	<i>Acropora speciosa</i>	Threatened	N/A	Found in protected environments with clear water and high diversity of Acropora and steep slopes or deep, shaded waters. Depth range is 12 to 40 meters and have been found in mesophotic habitat (40-150 m).	Veron 2014

Common Name	Scientific Name	ESA Listing Status	MMPA Status	Occurrence	References
N/A	<i>Euphyllia paradivisa</i>	Threatened	N/A	Found in environments protected from wave action on at least upper reef slopes, mid-slope terraces, and lagoons in depths ranging from 2 to 25 m depth.	Veron 2014
N/A	<i>Isopora crateriformis</i>	Threatened	N/A	Found in shallow, high-wave energy environments, from low tide to at least 12 meters deep, and have been reported from mesophotic depths (less than 50 m depth).	Veron 2014
Invertebrates					
Chambered nautilus	<i>Nautilus pompilius</i>	Threatened	N/A	Found in small, isolated populations throughout the Indo-Pacific on steep-sloped forereefs with sandy, silty, or muddy bottom substrates from depths of 100 m to 500 m.	83 FR 48948, CITES 2016

^a These species have critical habitat designated under the ESA. See Table B-4.

Table B-4. ESA-listed species' critical habitat in the Pacific Ocean^a

Common Name	Scientific Name	ESA Listing Status	Critical Habitat	References
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	Endangered	None in the Pacific Ocean.	63 FR 46693
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	Approximately 16,910 square miles (43,798 square km) stretching along the California coast from Point Arena to Point Arguello east of the 3,000 meter depth contour; and 25,004 square miles (64,760 square km) stretching from Cape Flattery, Washington to Cape Blanco, Oregon east of the 2,000 meter depth contour.	77 FR 4170
Hawaiian Monk Seal	<i>Neomonachus schauinslandi</i>	Endangered	Ten areas in the Northwestern Hawaiian Islands (NWHI) and six in the main Hawaiian Islands (MHI). These areas contain one or a combination of habitat types: Preferred pupping and nursing areas, significant haul-out areas, and/or marine foraging areas, that will support conservation for the species.	53 FR 18988, 51 FR 16047, 80 FR 50925
North Pacific Right Whale	<i>Eubalaena japonica</i>	Endangered	Two specific areas are designated, one in the Gulf of Alaska and another in the Bering Sea, comprising a total of approximately 95,200 square kilometers (36,750 square miles) of marine habitat.	73 FR 19000, 71 FR 38277

^a For maps of critical habitat, see <https://www.fisheries.noaa.gov/national/endangered-species-conservation/critical-habitat>.

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APPENDIX C: OBSERVER PROGRAM BYCATCH DATA**Table C-1. Total estimated bycatch in number of fish from the Pacific Islands Region Observer Program for the Hawaii deep-set longline fishery**

Species	2019	2020	2021	2022	2023
Lancetfish, Longnose	275,802	288,339	217,244	153,865	199,574
Snake Mackerel	49,481	43,862	67,877	59,556	98,779
Shark, Blue	134,067	139,284	124,209	87,911	88,965
Escolar	47,973	50,556	53,089	45,225	45,246
Stingray, Pelagic	10,949	9,357	8,526	9,533	10,646
Shark, Bigeye Thresher	10,399	9,754	13,313	11,746	9,219
Tuna, Albacore	145	80	790	881	8,689
Tuna, Bigeye	19,481	20,596	12,360	5,773	5,913
Swordfish	2,228	2,495	1,485	1,314	5,654
Dolphinfish	4,896	2,505	3,092	4,568	5,037
Pomfret, Dagger	8,929	5,667	9,450	5,936	4,948
Tuna, Unidentified	6,855	4,097	5,052	4,899	4,585
Tuna, Yellowfin	7,434	6,138	10,804	5,064	3,904
Pomfret, Brama spp.	5,038	4,961	3,288	2,908	3,515
Shark, Oceanic White-Tip	2,125	1,959	3,084	2,362	2,593
Dogfish, Velvet	2,216	2,639	1,629	636	2,568
Shark, Shortfin Mako	7,362	7,052	4,678	2,597	2,364
Escolar, Longfin	4,570	5,370	3,430	2,956	2,237
Oilfish	2,717	2,457	2,063	2,987	2,074
Wahoo	3,404	1,784	2,080	1,191	1,556
Spearfish, Shortbill	2,663	2,126	2,073	962	1,429
Pomfret, Sickie	1,510	1,337	1,525	1,121	1,189
Shark, Silky	1,831	959	1,419	1,316	1,094
Tuna, Skipjack	4,366	2,833	3,074	1,472	1,035
Shark, Unidentified	1,066	454	1,131	1,408	982
Puffer, Pelagic	267	526	538	394	525
Shark, Unid. Thresher	659	400	485	945	454
Pomfret, Rough	597	286	430	307	394
Marlin, Striped	2,781	1,186	536	759	392
Mobula (Devil Ray)	218	76	251	298	335
Shark, Crocodile	3,206	1,994	1,704	861	317
Mola, Common	183	114	165	212	274
Billfish, Unidentified	1,298	454	275	235	251
Dolphinfish, Pompano	82	59	288	196	241
Mola, Sharptail	59	55	33	61	225
Bony Fish, Unidentified	368	60	1,104	549	182

Species	2019	2020	2021	2022	2023
Marlin, Blue	817	476	224	168	179
Ribbonfish, Tapertail	207	164	215	180	137
Marlin, Unidentified	NC	82	137	152	131
Escolar, Roudi's	510	253	268	191	116
Gemfish, Black	147	268	111	101	115
Shark, Longfin Mako	212	340	193	210	113
Pomfret, Unidentified	294	113	165	149	108
Shark, Pelagic Thresher	212	132	158	208	107
Manta/Mobula	82	43	66	146	106
Fanfishes	32	57	46	36	90
Opah	1,315	932	144	91	86
Shark, Smooth Hammerhead	184	195	215	141	61
Shark, Galapagos	41	37	39	25	53
Crestfish	82	72	45	33	46
Barracuda, Great	204	433	233	46	42
Mola, Slender	196	226	19	13	39
Puffer, Unidentified	51	101	63	34	39
Shark, Sandbar	28	17	39	32	36
Hammerjaw	468	420	71	29	29
Shark, Cookie Cutter	5	21	15	0	24
Bony Fish, Other Identified	54	29	27	24	21
Pomfret, Lustrous	115	66	225	81	20
Cigarfishes	80	48	54	66	17
Ribbonfish, Scalloped	29	7	31	16	16
Swallowers	336	258	67	68	15
Rainbow Runner	5	0	5	10	12
Sailfish	331	63	21	20	11
Crestfish, Unicorn	NC	8	8	0	11
Manta Ray, Giant	0	7	11	0	11
Shark, Tiger	20	36	26	22	11
Shark, Unid. Hammerhead	32	43	49	17	11
Shark, Unid. Mako	171	82	36	22	10
Shark, Other Identified	0	0	5	13	8
Pufferfish, Porcupine	NC	30	5	11	7
Ray, Unidentified	0	6	26	9	7
Needle Fish, Gaping	0	0	0	0	5
Pomfret, Pacific	0	0	0	0	5
Jack, Cottonmouth	0	14	5	0	5
Snake Mackerel, Unidentified	148	55	38	237	5
Molas	NC	16	0	0	5
Shark, Common Thresher	6	23	29	28	4
Lancetfish, Shortnose	9	9	5	21	0

Species	2019	2020	2021	2022	2023
Triggerfish, Rough	3	0	8	0	0
Triggerfish, Unidentified	0	0	0	0	0
Pomfret, Bigtooth	0	0	0	0	0
Jack, Unidentified	0	0	0	0	0
Kahala, Unspecified (Amberjacks)	0	0	0	0	0
Pilotfish	NC	6	0	0	0
Yellowtail	0	0	0	0	0
Gurnards, Flying	NC	0	0	6	0
Flyingfish	0	0	0	0	0
Mackerel, Black Snake	NC	0	0	3	0
Marlin, Black	0	0	0	0	0
Louvar	0	0	0	0	0
Oarfish	0	6	0	11	0
Mackerel (incl. Chub, Spotted Chub)	0	0	0	0	0
Mackerel, Bullet	0	0	0	0	0
Tuna, Bluefin	0	0	0	0	0
Tuna, Dogtooth	NC	4	0	0	0
Tuna, Kawakawa	0	0	0	0	0
Tuna, Southern Bluefin	NC	0	0	0	0
Ribbonfishes	NC	0	8	0	0
Scabbardfish, Razorback	20	16	5	26	0
Scabbardfish, Unidentified	0	0	7	0	0
Ray, Torpedo	NC	0	0	4	0
Ray, Other Identified	0	0	0	0	0
Shark, Blacktip	0	0	0	0	0
Shark, Gray Reef	0	0	0	0	0
Shark, Bignose	0	0	0	0	0
Shark, Blacktip Reef	0	0	0	9	0
Shark, Salmon	6	0	8	36	0
Shark, White	0	0	0	0	0
Bigeye Sand Tiger Shark	22	31	18	10	0
Shark, Scalloped Hammerhead	0	0	0	0	0

Note: Species that did not have a unique species code prior to 2020 are listed as “NC” for each year from 2016 to 2019.

Table C-2. Total estimated bycatch in number of fish from the Pacific Islands Region Observer Program for the Hawaii shallow-set longline fishery

Species	2019	2020	2021	2022	2023
Shark, Blue	4,225	6,949	6,446	8,252	7,214
Lancetfish, Longnose	1,232	1,268	2,480	3,150	3,121
Shark, Shortfin Mako	298	1,151	808	1,224	1,007

Species	2019	2020	2021	2022	2023
Escolar	122	152	521	557	686
Swordfish	254	251	499	541	646
Oilfish	57	248	219	359	217
Pomfret, Brama spp.	27	45	21	28	143
Stingray, Pelagic	82	328	171	123	143
Snake Mackerel	16	31	98	151	104
Tuna, Albacore	1	51	63	82	104
Dolphinfish	18	20	75	69	86
Tuna, Yellowfin	8	46	71	24	62
Shark, Bigeye Thresher	3	21	58	67	60
Tuna, Bigeye	55	77	79	35	50
Shark, Unidentified	44	32	42	51	48
Mola, Common	5	41	9	24	32
Tuna, Unidentified	12	16	28	15	18
Shark, Oceanic White-Tip	0	13	37	54	13
Shark, Longfin Mako	1	2	1	4	10
Marlin, Striped	6	31	55	28	9
Spearfish, Shortbill	3	12	12	7	8
Wahoo	0	0	2	1	7
Shark, Pelagic Thresher	0	0	0	1	7
Ribbonfish, Tapertail	0	5	0	8	6
Shark, Unid. Mako	2	1	0	3	6
Billfish, Unidentified	2	3	10	2	5
Puffer, Pelagic	0	3	9	6	5
Pomfret, Dagger	2	3	21	23	4
Shark, Common Thresher	2	2	0	5	4
Shark, Salmon	5	3	2	1	4
Pomfret, Sickie	1	0	0	5	3
Opah	7	22	0	6	3
Tuna, Skipjack	4	0	9	1	3
Shark, Unid. Thresher	1	7	7	7	3
Marlin, Unidentified	NC	0	2	1	2
Mola, Sharptail	0	0	0	0	2
Bony Fish, Unidentified	1	3	30	31	2
Shark, Cookie Cutter	2	2	2	1	2
Shark, Smooth Hammerhead	0	1	3	6	2
Lancetfish, Shortnose	0	0	0	0	1
Dolphinfish, Pompano	0	0	1	0	1
Gurnards, Flying	NC				1
Escolar, Longfin	0	0	2	1	1
Escolar, Roudi's	0	0	0	0	1
Gemfish, Black	0	0	1	0	1

Species	2019	2020	2021	2022	2023
Marlin, Blue	0	7	7	5	1
Driftfish	NC				1
Manta/Mobula	0	1	4	0	1
Mobula (Devil Ray)	0	0	2	2	1
Shark, Blacktip Reef	0	0	0	0	1
Shark, White	0	0	0	0	1
Shark, Crocodile	0	0	2	4	1
Dogfish, Velvet	0	0	0	0	1
Triggerfish, Rough	0	0	0	2	0
Triggerfish, Unidentified	0	0	0	0	0
Needle Fish, Gaping	0	0	0	0	0
Fanfishes	0	1	0	1	0
Pomfret, Bigtooth	0	0	0	0	0
Pomfret, Lustrous	0	1	0	0	0
Pomfret, Pacific	0	0	0	0	0
Pomfret, Rough	0	0	0	0	0
Pomfret, Unidentified	4	0	0	0	0
Jack, Cottonmouth	0	0	0	0	0
Kahala, Unspecified (Amberjacks)	0	0	0	0	0
Rainbow Runner	0	0	0	0	0
Yellowtail	0	0	0	0	0
Swallowers	0	0	0	0	0
Flyingfish	0	0	0	0	0
Mackerel, Black Snake	NC				0
Snake Mackerel, Unidentified	3	0	0	0	0
Marlin, Black	0	0	0	0	0
Sailfish	0	0	0	0	0
Crestfish	0	0	0	0	0
Crestfish, Unicorn	NC	0	0	0	0
Louvar	0	0	0	0	0
Mola, Slender	0	0	1	0	0
Molas	NC	0	0	0	0
Cigarfishes	0	0	0	1	0
Hammerjaw	0	0	0	0	0
Mackerel (incl. Chub, Spotted Chub)	0	0	0	0	0
Mackerel, Bullet	0	0	0	0	0
Tuna, Bluefin	0	0	0	0	0
Tuna, Dogtooth	NC	0	0	0	0
Tuna, Kawakawa	0	0	0	0	0
Barracuda, Great	0	0	0	1	0
Puffer, Unidentified	0	0	7	0	0
Pufferfish, Porcupine	NC	0	0	0	0

Species	2019	2020	2021	2022	2023
Ribbonfish, Scalloped	0	0	1	0	0
Ribbonfishes	NC	0	0	0	0
Scabbardfish, Razorback	0	0	0	0	0
Scabbardfish, Unidentified	0	0	0	0	0
Bony Fish, Other Identified	1	0	0	0	0
Manta Ray, Giant	0	0	0	3	0
Ray, Torpedo	NC				0
Ray, Other Identified	0	0	0	0	0
Ray, Unidentified	0	0	0	1	0
Shark, Bignose	0	0	0	0	0
Shark, Galapagos	0	1	0	0	0
Shark, Sandbar	0	0	0	0	0
Shark, Silky	0	1	8	11	0
Shark, Tiger	0	0	0	1	0

Note: Species that did not have a unique species code prior to 2020 are listed as “NC” for each year from 2016 to 2019.

Table C-3. Total estimated bycatch in number of fish from the Pacific Islands Region Observer Program for the American Samoa longline fishery

Species	2019	2020	2021	2022	2023
Stingray, Pelagic	11,908	8,395	8,259	6,487	13,056
Lancetfish, Longnose	4,991	4,063	3,913	2,749	6,199
Escolar, Longfin	6,609	5,037	4,788	3,706	5,859
Escolar	5,094	5,540	5,517	3,111	3,989
Tuna, Albacore	1,584	1,136	1,077	1,258	2,131
Tuna, Yellowfin	1,180	1,476	1,363	1,755	1,893
Shark, Silky	1,840	1,227	1,238	949	1,734
Shark, Blue	2,681	2,958	2,721	1,752	1,451
Snake Mackerel, Unidentified	0	3	2	1	873
Pomfret, Sickle	535	407	425	515	782
Tuna, Bigeye	564	830	778	615	691
Tuna, Unidentified	824	1,473	1,313	519	669
Shark, Oceanic White-Tip	870	469	467	355	657
Swordfish	706	211	260	177	612
Barracuda, Great	747	442	434	477	589
Tuna, Skipjack	1,196	1,510	1,366	571	521
Crestfish	129	124	122	69	521
Oilfish	718	485	498	358	442
Spearfish, Shortbill	447	423	390	350	408
Escolar, Roudi's	521	417	406	184	261
Wahoo	326	728	690	185	249
Shark, Bigeye Thresher	148	159	158	115	227
Marlin, Blue	144	294	289	190	215

Species	2019	2020	2021	2022	2023
Pomfret, Brama spp.	232	145	135	71	181
Shark, Shortfin Mako	169	234	232	89	159
Pomfret, Dagger	344	85	85	95	125
Sailfish	163	98	97	63	79
Cigarfishes	9	8	10	21	79
Marlin, Striped	279	131	121	82	68
Hammerjaw	13	28	26	19	57
Mola, Slender	193	2,210	2,074	317	45
Pomfret, Lustrous	20	28	27	11	34
Opah	109	68	66	56	34
Ribbonfish, Tapertail	27	33	31	18	34
Turtle, Green/Black	26	11	10	4	23
Puffer, Pelagic	27	12	11	17	23
Shark, Longfin Mako	47	24	20	12	11
Shark, Smooth Hammerhead	9	2	2	2	11
Triggerfish, Rough	0	0	0	0	11
Fanfishes	0	1	1	2	11
Jack, Cottonmouth	0	5	5	2	11
Rainbow Runner	0	3	2	0	11
Swallowers	0	0	0	0	11
Dolphinfish	18	163	147	318	11
Gurnards, Flying	NC	#N/A	N/A	N/A	11
Mola, Common	0	9	8	9	11
Soapfish, Goldenstripe	34	7	10	1	11
Puffer, Unidentified	5	1	1	0	11
Scabbardfish, Razorback	16	14	13	10	11
Bony Fish, Unidentified	58	31	34	3	11
Manta/Mobula	24	4	5	7	11
Billfish, Unidentified	43	40	32	25	0
Marlin, Unidentified	NC	N/A	N/A	6	0
Shark, Pelagic Thresher	0	3	3	1	0
Shark, Unid. Thresher	27	25	25	22	0
Shark, Galapagos	11	7	4	2	0
Shark, Unid. Mako	13	6	5	2	0
Shark, Crocodile	5	5	8	10	0
Shark, Scalloped Hammerhead	0	4	3	2	0
Shark, Unid. Hammerhead	0	2	2	1	0
Dogfish, Velvet	0	4	4	0	0
Shark, Unidentified	96	62	57	76	0
Cardinalfish, Blackmouth	NC	1	N/A	0	0
Lancetfish, Shortnose	13	3	4	1	0
Yellowtail	0	1	1	0	0

Species	2019	2020	2021	2022	2023
Dolphinfish, Pompano	5	1	1	0	0
Gemfish, Black	31	57	54	16	0
Snake Mackerel	1,689	1,568	1,502	1,221	0
Mola, Sharptail	0	2	2	7	0
Bony Fish, Other Identified	24	34	34	8	0
Manta Ray, Giant	0	3	3	2	0

Note: Species that did not have a unique species code prior to 2020 are listed as “NC” for each year from 2016 to 2019.

APPENDIX D: LIST OF PLAN TEAM MEMBERS

Member; Title	Plan Team Role
Donald Koybayashi; NMFS PIFSC	Habitat and Living Marine Resources
Jason Philibotte; NMFS PIRO	International Fisheries
Jennifer Stahl; NMFS PIFSC	Pelagics
Ashley Tomita; NMFS PIFSC	Pelagics
Danika Kleiber; NMFS PIFSC	Human Dimensions
Emily Crigler; NMFS PIRO	Chair; Fisheries Policy
Michael Kinney; NMFS PIFSC	Life History
Minling Pan; NMFS PIFSC	Economics
T. Todd Jones; NMFS PIFSC	Protected Resources
Phoebe Woodworth-Jefcoats; NMFS PIFSC	Oceanography
Robert Ahrens; NMFS PIFSC	Management Strategy Evaluation
Michelle Scully; NMFS PIRO	International Fisheries
Chelsea Young; NMFS PIRO	Protected Resources
Melissa Snover; NMFS PIRO	Protected Resources
Jenny Suter; NMFS PIFSC	Fisheries Research & Monitoring
Lynn Rassel; NMFS PIFSC	Observer Program
Jason Helyer; Hawaii DAR	Hawaii
Sean Felise; American Samoa DMWR	American Samoa
Domingo Ochavillo; American Samoa DMWR	American Samoa
Jude Lizama; CNMI DFW	CNMI
Brent Tibbatts; Guam DAWR	Guam
Frank Roberto; Guam DAWR	Guam
Bryan Ishida; Hawaii DAR	Ex-Officio
Felipe Carvalho; NMFS PIFSC	Ex-Officio

APPENDIX E: PELAGIC PLAN TEAM REPORT – MAY 2025

Consistent with direction from the Council’s Pelagic Plan Team at its regular meeting in May 2025, the Pelagic Plan Team’s meeting report is appended to this annual SAFE report to provide readers with important context regarding fishery performance trends that are not otherwise provided in the annual SAFE report. The Pelagic Plan Team report begins on the following page.