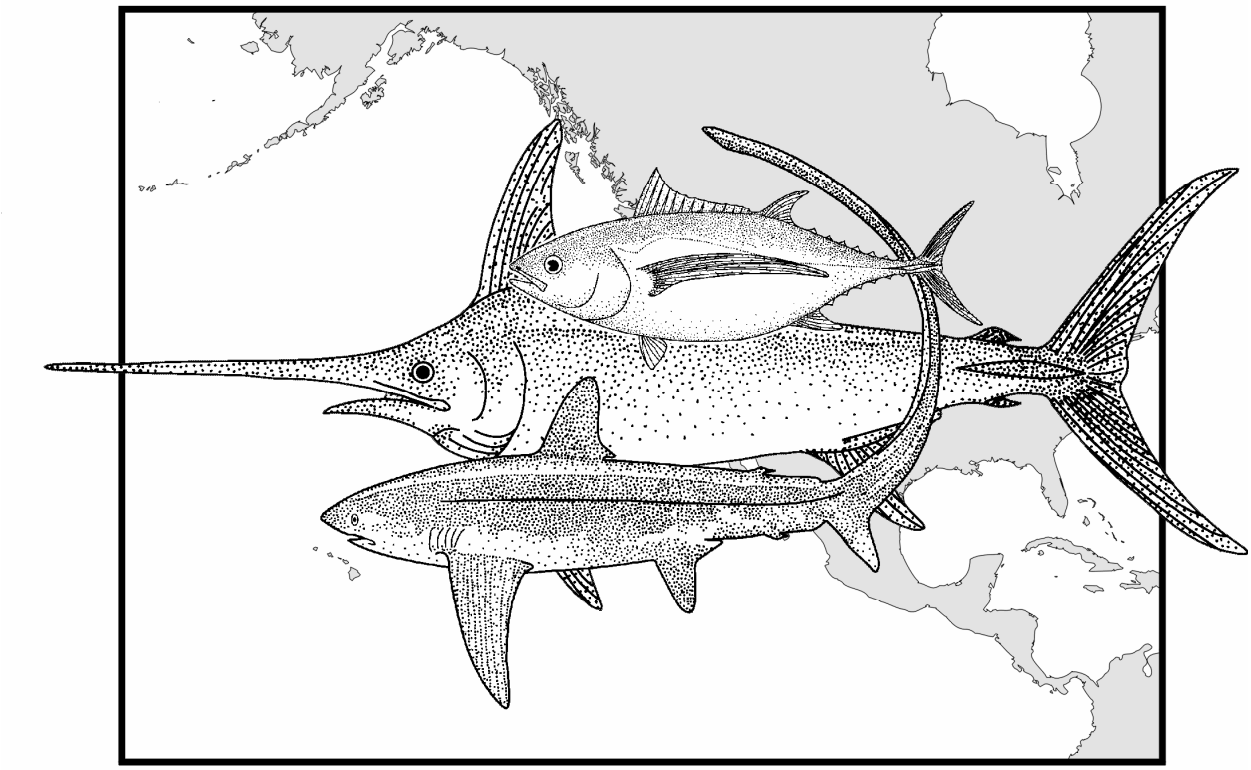
STATUS OF THE U.S. WEST COAST FISHERIES FOR HIGHLY MIGRATORY SPECIES THROUGH 2022



STOCK ASSESSMENT AND FISHERY EVALUATION

NOVEMBER 2023

PACIFIC FISHERY MANAGEMENT COUNCIL
WWW.PCOUNCIL.ORG
PORTLAND, OREGON

Cover illustration by Roy Allen, Southwest Fisheries Science Center, National Marine Fisheries Service, La Jolla, California

11/8/2023 10:22 AM

Prepared by the Pacific Fishery Management Council in conjunction with the National Marine Fisheries Service, Southwest Region under National Oceanic and Atmospheric Administration award number NA20NMF4410011.

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Commonly Used Acronyms

ACL	annual catch limit
AFRF	American Fishermen's Research Foundation
B	biomass
B_0	initial (unfished) biomass
BO	Biological Opinion
BREP	Bycatch Reduction Engineering Program
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CMM	Conservation and Management Measure
Council	Pacific Fishery Management Council
CPFV	commercial passenger fishing vessel
CPUE	catch per unit of effort
CRFS	California Recreational Fisheries Survey
DFO	Department of Fisheries and Oceans (Canada)
DGN	drift gillnet
DSBG	deep-set buoy gear
EEZ	exclusive economic zone
EFH	essential fish habitat
EPO	eastern Pacific Ocean
ESA	Endangered Species Act
F	fishing mortality rate
FL	fork length
FMP	fishery management plan
FR	Federal Register
HAPC	Habitat Area of Particular Concern
HMS	highly migratory species
HMS FMP	Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species
HMSAS	Highly Migratory Species Advisory Subpanel
HMSMT	Highly Migratory Species Management Team
IATTC	Inter-American Tropical Tuna Commission
ISC	International Scientific Committee for Tuna and Tuna-like Species in the North Pacific
IUU	illegal, unregulated, and unreported fishing
LOF	List of Fisheries
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRIP	Marine Recreational Information Program
MSA	Magnuson-Stevens Act, Magnuson-Stevens Fishery Conservation and Management Act
MSST	minimum stock size threshold
MSY	maximum sustainable yield
mt	metric ton
MUS	management unit species
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPO	North Pacific Ocean
NRIFSF	National Research Institute of Far Seas Fisheries (Japan)
ODFW	Oregon Department of Fish and Wildlife
OMB	Office of Management and Budget
ORBS	Ocean Recreational Boat Survey (Oregon)

OSP	Washington Ocean Sampling Program
OY	optimum yield
PacFIN	Pacific Fisheries Information Network
PIER	Pfleger Institute of Environmental Research
PIFSC	NMFS Pacific Islands Fisheries Science Center
PIRO	NMFS Pacific Islands Regional Office
PSAT	pop-off satellite archival tag
PSMFC	Pacific States Marine Fisheries Commission
RecFIN	Recreational Fisheries Information Network
RFMO	regional fishery management organization
SAC	IATTC Scientific Advisory Committee
SAFE	stock assessment and fishery evaluation
SBR	spawning biomass ratio
SCB	Southern California Bight
SEPO	Southeast Pacific Ocean
SLUTH	Swordfish and Leatherback Use of Temperate Habitat (Workshop)
SPOT Tag	smart position and/or temperature tag
SSB	spawning stock biomass
SST	sea surface temperature
SWFSC	Southwest Fisheries Science Center (NMFS)
SWR	Southwest Regional Office (NMFS)
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	western and central Pacific Ocean
WDFW	Washington Department of Fish and Wildlife

1. Introduction

1.1. SAFE Document Production Schedule

Since 2014 the SAFE has been maintained on the Council website. This makes it possible to regularly update information as it becomes available, although landings and revenue data are only reported through the previous calendar year. Information on fishery management plan amendments (Section 1.2), changes to fishery management plan regulations (Section 3.1), and information on the latest stock assessments for management species (Chapter 8) are reported through the publication of this document (November 2023).

Consistent with the schedule described in Section 4.6 of the Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species, a draft or final stock assessment and fishery evaluation (SAFE) document is produced from the website content to be submitted to the Council in September and November.

1.2. Amendments to the Fishery Management Plan

The Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species (HMS FMP) was developed by the Pacific Fishery Management Council in response to the need to coordinate state, Federal, and international management. The National Marine Fisheries Service (NMFS), on behalf of the U.S. Secretary of Commerce, partially approved the HMS FMP on February 4, 2004. The majority of HMS FMP implementing regulations became effective on April 7, 2004. Reporting and recordkeeping provisions became effective on February 10, 2005.

The HMS FMP has been amended seven times since its implementation. Amendment 1, approved by NMFS on June 7, 2007, incorporates recommended international measures to end overfishing of the Pacific stock of bigeye tuna (*Thunnus obesus*). Amendment 2, approved by NMFS on June 27, 2011, makes the FMP consistent with revised National Standard 1 Guidelines. Amendment 3, adopted in 2015, added a suite of lower trophic level species to the FMP's list of ecosystem component (EC) species. Consistent with the objectives of the Council's FMPs and its Fishery Ecosystem Plan, Amendment 3 prohibits future development of directed commercial fisheries for the suite of EC species shared between all four FMPs ("Shared EC Species") until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. Secretarial approval of Amendment 4 was approved on April 24, 2018. Amendment 4 revises and updates portions of the FMP to bring descriptions of the management context for HMS fisheries up to date and to better describe the Council's role in the process of making stock status determinations including evaluations of the best scientific information available (BSIA). This amendment also changes the biennial meeting schedule to better align it with the National Marine Fisheries Service's process for conducting HMS stock status determinations. Amendment 5 was approved December 14, 2017. This amendment creates a Federal permit for the California large mesh drift net fishery. Amendment 6, authorizing deep-set buoy gear (DSBG), was approved on March 31, 2023, with regulations becoming effective on June 7, 2023. This initiated the process for issuing limited entry permits to fish with DSBG in the Southern California Bight. The first batch of 50 permits was issued in September 2023. According to the framework established by the Council, going forward 25 additional permits will be issued to eligible applicants annually up to a maximum of 300 permits. Amendment 7 was part of a comprehensive package of amendments for all four of the Council's FMPs to establish a standardized reporting methodology to assess the amount and type of bycatch occurring in a fishery consistent with Section 303(a)(11) of the Magnuson-Stevens Act. Amendment 7 was approved on July 5, 2022.

1.3. Management Unit Species and Ecosystem Component Species

The HMS currently managed under the FMP are:

- Common thresher shark (*Alopias vulpinus)*
- Shortfin mako shark (bonito shark) (*Isurus oxyrinchus)*
- Blue shark (*Prionace glauca)*

- North Pacific albacore (*Thunnus alalunga)*
- Pacific bluefin tuna (*Thunnus orientalis)*
- Bigeye tuna (*Thunnus obesus)*
- Skipjack tuna (*Katsuwonus pelamis)*
- Yellowfin tuna (*Thunnus albacares)*

- Striped marlin (*Kajikia audax*)
- Swordfish (*Xiphias gladius)*

- Dorado, a.k.a. mahi mahi or dolphinfish (*Coryphaena hippurus)*

In addition, Amendment 2 added eight ecosystem component (EC) species to the FMP. The EC category is identified in the revised National Standard 1 Guidelines. The list was compiled from monitored species previously identified in the plan and by moving two management unit species to the EC category. Amendment 3 added additional EC species as part of ecosystem-based amendments to all four Council FMPs. The EC species are:

- Bigeye thresher shark *(Alopias superciliosus*)
- Common mola (*Mola mola*)
- Escolar (*Lepidocybium flavobrunneum*)
- Lancetfishes (Alepisauridae)
- Louvar (*Luvarus imperialis*)
- Pelagic sting ray (*Dasyetis violacea*)
- Pelagic thresher shark (*Alopias pelagicus*)
- Wahoo (*Acathocybium solandri*)

- Round herring, *Etrumeus teres*
- Thread herring, *Opisthonema libertate, O. medirastre*
- Mesopelagic fishes of the families *Myctophidae*, *Bathylagidae*, *Paralepididae*, and *Gonostomatidae* Pacific sand lance, *Ammodytes hexapterus*
- Pacific saury, *Cololabis saira* Silversides, *Atherinopsidae* Smelts of the family *Osmeridae*
- Pelagic squids (families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* except Humboldt squid (*Dosidicus gigas*), *Onychoteuthidae*, and *Thysanoteuthidae*)

National Standard Guidelines (50 CFR600 Subpart D) define EC species as "stocks that a Council or the Secretary has determined do not require conservation and management, but desire to list in an FMP in order to achieve ecosystem management objectives" (see 660.305(c)(5) and (d)(13)). Determining whether a stock requires conservation and management is based on factors enumerated at 600.305(c)(1). MSY, OY, and other reference points do not need to be specified for EC species. Identification of EC species will help the Council to track these species over time, periodically evaluate their status, and assess whether any

management is needed under the FMP, in which case an EC species could be reclassified as a managed species.

1.4. The Management Cycle

At the September Council meeting in even numbered years a draft SAFE report provides an update to the Council on status of the HMS fisheries and, as appropriate, proposed adjustments to the numerical estimates of maximum sustainable yield (MSY), optimum yield (OY), and status determination criteria (SDC). If necessary, Council directs HMSMT to prepare draft regulatory analysis to implement revised estimates of reference point values, ACLs, or other harvest objectives and/or management measures.

At the November Council meeting in even numbered years a final SAFE report on the status of HMS stocks and fisheries is presented to Council. If necessary, the Council directs HMSMT to prepare a draft regulatory analysis to implement revised estimates of reference point values, ACLs, or other harvest objectives and/or management measures. The Council adopts for public review proposed actions addressing concerns from current and previous SAFE reports.

At the next Council meeting, in March of odd numbered years, the Council adopts final recommendations to NMFS, Department of State, and Congress for international measures to end overfishing and/or rebuild stocks and proposed regulations necessary for domestic fishery management.

Any management measures proposed by the Council are implemented during the next fishing year, which starts on April 1, and stay in effect unless action is taken to modify the action. This process has been used infrequently to make regulatory amendments. Council meetings in 2006 initiated the first biennial management cycle under the HMS FMP. In this first cycle the Council recommended regulatory amendments to change vessel marking requirements (72 FR 43563) and albacore and Pacific bluefin tuna recreational bag limits in Southern California (72 FR 58258). In 2014 the Council considered an adjustment to recreational bag limits for Pacific bluefin tuna in Southern California and recommended reducing the bag limit to two fish per day per angler with a six fish maximum per angler for multi-day trips. This action also included requirements at processing of recreationally-caught bluefin at sea to allow species identification (80 FR 44887). See Section 3.1 for a list of changes to HMS FMP regulations.

1.5. Highly Migratory Species Management Team

As of November 2023 the HMSMT members were:

- Ms. Celia Barroso, NMFS West Coast Region
- Dr. Matthew Craig, NMFS Southwest Fisheries Science Center
- Mr. Phillip Dionne, Washington Department of Fish and Wildlife
- Ms. Elizabeth Hellmers (Vice-Chair), California Department of Fish and Wildlife
- Ms. Amber Rhodes, NMFS West Coast Region
- Mr. Alan Sarich (Chair), Tribal Representative
- Dr. Stephen Stohs, NMFS Southwest Fisheries Science Center
- Ms. Jessica Watson Oregon Department of Fish and Wildlife

A roster with contact information may be found on the Council website (https://www.pcouncil.org/rosters/).

2. Council HMS Activities in 2022

The Council made the following HMS-related decisions in 2022. (These decision summaries may be found on the Council website.)

2.1. March 2022

The Council received the NMFS Report on HMS-related regulatory activities and an update on international management activities but made no recommendations.

2.2. June 2022

2.2.1. International Management Activities

The Council endorsed the recommendations of its Highly Migratory Species Advisory Panel on harvest strategies for Pacific bluefin tuna and North Pacific albacore tuna.

Recommendations for U.S. actions at the upcoming July 11-13 meeting of the Inter-American Tropical Tuna Commission-Western and Central Pacific Fisheries Commission Northern Commission Joint Working Group on Pacific Bluefin Tuna Management:

- Oppose catch limit increases this year, if proposed.
- If increases are agreed to, ensure that, with a high probability, they do not result in overfishing and that the U.S. receives an equitable allocation of any catch limit increases.
- Submit a proposal to the Joint Working Group for development of a harvest strategy that would include mechanisms to carry out a management strategy evaluation.
- Include in any such harvest strategy proposal appropriate management objectives that are consistent with measures agreed to by U.S. stakeholders that stem from NMFS-sponsored stakeholder workshops. In particular, include those aimed at maintaining the stock at levels that can achieve maximum sustainable yield.

Recommendations for revisions to the US draft proposal on a North Pacific albacore harvest strategy (as an Inter-American Tropical Tuna Commission Resolution):

- Revise the beginning of paragraph 1 to read, "A harvest strategy shall be adopted for all fisheries which harvest North Pacific albacore in the Convention Area."
- For the purpose of implementing management measures, develop definitions to distinguish between fisheries (or vessels) that target North Pacific albacore and those that catch North Pacific albacore but are not targeting them.
- At paragraph 1(a)(iv) add language that there should be a low probability of management changes resulting in a 30 percent or greater decrease between consecutive assessment periods (consistent with the performance indicator described in the management strategy evaluation).
- Defer inclusion of harvest control rules (paragraph 1(f)) until further consultations with stakeholders can be completed.

2.2.2. Exempted Fishing Permits

The Council approved the following exempted fishing permit (EFP) applications for immediate issuance by NMFS:

- J. Bateman (Attachment 1)
- R. & F. Devoe (Attachment 2)
- S. Fukushima (Attachment 3)
- G. Gershman, et al (Attachment 4)
- R & M. Hupp (Attachment 7)
- M. Mandato (Attachment 9)
- M. Rippo (Attachment 13)
- J. Souza (Attachment 14)

The Council will take final action on the following EFP applications at its September 2022 meeting, with recommended modifications described below:

- G. Harold (Attachment 5): Remove requested fishing within state waters
- G. Honings (Attachment 6): Limit total pieces of gear to 15 and the current 5 nm footprint
- K. Jacobs & T. Gomez (Attachment 8)
- S. Mintz (Attachment 10): Remove the proposal to add time before and after sunrise and sunset
- N. Perez (Attachment 11): Limit total pieces of gear to 15
- Pfleger Institute of Environmental Research (PIER) (Attachment 12)

The Council also requested that NMFS provide the information necessary for the HMSMT to evaluate whether existing EFP holders requesting new EFPs (all of the above except for G. Harold) have been in compliance with logbook and annual report requirements, as specified in their EFP terms and conditions. The HMSMT will then report back on any compliance issues at the September 2022 meeting.

2.2.3. Drift Gillnet Fishery Hard Caps

The Council provided guidance on the completion of the analysis of the range of alternatives so that the Council may choose its final preferred alternative at the November 2022 meeting.

2.3. September 2022

2.3.1. International Management Activities

Based on input from its Highly Migratory Species Advisory Subpanel (HMSAS), the Council made the following recommendations for U.S. positions at the October WCPFC Northern Committee meeting:

- Voice the expectation that other countries will consult with their stakeholders and be prepared to adopt proposals on elements of a precautionary and comprehensive long-term Pacific bluefin harvest strategy in 2023, particularly management objectives, performance indicators, reference points, and harvest control rules.
- Adopt a clear work plan for the International Scientific Committee (ISC) that prioritizes development of elements of the Pacific bluefin tuna management strategy evaluation (MSE) in 2023. This should be an opportunity to proactively address, and correct, the current inequity of the Western Pacific Ocean/Eastern Pacific Ocean and U.S./Mexico allocations.
- Ensure that any North Pacific albacore harvest strategy adopted by the Northern Committee mirrors the harvest strategy in IATTC Resolution C-22-04. Specifically, consideration of harvest control rules should occur in 2023.

The Council also requested that NMFS provide information to and solicit informal input from U.S. stakeholders regarding MSE development that will be discussed at the upcoming November ISC Pacific

Bluefin Working Group technical meeting on MSE development and provide an update on the U.S. contribution to MSE analyst capacity at the November Council meeting.

Finally, NMFS should organize a workshop or workshops in early 2023 to engage stakeholders on harvest control rules that should be incorporated into the Inter-American Tropical Tuna Commission and Western and Central Pacific Fisheries Commission North Pacific albacore harvest strategy.

2.3.2. Exempted Fishing Permits

The Council reviewed the six exempted fishing permit (EFP) applications submitted for review at the September meeting and recommended NMFS issue EFPs to Gregory Harold (Attachment 1) for standard deep-set buoy gear (DSBG) and to Kris Honings (Attachment 2) to test standard DSBG with up to 10 pieces of gear at night. Fishing under these EFPs would occur in Federal waters only. The Council deferred a recommendation on the remaining four applications until a later date when more information would be available, as discussed below.

The Council directed its HMS Management Team to report back to the Council at a future meeting with information to inform the development of criteria for EFPs to test modified DSBG configurations, and specifically increases in the number of pieces of gear simultaneously deployed from the current limit of 10. The Council also asked NMFS to provide information on how any criteria established by the Council for future EFPs of this sort would influence the nature of any Endangered Species Act consultation process NMFS may need to undertake.

2.3.3. Swordfish Management and Monitoring Plan

The Council discussed the goals outlined in the draft Swordfish Management and Monitoring Plan (SMMP) and the actions in Supplemental NMFS Report 1, including existing and new exempted fishing permits (EFP), potential EFP metrics, the forthcoming Federal regulations for the deepset buoy gear fishery, and potential future fisheries. The Council recommended that the HMSMT and HMSAS scope the goals and objectives for a future swordfish workshop at their fall meetings. It's intended that outcomes of the workshop would guide future Council discussions regarding the draft SMMP and HMS FMP. Further consideration of this workshop is scheduled for the June 2023 Council meeting.

2.4. November 2022

2.4.1. International Management Activities

The Council endorsed the recommendations contained in Agenda Item G.2.a, Supplemental HMSAS Report 1 and those made by the Permanent Advisory Committee to the U.S. Section of the Western and Central Pacific Commission (WCPFC). Specifically, the Council recommends the following U.S. positions with regard to WCPFC actions:

- Adopt the harvest strategy for North Pacific albacore proposed by the WCPFC Northern Committee (NC) at the upcoming 19th Regular Session.
- Adopt the conservation and management measure for North Pacific swordfish proposed by the NC at the upcoming 19th Regular Session.
- Work with other nations at the 19th Regular Session to adopt a consistent Conservation and Management Measure (CMM) for North Pacific swordfish covering the area between the equator to 20º N. latitude, which is not covered by the CMM proposed by the NC. The U.S. should express concern about management measures, like the NC proposal, that are not applied throughout a

stock's range, recognizing the need for compatible management between areas under national jurisdiction and the high seas.
- Use a precautionary approach for managing Pacific bluefin tuna (PBF) with priority focused on rebuilding and a secondary priority to find a more equitable balance of harvest opportunity between the Western Pacific and Eastern Pacific.
- Continue to use the WCPFC NC – Inter-American Tropical Tuna Commission Joint Working Group (JWG) as the venue for all PBF management decisions.
- Continue to oppose attempts by other countries to create new exceptions to PBF rebuilding plan catch limits outside of the JWG process.
- Encourage other countries to conduct stakeholder outreach so that there can be meaningful progress on long-term comprehensive harvest strategy elements (management objectives, performance indicators, reference points, harvest control rules) for PBF in 2023.
- Ensure progress on long-term PBF harvest strategy development is a precondition for any discussions on new interim harvest control rules.
- Request that NMFS continue to update the Council on PBF management strategy evaluation development and provide opportunities for U.S. stakeholder engagement.

The Council also endorsed the following positions with regard to bilateral negotiations over the next fishing regime pursuant to the U.S.-Canada Albacore Treaty in relation to the proposal put forward by Canada:

- Negotiate towards a final outcome as close to the status quo as possible.
- Oppose any increase in the number of Canadian vessels authorized to fish in U.S. waters from the current level of 45 vessels.
- Oppose allowing a buffer of up to 10 feet (3 meters) in overall length when replacing vessels on the list of Canadian vessels authorized to fish in U.S. waters.
- Support modifications to the requirement to collect and share catch and effort data to ensure the provision of accurate information on fishing activity in the other Party's exclusive economic zones.
- Oppose proposed lengthening of fishing season under the Treaty to October 31. The historically agreed end date of September 15 is intended to reduce gear conflicts with bait boats that predominantly fish after September 15.

2.4.2. Drift Gillnet Fishery Hard Caps – Final Action

The Council did not take final action and instead narrowed the range of alternatives as follows:

- Alternative 1: No Action
- Alternative 2: Rolling two-year hard cap closures
- Alternative 3 A (modified): The entire fleet ceases fishing for the remainder of the fishing year when a fleetwide cap is **reached**
- Alternative 3 B:
    - If a vessel **reaches** an individual cap, that vessel and all unobservable vessels cease fishing for 30 days if the cap is reached before November 1, or 14 days if the cap is reached between November 1 and January 31.
    - If a vessel **exceeds** an individual cap, that vessel and all unobservable vessels cease fishing for the remainder of the fishing year.
    - If a fleetwide cap is **exceeded**, the entire fleet ceases fishing for the remainder of the fishing year.

The alternatives will be evaluated assuming a fleet size of 11 vessels, with four of those assumed to be unobservable.

The Council directed the HMSMT to update the impact analysis using the additional methods for reporting bootstrap simulation results recommended by the SSC. The HMSMT should also prepare analyses addressing the requirements of E.O. 12866 (Regulatory Impact Review) and the Regulatory Flexibility Act so that the Council may make an informed decision on a final preferred alternative with respect to these mandates.

More information on the Council's proposed action and the original range of alternatives may be found in the preliminary draft analytical document.

2.4.3. Biennial Harvest Specifications and Management Measures – Preliminary

Based on recommendations from the SSC, the Council approved the maximum sustainable yield proxies that NMFS proposed in September (Agenda Item I.4.a, Supplemental NMFS Report 1) for completing status determinations for Eastern Pacific skipjack tuna and North Pacific bluefin tuna as follows:

- Pacific bluefin tuna: 1-SPR20% for F_{MSY} and 20%SSB_0 for B_{MSY}
- Skipjack tuna: 30%SSB_0 for B_{MSY} and $F_{BTARGET}$ for F_{MSY}, where B_{TARGET} is equal to 30%SSB_0

With this action the Council completed its decision-making for the current (2023-2024) biennial management cycle.

3. HMS Regulatory Framework

3.1. Changes to HMS FMP Regulations

One rulemaking to modify HMS FMP regulations at 50 CFR 660 Subpart K occurred in 2023 and no rulemakings occurred in 2022. The following regulatory changes have been made since 2004:

Effective Date	Title	Citation
June 7, 2023	Amendment 6 to the Fishery Management Plan for West Coast Fisheries for Highly Migratory Species; Authorization of Deep-Set Buoy Gear	88 FR 29545
September 3, 2020	Protected Species Hard Caps for the California/Oregon Large-Mesh Drift Gillnet Fishery (This rule was vacated in 2021 by court order.)	85 FR 7246
June 6, 2018	Based on recommendations from the Pacific Fishery Management Council (Council), NMFS is issuing regulations under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to implement Amendment 4 to the Fishery Management Plan for U.S. West Coast Highly Migratory Species (HMS FMP).	83 FR 19981
April 13, 2018	California Drift Gillnet Fishery; Implementation of a Federal Limited Entry Drift Gillnet Permit	83 FR 11146
August 5, 2015	Revision to Prohibited Species Regulations	80 FR 46519
July 7, 2015	Recreational Fishing Restrictions for Pacific Bluefin Tuna	80 FR 44887
2014	Control Date for Large-Mesh Drift Gillnet Limited Entry Program	79 FR 64161
April 18, 2012	Swordfish Retention Limits	77 FR 15973
October 13, 2011	Annual Catch Limits and Accountability Measures	76 FR 56327
September 29, 2009	Collection of a permit fee for vessel owners participating in commercial and charter recreational fishing for highly migratory species (HMS) in the Exclusive Economic Zone (EEZ) off the West Coast of California, Oregon, and Washington.	74 FR 37177
November 14, 2007	Daily bag limits for sport-caught albacore tuna (*Thunnus alalunga*) and bluefin tuna (*Thunnus orientalis*) in the Exclusive Economic Zone (EEZ) off California	72 FR 58258
September 5, 2007	Amend vessel identification regulations of the Fishery Management Plan (FMP) for U.S. West Coast Fisheries for Highly Migratory Species (HMS)	72 FR 43563
June 8, 2007	Amend text in the regulations governing closures of the drift gillnet fishery in the Pacific Loggerhead Conservation Area during El Niño events	72 FR 31756
April 11, 2007	Revise the method for renewing and replacing permits issued under the Fishery Management Plan (FMP) for U.S. West Coast Fisheries for Highly Migratory Species (HMS)	72 FR 10935
May 7, 2004	Implement the approved portions of the Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species (FMP)	69 FR 18443

3.2. International Management

3.2.1. Regional Fishery Management Organizations

Regional fishery management organizations (RFMOs) are responsible for the conservation and management of fisheries for tunas and other species taken by tuna-fishing vessels both outside and within areas of national jurisdiction. These organizations agree to measures, usually by consensus, which are implemented by member countries for their flag vessels. In the Pacific Ocean the Inter-American Tropical

Tuna Commission (IATTC) and the Western and Central Pacific Fisheries Commission (WCPFC) establish measures within their respective Convention Areas, as illustrated in the figure below. Notice that there is an area of overlap between the two Convention areas in the South Pacific.

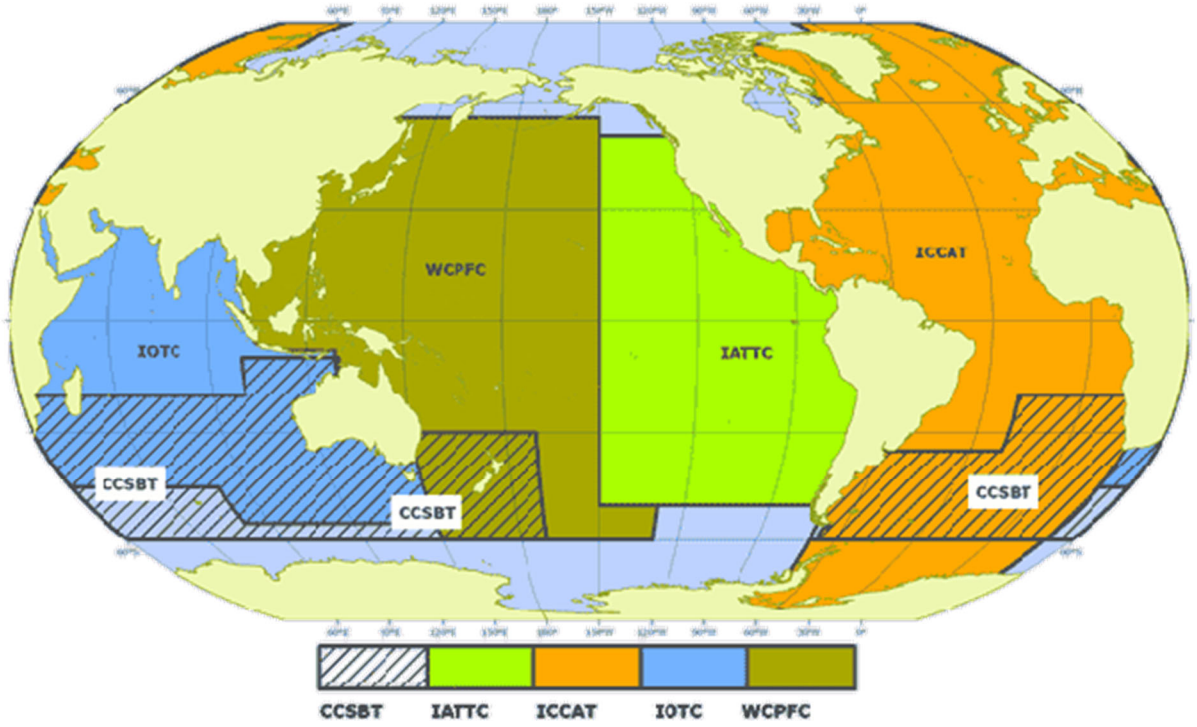

Figure 3-1. Global map of tuna RFMO jurisdictions. (Source: http://firms.fao.org/firms/fishery/459/en#FisheryArea).

West Coast fisheries are more directly affected by IATTC measures since vessels mostly fish within that Convention Area. However, the WCPFC is especially active in managing northern stocks (those predominately occurring north of 20° N. latitude) and specifically North Pacific albacore, Pacific bluefin tuna, and North Pacific swordfish). For these three stocks scientists recognize a single North Pacific stock occurring in both convention areas. Furthermore, under domestic law the Chair of the Pacific Council, or his or her designee, is allocated a spot as a Commissioner for the United States Section to the WCPFC. This provides a direct advisory role for the Pacific Council in policies and proposals that the U.S. may advocate in the WCPFC. The Council frequently provides advice to U.S. delegations to these RFMOs and Council staff attends their meetings.

3.2.2. 2022 IATTC and WCPFC Outcomes

Resolutions adopted at the 100th Regular Meeting of the IATTC (August 1-5, 2022):

- C-22-01 Application of Antigua Convention Article XV paragraph 4
- C-22-02 Compliance (replaces C-11-07)
- C-22-03 Transshipments (replaces C-12-07)
- C-22-04 North Albacore Harvest Strategy
- C-22-05 Closure periods
- C-22-06 Terms of reference for a Working Group on Ecosystem and Bycatch
- C-22-07 Establishment of an Ad Hoc Working Group on Electronic Monitoring
- C-22-08 Financing FY 2023

Conservation measures adopted at the Nineteenth Session of the Western and Central Pacific Fisheries Commission (November 27-December 3, 2022):

- CMM 22-01 Conservation and Management Measure on a Management Procedure for WCPO Skipjack Tuna
- CMM 22-02 Conservation and Management Measure for North Pacific Swordfish
- CMM 22-03 Conservation and Management Measure on Establishing a Harvest Strategy for key fisheries and stocks in the Western and Central Pacific Ocean
- CMM 22-04 Conservation and Management Measure for Sharks
- CMM 22-05 Standards, specifications and procedures for the Western and Central Pacific Fisheries Commission Record of Fishing Vessels
- CMM 22-06 Conservation and Management Measure on daily catch and effort reporting

3.2.3. Regulations for International HMS Fisheries and Related Activities in the Pacific Published in 2022

The following regulations implementing RFMO decisions were published in 2022. For earlier years consult previous editions of the SAFE.

Effective Date	Region	Title	Citation
August 12, 2022	EPO	2022-2024 Commercial Fishing Restrictions for Pacific Bluefin Tuna in the Eastern Pacific Ocean	87 FR 47939
July 25, 2022	EPO	Fishing Restrictions for Tropical Tuna and Silky Shark in the Eastern Pacific Ocean for 2022 and Beyond	87 FR 40731
July 06, 2022	WCPO	Extension of Period to Implement Decisions of the Western and Central Pacific Fisheries Commission Related to the COVID-19 Pandemic	87 FR 34584
July 07, 2022	WCPO	Implementation of Emergency Decisions of the Western and Central Pacific Fisheries Commission	87 FR 34580
March 25, 2022	EPO	Purse Seine Observer Exemptions in the Eastern Pacific Ocean	87 FR 17018

4. Commercial Fisheries

4.1. Fishery Descriptions

4.1.1. Surface hook-and-line fishery for albacore

This has been an economically valuable fishery for all three West Coast states for more than 100 years. The closure of West Coast canneries in the early 1980s led to precipitous drop in the number vessels landing albacore. In recent years landings have been concentrated in the Oregon ports of Newport and Astoria and the Washington ports of Westport and Ilwaco. This long-term northward shift in fishing effort into waters off Oregon and Washington, where albacore have been more available, is thought to be due to changing oceanographic conditions. In recent years lower operating costs and better landing facilities in Oregon and Washington compared to California also may have contributed to this shift. The following graph, showing the number of U.S. vessels in the albacore fishery making landings by year, illustrates these trends.

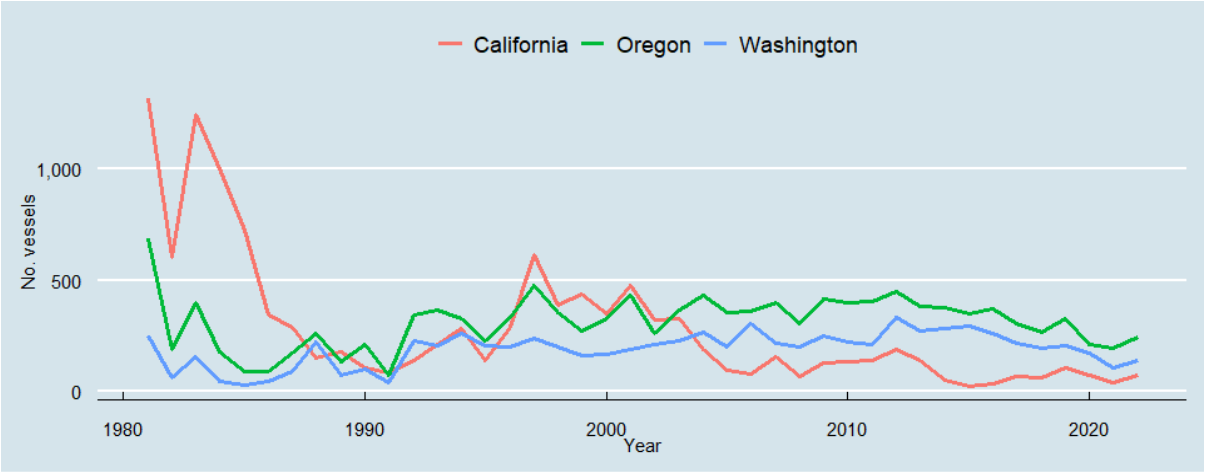

Figure 4-1. Number of vessels participating in the albacore hook-and-line fishery by state, 1981-2022.

Troll and bait boat (live bait) are the principal commercial gears, although some albacore is incidentally caught by purse seine, longline, and large mesh drift gillnet gears. Oceanographic conditions influence the occurrence of fish within range of the West Coast fleet, but a typical season runs July through October, with landings peaking in August-September. This fishery lands albacore almost exclusively with little incidental catch.

The HMS FMP requires a federal permit with a surface hook-and-line gear endorsement for all U.S. commercial and recreational charter fishing vessels that fish for HMS within the West Coast exclusive economic zone (EEZ, from 3– 200 nautical miles from the West Coast) and for U.S. vessels that pursue HMS on the high seas (seaward of the EEZ) and land their catch in California, Oregon, or Washington.

Albacore is mostly landed fresh or frozen, with a portion of the catch then exported to overseas markets for processing.

A treaty between the governments of the U.S. and Canada allows vessels from each country to fish in the other country's EEZ outside of 12 miles. Vessels also have port privileges and Canadian vessels may land albacore in designated ports. For more information, see the NOAA Fisheries website.

In 2022 the fishery landed 7,121 mt of albacore valued at $34.87 million. This was greater than 2021 when the fishery landed 3,490 mt valued at $16.62 million. Over the past 10 years the number of vessels participating in the fishery has varied from 293 to 701.

The following figure shows albacore landings in metric tons since 1981 through last year by U.S. and Canadian vessels. Note that confidential data (i.e., landings with less than three vessels or processors) is excluded in this figure. Less than three Canadian vessels made landings, or less than three processors received landings from those vessels, throughout the 1980s.

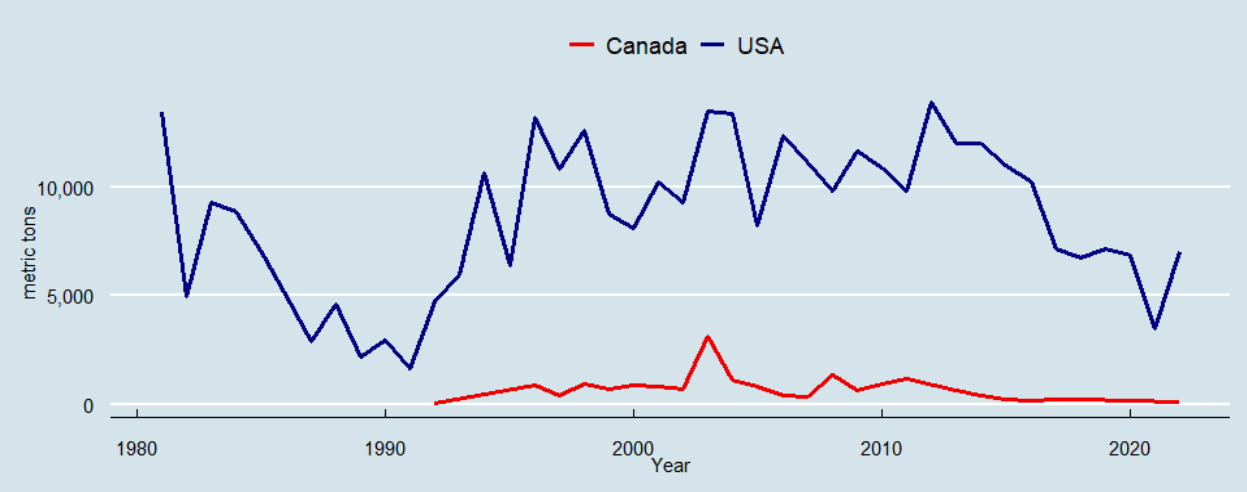

Figure 4-2. Landings to U.S. ports (mt) by U.S. and Canadian vessels in the albacore hook-and-line fishery, 1981-2022. Note that confidential data (i.e., landings with less than three vessels or processors) is excluded in this figure. Less than three Canadian vessels made landings, or less than three processors received landings from those vessels, throughout the 1980s.

This figure shows inflation-adjusted ex-vessel revenue from albacore for the same time period. As in the previous figure, confidential data is excluded in this figure.

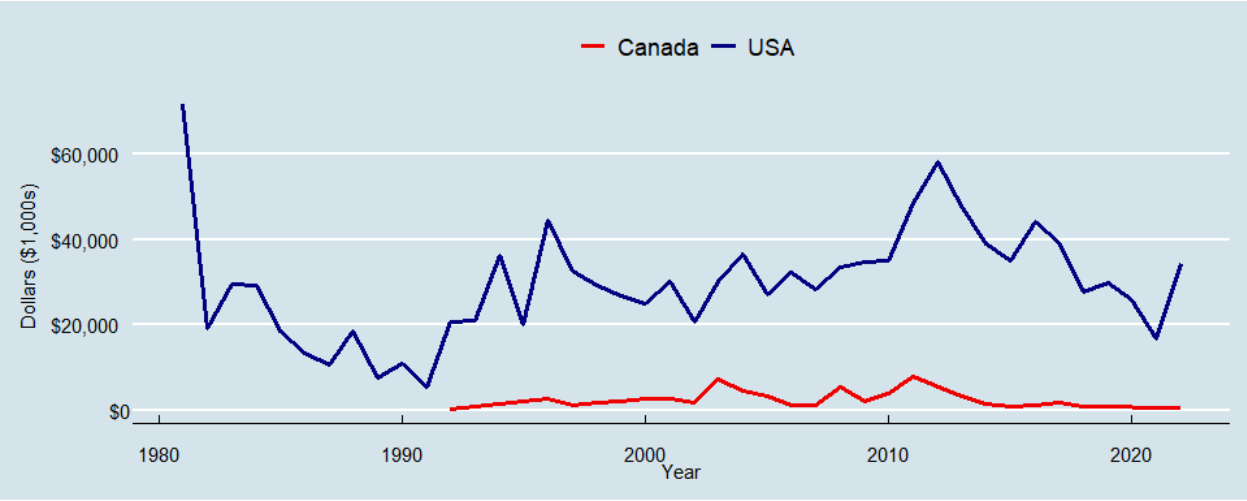

Figure 4-3. Inflation-adjusted ex-vessel revenue in the albacore hook-and-line fishery, 1981-2022. (Confidential data is excluded.)

4.1.2. Drift gillnet fishery for swordfish and shark

This gear consists of floating gillnet panels suspended vertically in the water column to catch pelagic species. It has a minimum stretched mesh size of 17 inches and a single set of the gear may not exceed 6,000 feet in length. The gear is set at night targeting thresher shark and swordfish. In recent decades swordfish has emerged as the dominant target species, likely due to its higher value compared to thresher shark and possibly shark conservation measures implemented in the 1990s.

Although historically operating as far north as Oregon, today fishing occurs south of Monterey, mainly in the Southern California Bight in the fall and winter.

The fishery originally developed in the 1980s and has been in steady decline in terms of participation and catch since then. This decline is at least in part due to restrictions on the operation of the fishery to mitigate catch of marine mammals and sea turtles.

Both Federal and California limited entry permits are required to participate. The federal limited entry permit was implemented in 2018 through Amendment 5 to the HMS FMP. It mirrors many of the features of the state limited entry permit and is required to fish in federal waters. In addition to these limited entry permits, the HMS FMP requires a general HMS permit with a drift gillnet gear endorsement for all U.S. vessels that fish for HMS within the West Coast EEZ and California requires a general resident or non-resident commercial fishing license, general gillnet permit, and a current vessel registration to catch and land fish caught in drift gillnet gear.

In September 2018 California enacted Senate Bill 1017, which created a program to phase out the fishery by 2024. The program includes a mechanism to buy back state limited entry drift gillnet permits along with the surrender of drift gillnet gear for destruction. The Federal limited entry permit also must be surrendered to participate in the program. In December 2022 Congress enacted the Driftnet Modernization and Bycatch Reduction Act, which amends the Magnuson-Stevens Act to prohibit the use of large mesh drift gillnet gear within five years after enactment (i.e., in December 2027). The Act also directs NMFS to implement a transition program that will compensate fishery participants for the cost of permits, surrendered drift gillnet gear, and purchase of alternative low bycatch gear.

Seasonal temperature fronts that concentrate feed for swordfish are a major influence on fishing activity but regulatory time-area closures also have a big influence on seasonal patterns. The fishery is closed in the West Coast EEZ from February 1 to April 30 and closed within 75 nautical miles of the mainland shore from May 1 through August 14. For this reason almost all fishing effort occurs after August 15. This fishery is then effectively closed in an area north of Point Conception from August 15 to November 15 to protect leatherback sea turtles (the Pacific Leatherback Conservation Area). As a result, landings mostly occur from November through January. The fishery also may be closed in an area south of Point Conception from June 1 to August 31 to protect Pacific loggerhead turtles during El Niños.

In the last 10 years DGN landings of HMS management unit species have varied between 76 mt and 239 mt while inflation-adjusted ex-vessel revenue has varied between $419,578 and $1,528,910. In 2022 the fishery landed 82 mt valued at $446,750. This was greater than 2021 when 76 mt worth $578,253 was landed. During that period the number of vessels participating in the fishery varied from 6 to 21.

The following figure shows HMS landings in the large mesh drift gillnet grouped by common thresher shark, swordfish, and other HMS for the past 10 years.

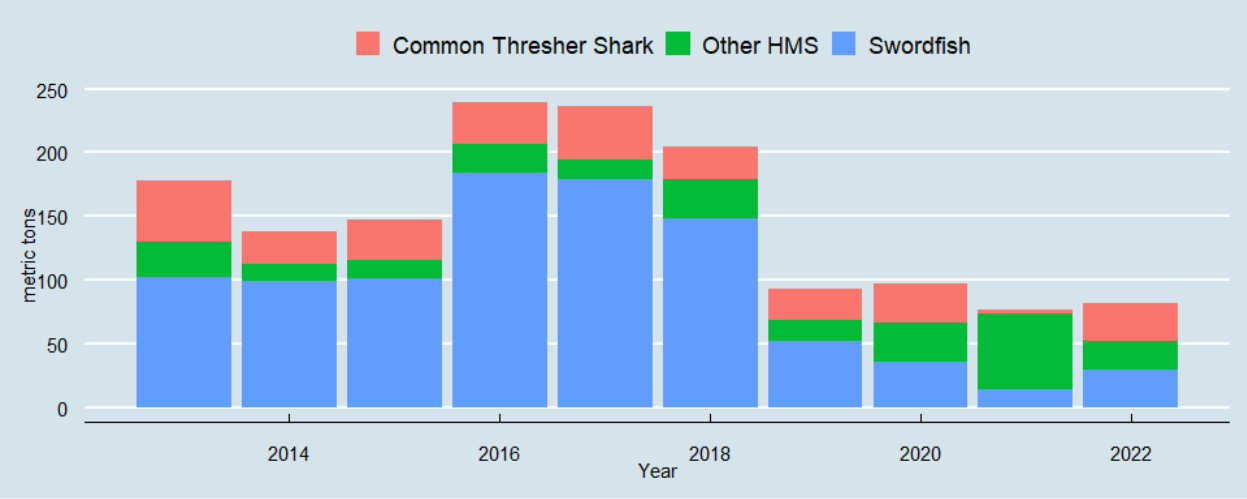

Figure 4-4. Landings (mt) in the large mesh drift gillnet grouped by common thresher shark, swordfish, and other HMS, 2013-2022.

This figure shows inflation-adjusted revenue from HMS over the same time period.

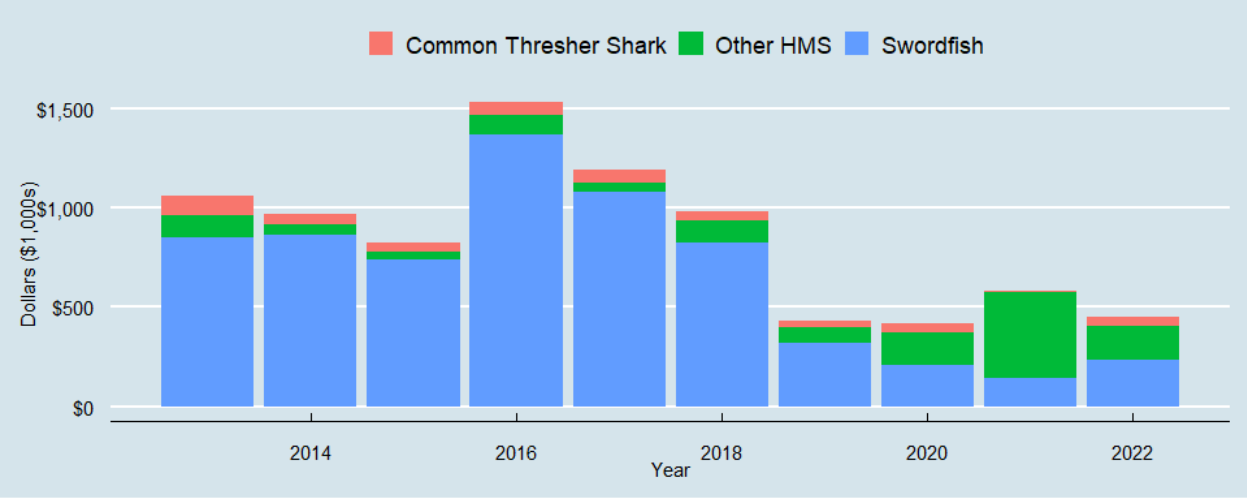

Figure 4-5. Inflation-adjusted revenue in the large mesh drift gillnet grouped by common thresher shark, swordfish, and other HMS, 2013-2022.

4.1.3. Harpoon fishery for swordfish

California's modern harpoon fishery for swordfish developed in the early 1900s. Prior to 1980, harpoon and hook-and-line were the only legal gears for commercially harvesting swordfish. At that time, harpoon gear accounted for the majority of swordfish landings in California ports. But the development of the drift gillnet fishery in the 1980s supplanted harpoon gear as the main swordfish fishery. The pelagic longline fishery has also become a larger source of swordfish landings on the West Coast in recent years. As a result, participation in this fishery has declined.

The fishery typically occurs in the Southern California Bight from May to December, with landings peaking in August, depending on weather conditions and the availability of fish in coastal waters. Some vessel operators work in conjunction with a spotter airplane to increase the search area and to locate swordfish

difficult to see from the vessel. This practice tends to increase the catch-per-unit-effort compared to vessels that do not use a spotter plane, but at higher operating cost.

A state permit and logbook are required to participate in the harpoon fishery in addition to a general resident or non-resident commercial fishing license and a current CDFG vessel registration along with the federal general HMS permit.

In the past 10 years harpoon fishery landings of swordfish have varied between 5 mt and 32 mt while inflation-adjusted ex-vessel revenue has varied between $84,218 and $421,644. In 2022 the fishery landed 32 mt valued at $421,644 compared to 7 mt valued at $97,367 in 2021. During that period the number of vessels participating in the fishery varied from 11 to 21.

The figure below shows harpoon fishery swordfish landings, in metric tons, over the past 10 years.

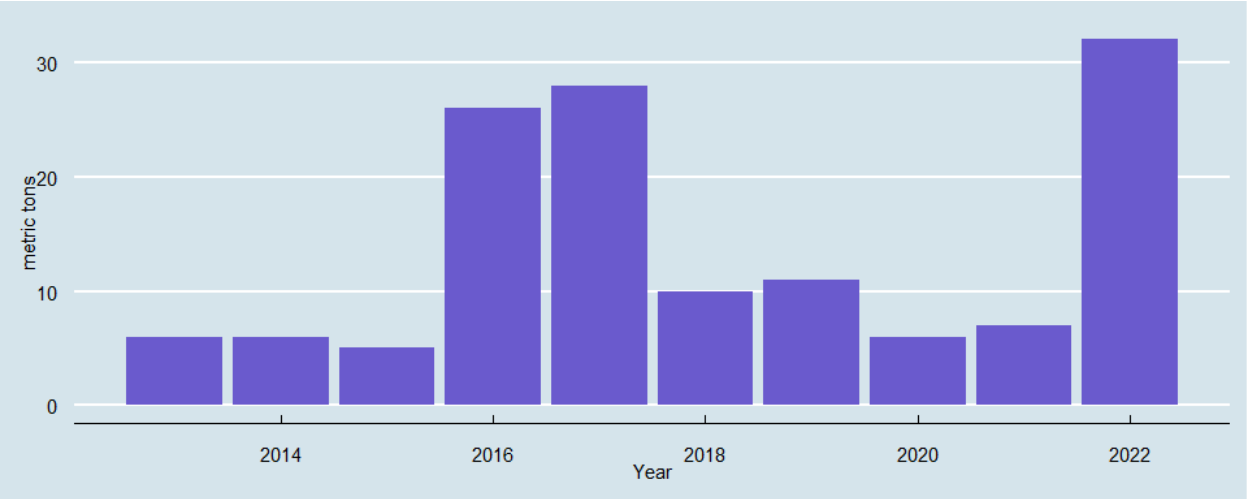

Figure 4-6. Harpoon fishery landings (mt), 2013-2022.

This figure shows inflation-adjusted ex-vessel revenue from swordfish over the same period.

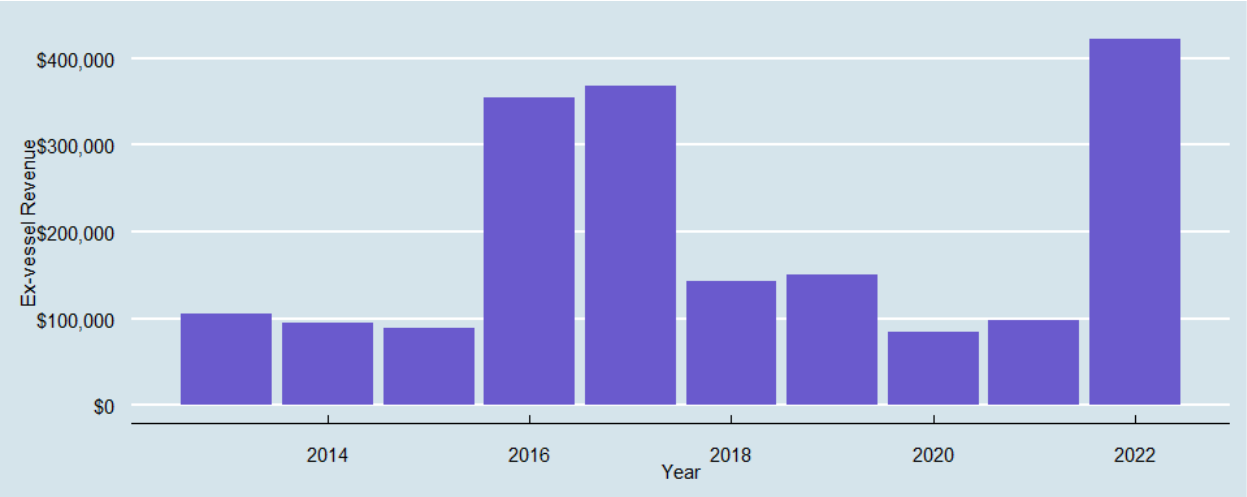

Figure 4-7. Inflation-adjusted ex-vessel revenue in the harpoon fishery, 2013-2022.

4.1.4. High seas longline fishery for swordfish, tuna, and opah

The HMS FMP prohibits pelagic longline fishing within the EEZ. (Commercial landings of striped marlin, an incidentally caught species, are also prohibited on the West Coast.) Pelagic longline vessels fishing outside the West Coast EEZ land swordfish and tuna in West Coast ports, mainly San Francisco, Los Angeles, and San Diego. Historically, pelagic longline vessels landing on the West Coast have been based in Honolulu but in recent years some vessels have made San Diego their home port.

The HMS FMP prohibits targeting swordfish with pelagic longline gear. However, vessels possessing a Hawaii longline limited access permit may land swordfish at West Coast ports. More than four-fifths of vessels landing on the West Coast possess a Hawaii permit.

In recent years pelagic longline has accounted for about two-thirds of total West Coast swordfish landings and a quarter of tuna landings, other than albacore tuna.

In the last 10 years the number of pelagic longline vessels making landings of HMS and opah on the West Coast has varied from 8 to 23. Landings composition has shifted from swordfish to tunas and other species over the decade. In 2013 swordfish accounted for 89% and tunas 7% of the 480 mt in landings of HMS and opah made by this fishery. In 2022 swordfish accounted for 31% while tunas accounted for 57% of the 374 mt in landings of HMS and opah. Opah, which is not a management unit species in the HMS FMP, is also a significant component of landings. In 2022 at 40 mt it accounted for 11% of landings of HMS and opah.

The following figure shows landings trends for tuna, swordfish, opah, and other HMS in metric tons, over the past 10 years.

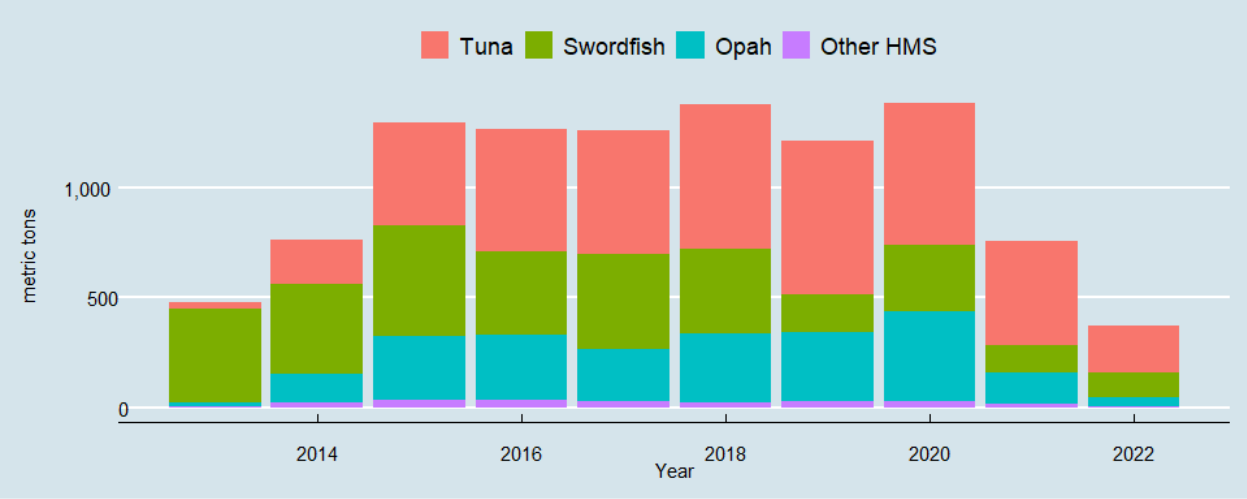

Figure 4-8. Landings trends for opah, swordfish, and tuna (mt) in the pelagic longline fishery, 2013-2022.

This figure shows inflation-adjusted ex-vessel revenue for the aforementioned species.

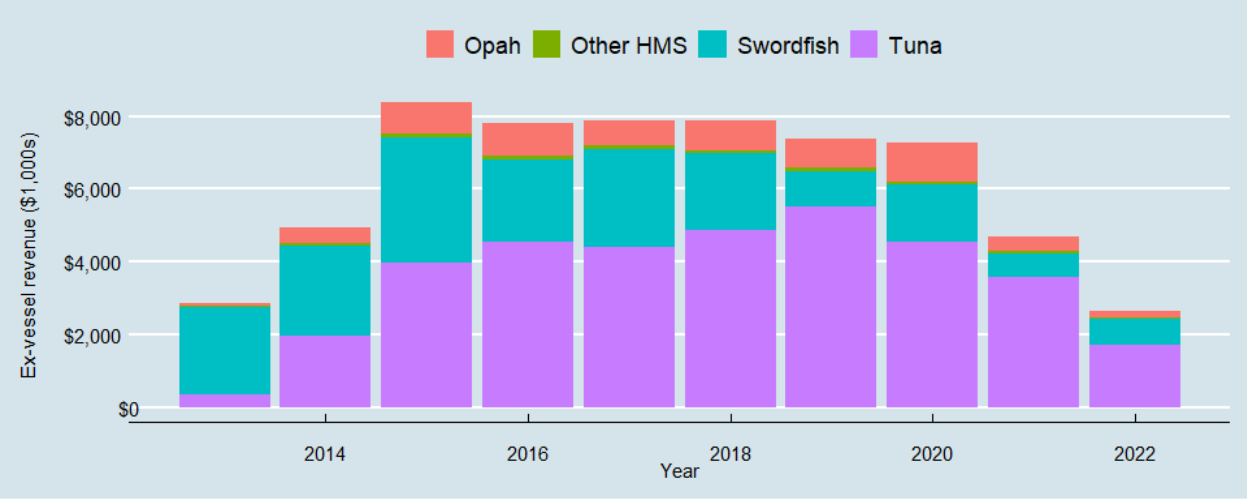

Figure 4-9. Inflation-adjusted ex-vessel revenue for opah, swordfish, and tuna (mt) in the pelagic longline fishery, 2013-2022.

4.1.5. Coastal purse seine fishery for yellowfin, skipjack, and bluefin tunas

This fishery is prosecuted by small coastal purse seine vessels operating in the Southern California Bight from May to October. These vessels usually target small pelagic species, such as Pacific mackerel, Pacific sardine, anchovy, and market squid. However, they will target more tropically distributed yellowfin and skipjack tunas when intrusions of warm water from the south, typically during periodic El Niño episodes, bring these species within range of this coastal fleet. Similarly, purse seine vessel operators will target the higher-valued temperate water Pacific bluefin tuna when they enter the coastal waters of the Southern California Bight. In recent years, the availability of Pacific bluefin in Southern California has increased substantially and has comprised about 15% of landings.

Between 2014 and 2022 purse seine fishery HMS landings have varied between 598 mt and 2,500 mt while inflation-adjusted ex-vessel revenue has varied between $717,410 and $3,162,275. (Earlier years are excluded due to data confidentiality requirements.) In 2022 the fishery landed 602 mt valued at $776,258. This compares to 1,882 mt in 2020. During the past 10 years the number of vessels participating in the fishery varied from 3 to 14.

The following figure shows purse seine fishery landings of HMS tunas, in metric tons, between 2014 and 2022. (Some years are excluded due to data confidentiality requirements.)

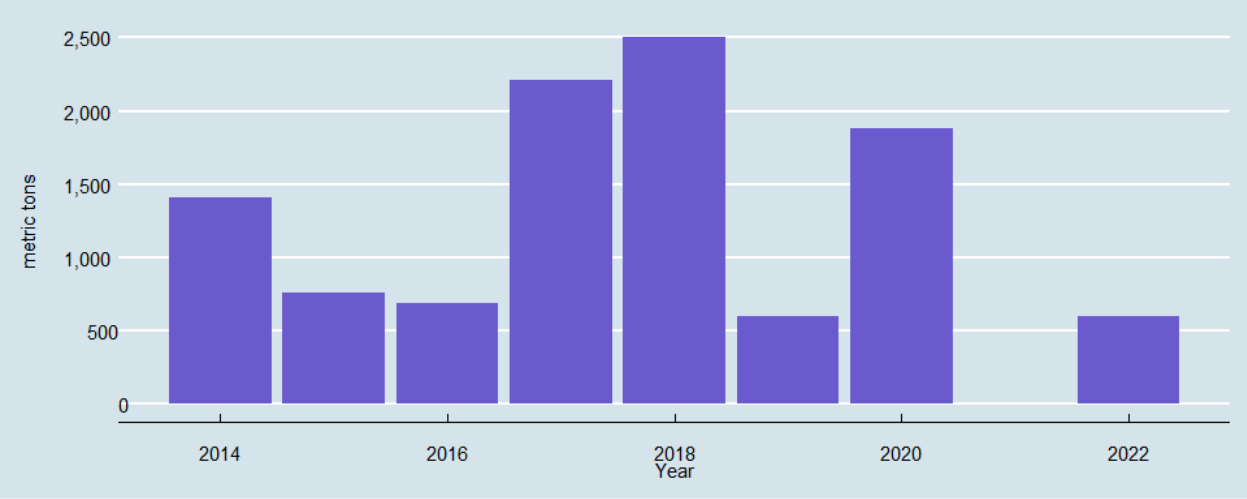

Figure 4-10. Inflation-adjusted ex-vessel revenue for opah, swordfish, and tuna (mt) in the pelagic longline fishery, 2013-2022.

This figure shows inflation-adjusted ex-vessel revenue from HMS tunas for the fishery over the same period.

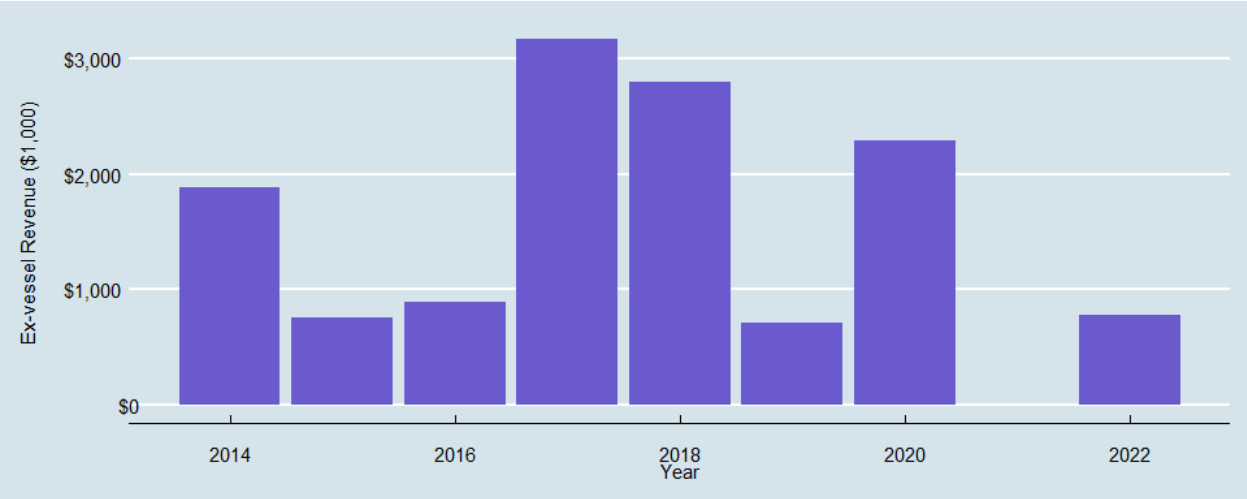

Figure 4-11. Inflation-adjusted ex-vessel revenue for the purse seine fishery, 2013-2022.

4.1.6. Deep-set buoy gear

Beginning in 2010 the Pfleger Institute of Environmental Research (PIER) began design and testing of deep-set buoy gear (DSBG) as a low bycatch method to catch swordfish. The design was inspired by gear used off the east coast of Florida, but both the gear and deployment method were modified to suit conditions on the West Coast. PIER first presented preliminary results to the Council in March 2012 after the first year of research trials. In March 2015 PIER submitted an exempted fishing permit (EFP) application for review by the Council. Under its proposal up to five commercial vessels would be authorized to test the gear with PIER researchers monitoring their activity. (Two other individuals independently applied for EFPs to test the gear type at this time.) While fishing under the PIER EFP continued, the Council began actively soliciting EFP applications to expand the number of vessels testing the gear. At the same time, the Council began scoping an FMP amendment to make DSBG a legal gear along with associated fishery management measures. Since then, the Council has reviewed and made recommendations on over 100 EFP applications

to test DSBG and related gear configurations and NMFS has issued permits to more than 50 vessels. As of 2022, 41 vessels have made landings with the gear.

Two DSBG gear configurations have been tested. So-called standard DSBG consists of independently deployed pieces of gear. Each piece consists of a set of floats at the surface that allows fish strikes on the gear to be detected, a weighted vertical line that puts up to three hooks below surface waters where sea turtles and marine mammals typically occur, or at least 100 meters (55 fathoms, 328 feet) below the surface. The terms of the EFPs allow no more than 10 pieces of gear to be deployed at any one time and the gear must be monitored during deployment. Strike detection leading to fast gear retrieval, deployment at depth, and active monitoring contribute to low bycatch with this gear. PIER subsequently developed a linked buoy gear configuration intended for larger vessels and greater production. Each piece of linked gear consists of two buoy and vertical line sets joined by a horizontal line at depth with three hooks attached to it by branch lines. Each of these gear pieces is joined by a horizontal line at least 11 meters (36 feet) below the surface. As with the standard configuration, no more than 10 pieces may be deployed at any time and the gear must be actively monitored. The figure below shows these gear configurations.

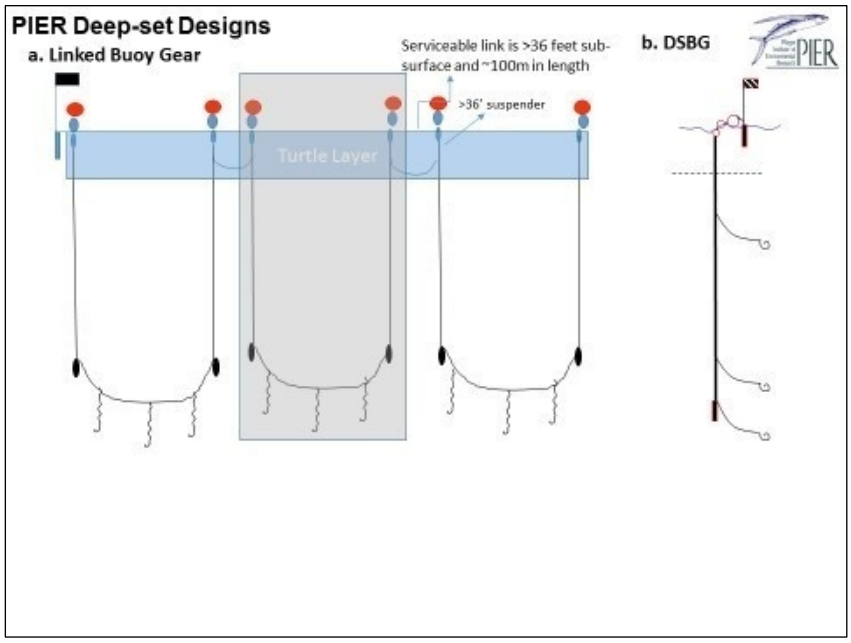

Figure 4-12. Standard and linked DSBG configurations. (Source: PIER.)

In September 2019 and March 2020 the Council adopted an FMP Amendment (Amendment 6) describing management measures including a limited entry permit program for vessels fishing in the Southern California Bight. The FMP Amendment was submitted to NMFS for review and regulations authorizing the gear went into place in 2023. The process to issue limited entry permits began when regulations authorizing the gear went into place and the first batch of 50 permits was issued in September 2023. (See section 1.2.) Current EFPs to allow fishing to continue in the Southern California Bight were then withdrawn.

Between 2015 and 2022 DSBG HMS landings (including LBG) have varied from 12 mt in 2015 and 125 mt in 2020. Inflation adjusted ex-vessel revenue from HMS varied between $128,261 and $1,183,027. During the past 10 years the number of vessels participating in the fishery varied from 2 to 26.

The following figure shows HMS landings in metric tons during this period.

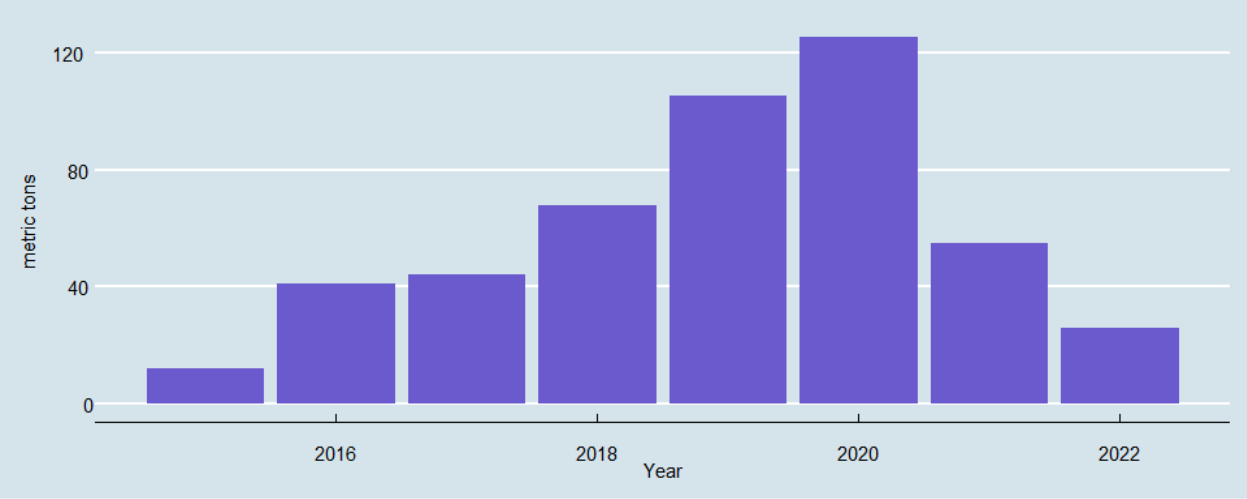

Figure 4-13. Landings (mt) in the DSBG fishery, 2013-2022.

This figure shows the resulting inflation adjusted ex-vessel revenue ($1,000s) from HMS for the same time period.

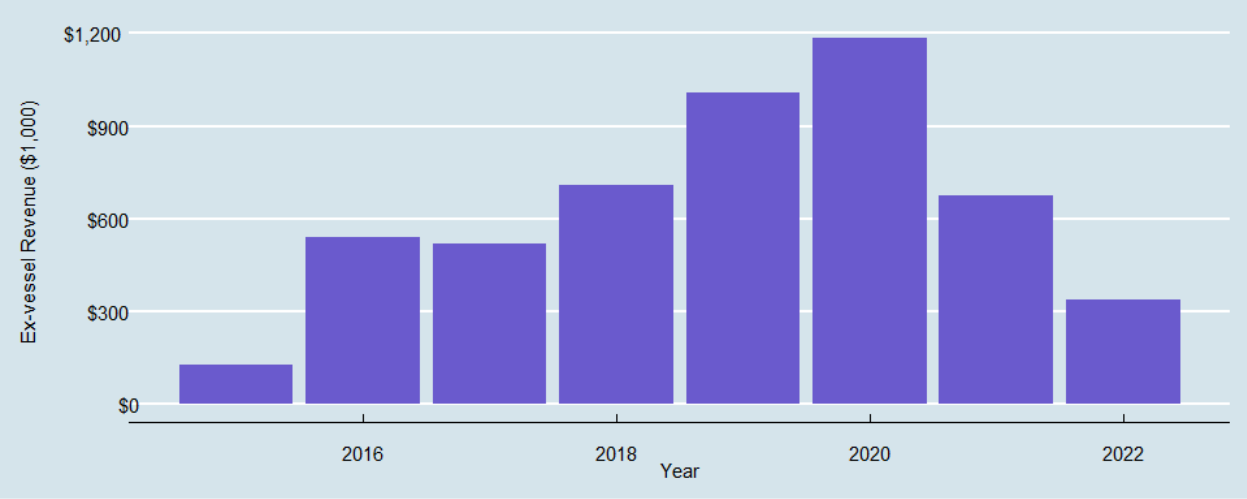

Figure 4-14. Inflation adjusted ex-vessel revenue ($1,000s) in the DSBG fishery, 2013-2022.

4.2. Participation by fishery

The following figures shows trends in the number of vessels making HMS landings by fishery over the last 10 years.

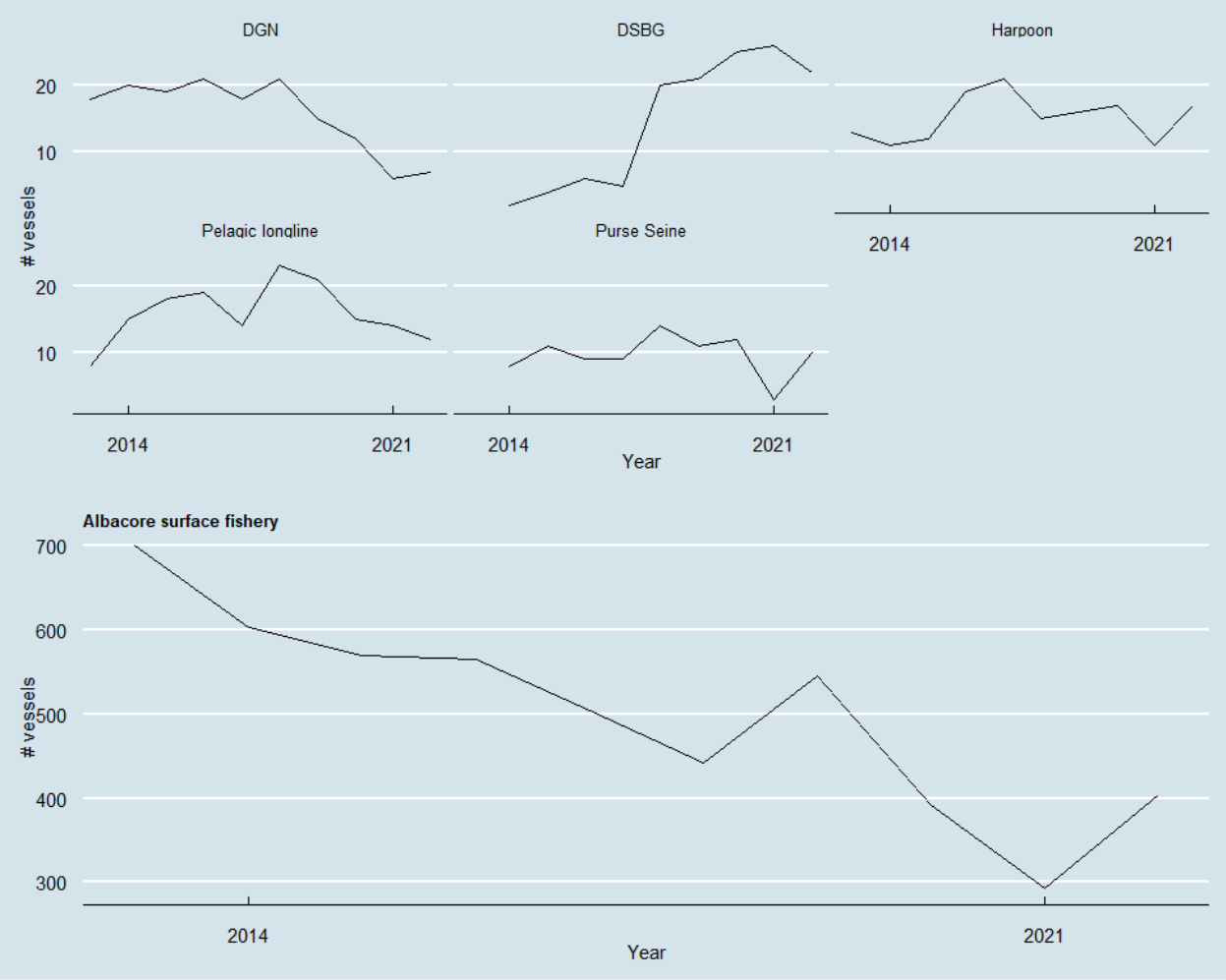

Figure 4-15. Participation (no of vessels) by HMS fishery, 2013-2022.

4.3. Seasonality of HMS landings

Landings in HMS fisheries vary throughout the year. This seasonal pattern of HMS landings is shown in the following two figures showing average monthly landings over the past 10 years. (Landings in the albacore surface fishery are shown separately because they are at much larger scale than the other HMS fisheries.) Overall, landings have been highest in August at 3,776 mt. and lowest in April at 101 mt.

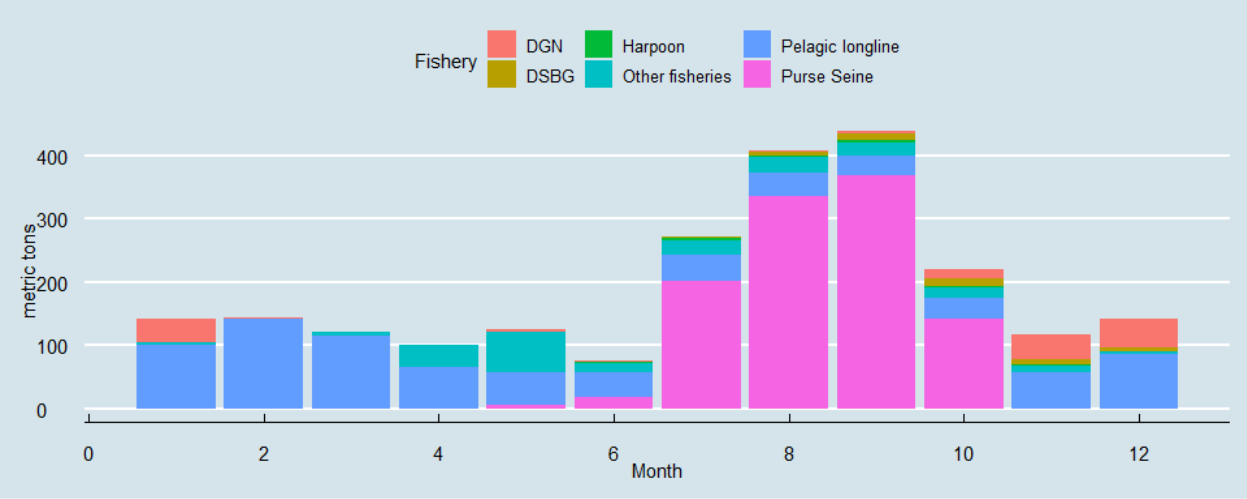

Figure 4-16. Average monthly landings (mt) by HMS fishery (other than albacore), 2013-2022.

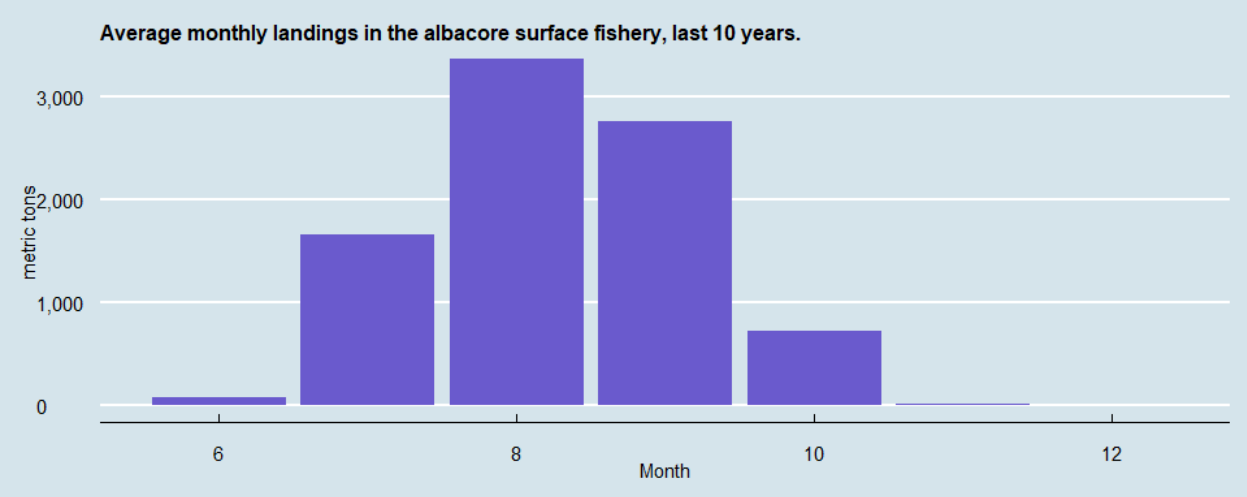

Figure 4-17. Average monthly landings in the albacore hook-and-line fishery, 2013-2022.

4.4. Commercial Fisheries Landings by Species

The figures on this page present information on HMS landings over the last 10 years, or 2013 - 2022. Confidential data (less than 3 vessels or dealers) is excluded from the figures and any reported values.

4.4.1. HMS landings and revenue compared to other species groups

The graph below shows landings in metric tons and inflation-adjusted ex-vessel revenue from species managed under the Council's four FMPs. For HMS this has varied from $24 million to $56 million during this period. As a portion of total West Coast ex-vessel revenue (including species not managed under Council FMPs) this equates to between 3% and 8%.

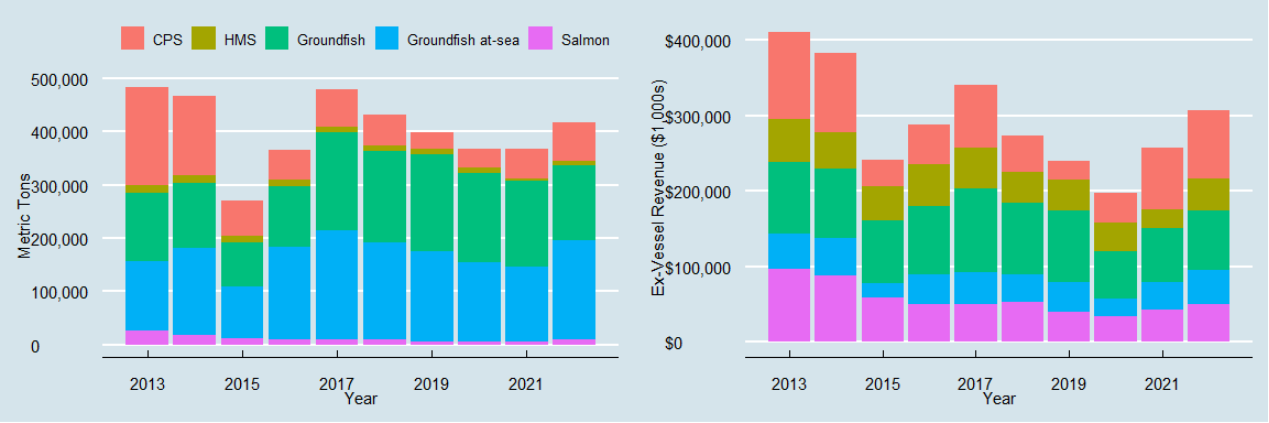

Figure 4-18. Inflation-adjusted ex-vessel revenue by species group, 2013-22.

4.4.2. North Pacific albacore tuna

In 2022 albacore landings totaled 7,214 metric tons worth $35,272,048 compared to 3,591 metric tons worth $17,072,620 in 2021. The following figure shows albacore landings (mt) and inflation-adjusted ex-vessel revenue ($1,000s) by year.

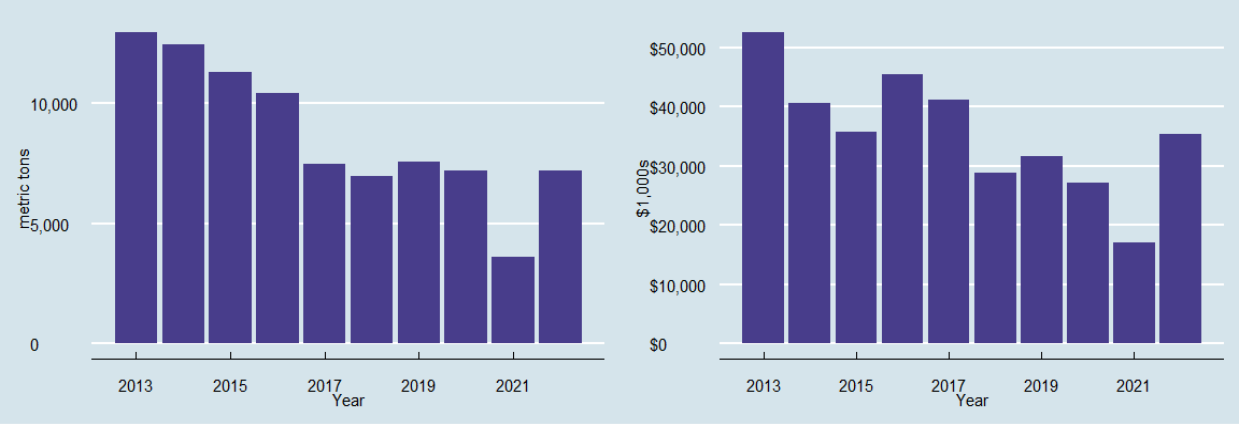

Figure 4-19. North Pacific albacore landings, mt (left), and revenue, current dollars, $1,000s (right), 2013-2022.

4.4.3. Swordfish

In 2022 swordfish landings totaled 179 metric tons worth $1,390,177 compared to 146 metric tons worth $906,993 in 2021. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue ($1,000s) by year.

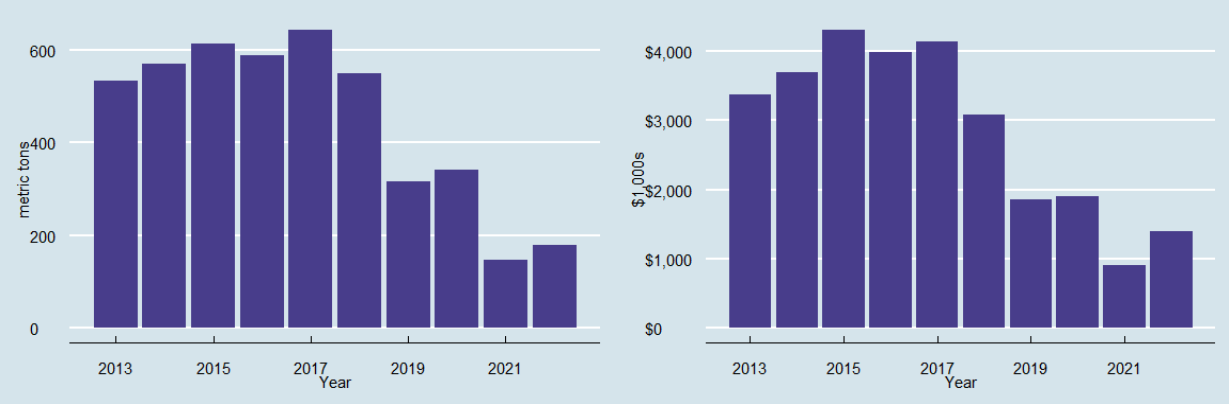

Figure 4-20. Swordfish landings, mt (left), and revenue, current dollars, $1,000s (right), 2013-2022.

4.4.4. Tunas (other than albacore)

In 2022 landings of bigeye, bluefin, skipjack, and yellowfin tunas totaled 1,088 metric tons worth $5,294,901 compared to 678 metric tons worth $5,386,857 in 2021. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue ($1,000s) by year.

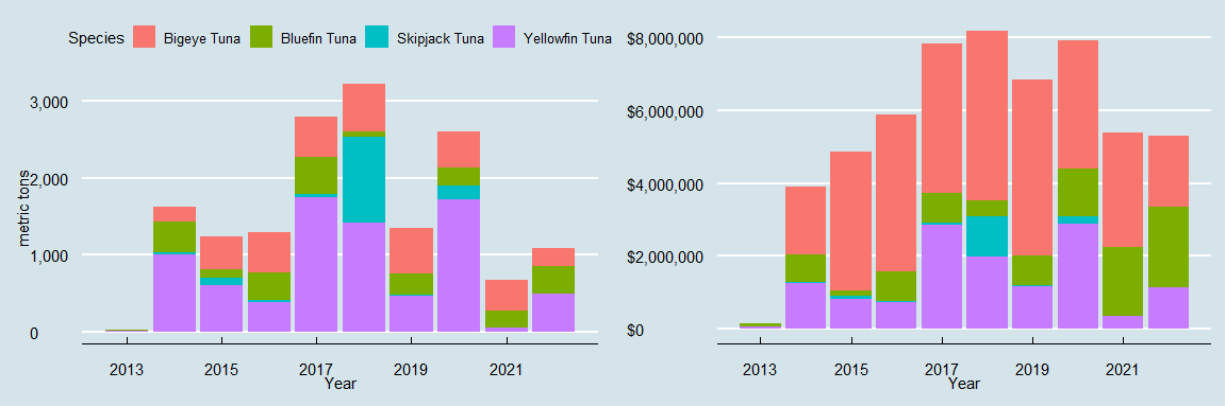

Figure 4-21. Landings of tunas, excluding albacore, metric tons (left) and inflation-adjusted ex-vessel revenue (right), 2013-2022.

The following figure shows Pacific bluefin tuna landings by selected gear types over the past 10 years. Pacific bluefin catch is subject to trip limits in order to comply with catch limits pursuant to an Inter-American Tropical Tuna Commission Resolution. (Unreported confidential data is indicated by * and the excluded fishery.) During this period Purse seine has accounted for most landings, amounting to 74% of the total followed by HMS Hook and Line fishery at 19% and DGN at 6%.

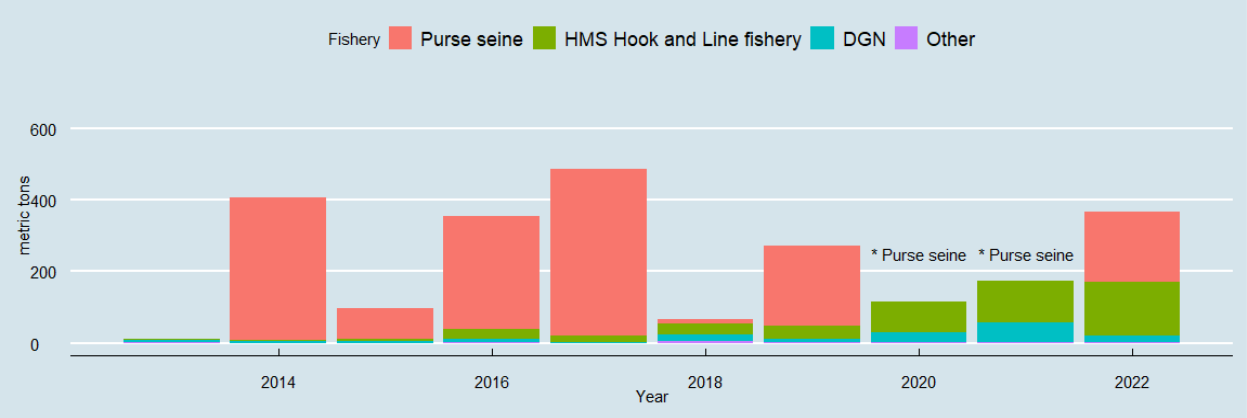

Figure 4-22. Landings of Pacific bluefin tuna (mt) by gear type, 2013-2022.

4.4.5. Sharks

In 2022 landings of common thresher and shortfin mako sharks totaled 50 metric tons worth $85,727 compared to 45 metric tons worth $81,830 in 2021. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue for these species by year.

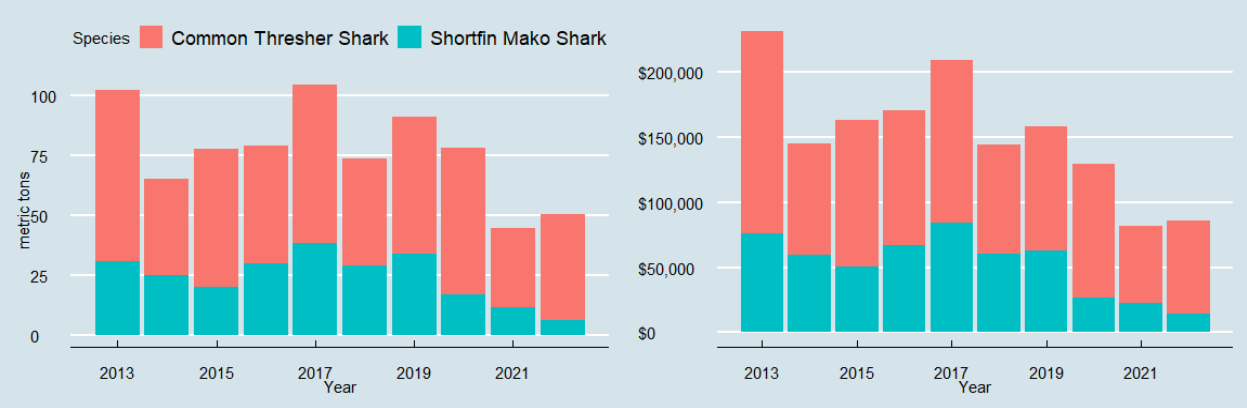

Figure 4-23. Landings of common thresher and shortfin mako sharks, metric tons (left) and inflation-adjusted ex-vessel revenue (right), 2013-2022.

4.4.6. Other species

Blue shark and dorado landings are relatively modest in commercial fisheries compared to other HMS. In 2022 blue shark landings amounted to 3 metric tons worth $592 while dorado landings amounted 15 metric tons worth $113,344. This compares to landings of 2 metric tons worth $171 for blue shark and 7 metric tons worth $38,487 for dorado in 2021. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue for these species by year.

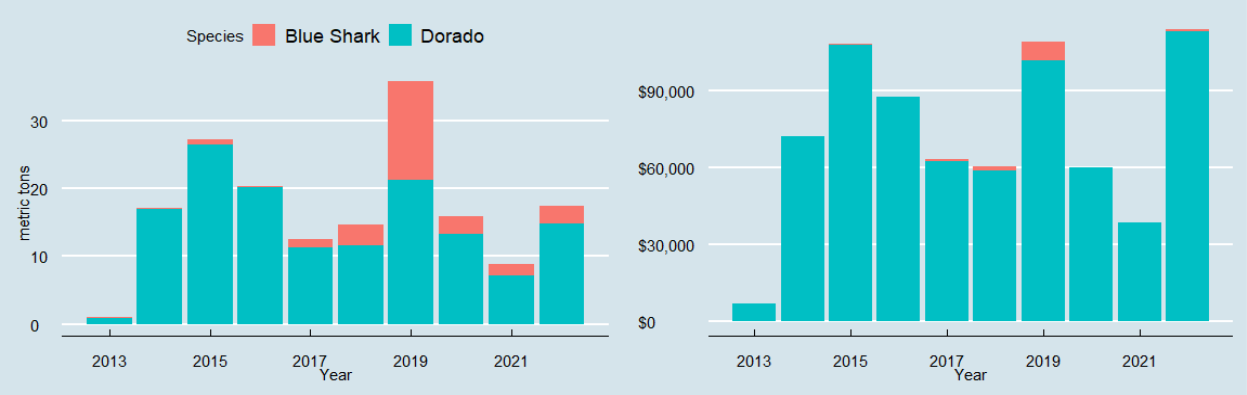

Figure 4-24. Landings of blue shark and dorado, metric tons, 2013-2022.

4.5. Summaries of commercial fishery catch, revenue, and effort (PacFIN data)

4.5.1. HMS SAFE Data Portal

PacFIN data for the HMS SAFE is available through the HMS SAFE Portal hosted on the Pacific Fisheries Information Network (PacFIN) website. This HMS SAFE Portal, developed and maintained by PacFIN, provides a point of public access to HMS fisheries landings, revenues and participation data. This Portal supplements information provided on the Council website. In addition, APEX report HMS006 tracks cumulative landings during the current year by species and fisheries up to the most recent landing date entered in the PacFIN database.

For easy reference, six summary tables showing landings, revenue, and price per pound for HMS management unit species by species and fishery are found below. (Note that the reports in the HMS SAFE Portal may present data for different species groupings, in which case the totals will not match.)

Confidential values (less than 3 vessels or dealers) are not reported and the cells are denoted by "C". Values less than 0.5 are rounded to 0. Blank cells indicate null value (no data exist for that stratum).

4.5.2. Data for HMS Species

Table 4-1. West Coast commercial landings (round mt) of HMS by all HMS and non-HMS gears, 1981 - 2022.

	Tunas						Swordfish	Shark			Dorado
Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1981	13,712	1,168	868	57,869	76,090	40	749	92	1,521	182	4
1982	5,410	968	2,404	41,904	61,769	51	1,112	27	1,848	351	1
1983	9,578	21	764	44,995	55,740	55	1,763	7	1,331	217	1
1984	12,654	126	635	31,251	35,062	1,014	2,889	2	1,279	160	4
1985	7,301	7	3,254	2,977	15,024	468	3,418	1	1,190	149	0
1986	5,243	29	4,731	1,361	21,517	143	2,530	2	974	312	C
1987	3,159	50	823	5,724	23,201	129	1,803	2	562	403	C
1988	4,912	6	804	8,863	19,520	11	1,636	3	500	322	0
1989	2,214	1	1,019	4,505	17,615	77	1,358	6	504	255	0
1990	3,028	2	925	2,256	8,509	46	1,236	20	357	373	1
1991	1,676	7	104	3,407	4,177	11	1,029	1	584	219	0
1992	4,902	7	1,087	2,586	3,350	10	1,546	1	292	142	3
1993	6,166	26	559	4,539	3,795	16	1,767	0	275	122	17
1994	10,751	47	916	2,111	5,056	33	1,700	12	330	128	41
1995	6,530	49	714	7,037	3,038	1	1,162	5	270	95	5
1996	14,173	62	4,688	5,455	3,347	3	1,198	1	319	96	10
1997	11,292	82	2,251	6,070	4,775	11	1,459	1	320	132	5

	Tunas						Swordfish	Shark			Dorado
Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1998	13,915	53	1,949	5,846	5,799	12	1,408	3	361	100	3
1999	9,782	108	186	3,758	1,353	12	2,033	0	321	63	17
2000	9,071	84	312	780	1,159	1	2,657	1	296	80	43
2001	11,194	53	196	58	655	1	2,205	2	373	46	16
2002	10,031	10	11	236	544	2	1,726	41	301	82	0
2003	16,668	35	36	349	465	C	2,135	1	301	70	6
2004	14,540	22	10	307	488	9	1,184	1	115	54	1
2005	9,055	C	207	523	285	C	297	1	179	33	0
2006	12,786	C	1	48	77	C	541	0	160	46	3
2007	11,594	C	45	5	104	C	550	10	204	45	2
2008	11,137	27	1	3	65	1	531	0	148	35	2
2009	12,335	C	415	5	45		414	1	106	31	1
2010	11,856	C	1	C	1	C	370	0	96	22	4
2011	11,050	46	118	1	4	C	620	0	77	19	3
2012	13,935	49	43	1	2		403	0	70	27	10
2013	12,944	C	10	1	6	C	533	0	71	31	1
2014	12,467	185	408	19	1,009	1	574	0	40	25	17
2015	11,317	440	98	110	596	1	624	1	58	20	26
2016	10,451	523	356	36	379	1	629	0	50	30	20
2017	7,462	520	486	42	1,748	C	686	1	66	38	11
2018	6,951	615	65	1,124	1,417		616	3	45	29	12
2019	7,585	598	274	19	460		421	15	57	34	21
2020	7,190	473	231	179	1,719		465	3	62	17	13
2021	3,591	405	217	3	53		200	2	34	12	7
2022	7,214	232	368	C	488	C	205	3	44	6	15

Table 4-2. West Coast real commercial ex-vessel revenues (inflation adjusted, 2022, $1,000s) from HMS landings by all HMS and non-HMS gears, 1981-2022.

	Tunas						Swordfish	Shark			Dorado
Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1981	$72,968	$4,318	$3,409	$182,477	$271,585	$200	$9,230	$162	$4,059	$447	$8
1982	$20,814	$3,130	$6,970	$104,955	$192,947	$256	$13,256	$49	$5,132	$879	$2
1983	$30,520	$115	$2,650	$91,374	$148,273	$238	$16,953	$12	$3,675	$573	$2

	Tunas						Swordfish	Shark			Dorado
Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1984	$41,421	$420	$2,178	$59,671	$89,151	$6,235	$27,973	$6	$3,953	$457	$10
1985	$19,347	$41	$6,577	$4,942	$34,272	$2,400	$31,297	$5	$4,239	$450	$1
1986	$14,129	$206	$10,604	$2,069	$41,348	$453	$29,105	$3	$3,867	$979	C
1987	$11,445	$394	$4,592	$9,880	$62,225	$1,000	$24,811	$4	$2,643	$1,596	C
1988	$19,658	$56	$4,464	$19,943	$58,277	$174	$20,955	$5	$2,113	$1,401	$1
1989	$7,851	$5	$2,638	$8,182	$43,189	$264	$17,130	$7	$1,958	$1,146	$1
1990	$11,236	$18	$2,298	$3,796	$18,758	$113	$14,287	$21	$1,277	$1,478	$4
1991	$5,461	$83	$225	$5,207	$7,730	$41	$12,266	$2	$1,874	$803	$2
1992	$21,715	$85	$2,136	$2,667	$6,954	$40	$14,308	$3	$877	$437	$12
1993	$21,605	$391	$1,390	$6,063	$8,906	$134	$16,538	$1	$847	$409	$78
1994	$36,522	$556	$3,028	$3,168	$8,181	$100	$17,359	$29	$1,057	$447	$135
1995	$20,495	$458	$1,874	$8,417	$5,392	$9	$11,634	$5	$846	$293	$10
1996	$47,367	$453	$7,022	$6,936	$5,622	$49	$10,551	$1	$1,049	$291	$17
1997	$34,070	$615	$4,743	$9,413	$8,535	$37	$10,513	$1	$1,011	$389	$19
1998	$31,952	$460	$5,015	$8,815	$9,913	$104	$10,115	$10	$1,058	$298	$18
1999	$29,504	$1,096	$1,480	$4,584	$2,385	$101	$14,086	$0	$1,030	$185	$80
2000	$28,022	$924	$882	$788	$2,018	$4	$19,230	$1	$932	$216	$103
2001	$32,936	$510	$745	$54	$742	$3	$13,945	$2	$948	$120	$32
2002	$22,368	$135	$66	$201	$924	$10	$10,058	$29	$790	$195	$1
2003	$37,543	$405	$114	$246	$690	C	$12,092	$1	$747	$178	$16
2004	$41,111	$222	$57	$164	$670	$82	$7,243	$1	$296	$147	$8
2005	$30,277	C	$199	$425	$459	C	$2,762	$1	$395	$84	$2
2006	$33,525	C	$5	$57	$247	C	$3,876	$0	$425	$112	$25
2007	$29,726	C	$80	$6	$205	C	$4,299	$3	$464	$108	$14
2008	$38,871	$277	$4	$5	$169	$5	$3,188	$0	$378	$88	$12
2009	$37,026	C	$593	$7	$223		$2,614	$3	$264	$73	$6
2010	$39,110	C	$8	C	$9	C	$2,914	$0	$209	$43	$21
2011	$56,183	$423	$311	$2	$18	C	$4,342	$0	$133	$49	$15
2012	$58,322	$467	$123	$2	$17		$2,659	$0	$145	$67	$45
2013	$52,456	C	$86	$4	$51	C	$3,376	$0	$155	$76	$7
2014	$40,534	$1,863	$770	$18	$1,257	$4	$3,763	$0	$85	$60	$72
2015	$35,782	$3,800	$161	$91	$809	$8	$4,424	$1	$114	$50	$108
2016	$45,364	$4,280	$822	$41	$723	$2	$4,527	$0	$105	$67	$88

	Tunas						Swordfish	Shark			Dorado
Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
2017	$41,124	$4,096	$829	$50	$2,856	C	$4,663	$1	$126	$84	$63
2018	$28,746	$4,619	$459	$1,101	$1,976		$3,784	$2	$85	$61	$59
2019	$31,541	$4,807	$827	$23	$1,170		$2,866	$7	$96	$63	$102
2020	$27,066	$3,513	$1,328	$187	$2,890		$3,076	$0	$104	$27	$60
2021	$17,073	$3,144	$1,892	$9	$349		$1,574	$0	$61	$23	$38
2022	$35,272	$1,942	$2,216	C	$1,137	C	$1,725	$1	$71	$15	$114

Table 4-3. Average price-per-pound (inflation-adjusted dollars, 2022) from HMS landings by all HMS and non-HMS gears, 1981-2022.

	Tunas						Swordfish	Shark			Dorado
Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1981	$2.41	$1.68	$1.78	$1.43	$1.62	$2.29	$8.10	$0.80	$2.06	$1.61	$0.92
1982	$1.75	$1.47	$1.31	$1.14	$1.42	$2.29	$7.84	$0.83	$2.14	$1.65	$0.99
1983	$1.45	$2.43	$1.58	$0.92	$1.21	$1.95	$6.33	$0.79	$2.13	$1.73	$1.33
1984	$1.48	$1.51	$1.55	$0.87	$1.15	$2.79	$6.37	$1.50	$2.38	$1.88	$1.32
1985	$1.20	$2.82	$0.92	$0.75	$1.03	$2.32	$6.02	$1.94	$2.75	$1.99	$2.07
1986	$1.22	$3.26	$1.02	$0.69	$0.87	$1.44	$7.57	$0.85	$3.08	$2.07	C
1987	$1.64	$3.59	$2.53	$0.78	$1.22	$3.53	$9.05	$1.06	$3.43	$2.61	C
1988	$1.82	$3.98	$2.52	$1.02	$1.35	$7.17	$8.42	$0.67	$3.30	$2.86	$3.01
1989	$1.61	$3.64	$1.17	$0.82	$1.11	$1.56	$8.30	$0.53	$2.99	$2.95	$1.21
1990	$1.68	$3.56	$1.13	$0.76	$1.00	$1.12	$7.60	$0.47	$2.76	$2.60	$2.56
1991	$1.48	$5.15	$0.98	$0.69	$0.84	$1.62	$7.84	$1.17	$2.47	$2.42	$3.17
1992	$2.01	$5.75	$0.89	$0.47	$0.94	$1.79	$6.09	$1.12	$2.31	$2.02	$1.66
1993	$1.59	$6.94	$1.13	$0.61	$1.06	$3.81	$6.16	$1.13	$2.37	$2.20	$2.09
1994	$1.54	$6.68	$1.50	$0.68	$0.73	$1.41	$6.72	$1.16	$2.47	$2.30	$1.65
1995	$1.42	$5.36	$1.20	$0.54	$0.81	$3.45	$6.57	$0.60	$2.39	$2.02	$0.88
1996	$1.52	$4.08	$0.68	$0.58	$0.76	$7.09	$5.74	$0.57	$2.51	$1.99	$0.88
1997	$1.37	$3.68	$0.96	$0.70	$0.81	$1.60	$4.73	$0.44	$2.43	$1.93	$1.77
1998	$1.05	$4.58	$1.17	$0.70	$0.78	$4.38	$4.65	$1.67	$2.23	$1.94	$2.55
1999	$1.38	$5.07	$3.65	$0.55	$0.80	$4.10	$4.54	$0.23	$2.16	$1.93	$2.23
2000	$1.40	$5.96	$1.30	$0.46	$0.79	$1.90	$4.76	$0.70	$2.19	$1.77	$1.28
2001	$1.33	$5.11	$1.74	$0.42	$0.52	$2.76	$4.16	$0.43	$1.91	$1.71	$0.95
2002	$1.01	$6.52	$2.72	$0.39	$0.77	$2.76	$3.83	$0.47	$2.03	$1.56	$1.92

	Tunas						Swordfish	Shark			Dorado
Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
2003	$1.02	$5.38	$1.44	$0.32	$0.67	C	$3.72	$0.33	$1.91	$1.68	$1.21
2004	$1.28	$4.88	$2.75	$0.24	$0.64	$4.09	$4.02	$0.64	$1.98	$1.78	$3.46
2005	$1.52	C	$0.44	$0.37	$0.73	C	$6.12	$0.32	$1.70	$1.65	$3.81
2006	$1.19	C	$3.18	$0.54	$1.51	C	$4.71	$0.51	$2.04	$1.61	$4.11
2007	$1.16	C	$0.81	$0.54	$0.89	C	$5.14	$0.13	$1.75	$1.59	$3.31
2008	$1.58	$4.59	$2.49	$0.76	$1.18	$3.42	$3.95	$0.86	$1.97	$1.65	$3.13
2009	$1.36	C	$0.65	$0.63	$2.32		$4.16	$1.43	$1.91	$1.58	$3.82
2010	$1.50	C	$2.88	C	$5.55	C	$5.18	$0.44	$1.67	$1.30	$2.84
2011	$2.31	$5.24	$1.19	$0.90	$2.34	C	$4.61	$0.40	$1.33	$1.68	$2.25
2012	$1.90	$5.22	$1.29	$0.98	$4.91		$4.34	$0.02	$1.53	$1.60	$2.21
2013	$1.84	C	$3.81	$1.97	$3.92	C	$4.17	$0.18	$1.67	$1.64	$3.42
2014	$1.47	$4.56	$0.86	$0.43	$0.57	$1.84	$4.32	$0.05	$1.62	$1.59	$1.93
2015	$1.43	$4.00	$0.75	$0.37	$0.62	$4.62	$4.66	$0.34	$1.51	$1.64	$1.86
2016	$1.97	$3.73	$1.05	$0.52	$0.87	$0.80	$4.73	$0.08	$1.63	$1.47	$1.98
2017	$2.50	$3.57	$0.77	$0.54	$0.74	C	$4.47	$0.32	$1.47	$1.44	$2.53
2018	$1.88	$3.41	$3.26	$0.44	$0.63		$4.04	$0.23	$1.45	$1.37	$2.30
2019	$1.89	$3.90	$1.39	$0.54	$1.17		$4.47	$0.26	$1.28	$1.22	$2.31
2020	$1.71	$3.63	$2.66	$0.47	$0.77		$4.35	$0.04	$1.29	$1.05	$2.22
2021	$2.16	$3.87	$4.11	$1.13	$3.14		$5.19	$0.05	$1.38	$1.29	$2.55
2022	$2.22	$4.02	$2.78	C	$1.06	C	$5.52	$0.10	$1.23	$1.60	$3.52

4.5.3. Data for HMS Fisheries

Table 4-4. West Coast commercial HMS landings (round mt) by HMS fishery, 1990-2022. (Albacore hook-and-line fishery U.S. vessels only.)

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
1990	2,976	1,521	67	C	6,517		5,532
1991	1,654	1,462	21	C	6,671		1,182
1992	4,704	1,669	78	54	5,762		1,347
1993	5,952	1,935	170	203	5,577		3,381
1994	10,649	1,114	158	902	5,369		2,803
1995	6,408	1,080	99	355	8,840		1,826
1996	13,209	1,133	82	438	12,238		1,249
1997	10,832	1,145	87	760	11,539		1,554

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
1998	12,628	1,317	49	591	10,519		3,077
1999	8,769	843	82	1,392	4,026		1,675
2000	8,081	729	90	2,097	2,173		320
2001	10,264	586	53	2,008	805		193
2002	9,301	480	90	1,386	C		127
2003	13,488	443	107	1,852	862		115
2004	13,367	271	70	969	770		104
2005	8,217	387	77	C	1,006		22
2006	12,374	576	75	C	C		37
2007	11,151	670	59	C	223		28
2008	9,798	525	49	94	C		47
2009	11,650	325	51	144	460		38
2010	10,891	119	38	318			29
2011	9,832	206	25	557	C		18
2012	13,885	178	5	370	C		29
2013	12,031	179	7	460			20
2014	12,017	138	6	636	1,413	C	77
2015	11,026	146	5	1,006	758	12	46
2016	10,240	239	26	970	686	41	56
2017	7,180	236	28	1,029	2,206	44	68
2018	6,717	205	10	1,069	2,500	68	74
2019	7,185	93	11	897	598	105	197
2020	6,858	97	7	971	1,882	125	137
2021	3,491	76	7	618	C	55	216
2022	7,038	83	32	334	602	26	378

Table 4-5.West Coast commercial HMS ex-vessel revenue (inflation adjusted, 2022, $1,000s) by HMS fishery, 1990-2022. (Albacore hook-and-line fishery U.S. vessels only.)

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
1990	$11,022	$14,243	$1,090	C	$13,445		$12,989
1991	$5,383	$12,973	$352	C	$11,414		$2,517
1992	$20,706	$13,432	$1,121	$581	$8,571		$3,722
1993	$20,951	$14,423	$2,096	$2,008	$8,630		$8,025
1994	$36,195	$9,533	$2,306	$7,445	$9,672		$4,967
1995	$20,119	$9,130	$1,353	$2,562	$13,044		$2,569
1996	$44,356	$8,370	$1,107	$2,902	$17,511		$1,906
1997	$32,670	$7,218	$1,178	$4,315	$19,525		$2,938

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
1998	$29,046	$7,977	$684	$3,945	$17,881		$5,294
1999	$26,665	$5,323	$1,027	$9,309	$5,695		$3,992
2000	$24,994	$4,471	$1,225	$14,571	$3,241		$1,555
2001	$29,977	$2,881	$749	$11,866	$1,114		$562
2002	$20,674	$2,872	$1,063	$6,769	C		$366
2003	$30,145	$2,233	$1,295	$9,478	$959		$416
2004	$36,420	$1,672	$1,009	$5,139	$803		$262
2005	$26,910	$2,122	$1,034	C	$1,039		$65
2006	$32,194	$3,159	$966	C	C		$125
2007	$28,404	$3,867	$822	C	$395		$87
2008	$33,569	$2,592	$617	$503	C		$175
2009	$34,818	$1,638	$629	$838	$627		$114
2010	$35,008	$654	$485	$2,280			$83
2011	$48,300	$1,219	$328	$3,576	C		$51
2012	$58,054	$1,196	$81	$2,212	C		$91
2013	$47,652	$1,060	$106	$2,768			$87
2014	$38,897	$965	$96	$4,509	$1,883	C	$376
2015	$34,881	$825	$89	$7,525	$759	$128	$234
2016	$44,190	$1,529	$356	$6,898	$891	$541	$426
2017	$39,180	$1,189	$368	$7,183	$3,162	$521	$406
2018	$27,687	$979	$144	$7,044	$2,797	$710	$469
2019	$29,681	$432	$150	$6,592	$717	$1,009	$1,066
2020	$25,873	$420	$85	$6,204	$2,288	$1,183	$1,164
2021	$16,627	$578	$98	$4,276	C	$676	$1,807
2022	$34,358	$447	$422	$2,458	$776	$336	$3,180

Table 4-6. Average price-per-pound (inflation adjusted dollars, 2022) from HMS landings by fishery, 1990-2022. (Albacore hook-and-line fishery U.S. vessels only.)

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
1990	$1.68	$6.20	$10.65	C	$0.94		$1.08
1991	$1.48	$6.01	$11.08	C	$0.78		$1.01
1992	$2.00	$5.24	$9.41	$6.73	$0.67		$1.28
1993	$1.60	$4.72	$8.11	$5.81	$0.70		$1.09
1994	$1.54	$5.59	$9.62	$5.28	$0.82		$0.81
1995	$1.42	$5.48	$9.01	$4.58	$0.67		$0.64
1996	$1.52	$4.71	$8.83	$4.20	$0.65		$0.70
1997	$1.37	$4.07	$8.90	$3.59	$0.77		$0.87
1998	$1.05	$3.86	$9.20	$4.16	$0.78		$0.79
1999	$1.39	$3.94	$8.24	$4.19	$0.64		$1.15

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
2000	$1.40	$3.95	$8.91	$4.49	$0.68		$2.94
2001	$1.32	$3.16	$9.33	$3.81	$0.63		$1.68
2002	$1.01	$3.97	$7.73	$3.20	C		$2.02
2003	$1.01	$3.41	$7.96	$3.34	$0.50		$2.35
2004	$1.24	$4.05	$9.51	$3.44	$0.48		$1.58
2005	$1.49	$3.68	$8.83	C	$0.47		$1.97
2006	$1.18	$3.68	$8.52	C	C		$2.35
2007	$1.16	$3.90	$9.10	C	$0.80		$2.22
2008	$1.55	$3.33	$8.35	$3.05	C		$2.53
2009	$1.36	$3.35	$8.14	$3.50	$0.62		$2.01
2010	$1.46	$3.72	$8.42	$4.48			$2.07
2011	$2.23	$3.85	$8.67	$4.09	C		$1.97
2012	$1.90	$4.42	$9.78	$3.71	C		$1.71
2013	$1.80	$3.94	$10.63	$3.83			$2.59
2014	$1.47	$4.64	$9.87	$4.05	$0.60	C	$3.00
2015	$1.43	$3.77	$10.81	$4.08	$0.45	$7.24	$2.71
2016	$1.96	$4.22	$8.91	$3.70	$0.59	$8.65	$3.96
2017	$2.48	$3.39	$8.62	$3.67	$0.65	$7.78	$3.28
2018	$1.87	$3.08	$9.38	$3.39	$0.51	$6.88	$3.34
2019	$1.87	$3.08	$8.82	$3.76	$0.54	$6.31	$3.26
2020	$1.71	$2.68	$8.17	$3.40	$0.55	$6.25	$4.39
2021	$2.16	$3.94	$9.05	$3.62	C	$8.09	$4.13
2022	$2.21	$3.43	$8.54	$3.87	$0.58	$8.43	$4.04

5. HMS Recreational Fisheries Description and Recent Catch and Effort

Washington recreational HMS fishery statistics are available from PSMFC through their Recreational Fisheries Information Network (RecFIN) website. RecFIN provides estimates based on field sampling of HMS catch and telephone survey for effort. While RecFIN also contains estimates for Oregon, ODFW's Ocean Recreational Boat Survey (ORBS) data are used here given nuances in recreational fishery sector differentiation. RecFIN does not contain estimates of HMS catch and effort for California, and CDFW similarly provides data from its Marine Logbook System (MLS) and California Recreational Fishing Survey (CRFS) estimates.

5.1. Albacore

Recreational anglers fishing from private vessels and from commercial passenger fishing vessels (CPFVs) target albacore in all three West Coast states. Albacore is targeted almost exclusively with rod-and-reel gear, and success is highly dependent upon the distance from port to the fish, weather and ocean conditions, and fuel prices.

In recent years albacore typically begin to show up within range of the recreational fishery in California in late spring, migrating northward and appearing off Oregon and Washington in mid to late June, and are available through late September or early October in most years.

5.1.1. Fishery performance

The following tables show recreational albacore catch, fishing effort, and catch per unit of effort (tables updated 09/28/2023).

Note: California and Oregon record catch and effort by angler day. Washington records catch and effort by angler trip, although the majority of trips are equal to one day. With very infrequent exceptions, the duration of Oregon recreational fishing trips by private anglers and by charter anglers is 24 hours or less, and encompasses one day of fishing activity. NAs represent data that are not collected/able to be calculated. Zeros represent no catch.

Table 5-1 (Table R1a). Recreational albacore catch (number of kept fish) for charter and private boats by year and port, 2020-2022 for trips targeting tuna.

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
North Coast	NA	NA	NA	0	42	42	0	705	705
Westport	8718	13097	21814	3,356	3,034	6,390	10,219	23,667	33,886
Ilwaco	965	4465	5431	928	3,188	4,117	3,046	12,152	15,198
Washington Subtotal	**9683**	**17562**	**27245**	**4,284**	**6,264**	**10,549**	**13,265**	**36,524**	**49,789**
Astoria	0	85	85	0	53	53	0	1,670	1,670
Pacific City	0	78	78	0	122	122	0	182	182
Garibaldi	63	1111	1174	59	1,384	1,443	0	5,066	5,066
Depoe Bay	0	478	478	36	1,018	1,054	396	2,407	2,803
Newport	11	887	898	56	1,866	1,922	168	4,134	4,302

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
Florence	0	0	0	0	186	186	0	0	0
Winchester Bay	0	15	15	0	4,626	4,626	0	592	592
Coos Bay	0	465	465	52	7,144	7,196	0	2,967	2,967
Bandon	0	0	0	83	243	326	0	0	0
Gold Beach	0	0	0	0	0	0	0	0	0
Brookings	0	1699	1699	233	3,696	3,929	167	2,852	3,019
Oregon Subtotal	**74**	**4818**	**4892**	**519**	**20,338**	**20,857**	**731**	**19,870**	**20,601**
Redwood District	844	5644	6488	373	9,269	9,642	2,036	4,728	6,764
Wine District	327	6863	7190	55	0	55	377	26,811	27,188
San Francisco District	57	0	57	10	0	10	15	270	285
Central District	0	0	0	0	0	0	0	0	0
Channel District	0	0	0	0	0	0	0	0	0
South District	0	0	0	0	0	0	0	0	0
California Subtotal	**1228**	**12507**	**13735**	**438**	**9,269**	**9,707**	**2,428**	**31,809**	**34,237**
Mex	0	0	0	0	0	0	0	0	0
Mexico Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Oregon-Washington Total	**9757**	**22380**	**32137**	**4,803**	**26,602**	**31,406**	**13,996**	**56,394**	**70,390**
U.S. Total	**10985**	**34887**	**45872**	**5,241**	**35,871**	**41,113**	**16,424**	**88,203**	**104,627**
Coastwide Total	**10985**	**34887**	**45872**	**5,241**	**35,871**	**41,113**	**16,424**	**88,203**	**104,627**

Table 5-2 (Table R1b). Recreational albacore catch (number of kept fish) for charter and private boats by year and port, 2020-2022 regardless of trip type.

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
North Coast	NA	NA	NA	0	42	42	0	942	942
Westport	8718	13265	21982	3,405	3,115	6,520	10,350	24,389	34,739
Ilwaco	965	4465	5431	928	3,242	4,170	3,046	12,636	15,682
Washington Subtotal	**9683**	**17730**	**27413**	**4,333**	**6,399**	**10,732**	**13,396**	**37,967**	**51,363**
Astoria	0	87	87	0	53	53	0	1,841	1,841
Pacific City	0	78	78	0	122	122	0	182	182
Garibaldi	63	1282	1345	59	1,437	1,496	0	5,446	5,446
Depoe Bay	12	583	595	36	1,045	1,081	396	2,494	2,890
Newport	11	1000	1011	56	2,157	2,213	168	4,369	4,537
Florence	0	0	0	0	186	186	0	0	0
Winchester Bay	0	57	57	0	4,948	4,948	0	619	619

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
Coos Bay	0	465	465	52	7,144	7,196	0	3,268	3,268
Bandon	0	0	0	83	243	326	0	0	0
Gold Beach	0	0	0	0	0	0	0	0	0
Brookings	0	1719	1719	245	3,730	3,975	167	2,873	3,040
Oregon Subtotal	**86**	**5271**	**5357**	**531**	**21,065**	**21,596**	**731**	**21,092**	**21,823**
Redwood District	844	5644	6488	373	9,269	9,642	2,036	4,728	6,764
Wine District	327	6863	7190	55	0	55	377	26,811	27,188
San Francisco District	57	0	57	10	0	10	15	270	285
Central District	0	0	0	0	0	0	0	0	0
Channel District	0	0	0	0	0	0	0	0	0
South District	0	0	0	0	0	0	0	0	0
California Subtotal	**1228**	**12507**	**13735**	**438**	**9,269**	**9,707**	**2,428**	**31,809**	**34,237**
Mex	0	0	0	0	0	0	0	0	0
Mexico Subtotal	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Oregon-Washington Total	**9769**	**23001**	**32770**	**4,864**	**27,464**	**32,328**	**14,127**	**59,059**	**73,186**
U.S. Total	**10997**	**35508**	**46505**	**5,302**	**36,733**	**42,035**	**16,555**	**90,868**	**107,423**
Coastwide Total	**10997**	**35508**	**46505**	**5,302**	**36,733**	**42,035**	**16,555**	**90,868**	**107,423**

Table 5-3 (Table R2). Recreational albacore effort (angler days*) for charter and private boats by year and port, 2020-2022.

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
North Coast	NA	NA	NA	0	49	49	5	149	154
Westport	757	3735	4492	613	1944	2557	863	4962	5825
Ilwaco	571	1743	2314	630	1310	1940	936	2682	3618
Washington Subtotal	**1328**	**5478**	**6806**	**1,243**	**3303**	**4546**	**1,804**	**7793**	**9597**
Astoria	0	63	63	0	61	61	0	413	413
Pacific City	0	94	94	0	43	43	0	73	73
Garibaldi	47	797	844	38	762	800	0	1207	1207
Depoe Bay	0	264	264	33	260	293	236	535	771
Newport	23	521	544	10	536	546	104	1003	1107
Florence	0	0	0	0	34	34	0	4	4
Winchester Bay	0	31	31	0	1117	1117	0	226	226
Coos Bay	0	317	317	31	1730	1761	7	1093	1100
Bandon	0	0	0	32	98	130	0	0	0

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
Gold Beach	0	0	0	0	0	0	0	0	0
Brookings	0	409	409	38	984	1022	36	385	421
Oregon Subtotal	**70**	**2496**	**2566**	**182**	**5625**	**5807**	**383**	**4939**	**5322**
Redwood District	203	NA	NA	47	NA	NA	488	NA	NA
Wine District	101	NA	NA	5	NA	NA	130	NA	NA
San Francisco District	24	NA	NA	8	NA	NA	29	NA	NA
Central District	0	NA	NA	0	NA	NA	0	NA	NA
Channel District	4	NA	NA	0	NA	NA	0	NA	NA
South District	0	NA	NA	0	NA	NA	0	NA	NA
California Subtotal	**332**	**NA**	**NA**	**60**	**NA**	**NA**	**647**	**NA**	**NA**
Mex	0	NA	NA	0	NA	NA	0	NA	NA
Mexico Subtotal	**0**	**NA**	**NA**	**0**	**NA**	**NA**	**0**	**NA**	**NA**
Oregon-Washington Total	**1398**	**NA**	**NA**	**1,425**	**NA**	**NA**	**2,187**	**NA**	**NA**
U.S. Total	**1730**	**NA**	**NA**	**1,485**	**NA**	**NA**	**2,834**	**NA**	**NA**
Coastwide Total	**1730**	**NA**	**NA**	**1,485**	**NA**	**NA**	**2,834**	**NA**	**NA**

Table 5-4 (Table R3). Recreational albacore catch per unit of effort (number of kept fish/angler day, see note above) for charter and private boats by year and port, 2020-2022.

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
North Coast	NA	NA	NA	0.0	0.9	0.9	0.0	4.7	4.6
Westport	11.5	3.5	4.9	5.5	1.6	2.5	11.8	4.8	5.8
Ilwaco	1.7	2.6	2.3	1.5	2.4	2.1	3.3	4.5	4.2
Washington Subtotal	**7.3**	**3.2**	**4**	**3.4**	**1.9**	**2.3**	**7.4**	**4.7**	**5.2**
Astoria	0	1.3	1.3	0.0	0.9	0.9	0.0	4	4
Pacific City	0	0.8	0.8	0.0	2.8	2.8	0.0	2.5	2.5
Garibaldi	1.3	1.4	1.4	1.6	1.8	1.8	0.0	4.2	4.2
Depoe Bay	0	1.8	1.8	1.1	3.9	3.6	1.7	4.5	3.6
Newport	0.5	1.7	1.7	5.6	3.5	3.5	1.6	4.1	3.9
Florence	0	0	0	0.0	5.5	5.5	0.0	0	0
Winchester Bay	0	0.5	0.5	0.0	4.1	4.1	0.0	2.6	2.6
Coos Bay	0	1.5	1.5	1.7	4.1	4.1	0.0	2.7	2.7
Bandon	0	0	0	2.6	2.5	2.5	0.0	0	0
Gold Beach	0	0	0	0.0	0	0	0.0	0	0
Brookings	0	4.2	4.2	6.1	3.8	3.8	4.6	7.4	7.2

	2020			2021			2022		
Port Area	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**	**Charter**	**Private**	**Combined**
Oregon Subtotal	**1.1**	**1.9**	**1.9**	**2.9**	**3.6**	**3.6**	**1.9**	**4**	**3.9**
Redwood District	4.2	NA	NA	7.9	NA	NA	4.2	NA	NA
Wine District	3.2	NA	NA	11.0	NA	NA	2.9	NA	NA
San Francisco District	2.4	NA	NA	1.2	NA	NA	0.5	NA	NA
Central District	0	NA	NA	0.0	NA	NA	0.0	NA	NA
Channel District	0	NA	NA	0.0	NA	NA	0.0	NA	NA
South District	0	NA	NA	0.0	NA	NA	0.0	NA	NA
California Subtotal	**3.7**	**NA**	**NA**	**7.3**	**NA**	**NA**	**3.8**	**NA**	**NA**
Mex	0	NA	NA	0.0	NA	NA	0.0	NA	NA
Mexico Subtotal	**0**	**NA**	**NA**	**0.0**	**NA**	**NA**	**0.0**	**NA**	**NA**
Oregon-Washington Total	**7**	**NA**	**NA**	**3.4**	**NA**	**NA**	**6.4**	**NA**	**NA**
U.S. Total	**6.3**	**NA**	**NA**	**3.5**	**NA**	**NA**	**5.8**	**NA**	**NA**
Coastwide Total	**6.3**	**NA**	**NA**	**3.5**	**NA**	**NA**	**5.8**	**NA**	**NA**

5.2. Other HMS (Southern California)

Recreational anglers in California take the entire suite of management unit species (MUS) included within the HMS FMP using rod-and-reel gear almost exclusively; in addition, a nominal amount of fish, primarily tunas and dorado, are taken by free divers using spear guns. In Oregon and Washington anglers only occasionally take HMS species other than albacore, such as blue sharks, and more recently Pacific bluefin tuna.

CPFVs also make trips from Southern California ports (primarily San Diego) into Mexican waters. Yellowfin, bluefin, and skipjack tunas as well as dorado are the most commonly caught HMS species.

Private vessel data for California are collected by the CRFS program while the state's mandatory logbook program provides an estimate of fishing activity for CPFVs. The fact that a much higher overall percentage of highly migratory MUS catches are represented in logbook data than in CRFS samples is why logbooks are preferred over CRFS in determining the catch of these species by anglers fishing from CPFVs. Logbooks also have the advantage of supplying catch information on MUS taken in Mexico. However, CRFS data are the best available for making catch estimates of anglers fishing from private boats. Statistics for the CPFV fishery are also available from the federal charter logbook program. In Oregon statistics for recreational fisheries, including private, CPFV, and tournament fisheries, are available from the ODFW ORBS Program. Beginning in 2005, a mandatory charter boat tuna logbook program was implemented in Washington to provide additional information on location and effort in the charter albacore fishery.

5.2.1. Fishery performance

The following tables present recreational catch in Southern California waters (tables updated September 29, 2023). NAs represent data that are not collected/able to be calculated. Zeros represent no catch. CONFID represents data excluded for confidentiality.

Table 5-5 (Table R-4). Estimated number of highly migratory MUS kept and thrown back alive by recreational anglers fishing from California private vessels in U.S. EEZ waters, 2020-2023.

	2020		2021		2022	
	No. Fish		No. Fish		No. Fish	
Species	**Kept**	**Released**	**Kept**	**Released**	**Kept**	**Released**
Tuna						
Tuna, albacore	12,507	26	9,269	194	31,809	0
Tuna, bigeye	0	0	0	0	73	0
Tuna, bluefin	1,335	74	4,363	361	4,096	139
Tuna, skipjack	189	96	52	49	0	0
Tuna, yellowfin	397	10	373	0	1,063	102
Billfish						
Marlin, striped	0	19	0	0	11	60
Swordfish	43	0	44	0	12	0
Sharks						
Shark, blue	46	127	0	281	0	298
Shark, shortfin mako	23	70	10	60	99	332
Shark, thresher	127	319	396	678	181	531
Other Fish						
Dolphin (fish)	2,196	545	3,418	351	48,265	3,815
Total	**16,863**	**1,286**	**17,925**	**1,974**	**85,609**	**5,277**

Table 5-6 (Table R-5). Estimated number of highly migratory MUS kept and thrown back alive by recreational anglers fishing from California private vessels in Mexico waters, 2020-2023

	2020		2021		2022	
	No. Fish		No. Fish		No. Fish	
Species	**Kept**	**Released**	**Kept**	**Released**	**Kept**	**Released**
Tuna						
Tuna, albacore	0	0	0	0	0	0
Tuna, bigeye	0	0	0	0	0	0
Tuna, bluefin	593	21	1,673	11	916	111
Tuna, skipjack	1,498	1,067	12	16	83	0
Tuna, yellowfin	3,556	298	670	11	492	50
Billfish						
Marlin, striped	0	0	0	0	11	14
Swordfish	0	0	0	0	0	0
Sharks						
Shark, blue	0	66	0	22	0	105
Shark, shortfin mako	11	23	11	23	13	83
Shark, thresher	0	41	0	0	0	0
Other Fish						
Dolphin (fish)	2,547	769	815	785	5,575	765
Total	**8,205**	**2,285**	**3,181**	**868**	**7,090**	**1,128**

Table 5-7 (Table R-6). Reported number of highly migratory MUS kept and thrown back by recreational anglers fishing from California Commercial Passenger Fishing Vessels (CPFVs) in U.S. EEZ waters, 2020-2023.

	2020		2021		2022	
	No. Fish		No. Fish		No. Fish	
Species	**Kept**	**Released**	**Kept**	**Released**	**Kept**	**Released**
Tuna						
Tuna, bigeye	0	0	0	0	0	0
Tuna, bluefin	25,981	403	34,482	305	23,173	252
Tuna, albacore	1,228	4	438	0	2,428	3
Tuna, skipjack	2,958	496	374	182	25	3
Tuna, yellowfin	9,493	67	2,949	19	6,111	48
Billfish						
Swordfish	6	0	5	0	CONFID	0
Marlin, striped	CONFID	CONFID	3	CONFID	8	8
Sharks						
Shark, blue	CONFID	42	0	40	CONFID	60
Shark, shortfin mako	39	45	31	81	40	101
Shark, thresher	21	7	10	CONFID	15	11
Other Fish						
Dolphin (fish)	9,226	727	6,483	98	69,319	1,248
Total	**48,950**	**1,790**	**44,775**	**723**	**101,117**	**1,734**

Table 5-8 (Table R-7). Reported number of highly migratory MUS kept and thrown back by recreational anglers fishing from California Commercial Passenger Fishing Vessels (CPFVs) in Mexico waters, 2020-2023.

	2020		2021		2022	
	No. Fish		No. Fish		No. Fish	
Species	**Kept**	**Released**	**Kept**	**Released**	**Kept**	**Released**
Tuna						
Tuna, bigeye	12	0	6	0	206	0
Tuna, bluefin	19,397	103	9,914	44	27,950	153
Tuna, albacore	0	0	19	20	0	0
Tuna, skipjack	1,515	2,828	4,084	1,034	78	55
Tuna, yellowfin	35,328	2,008	36,912	2,434	42,497	3,418
Billfish						
Swordfish	CONFID	0	0	0	0	0
Marlin, striped	CONFID	61	CONFID	153	CONFID	343
Sharks						
Shark, blue	0	0	0	0	0	CONFID
Shark, shortfin mako	CONFID	3	4	CONFID	7	CONFID
Shark, thresher	0	0	0	0	0	0
Other Fish						
Dolphin (fish)	7,334	738	20,149	3,319	31,995	1,581
Total	**63,583**	**5,741**	**71,087**	**7,003**	**102,732**	**5,548**

Data from these tables are summarized in the figures below.

This figure shows estimated catch (retained plus discarded) by fleet, zone (Mexico or US waters), and species group for the years 2020 to 2022. The Tuna species group accounted for the most catch at 63%. The CPFV fleet in Mexico waters accounted for 42% of catch followed by the CPFV fleet in US waters at 33%.

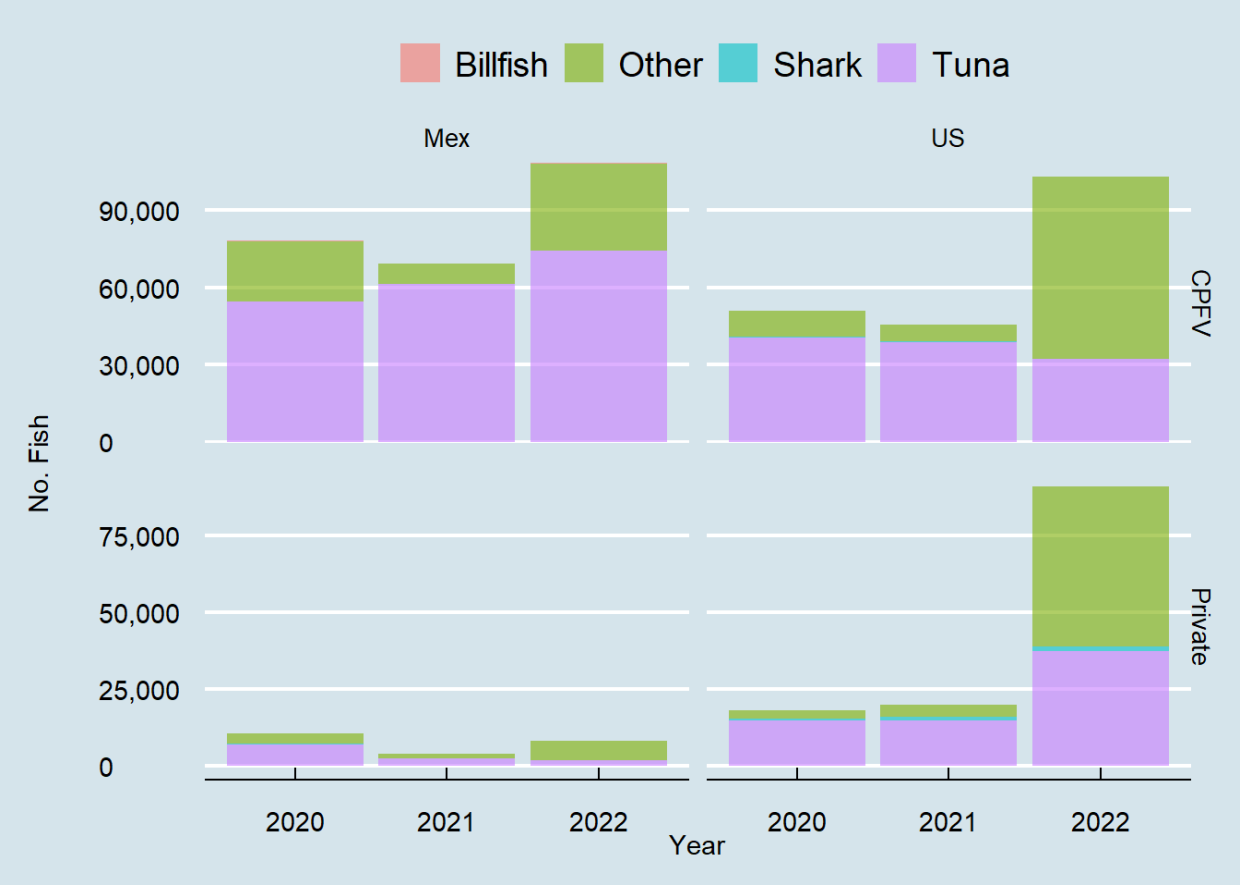

Figure 5-1. Total recreational catch (retained plus discarded) by sector and zone.

This figure shows catch by species (retained plus discarded) aggregated by fleet and zone, 2020 - 2022.

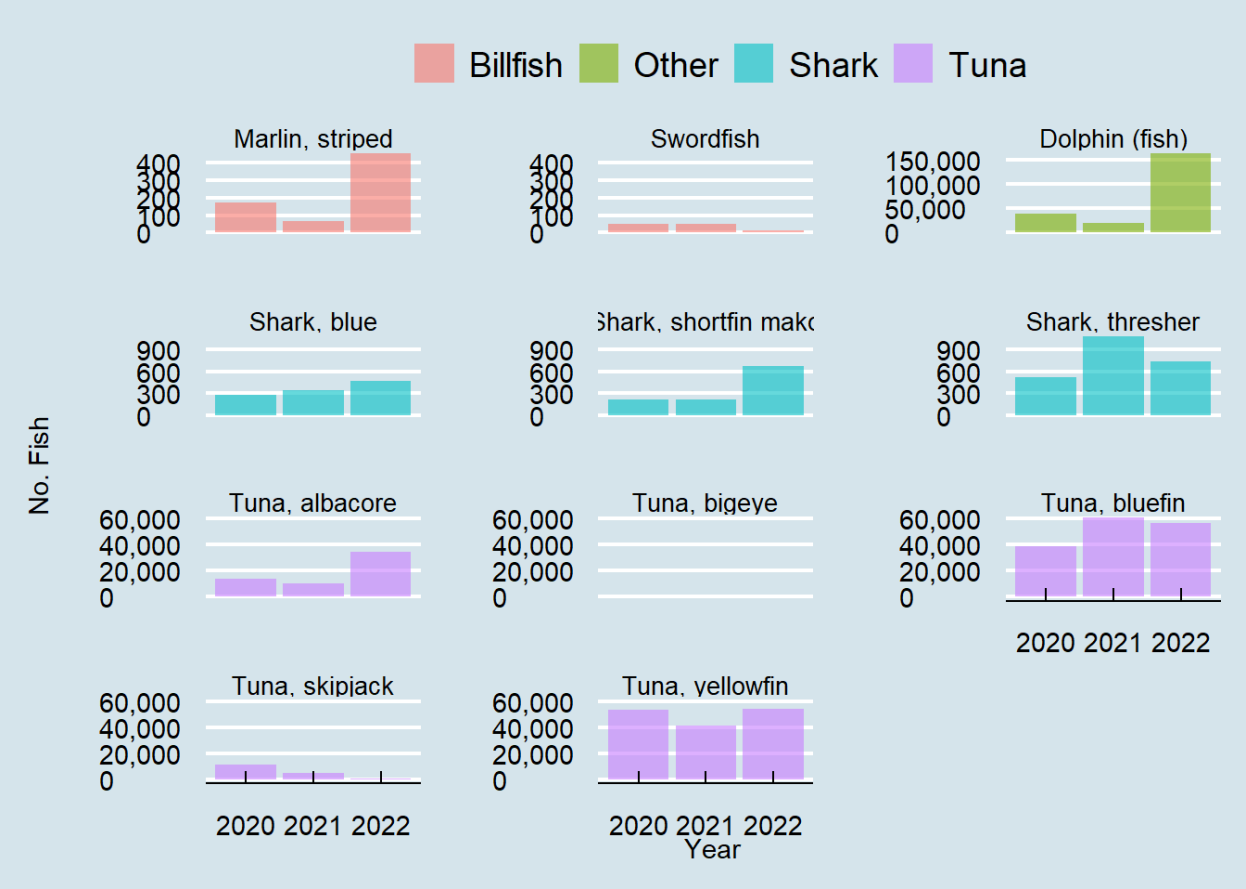

Figure 5-2. Total catch (retained plus discarded) by species.

6. U.S.-Canada Albacore Treaty Data Exchange

National Marine Fisheries Service and Department of Fisheries and Oceans – Canada collaborate through the Data Working Group (DWG) to develop a mutually agreed upon data summary of catch and landings of North Pacific albacore landed on west coast of Canada and the United States. The DWG has developed a Data Exchange Template, designed to provide relevant data to the delegations for the treaty between the United States and Canada on Pacific Coast Albacore Tuna vessels and Port Privileges. The summary tables are available here thanks to the respective governments' willingness to allow public dissemination of this information. (As noted in the tables, the most recent year's data are considered preliminary and may be subsequently updated.)

The tables are included in Appendix A as well as online.

Data Description

U.S. Fishery Data

The Data Exchange Template was designed to provide relevant data to the delegations for the treaty between the United States and Canada on Pacific Coast Albacore Tuna vessels and Port Privileges. It has been agreed that the time-series would be constrained to the years for which all of the data are reliable and comparable; therefore, not all data considered reliable has been provided. The sources are self-reported logbooks from albacore harvesters and fish tickets provided by the States of Washington, Oregon and California to the PacFIN database.

While a U.S. fishery for north Pacific albacore has existed since the early 1900's, the collection of logbook data began in 1951 as a voluntary program. In 2004 the fishery management plan for highly migratory species made logbook submission mandatory for the albacore fleet operating in or adjacent to the U.S. exclusive economic zone thereby increasing the coverage rate considerably. The average coverage rate based on the ratio of trip landings weights recorded in logbooks to the sum of landings from PacFIN and foreign ports is 40% for years 1996 through 2004 and 78% for 2005 through 2011. Although similar coverage rates of around 40% prior to 1995, the template is constrained by the year for which Canada can provide reliable data.

Since 1974 there have been attempts to coordinate State landings data. First through the Albacore Coordination Committee and later through the Pacific States Marine Fisheries Commission's database PacFIN. Within the PacFIN system, Fish Ticket data are considered complete for years since 1981. Again, data has been constrained by the year 1995 due to limitations in Canadian data.

A sales slip system was implemented in 1951 and data compiled from these records were used to estimate Canadian total annual albacore catch until 1994. This system provides a better estimate of total catch because it captures fish landed at all Canadian ports, but it still underestimates catch because sales slips do not account for albacore landed at US or other foreign ports nor do they fully account for direct sales of albacore to the public, i.e., dockside sales. Effort data were not compiled nor reported for this period. Although the sales slip system has been used to capture some of the spatial and temporal resolution of landings in other domestic, these data were not compiled nor reported for albacore.

Canadian Fishery Data

The Data Exchange Template was designed to provide relevant data to the delegations for the treaty between the United States and Canada on Pacific Coast Albacore Tuna vessels and Port Privileges. It has been agreed that the time-series would be constrained to the years for which all of the data are reliable and comparable.

Canadian data sources include logbooks completed by albacore harvesters turned end at the end of the fishing season, sales slips recording the landing weight of all albacore on a trip, and hail records, which identify vessels participating in the fishery and the zone in which those vessels are fishing. Logbooks, sales slips from domestic buyers, and at-sea trans-shipment slips, completed at the time fish are landed and sold, must be returned to Fisheries and Oceans Canada (DFO) for entry into the Canadian albacore tuna catch-effort database (Stocker et al. 2007). Entering new data into the database creates a new version of the database on that date. Canadian data are always reported with the database version number, which reflects the date of data entry (YY.MM.DD). For example, Database version 12.12.01 was created 01 Dec 2012.

The Canadian fishery for north Pacific albacore tuna (Thunnus alalunga) began in 1939. Total catch data from 1939 to 1951 are based on landings and were estimated by converting canned weights shipped by Canadian canneries to landed weights using standard conversion factors for salmon and were reported in annual statistical reports. These data are not reliable estimates of activity by the Canadian fishery because: (1) albacore landed in United States ports were not included in the estimates, (2) albacore imported from foreign sources by Canadian processors were included in these estimates, and (3) no measure of effort is available for this period. In addition, the spatial distribution of catch and effort is unknown beyond narratives in the annual reports noting that catches were occurring in BC and WA waters.

The Canadian fishery for north Pacific albacore tuna (Thunnus alalunga) began in 1939. Total catch data from 1939 to 1951 are based on landings and were estimated by converting canned weights shipped by Canadian canneries to landed weights using standard conversion factors for salmon and were reported in annual statistical reports. These data are not reliable estimates of activity by the Canadian fishery because: (1) albacore landed in United States ports were not included in the estimates, (2) albacore imported from foreign sources by Canadian processors were included in these estimates, and (3) no measure of effort is available for this period. In addition, the spatial distribution of catch and effort is unknown beyond narratives in the annual reports noting that catches were occurring in BC and WA waters.

Fishery statistics reported since 1995 are based on data compiled in the Canadian Albacore Tuna Catch and Effort Database from hails, sales slips, and logbooks. These data are considered the most reliable estimates of fishery activity by the Canadian fleet because: (1) they account for fish caught and landed in foreign waters, (2) they have high spatial and temporal resolution in catch and effort (daily position by vessel), (3) sales slip weights provide independent validation of logbook data, and (4) data are obtained from all known vessels active in the fishery in a given year.

7. Pacific-Wide Catch

The data used in the graphs and summaries below use Inter-American Tropical Tuna Commission (IATTC) public domain data, Western and Central Pacific Fisheries Commission (WCPFC) Tuna Fishery Yearbook annual catch estimates, and International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) annual catch tables.

7.1. Eastern Pacific Ocean Landings (IATTC Data): 2012 - 2021

The plot below shows average annual landings by country for all species recorded in IATTC data.

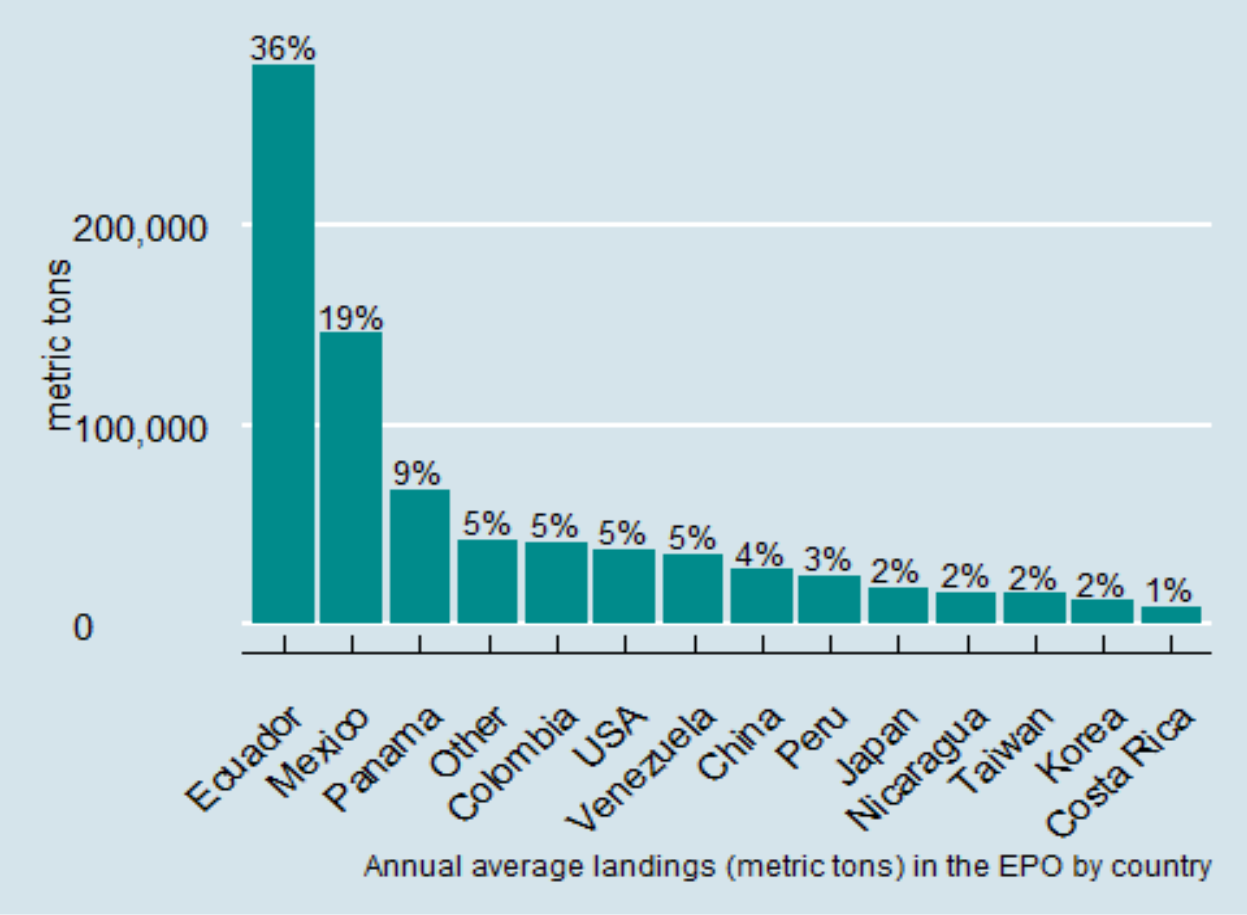

Figure 7-1. Annual average landings (mt) by country in the EPO, 2012-2021. The Other category includes Chile, Vanuatu, Canada, Belize, Unknown, Guatemala, El Salvador, each of which has landings less than 1% of the total, and others not specified in the source data.

The following plot shows landings by major tuna species. During 2012-2021 Albacore accounted for 5.8% of total landings, Bigeye tuna for 14.0%, Skipjack tuna for 44.9%, and Yellowfin tuna for 35.3%.

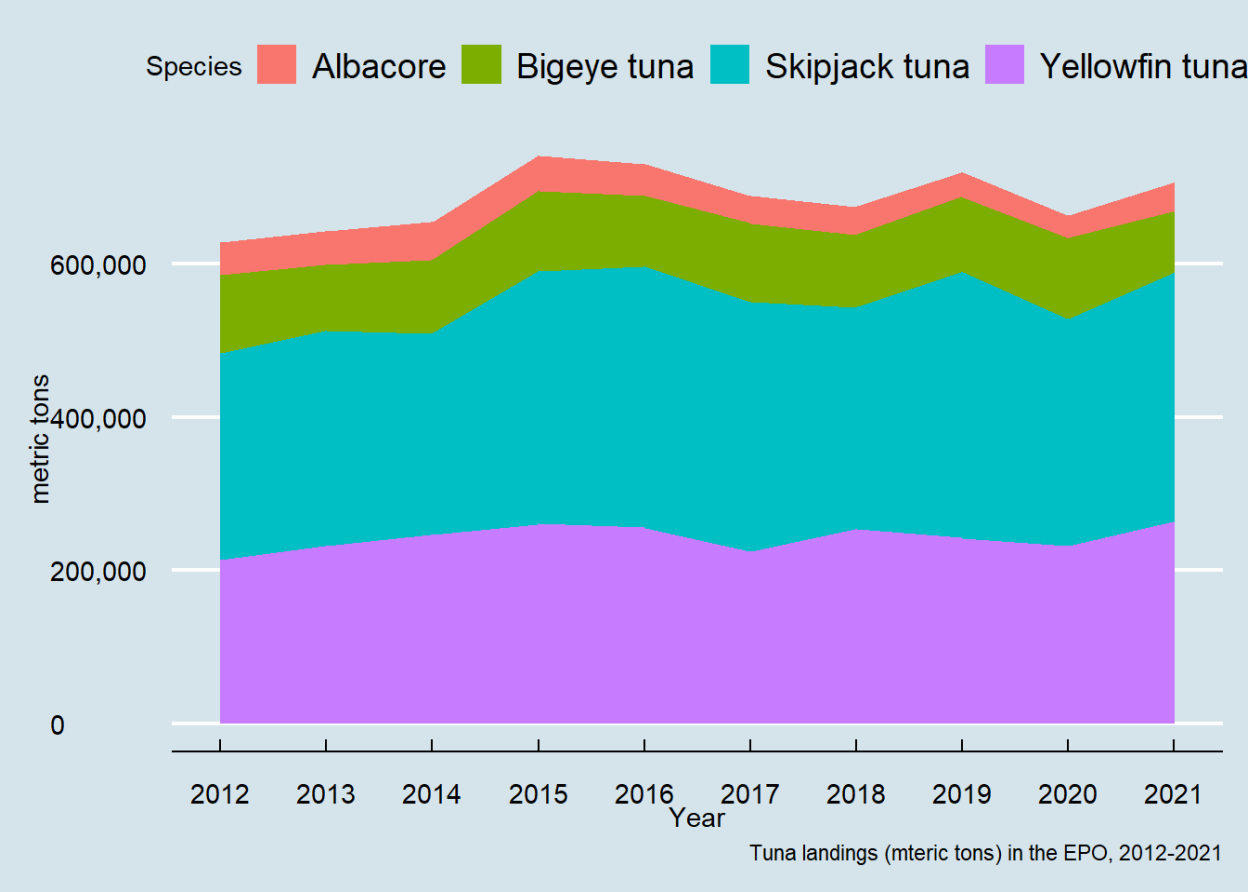

Figure 7-2. Tuna landings (mt) in the EPO, 2012-2021.

The following figure shows landings by gear type.

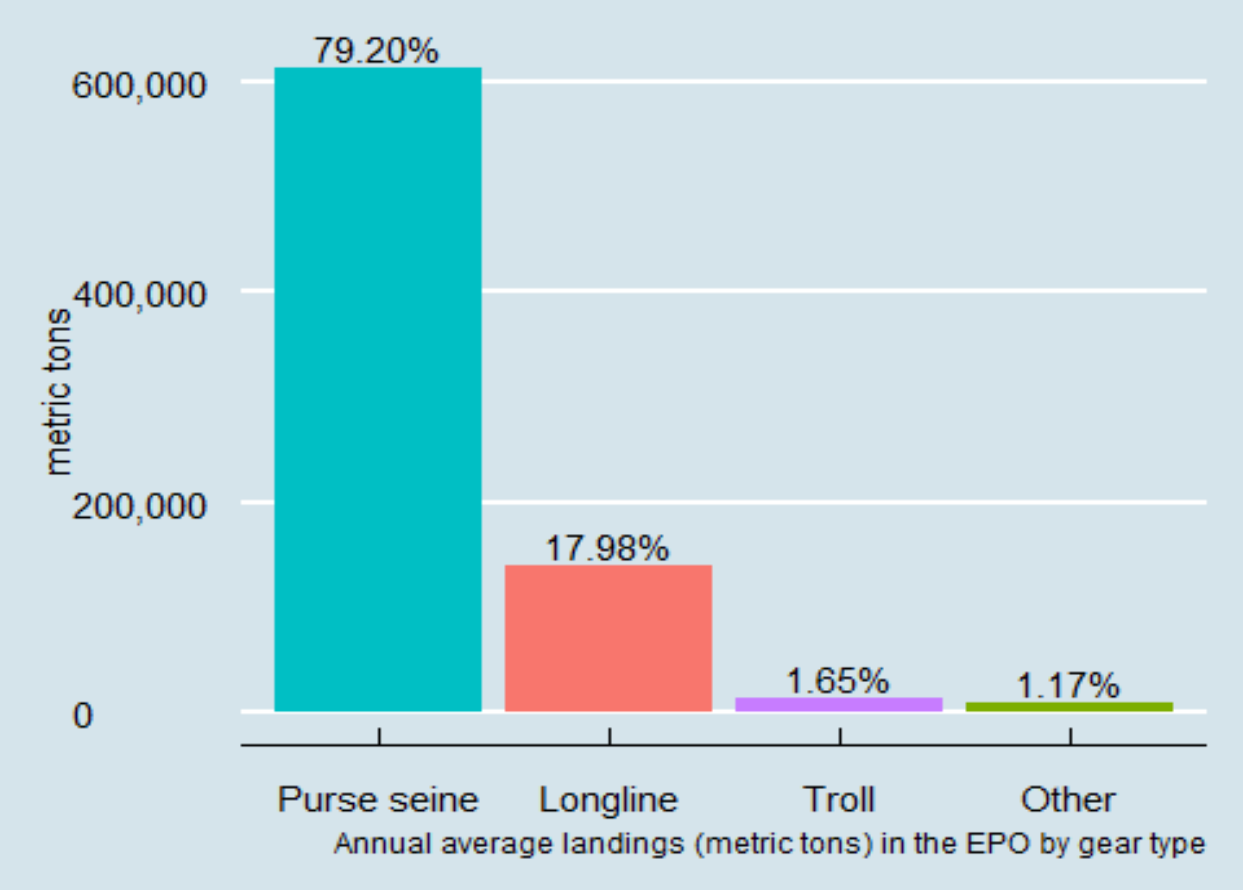

Figure 7-3. Annual average landings (mt) in the EPO by gear type, 2012-2021. The Other category includes Gillnet, Recreational, Pole-and-line, Harpoon, Trawl and others not specified in the source data.

7.2. Western and Central Pacific Ocean (WCPFC Data): 2012 - 2021

The following figure shows landings by country in the WCPO.

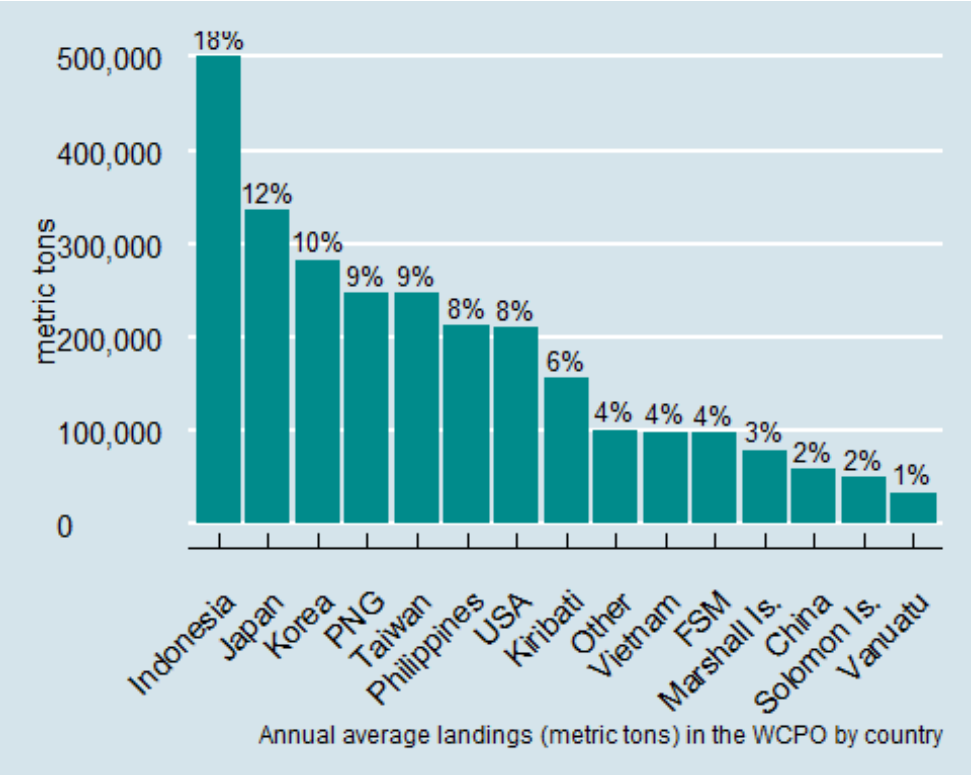

Figure 7-4. Annual average landings, 2012-2021, in the WCPO by country. PNG: Papua New Guinea, FSM: Federated States of Micronesia; the Other category includes Spain, Ecuador, New Zealand, Fiji, Tuvalu, El Salvador, Australia, Cook Islands, New Caledonia, Samoa, French Polynesia, Palau, Tonga, Tokelau, Belize, Canada, Niue, each of which has landings less than 1% of the total.

The following figure shows landings by major tuna species. During the 2012- 2021 period, Albacore accounted for 3.9% of total landings, Bigeye Tuna accounted for 5.5%, Skipjack Tuna accounted for 66.0%, and Yellowfin Tuna accounted for 24.6%.

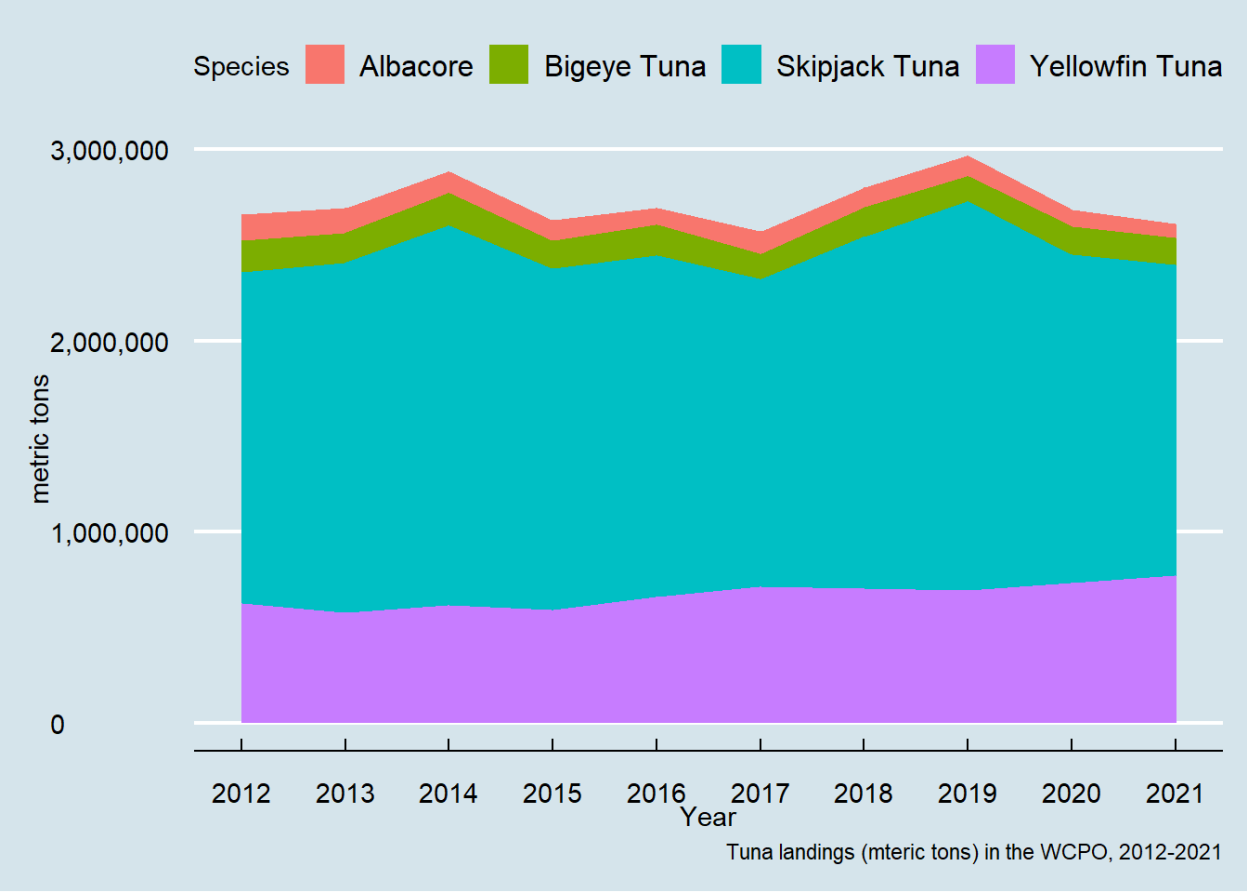

Figure 7-5. Tuna landings (mt) in the WCPO, 2012-2021.

The following figure shows landings by gear type.

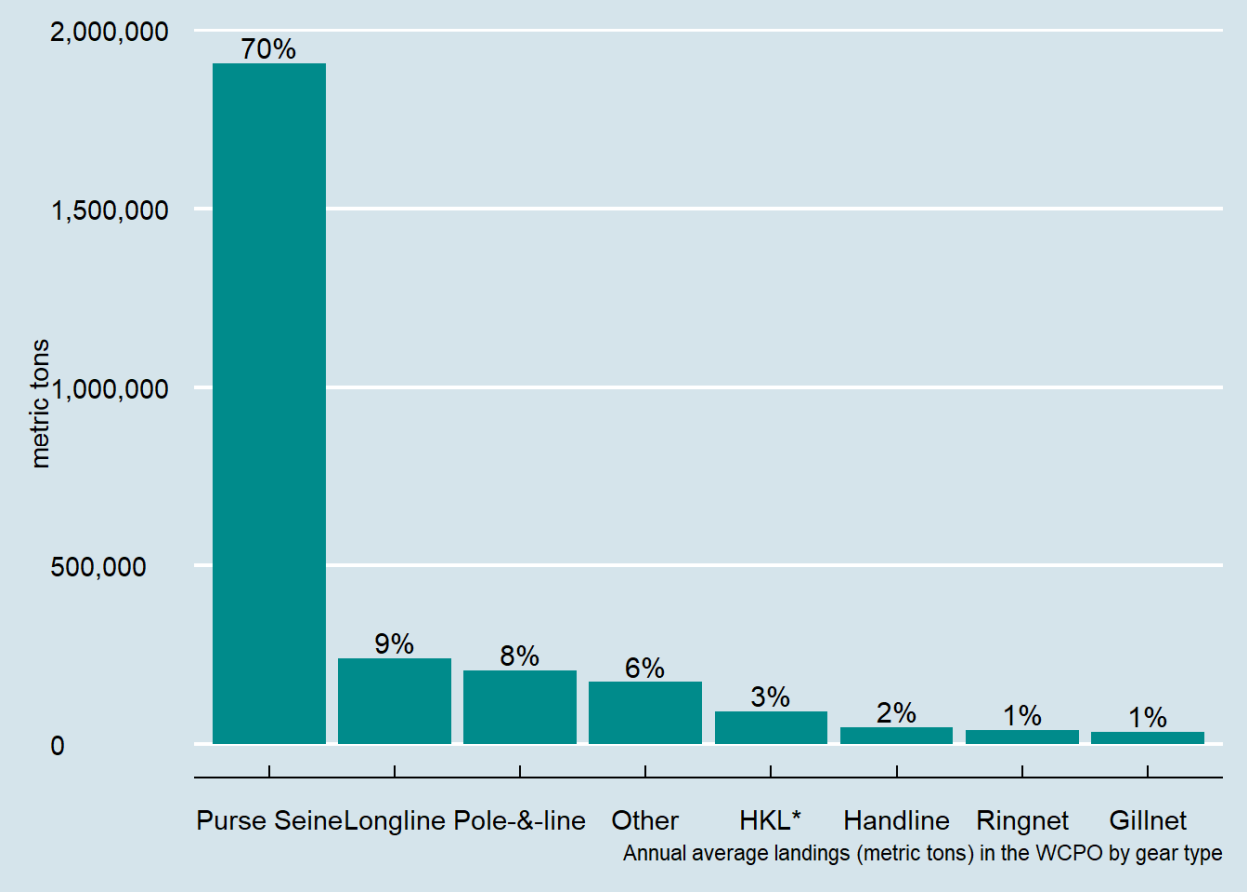

Figure 7-6. Annual average landings (mt) in the WCPO by gear type, 2012-2021. *Small-scale hook-and-line (Philippines and Indonesia). The Other category from source data.

7.3. North Pacific (ISC Data): 2013 - 2022

The ISC provides member country catch data for the species it assesses. Of these, landings of North Pacific albacore, Pacific bluefin tuna, and swordfish are summarized here. (The other assessed species are blue and short-fin mako sharks, and striped and blue marlins.). ISC catch table data provided in a suitable format for processing by the ISC Data Manager, Kiara Nishikawa.

The following figure shows landings of northern species by country. Japan accounts for the largest proportion of these three species landings, 66%, averaging 53,322 metric tons annually during the 2013-2022 period. U.S. landings averaged 12,238 metric tons or 15% of total landings.

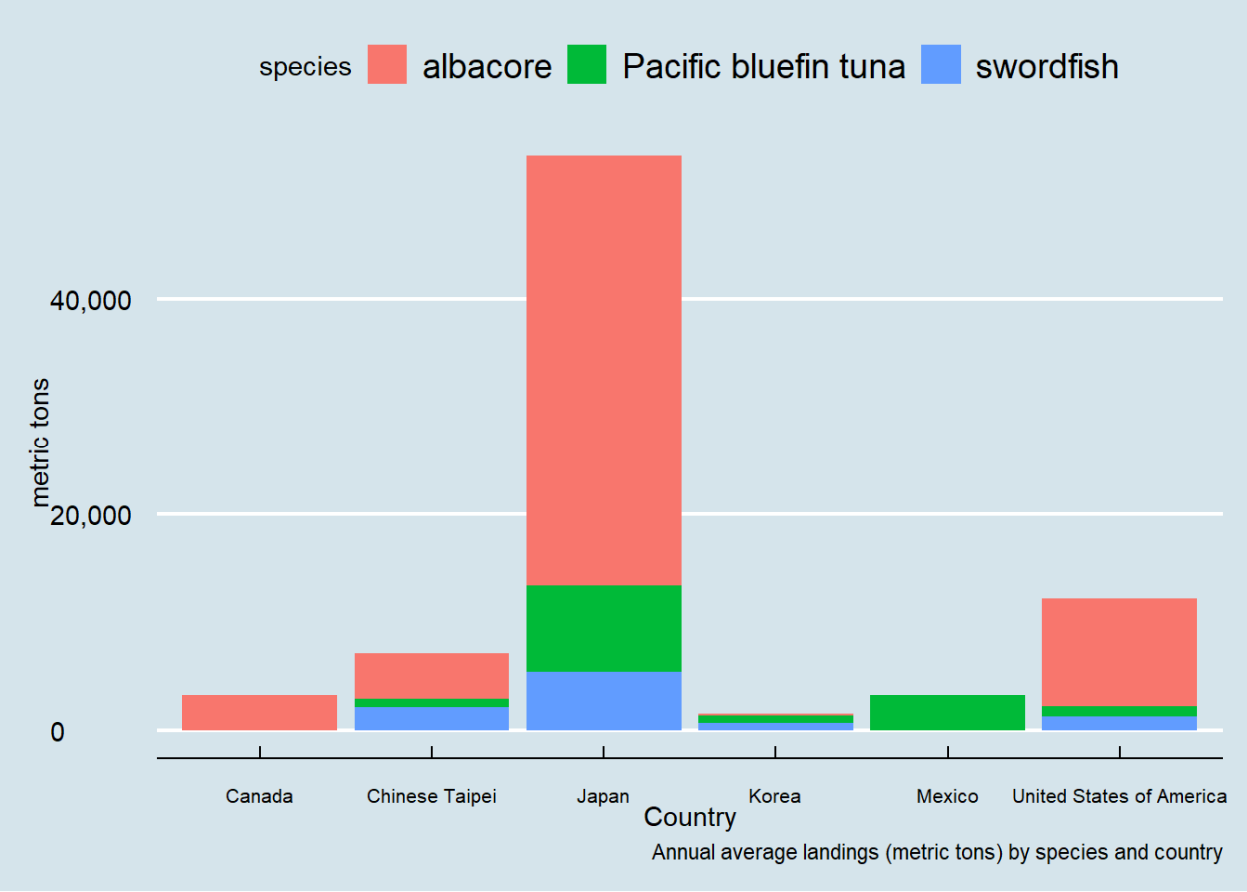

Figure 7-7. Annual average landings (mt), 2013-2022, by species and country.

As depicted below, landings of albacore, Pacific bluefin, and swordfish have declined over this 10-year period. Albacore landings were lowest in 2019 at 39,631 mt, Pacific bluefin landings were lowest in 2018 at 10,565 mt, and swordfish landings were lowest in 2022 at 6,661 mt. Note that Pacific bluefin is managed by catch limits pursuant to the WCPFC Northern Committee's stock rebuilding plan.

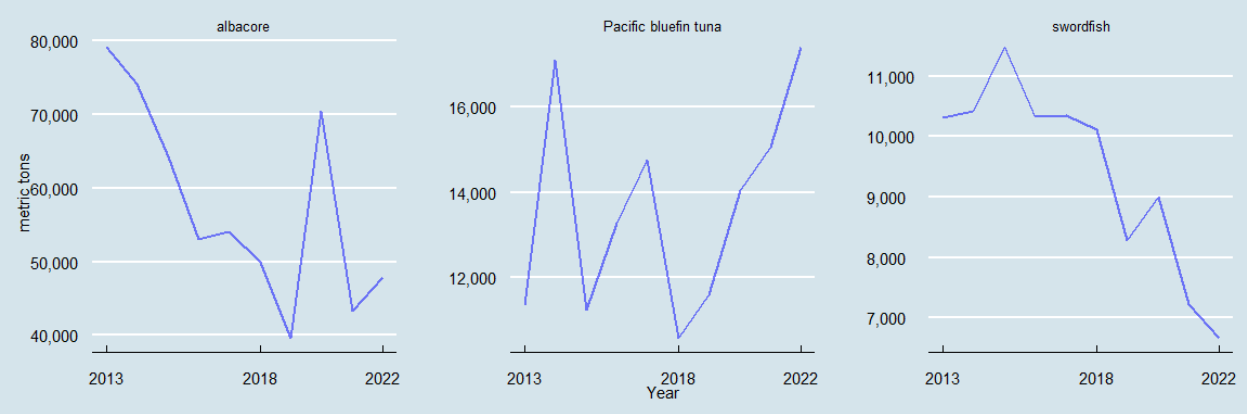

Figure 7-8. Landings of North Pacific albacore, Pacific bluefin, and swordfish (mt), 2013-2022.

The gear types depicted below are the three top ranked in terms of landings of North Pacific albacore and accounted for 95% of total albacore landings.

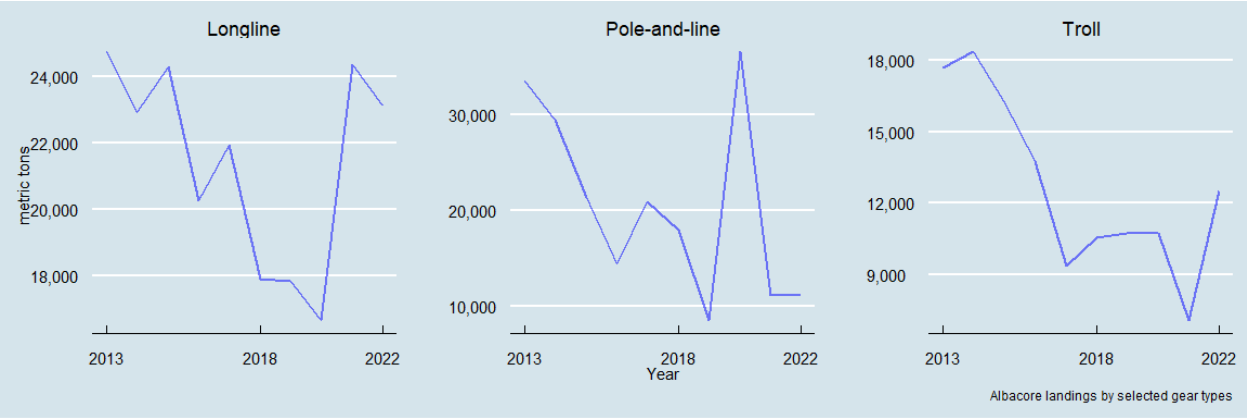

Figure 7-9. Landings of North Pacific albacore by gear type, 2013-2022.

The gear types depicted below are the three top ranked in terms of landings of Pacific bluefin tuna and accounted for 85% of total Pacific bluefin landings. Setnet landings increased markedly in 2017.

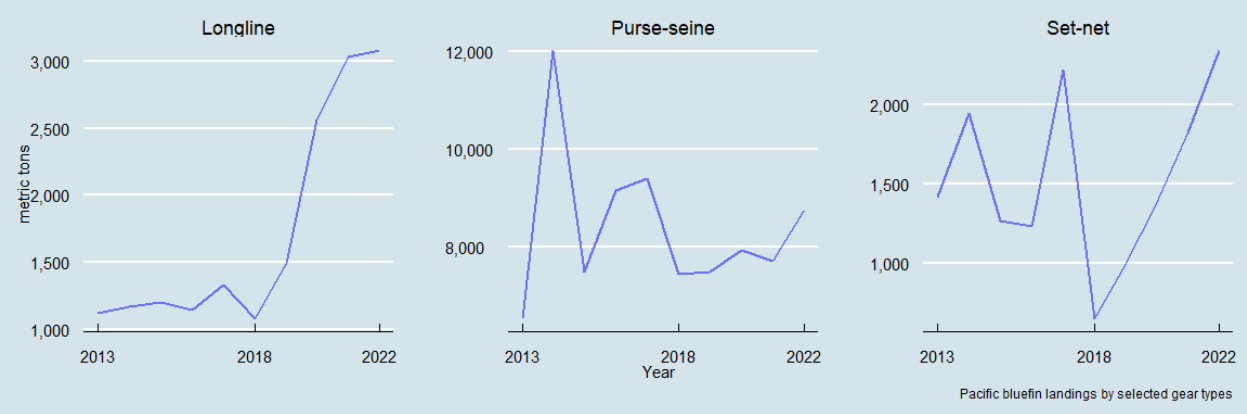

Figure 7-10. Landings of Pacific bluefin tuna (mt) by gear type, 2013-2022.

The gear types depicted below are the three top ranked in terms of landings of swordfish and accounted for 97% of total swordfish landings.

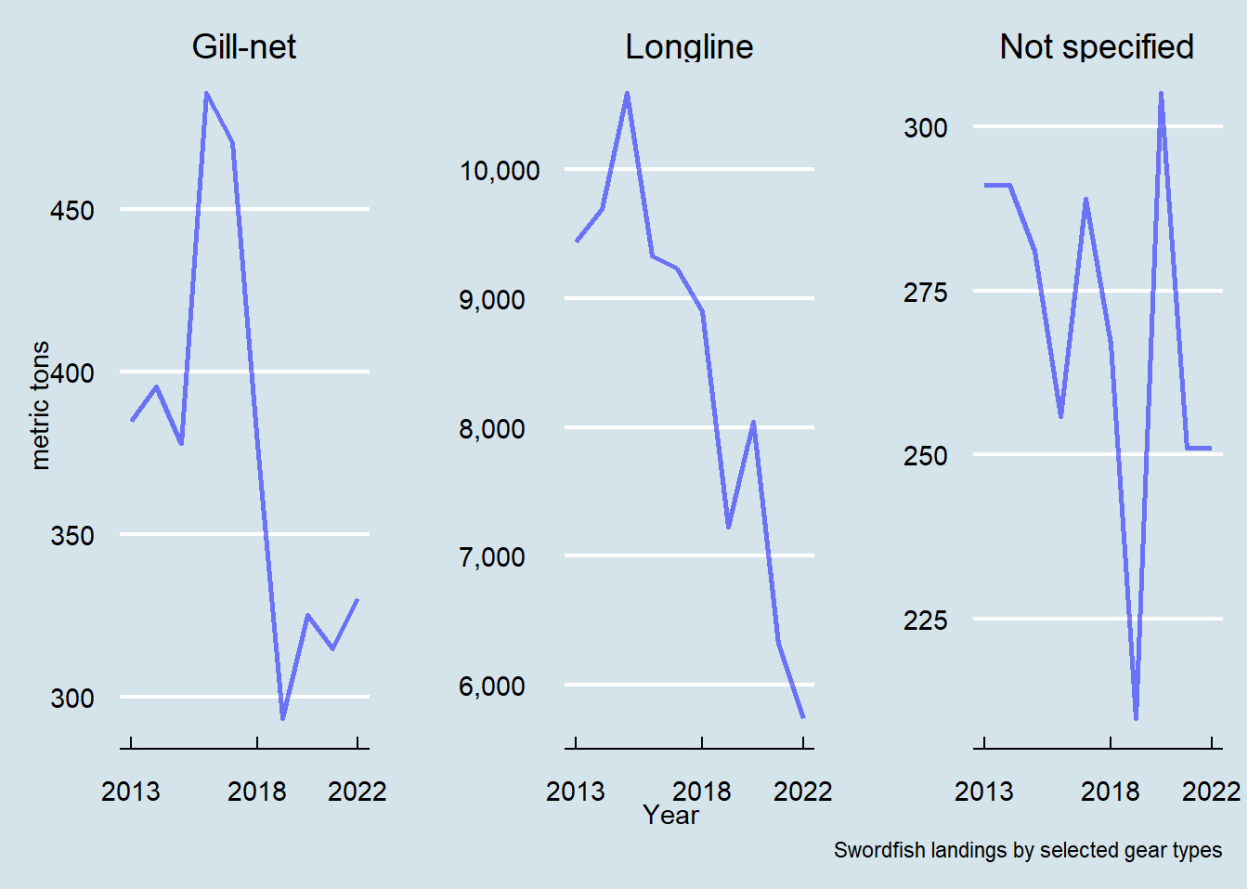

Figure 7-11. Landings of North Pacific swordfish (mt) by gear type, 2013-2022.

8. Status of HMS Stocks

Under the Magnuson-Stevens Act (MSA), Councils must identify status determination criteria (SDC) that can be used to decide whether overfishing is occurring (fishing mortality is above a maximum fishing mortality threshold, MFMT) or the stock is overfished (biomass is less than a minimum stock size threshold, MSST). They are derived from an estimate of maximum sustainable yield (MSY), "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics (e.g., gear selectivity), and the distribution of catch among fleets." Frequently MSY is difficult to estimate for HMS stocks, either due to stock dynamics or the lack of sufficient information to conduct a stock assessment. In those cases, proxy values may be determined for MSY and related status determination criteria. In general, the Council considers the biological reference points, or related proxies, adopted by regional fishery management organizations, to be the 'best available science.' The HMS FMP defines these thresholds as follows:

> MFMT equals F_{MSY}. The overfishing limit (OFL) is the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish. Overfishing occurs when fishing mortality F is greater than the MFMT mortality or catch exceeds OFL for one year or more.
>
> MSST is calculated as the greater of:
>
> $B_{MSST} = (1\text{-}M)B_{MSY}$ when M (natural mortality) ≤ 0.5, or
> $B_{MSST} = 0.5B_{MSY}$ when $M > 0.5$
>
> MSST or a reasonable proxy must be expressed in terms of spawning biomass or other reproductive potential. Should the estimated size of an HMS stock in a given year fall below this threshold, the stock is considered overfished.

Additional information on status determination criteria and related management quantities may be found in Chapter 4 of the HMS FMP.

In the case of HMS in the Pacific, most stock assessments are conducted by several international organizations established through conventions that function akin to treaties among sovereign governments. This makes it difficult, if not impossible, for the U.S., or any participating country, to unilaterally peer review the assessments sponsored by these organizations. Therefore, NMFS employs "other peer review processes" to determine whether the assessments constitute the best scientific information available for these transboundary stocks (81 FR 54561; August 16, 2016), including through participation by the U.S. government in these organizations. Once NMFS makes a best scientific information available (BSIA) determination on the outputs of an assessment produced by an international organization, the agency uses this information to determine the status of stocks relative to SDC identified in the FMP for the purposes of domestic management. In instances where the use of proxies is necessary for making status determinations for domestic management based on the best scientific information available from internationally produced assessments, the Council and its advisory bodies may review and comment on the suitability of such proxies. International organizations that conduct stock assessments for HMS FMP management unit species are:

- In the Eastern Pacific Ocean (EPO) scientific staff employed by the Inter-American Tropical Tuna Commission (IATTC) conduct stock assessments mainly for tropical tunas (bigeye, yellowfin, and skipjack) and some billfish (striped marlin, swordfish). The Fishery Status Reports summarize fisheries and stock status and the most recent stock assessment reports may be accessed on

Scientific Advisory Committee (SAC) meeting webpages. All IATTC staff assessments and analyses are reviewed by the Scientific Advisory Committee.

- In the Western and Central Pacific Ocean (WCPO), the Secretariat of the Pacific Community Oceanic Fisheries Program (SPC-OFP) conducts stock assessments as the science provider to the Western and Central Pacific Fisheries Commission (WCPFC). Like the IATTC, they tend to focus on the tropical tunas, but SPC has also completed stock assessments for species other than the tropical tunas. Their stock assessments may be accessed by visiting the SPC-OFP stock assessment webpage or webpages for relevant WCPFC Scientific Committee meetings.
- In the North Pacific Ocean (NPO) the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) conducts stock assessments, also as a science provider for the WCPFC, and specifically that organization's Northern Committee. The ISC has formed working groups for North Pacific albacore, Pacific bluefin tuna, billfish (marlins and swordfish), and sharks. Shark species of interest include blue, shortfin, mako, bigeye thresher, pelagic thresher, silky, oceanic whitetip, and hammerhead species. The ISC Plenary reviews assessments and analyses, and ISC annual Plenary Reports provide stock status updates and conservation recommendations. ISC stock assessments can be found on its Stock Assessment webpage.

In addition to stock assessments prepared by these international organizations, in 2016 NMFS Southwest Fisheries Science Center (SWFSC) scientists, in collaboration with scientists from Mexico, assessed the status of the stock of common thresher shark (*Alopias vulpinus*) along the West Coast of North America.

Based on these stock assessments, NMFS West Coast Region and Southwest Fisheries Science Center (SWFSC) make BSIA and status determinations for some but not all stocks of HMS FMP management unit species. These status determinations are presented to the Council as part of the biennial management process described in Chapter 5 in the HMS FMP. When appropriate, the Council's SSC may provide advice on the basis for such determinations, which the Council may transmit as recommendations to NMFS. The Pacific Islands Regional Office and Pacific Islands Fisheries Science Center (PIFISC) are the lead in making status and BSIA determinations for Western and Central Pacific and may co-lead with the SWFSC for certain North Pacific-wide stocks (blue shark, shortfin mako shark).

The stock assessments upon which the status determination is based and resulting determinations are described below. (Status determinations are excerpted from Agenda Item I.4.a, Supplemental NMFS Report 1, September 2022 with pending determinations updated, as appropriate.)

8.1. Albacore (Thunnus alalunga)

Two albacore tuna stocks are defined and assessed in the Pacific Ocean, a North Pacific stock and a South Pacific stock. The North Pacific stock is managed under the HMS FMP.

The most recent stock assessment was completed by the ISC in 2023:

> Stock Assessment of Albacore Tuna in the North Pacific Ocean in 2023. Report of the Albacore Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean. 12-17 July 2023.

The ISC23 (Plenary Report section 6.1.2) found that:

1. The stock is likely not overfished relative to the threshold (30%SSBcurrent, F=0) and limit (14%SSBcurrent, F=0) reference points adopted by the WCPFC and IATTC;
2. The stock is likely not experiencing overfishing relative to the adopted target reference point (F45%SPR); and

3. Current fishing intensity (F2018-2020) is lower than the average fishing intensity from the 2002-2004 period (the reference level for IATTC Resolution C-05-02 and WCPFC CMM-2019-03).

Both the IATTC and WCPFC have adopted a harvest strategy for this stock that includes reference points and harvest control rules. See IATTC Resolution C-23-02.

The NMFS status determination is currently based on the 2020 ISC stock assessment but reaches the same conclusion, consistent with the framework in the HMS FMP, that the stock is not subject to overfishing nor overfished. Table 8-1 shows the reference points from the 2020 ISC stock assessment used for the current status determinations.

Table 8-1. Reference points used to determine stock status of North Pacific albacore tuna.

Overfishing					
MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
F_{MSY}	0.83	$F_{2015\text{-}17} = 0.5$	NA	0.6	No

Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB_{MSY} or 0.5B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
SSB_{MSY}	19,535 mt	SSB_{2018} = 58,858 mt	10,158 mt	5.79	20%$_{SSBcurrent}$, F=0 =25,590 mt	No

8.2. Pacific Bluefin Tuna (Thunnus orientalis)

Pacific bluefin tuna is considered a single stock across the North Pacific. However, its major spawning grounds occur in the Western Pacific in waters between the Ryukyu Islands in Japan and the east of Taiwan, in the southern portion of the Sea of Japan, and possibly the Kuroshio-Oyashio transition area in the coastal area of northeastern Japan. A portion of juvenile fish migrate from spawning grounds in the Western Pacific to forage in the California Current System before returning west at ages 3-7+ years. Since 1990, about 80% of the catch has occurred in waters around Japan, Korea, and Taiwan with almost all remaining catch occurring in waters off the west coasts of Mexico and the U.S. A small portion of the stock may migrate into waters in the Southwest Pacific and Indian Ocean. This single North Pacific stock is subject to management under the HMS FMP.

The most recent stock assessment was completed by the ISC in 2022:

> Stock Assessment of Pacific Bluefin Tuna in the Pacific Ocean in 2022. ISC Pacific Bluefin Tuna Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean 12-18 July 2022.

The 2022 assessment was reviewed at ISC22. ISC23 forwarded its 2022 conclusions as follows (Plenary Report section 6.2):

1. No biomass-based limit or target reference points have been adopted for PBF, but the PBF stock is overfished relative to the potential biomass-based reference points (20%SSB_0) adopted for other tuna species by the IATTC and WCPFC. On the other hand, SSB reached its initial

rebuilding target (SSB_{MED} = 6.3%SSB_0) in 2019, five years earlier than originally anticipated by the RFMOs; and

2. No fishing mortality-based reference points have been adopted for PBF by the IATTC and WCPFC. The recent (2018-2020) $F_{\%SPR}$ is estimated to produce a fishing intensity of 30.7%SPR and is below the level corresponding to overfishing for many F-based reference points proposed for tuna species, including $SPR_{20\%}$.

Both the IATTC and WCPFC have adopted a rebuilding plan as part of a long-term management framework. See IATTC Resolution C-23-01. The rebuilding plan includes two rebuilding targets: 1) $SSB_{med,1952-2014}$ (the median point estimate for 1952-2014) to be achieved by 2024 with at least 60% probability; and (2) $20\%_{SSBF=0}$ to be achieved within 10 years of reaching the initial rebuilding target or by 2034, whichever is earlier, with at least 60% probability. Stock rebuilding is being accomplished through national/fishery catch limits for fish ≤30 kg and >30 kg. According to the 2022 stock assessment, the first rebuilding target has been met. The management framework also describes interim measures for the period between when the second rebuilding target is met (expected to be confirmed in 2024) and when the long-term harvest strategy is agreed to, based on management strategy evaluation results.

The current NMFS status determination is based on the 2022 ISC stock assessment and finds the stock is not subject to overfishing but is overfished, based on the framework in the HMS FMP. Table 8-2 shows the reference points from the 2022 ISC stock assessment used for the current status determinations.

Table 8-2. Reference points used to determine stock status of Pacific bluefin tuna.

Overfishing					
MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
1-20%SPR	0.8	$1\text{-}SPR_{2018\text{-}20}$ = .693	NA	0.86625	No

Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB_{MSY} or 0.5B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
20%SSB0	128,716 mt	$SSB_{2020}0$ = 65,464	96,537	0.678	NA	Yes

8.3. Bigeye Tuna (*Thunnus obesus*)

Two bigeye tuna stocks are identified in the Pacific Ocean, the EPO stock and the WCPFO stock, defined by the IATTC and WCPFC Convention Areas. The stock managed under the HMS FMP is the EPO stock.

The most recent stock assessment for the EPO stock was completed by the IATTC scientific staff in 2020:

> Bigeye Tuna in the Eastern Pacific Ocean, 2019: Benchmark Assessment. Haikun Xu, Mark N. Maunder, Carolina Minte-Vera, Juan L. Valero, Cleridy Lennert-Cody, and Alexandre Aires-da-Silva. Prepared for the Eleventh Meeting of the Inter-American Tropical Tuna Commission (IATTC) Scientific Advisory Committee. Doc SAC-11-06.

As noted in Agenda Item E.3.a, Supplemental Joint NMFS SWFSC Report 1, September 2020: "In 2020, IATTC scientific staff used a new approach for assessing bigeye and yellowfin tuna in the eastern Pacific Ocean. IATTC scientific staff presented risk assessments for both stocks instead of base case assessments.

The risk assessments show the probability of exceeding F_{MSY} or SSB_{MSY} as opposed to providing a base case model estimate for $F_{current}$ and $SSB_{current}$." This presented challenges in using these assessments to develop the status determination criteria specified in the HMS FMP. NMFS concluded that it could identify MFMT proxies using the assessment results but could not identify suitable proxies for MSST. It requested the Council's SSC review three alternative approaches for identifying these proxies. In its March 2021 report (Agenda Item H.5.a, Supplemental Joint SWFSC-NMFS Report 1) NMFS noted: "

> In addition to the added complexity of interpreting the results of the probabilistic framework used in the 2020 benchmark assessment, the posterior distributions of $P(F_{CUR}>F_{MSY})$ and $P(F_{CUR}>F_{LIMIT})$ were also bimodal (i.e., one set of model results exceeds the reference point while another does not). For bigeye, there is a 50 percent probability that 2017-19 fishing mortality exceeds the MSY level ($P(F_{CUR}>F_{MSY}) = 50\%$). Based on NMFS-suggested proxy for MFMT, EPO bigeye tuna would not be subject to overfishing. It may also be worth consideration that the recent assessment indicated a 5 percent probability that the IATTC's F limit reference point has been exceeded ($P(F_{CUR}>F_{LIMIT}) = 5\%$) (See Appendix A for more detail). To obtain these probabilities, the posterior distributions from individual models were weighted and combined.

Based on its review (through its HMS subcommittee), the SSC agreed that:

> …applying the proxy for the Maximum Fishing Mortality Threshold outlined in Joint SWFSC-WCR NMFS Report 1 is a reasonable approach for these assessments. For the Minimum Stock Size Threshold (MSST), the SSC agrees that the second example under Alternative 3 is appropriate whenever the central values of natural mortality rate (*M*; either a fixed value or the median of a distribution for each individual model) are greater than 0.5 for all models in the ensemble. Option 1, whereby the assessment results include reference levels consistent with domestic SDC, is preferred in cases where some or all of these *M* central values are below 0.5 (including when *M* is age-dependent and this is true for a subset of ages). If only a small minority of the models have *M* central values below 0.5, the above proxy for MSST may still be acceptable. (Agenda Item H.5.a, Supplemental SSC Report 1, March 2021)

Given these considerations, NMFS made its overfishing and overfished determination based on the 2020 IATTC stock assessment (Table 8-3), finding the stock is not subject to overfishing and not overfished.

Table 8-3. Reference points used for the current NMFS status determinations for EPO bigeye tuna. based on the 2020 IATTC stock assessment.

MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
F_{MSY}	NA	NA	NA	median of F2017-19/F_{MSY} = 1.00	No

B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB$_{MSY}$ or 0.5B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
NA	NA	NA	NA	$S_{2020}/0.5*S_{MSY}$= 1.84	NA	No

8.4. Skipjack Tuna (*Katsuwonus pelamis*)

Two skipjack tuna stocks are identified in the Pacific Ocean, the EPO stock and the WCPO stock, defined by the IATTC and WCPFC Convention Areas. The stock managed under the HMS FMP is the EPO stock.

The most recent interim stock assessment for the EPO stock was conducted by the IATTC scientific staff in 2022:

> Skipjack Tuna in the Eastern Pacific Ocean: Interim Assessment. Maunder, M, Xu, H., Minte-Vera, C., Valero, J.L., Lennert-Cody, C.E., and Aires-da-Silva, A. Prepared for the Thirteenth Meeting of the IATTC SAC, May 16-20, 2022, La Jolla, California USA. Doc SAC-13-07.

Although labeled interim by the IATTC scientific staff, the IATTC scientific staff concluded it was suitable for management use, but highlighted ongoing work needed to improve the model framework to reduce uncertainty in the results including the incorporation of tagging data. This assessment was reviewed by the SAC and considered by the IATTC. In terms of stock status, the assessment Executive Summary states:

- The reference model estimated that the 2021 exploitation rate was slightly above status quo (average level of 2017-2019) as did over half of the sensitivity models ranging from being only slightly above to being 0.1 higher (except one model that estimated high exploitation rates).
- The reference model and most of the sensitivity analyses estimate that the current biomass is above the target reference point and the fishing mortality is below the target fishing mortality.

These results indicate that the stock is not subject to overfishing nor overfished. Because the assessment results indicate that $F_{current}/F_{Btarget} = 0.25$ (i.e., less than 1), current fishing mortality is lower than the MFMT. Additionally, because the assessment results indicate that current spawning biomass is above B_{TARGET}, it is also above the MSST for this stock. The current NMFS status determination is based on these results as shown in Table 8-4.

Table 8-4. Reference points used for the current NMFS status status determination for EPO skipjack tuna based on the 2022 IATTC stock assessment.

Overfishing					
MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
NA	$F_{Btarget}$, where $B_{target} = 0.3$ SSB_0	NA	NA	0.25	No

Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB$_{MSY}$ or 0.5B$_{MSY}$)	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
30%SSB0	NA	SB_{2021} = 26,871	NA	Greater than 1 since SBcurrent>30%SSB0 (or B_{MSY} proxy)	BMSY target, with 30%SSB0 as proxy	No

8.5. Yellowfin Tuna (Thunnus albacares)

Two yellowfin tuna stocks are identified in the Pacific Ocean, the EPO stock and the WCPO stock, defined by the IATTC and WCPFC Convention Areas. The stock managed under the HMS FMP is the EPO stock.

The most recent assessment of the EPO stock was completed by IATTC scientific staff in 2020:

Yellowfin Tuna in the Eastern Pacific Ocean, 2019: Benchmark Assessment. Carolina Minte-Vera, Mark N. Maunder, Haikun Xu, Juan L. Valero, Cleridy E. Lennert-Cody, and Alexandre Aires-da-Silva. Prepared for the Eleventh Meeting of the Inter-American Tropical Tuna Commission (IATTC) Scientific Advisory Committee. Doc SAC-10-07.

This assessment integrated an ensemble of 12 different reference models tested against four different steepness assumptions s (0.7, 0.8, 0.9, and 1.0), for a total of 48 models. The assessment was used as the basis for a risk assessment by IATTC scientific staff (SAC-11-08 Rev1). "[T]he overall results of the risk analysis, which include all 48 reference models, indicate only a 9% probability that the fishing mortality corresponding to the maximum sustainable yield (F_{MSY}) has been exceeded. There is a 12% probability that the spawning stock biomass corresponding to the maximum sustainable yield (S_{MSY}) has been breached."

In its November 2020 report (Agenda Item I.3.a, Supplemental NMFS Report 1) NMFS concluded:

> The 2020 assessment indicates a 12 percent probability that spawning biomass at the beginning of 2020 (S) is below a maximum sustainable yield (MSY) level (i.e., $P(S_{CUR}<S_{MSY})= 12\%$), and a nine percent probability that 2017-19 fishing mortality exceeds the MSY level (i.e., $P(F_{CUR}>F_{MSY}) = 9\%$). Because the IATTC's target biomass threshold (S_{MSY}) is more conservative than MSST (i.e., $1\text{-}M*B_{MSY}$, where M is natural mortality), the assessment results suggest that the EPO yellowfin tuna stock is unlikely to be overfished. Because the IATTC's target fishing mortality threshold (F_{MSY}) is the same reference level as MFMT, the assessment results suggest it is also unlikely that the stock is subject to overfishing. There is zero probability that both IATTC's S and F limit reference points have been exceeded ($P(S_{CUR}<F_{LIMIT}) = 0\%$; $P(F_{CUR}>F_{LIMIT}) = 0\%$).

The current NMFS overfishing status determination is based on the 2020 IATTC stock assessment and finds the stock is not subject to overfishing, see Table 8-5. Because of issues in deriving a proxy for MSST from a probabilistic assessment framework, the overfished status determination is based on the 2018 IATTC stock assessment (see Stock Assessment Report 20). Based on that assessment, NMFS finds the stock is not overfished, see Table 8-6.

Table 8-5. Reference points used for the current NMFS overfishing status determination for EPO yellowfin tuna based on the 2020 IATTC stock assessment.

MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
F_{MSY}	NA	NA	NA	median of F2017-19/Fmsy = 0.65	No

Table 8-6. Reference points used for the current NMFS overfished status determination for EPO yellowfin tuna based on the 2018 IATTC stock assessment.

B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST ($1\text{-}MxB_{MSY}$ or $0.5B_{MSY}$)	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
S_{MSY} (S= unitless spawning biomass index)	3,634	S = 3,925 (S= unitless spawning biomass index)	1,817	2.1	NA	No

8.6. Striped marlin (*Kajikia audax*)

Stock assessments have been performed on three striped marlin stocks in the Pacific Ocean: a northern EPO stock (assessed by the IATTC in 2009), a WCNPO stock (assessed by the ISC in 2023), and a Southwest Pacific Ocean stock (assessed by the SPC in 2019). The stock managed under the HMS FMP is the EPO stock.

The assessment for the northern EPO stock, completed by IATTC scientific staff in 2010 is:

> Assessment of Striped Marlin in the Eastern Pacific Ocean In 2008 and Outlook for the Future. Michael G. Hinton. Inter-American Tropical Tuna Commission. Document SAC-01-10 and also included in Stock Assessment Report 10.

Stock status as reported in the assessment for 2009, the terminal year of the assessment:

> …the northern EPO stock of striped marlin is not being overfished [C(2009)/MSY = 0.36, F_{mult} = 6.4], and that the stock biomass is increasing from the low biomass (about 750 t) and SBR (about 0.16) observed in 2003. The estimates of biomass and SBR for 2009 were about 3,600 t and 0.31, respectively.
>
> The results of the base case assessment indicate that at present the SBR for the stock is about 0.31, and that $S(2009)/S_{MSY} = 1.2$, which indicates that the spawning biomass is above the level expected to support harvests at the estimated MSY of 2,000 t.
>
> The results of the assessment ($F_{mult} = 6.4$) also indicate that levels of fishing effort are below those which would be expected to harvest striped marlin at the MSY level. Recent catches, which are estimated to be about 750 to 850 t, are about 40 percent of MSY. If harvests continue at this level, then it is expected that the biomass of the northern EPO stock of striped marlin will continue to increase over the near term.

The current NMFS status determination is based on the 2009 IATTC stock assessment and finds the stock is not subject to overfishing and is not overfished, based on the framework in the HMS FMP. Table 8-7 shows the reference points derived from the 2010 IATTC assessment used for the overfishing determination shows the reference points used for the overfished determination.

Table 8-7. Reference points used for the current NMFS stock status determination for EPO striped marlin based on the 2010 IATTC stock assessment.

Overfishing					
MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
F	NA	NA	NA	0.16	No
Overfished					

B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB_{MSY} or 0.5B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
SSB_{MSY}	1246 mt	SSB2009 = 1488 mt	623 mt	2.3	NA	No

8.7. Swordfish (Xiphias gladius)

Three swordfish stocks have been assessed in the Pacific Ocean: A North Pacific Stock, a Southeast Pacific Ocean stock (south of 10°N in the IATTC Convention Area), and a southwest Pacific stock in the WCPFC Convention Area south of the equator. The North Pacific stock is the stock managed under the HMS FMP.

The most recent stock assessment for swordfish in the North Pacific was completed by the ISC Billfish Working Group in 2023:

> Stock Assessment Report for Swordfish (*Xiphias gladius*) in the North Pacific Ocean Through 2021. ISC Billfish Working Group. Prepared for the Twenty-third Meeting of the ISC, July 12-17, 2023. The assessed stock is defined to be the waters of the North Pacific Ocean contained in the WCPFC Convention Area bounded by the equator and the waters of the IATTC Convention Area north of 10°N.

The following information on the status of this stock was provided by ISC23 (Plenary Report section 6.5):

1. Female spawning stock biomass was estimated to be 35,778 mt in 2021, with a relative SSB ratio of SSB/SSB_{MSY} = 2.18 in 2021;
2. Estimated F (arithmetic average of F for ages 1 – 10) averaged roughly F=0.09 yr-1 during 2019-2021 with a relative fishing mortality of F/F_{MSY} = 0.49 in 2021; and
3. Relative to MSY-based reference points, overfishing is very likely not occurring (>99% probability) and the NPO SWO stock is very likely not overfished (>99% probability).

The current NMFS status determination is based on previous ISC stock assessment from 2018 but reaches comparable conclusions with respect to status. This assessment defined the stock boundaries somewhat differently, excluding a triangular area in the EPO, approximately bounded by a line extending southwest from Baja California, Mexico, to the equator and then eastwards to the coast of North America at 10°N. Using that assessment, NMFS found the stock is not subject to overfishing and is not overfished, based on the framework in the HMS FMP. Table 8-8 shows the reference points from the 2018 ISC stock assessment used for the current status determinations.

Table 8-8. Reference points used for the current NMFS stock status determination for NPO swordfish based on the 2018 ISC stock assessment.

Overfishing					
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB_{MSY} or 0.5B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)
U (exploitation rate = catch/biomass)	0.18	F2012 = 0.19	NA	1.11	Yes
Overfished					

B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB$_{MSY}$ or 0.5B$_{MSY}$)	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
B_{MSY}	31,200	B2012 = 58,590 mt	20,280 mt	3*	NA	No

*For EPO swordfish, B_{2012}/B_{MSY} = 1.87 used for the status determination instead of B_{2012}/B_{MSST} = 3; status is the same, not overfished.

8.8. Blue shark (*Prionace glauca*)

Two blue shark stocks are recognized in the Pacific Ocean, a North Pacific stock and a South Pacific stock or stocks. (WCPFC conducted a stock assessment on the South Pacific stock in its Convention Area in 2021. IATTC is currently developing an assessment for the SEPO.) The North Pacific stock is subject to management under the HMS FMP.

The most recent NPO blue shark stock assessment was completed by the ISC in 2022:

> Stock Assessment and Future Projections of Blue Shark in the North Pacific Ocean Through 2020. Report of the Shark Working Group. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. 12-18 July 2022.

The following information on the status of the NPO blue shark stock was provided by the ISC23 Plenary based on the 2022 stock assessment (Plenary Report section 6.3):

1. Target and limit reference points have not been established for pelagic sharks in the Pacific Ocean. Stock status is reported in relation to MSY-based reference points;
2. Median female SSB in 2020 (SSB_{2020}) was estimated to be 1.170 of SSB_{MSY} (80th percentile, 0.570 - 1.776) and is likely (63.5% probability) not in an overfished condition relative to MSY-based reference points;
3. Recent annual F (F2017-2019) is estimated to be below FMSY and overfishing of the stock is very likely (91.9% probability) not occurring relative to MSY-based reference points; and
4. The base case model results show that there is a 61.9% joint probability that NPO BSH stock is not in an overfished condition and that overfishing is not occurring relative to MSY-based reference points.

The pending NMFS status determination is based on the 2022 ISC stock assessment and finds the stock is not subject to overfishing and is not overfished, based on the framework in the HMS FMP. Table 8-9 shows the reference points from the 2022 ISC stock assessment used for the current status determinations.

Table 8-9. Reference points used for the current NMFS stock status determination for NPO blue shark based on the 2022 ISC stock assessment.

Overfishing					
MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
FMSY	0.76	F2017-19 = 0.33	NA	0.45	No (pending)

Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB$_{MSY}$ or 0.5B$_{MSY}$)	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?

Female SSB_{MSY}	83,545	SSB_{2020} = 92,954	63,494-71,013	1.3-1.46	NA	No (pending)

8.9. Common Thresher Shark (*Alopias vulpinus*)

Although a pelagic species, common thresher sharks are relatively coastal, occurring primarily within 40-75 miles of land, over continental and insular shelves and slopes, and occupy cooler, more temperate waters. Although distributed around the Pacific basin (and circumglobally), an assessment has only been completed on the stock occurring off the west coast of North America (see below), which is the stock managed under the HMS FMP.

The most recent stock assessment was completed by NMFS in 2018:

> Status of Common Thresher Sharks, *Alopias vulpinus*, along the West Coast of North America: Updated Stock Assessment Based on Alternative Life History. Teo, S., Garcia Rodriguez, E. and Sosa-Nishizaki. O. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-595. https://doi.org/10.7289/V5/TM-SWFSC-595

This is the first assessment completed for this stock. This assessment was peer reviewed in 2017 and revised in 2018. The assessment found:

> The estimated fishing intensity (1-SPR) on common thresher sharks off the west coast of North America is currently relatively low at 0.097 (average of 2012 – 2014) and substantially below the estimated overfishing threshold (MFMT), with $(1\text{-}SPR_{12\text{-}14})/(1\text{-}SPR_{MSY})$ at 0.21. Similarly, the estimated number of mature female sharks in 2014 (S_{2014}) for this stock is at 62% of its unexploited level and is substantially larger than the estimated MSST, with S_{2014}/MSST at 1.40. Thus, this stock of common thresher sharks is unlikely to be in an overfished condition nor experiencing overfishing. (Table references excluded.)

Based on the 2018 assessment NMFS determined the stock is not subject to overfishing and is not overfished, based on the framework in the HMS FMP. Table 8-10 shows the reference points from the 2018 NMFS stock assessment used for the current status determinations.

Table 8-10. Reference points used for the current NMFS stock status determination for common thresher shark based on the 2018 NMFS stock assessment.

Overfishing					
MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/F_{MSY} ratio	Subject to Overfishing?
$1\text{-}SPR_{MSY}$	0.45	1-SPR2012-14 = 0.097	NA	0.21	No

Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST ($1\text{-}MxB_{MSY}$ or $0.5B_{MSY}$)	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
SSB_{MSY}	101,500 mature females	SSB = 136,800 mature females	97,500 mature females	1.4	NA	No

8.10. Shortfin Mako Shark (Isurus oxyrinchus)

A single shortfin mako shark stock is assumed in the NPO based on evidence from genetics, tagging studies, and lower catch rates of shortfin mako near the equator relative to temperate areas. The WCPFC completed a stock assessment for the stock within its Convention Area in the South Pacific. The NPO stock is managed under the HMS FMP.

The most recent assessment for the NPO stock was completed in 2018:

> Stock Assessment of Shortfin Mako Shark in the North Pacific Ocean through 2016. Report of the Shark Working Group. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. July 11-16, 2018, Yeosu, Republic of Korea. Additionally, the ISC completed an indicator analysis in 2021.

ISC23 endorsed the following stock status information based on the 2018 assessment (Plenary Report section 6.4):

1. Target and limit reference points have not been established for pelagic sharks in the Pacific Ocean. Stock status is reported in relation to MSY-based reference points; and
2. The results from the base case model and six sensitivity analyses that represent the most important sources of uncertainty in the assessment show that the NPO SMA stock is likely (>50%) not in an overfished condition and overfishing is likely (>50%) not occurring relative to MSY-based abundance and fishing intensity reference points.

Based on the 2018 ISC assessment, NMFS determined the stock is not subject to overfishing and is not overfished, based on the framework in the HMS FMP.

Table 8-11. Reference points used for the current NMFS stock status determination for NPO shortfin mako shark based on the 2018 ISC stock assessment.

Overfishing					
MFMT (F_{MSY} or Proxy)	Current F_{MSY} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/FMSY ratio	Subject to Overfishing?
1-SPRMSY	0.26	1-SPRmsy2013-15 = 0.16	NA	0.62	No

Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1-MxB_{MSY} or 0.5B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
SA_{MSY}	633,700 female sharks	SA2016 = 860,200 female sharks	(1-0.128)x633700 = 552,586 female sharks	1.6	NA	No

8.11. Dorado (Coryphaena hippurus)

Dorado, or mahi mahi, are found circumglobally in tropical and subtropical waters but stock structure in the Pacific is poorly understood. Throughout their range they are often found associated with both natural and manmade floating objects. In the Eastern Pacific, dorado are most abundant off Mexico, Panama, Ecuador, Peru, and around the Galapagos Islands. They move into U.S. waters as far north as Point Conception, California, primarily during warm water years. The exploratory stock assessment referenced below found "the available information does not provide strong evidence that there is more than one stock

of dorado in the EPO, although there are indications of some spatial structure." For the purposes of management under the HMS FMP, the stock is considered the portion of the population occurring in the EPO.

The IATTC conducted an exploratory assessment for a EPO stock south of the equator in 2016:

> Exploratory Stock Assessment of Dorado (*Coryphaena Hippurus*) in the Southeastern Pacific Ocean (DRAFT). Alexandre Aires-da-Silva, Juan L. Valero, Mark. N. Maunder, Carolina Minte-Vera, Cleridy Lennert-Cody, Marlon H. Román, Jimmy Martínez-Ortiz, Edgar J. Torrejón-Magallanes and Miguel N. Carranza. Inter-American Tropical Tuna Commission, Scientific Advisory Committee Sixth Meeting. May 9-13, 2016.

Although, a single stock may occur over a larger area of the EPO, data were only sufficient to conduct the assessment on the population south of the equator, based on a "core area" located off Ecuador and Peru. The assessment executive summary concludes:

> Although the assessment results contribute to knowledge about the population dynamics of dorado and its history of exploitation in the EPO, the IATTC staff is unable to draw conclusions about stock status, because no reference points, target or limit, have been defined for dorado in the EPO. Nonetheless, some management quantities are presented and discussed for consideration. Recent catches are near the estimates of maximum sustainable yield (MSY) from the stock assessment. However, yield-per-recruit (YPR) analyses show that the yield curve is very flat, and the fishing mortality required to achieve the MSY is poorly defined. A complementary study presents an exploratory management strategy evaluation (MSE) for dorado in the southern EPO. Overall, this study shows that Stock Synthesis is a promising tool for conducting stock assessments of this species in the EPO. More research is needed to refine the model and the data used, and to prioritize collection of new data for assessing dorado. Analyses expanding the spatial extent of the assessment and including data from more fisheries (e.g., Central America, Mexico, and Chile) could be considered in the future.

NMFS concluded that the status of the stock is unknown given the lack of data available to assess status.

8.12. Assessments for Other Pacific Ocean Stocks

Other stocks of HMS management unit species occur in the Pacific Ocean. These stocks are not managed under the HMS FMP. For reference the most recent assessments for these stocks are listed below.

- Albacore (South Pacific) (2021); Stock assessment of South Pacific albacore tuna (Rev 2). WCPFC Scientific Committee Seventeenth Regular Session, August 11-19, 2021. WCPFC-SC17-2021/SA-WP-02.
- Bigeye (WCPO) (2023): Stock assessment of bigeye tuna in the western and central Pacific Ocean: 2023 - Rev.02 (Final). J. Day, A. Magnusson, T. Teears, J. Hampton, N. Davies, C. Castillo Jordan, T. Peatman, R. Scott, J. Scutt Phillips, S. McKechnie, F. Scott, N. Yao, G. Pilling, P. Williams, P. Hamer. Scientific Committee Nineteenth Regular Session, August 16-24, 2023. SC16-SA-WP-03.
- Skipjack (WCPO) (2022): Stock assessment of skipjack tuna in the western and central Pacific Ocean (Rev.3). Jordán, C.C., Teears, T., Hampton, J., Davies, N., Phillips, J.S., McHenchie, S., and others . Scientific Committee Eighteenth Regular Session. Western and Central Pacific Fisheries Commission, August 10-18, 2022. WCPFC-SC18-2022/SA-WP-01.
- Yellowfin (WCPO) (2023): Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean: 2023 - Rev.02 (Final). A. Magnusson, J. Day, T. Teears, J. Hampton, N. Davies,

C. Castillo Jordán, T. Peatman, R. Scott, J. Scutt Phillips , S. McKechnie, F. Scott, N. Yao, G. Pilling P. Williams, P. Hamer. Scientific Committee Nineteenth Regular Session, August 16-24, 2023. SC19-SA-WP-04,

- Striped Marlin (WCNPO) (2023): Stock assessment report for striped marlin (*Kajikia audax*) in the Western and Central North Pacific Ocean through 2020. 23rd Meeting of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean, July 12-17, 2023. ISC/23/ANNEX/14.
- Striped Marlin (SW Pacific – WCPO) (2019): Stock assessment of SW Pacific striped marlin in the WCPO. Ducharme Barth, N., Pilling, G. and Hampton, J. Scientific Committee Fifteenth Regular Session. Western and Central Pacific Fisheries Commission, August 12-19, 2019. WCPFC-SC15-2019/SA-WP-07.
- Swordfish (SWPO) (2021): Stock Assessment for Southwest Pacific swordfish. N. Ducharme-Barth, C. Castillo-Jordan, J. Hampton, P. Williams1, G. Pilling, P. Hamer. WCPFC-SC17-2021/SA-WP-04. July 21, 2021.
- Swordfish (SEPO) (2022): South EPO swordfish benchmark assessment in 2019. Carolina Minte-Vera, Mark N. Maunder, Haikun Xu, Juan Valero, Alexandre Aires-da-Silva. IATTC 100th Meeting, August 1-5, 2022. Document IATTC-100 INF-B.

- Blue shark (SWPO) (2021). 2021 Stock assessment of Southwest Pacific blue shark. Philipp Neubauer, Kath Large and Stephen Brouwer. WCPFC-SC17-2021/SA-WP-03 Rev. 1. August 10, 2021.
- Shortfin Mako Shark (SWPO) (2022): Stock assessment of Southwest Pacific shortfin mako shark. Large, K., Neubauer, P. and Brouwer, S. Western and Central Pacific Fisheries Commission, August 10-18, 2022. WCPFC-SC18-2022/SA-WP-02-Rev1.

8.13. Catches of HMS Management Unit Species in West Coast Fisheries

Except for North Pacific albacore, Pacific bluefin tuna, and swordfish, West Coast fisheries catch of HMS FMP management unit species has comprised less than one percent of stockwide catch. Historically, West Coast North Pacific albacore catch has been about one-fifth of the stockwide total. For Pacific bluefin tuna and swordfish it has been about 5% of stockwide catch. These catch fractions can inform considerations of the "relative impact of U.S. fishing vessels on the stock" when the Council considers responses to a notification that a stock is subject to overfishing or overfished "due to excessive international fishing pressure." When notified by NMFS, Magnuson-Stevens Act section 304(i) requires the Council to develop recommendations for domestic regulations and international actions taking into account this relative impact.

Appendix A: U.S.-Canada Albacore Treaty Data Exchange Tables

Table 1. Catch of Albacore by Canadian and U.S. Albacore Troll and Pole-and-Line Vessels in the North Pacific Ocean [1]

	Canadian Fleet [2, 3]					U.S. Fleet [5, 9]				
Year	*Canadian EEZ (%)*	*U.S. EEZ (%)*	*High Seas (%)*	*Total catch (metric tons)*	*Logbook coverage (%)* [4]	*U.S. EEZ (%)*	*Canadian EEZ (%)*	*High Seas (%)*	*Total catch (metric tons)* [6]	*Logbook coverage (%)* [7]
1995	88	2.2	9.8	1,761	18	5.4	5.7	88.9	8,125	*63*
1996	16.9	45.8	37.3	3,321	24	13.5	0.1	86.4	16,962	*42*
1997	7.2	30.5	62.3	2,166	30	16.5	3.5	80.0	14,325	38
1998	7.3	43.6	49.1	4,177	50	14.8	0.1	85.1	14,489	35
1999	16.6	66.8	16.6	2,734	71	65.3	0.8	33.9	10,120	35
2000	9.6	73.1	17.4	4,531	68	69.6	0.2	30.2	9,714	41
2001	13.5	72.7	13.9	5,248	81	57.0	0.3	42.7	11,349	49
2002	7.8	86.2	5.9	5,379	74	63.9	2.0	34.0	10,768	38
2003	8.0	85.3	6.6	6,847	96	86.0	0.6	13.3	14,161	36
2004	16.9	80.7	2.4	7,857	92	92.9	1.2	5.9	13,473	47
2005	33.1	62.6	4.3	4,829	94	92.0	2.3	5.8	8,479	73
2006	18.5	70.1	11.3	5,833	95	82.5	1.0	16.5	12,547	93
2007	21.5	78.5	0.1	6,041	92	98.8	0.7	0.5	11,908	86
2008	4.5	86.4	9.1	5,464	93	78.5	6.0	15.5	11,761	79
2009	7.1	91.3	1.5	5,693	97	93.1	2.5	4.4	12,340	86
2010	35.9	51.2	12.9	6,526	96	72.1	2.1	25.9	11,689	76
2011	12.4	85.7	2.0	5,415	98	94.9	0.4	4.7	10,143	84
2012	83.0	0.0	17.0	2,484	100	99.2	0.0	0.8	14,149	81
2013	59.6	37.9	2.5	5,088	99	96.4	1.5	2.1	12,310	76
2014	55.3	44.6	0.1	4,780	100	94.6	5.2	0.2	13,398	84
2015	66.5	33.4	0.1	4,391	100	96.5	3.3	0.2	11,595	86
2016	54.8	44.4	0.8	2,842	100	97.9	1.4	0.7	10,777	79
2017	11.2	75.0	13.8	1,830	100	91.2	0.2	8.7	7,430	81
2018	30.8	68.9	0.3	2,717	100	95.4	3.8	0.8	7,728	72
2019	51.7	44.9	3.4	2,402	100	93.0	4.2	2.8	7,797	76
2020	71.5	19.6	8.9	2,376	100	77.8	9.5	12.7	7,516	73
2021	70.1	27.9	2.0	2,419	100	80.3	13.6	6.1	4,209	85.6
2022 [8]	67.7	31.0	1.3	3,639	100	86.5	12.3	1.2	8,450	91.8

Data Sources and Notes:

[1] Locations are based on logbook records, which are self-reported by vessels.

[2] Canadian data during 1995-2011 are taken from Canadian Tuna Database version 13.02.11.

[3] Percentage of Canadian catch in various zones is based catch locations recorded in logbook. Total Canadian catch data reported in this table are expanded to account for non-reporting vessels based on logbook coverage (cf. Table 2).

[4] Canadian logbook coverage rates are calculated by dividing the number of logbook reporting vessels with the total number of vessels.

[5] USA catch in various zones are based on the percentage of catch recorded by logbooks in each zone.

[6] USA total catch is the sum of landings in the USA west coast ports (from PacFIN) and landings in foreign ports. Since these data sources are considered to be complete, total catch is not expanded based on logbook coverage.

[7] USA logbook coverage rates are based on the ratio of trip landings weights recorded in logbooks to the sum of landings from PacFIN and foreign ports (see Footnote 6).

[8] Preliminary data subject to change. Canadian data from Canadian tuna database version 23.01.26

[9] Proportion of US catch in high seas zone was estimated from logbook data, and includes catch in U.S. EEZ off Alaska due to shapefile used. Catch in waters off Alaska were limited and do not affect the estimates substantially.

Table 2a. Landings of Albacore (by country of landing port) by Canadian Albacore Troll and Pole-and-Line Vessels in the North Pacific Ocean.

	Canadian Fleet [1]										
	Landings (metric tons) [2]					Number of Landings			Number of Landing Vessels		
Year	*Canadian Ports*	*U.S. Ports (DFO estimates)* [3]	*U.S. Ports (NOAA estimates)* [4]	*Other Ports* [5,8]	*Total* [10]	*Canadian Ports*	*U.S. Ports (DFO estimates)* [3]	*U.S. Ports (NOAA estimates)* [4]	*Canadian Ports*	*U.S. Ports (DFO estimates)*	*U.S. Ports (NOAA estimates)* [9]
1995	230	67	67	104	401	*76*	4	7	53	3	4
1996	662	311	868	106	1,636	93	33	102	62	20	66
1997	563	294	399	147	1,109	67	25	54	51	14	32
1998	1,892	281	961	82	2,935	173	30	67	104	16	29
1999	1,574	484	713	193	2,480	274	69	106	158	35	52
2000	2,432	537	889	424	3,745	346	79	110	160	44	57
2001	3,474	617	806	364	4,644	520	51	92	193	31	52
2002	3,866	181	702	347	4,915	465	29	71	169	17	38
2003	3,781	2,132	3,118	655	7,554	464	241	285	177	87	105
2004	2,586	977	1,130	3,590	7,306	659	141	89	198	67	52
2005	3,473	745	811	286	4,570	513	88	85	195	49	45
2006	5,281	327	397	300	5,978	495	35	31	161	18	19
2007	5,596	283	357	73	6,025	559	29	35	191	20	22
2008	3,693	1,236	1,359	122	5,174	341	106	114	123	42	46
2009	4,662	642	650	298	5,610	434	53	47	134	30	26
2010	4,961	811	958	446	6,364	502	78	76	154	45	42
2011	4,059	1,094	1,179	170	5,408	453	89	93	174	47	47
2012	2,219	0	0	265	2,484	276	0	0	174	0	0
2013	4,301	609	650	168	5,119	278	39	41	177	19	22
2014	4,130	395	415	256	4,801	339	26	28	147	12	12
2015	3,978	244	245	160	4,383	408	19	19	160	11	11
2016	2,634	186	189	22	2,845	388	17	17	150	9	9
2017	1,583	248	236	0	1,831	240	21	20	121	12	11
2018	2,483	234	221	0	2,717	275	20	19	121	9	8
2019	2,235	139	136	28	2,402	269	12	12	122	7	7
2020	2,376	0	^	0	2,376	247	0	^	104	0	^
2021	2,419	0	^	0	2,419	270	0	^	113	0	^
2022 [12]	3,487	144	84	8	3,639	202	10	12	117	10	7

Data Sources and Notes:

[1] Canadian landings data prior to 2012 are from Canadian Tuna Database version 13.02.11

[2] Landings for Canadian fleet are based on salesslip weights (where available) or estimated weights in logbooks and are not expanded to account for non-reporting vessels (cf. Table 1).

[3] DFO estimates of Canadian landings in US ports are based on estimated weights in logbooks and are not expanded.

[4] NOAA estimates of landings data by Canadian fleet are derived from PacFIN and are not expanded.

[5] Other ports category is used for landings in non-US and non-Canada ports or where the landing port was unknown due to missing data. Occasional landings in American Samoa (Pago pago) are included early in the time series.

[6] DFO estimates of US landings in Canadian ports based on offloading fish slip data. These are not expanded likely to be a minimum bound because of incomplete fish slip data and reports from Canadian buyers/processors.

[7] Number of landing vessels may be slightly inaccurate due to landing slips with invalid or missing vessel IDs (0.15 to 3.9%)

[8] The majority of Canadian landings in 2004 did not include information on landing port but the majority of these landings were likely made in Canadian ports.

[9] U.S. DATA Source: Pacific Fisheries Information Network (PacFIN) retrieval dated , 03/28/2023. Number of landings estimated from unique vessel ID and Fish Ticket Dates

[10] Where both DFO and NOAA estimates exist, total is calculated by adding the greater of the two values

[11] USA landings in Other Ports (non-US West Coast & non-Canadian ports) include American Samoa and Hawaii

[12] Preliminary data subject to change. Canadian data from Canadian tuna database version 23.01.26

[13] U.S. landings data do not include <200 mt of albacore landings in Alaskan ports made by U.S. vessels during 1994-2015.

[14] DFO estimates of US landings in Canadian ports based port access applications submitted by US vessels. To be reviewed in detail by Data WG in 2024.

* = no data, 0 = more than 0 mt but less than 1, ^ = confidential data (less than 3 vessels)

Table 2b. Landings of Albacore (by country of landing port) by U.S. Albacore Troll and Pole-and-Line Vessels in the North Pacific Ocean.

	US fleet[13]													
	Landings (metric tons)						Number of Landings				Number of Vessels that landed fish [7]			
Year	*Ports (DFO*	*Ports (DFO*	*Ports (NOAA*	*U.S. Ports [9]*	*Other Ports [11]*	*Total [10]*	*Ports (DFO*	*Ports (DFO*	*Ports (NOAA*	*U.S. Ports [9]*	*Ports (DFO*	*Ports (DFO*	*Ports (NOAA*	U.S. Ports [9]
1995				6,407	1,753	8,160				1,000				472
1996				13,209	2,188	15,397				1,710				658
1997				10,831	3,009	13,840				3,674				1,160
1998				12,628	1,135	13,763				2,470				838
1999				8,809	1,422	10,231				2,619				772
2000				8,086	1,574	9,660				2,230				707
2001				10,263	972	11,235				3,453				929
2002			^	9,298	163	9,461			<3	2,432			<3	696
2003			^	13,491	487	13,978			<3	2,821			<3	782
2004			444	13,367	24	13,835			10	2,727			<3	727
2005			83	8,217	9	8,309			4	1,761			3	552
2006			^	12,374		12,374			<3	2,163			<3	615
2007			674	11,143		11,817			13	2,471			9	651
2008	721		455	9,768		10,489	19		9	1,700	11		6	477
2009	721		664	11,621		12,342	16		12	2,596	11		8	655
2010	919		601	10,871		11,790	24		17	2,339	16		9	609
2011	611		282	9,840		10,451	21		12	2,560	13		8	640
2012	0		0	13,861		13,861	0		0	3,309	0		0	816
2013	514		289	12,019		12,533	16		9	2,559	12		6	684
2014	1459		1,290	12,108		13,567	36		30	2,513	18		17	590
2015	756		557	11,038		11,794	30		20	2,389	19		13	560
2016	482		511	10,266		10,777	22		22	2,488	12		15	557
2017	659		328	7,102		7,761	27		16	2,008	14		13	495
2018	680	1,043	855	6,873		7,916	28		28	1,656	13		20	434
2019	367	1,126	578	7,188		8,314	12		18	2,229	7		12	540
2020	282	1,360	648	6,868		8,228	7		15	1,422	5		11	391
2021	209	1,212	719	3,490		4,702	8		22	845	3		17	292
2022 [12]		1,775	1,412	7,038		8,813		43	32	1,411		27	19	397

Data Sources and Notes:

[1] Canadian landings data prior to 2012 are from Canadian Tuna Database version 13.02.11

[2] Landings for Canadian fleet are based on salesslip weights (where available) or estimated weights in logbooks and are not expanded to account for non-reporting vessels (cf. Table 1).

[3] DFO estimates of Canadian landings in US ports are based on estimated weights in logbooks and are not expanded.

[4] NOAA estimates of landings data by Canadian fleet are derived from PacFIN and are not expanded.

[5] Other ports category is used for landings in non-US and non-Canada ports or where the landing port was unknown due to missing data.

[6] DFO estimates of US landings in Canadian ports based on offloading fish slip data. These are not expanded likely to be a minimum bound

[7] Number of landing vessels may be slightly inaccurate due to landing slips with invalid or missing vessel IDs (0.15 to 3.9%)

[8] The majority of Canadian landings in 2004 did not include information on landing port but the majority of these landings were likely made in Canadian ports.

[9] U.S. DATA Source: Pacific Fisheries Information Network (PacFIN) retrieval dated , 03/28/2023. Number of landings estimated from unique vessel ID and Fish Ticket Dates

[10] Where both DFO and NOAA estimates exist, total is calculated by adding the greater of the two values

[11] USA landings in Other Ports (non-US West Coast & non-Canadian ports) include American Samoa and Hawaii

[12] Preliminary data subject to change. Canadian data from Canadian tuna database version 23.01.26

[13] U.S. landings data do not include <200 mt of albacore landings in Alaskan ports made by U.S. vessels during 1994-2015.

[14] DFO estimates of US landings in Canadian ports based port access applications submitted by US vessels. To be reviewed in detail by Data WG in 2024.

* = no data, 0 = more than 0 mt but less than 1, ^ = confidential data (less than 3 vessels)

Table 3a. Distribution of Canadian Albacore Troll and Pole-and-Line Fleet Fishing Effort in the North Pacific Ocean [1]

Year	Canadian Fleet [1]						
	Number of vessels/months allowed to fish in US EEZ	*Number of vessels that fished in US EEZ* [3]	*Number of vessels that fished in Canadian EEZ* [5]	*Vessel Months Used* [4]	*Fishing Effort in US EEZ (boat fishing days)* [2]	*Fishing Effort in Canadian EEZ (boat fishing days)* [2]	*Fishing Effort on high seas (boat fishing days)* [2]
1995	Unlimited	9	175	N/A	191	5,535	197
1996	Unlimited	83	90	N/A	4,222	2,813	1,130
1997	Unlimited	59	67	N/A	1,972	1,010	1,339
1998	Unlimited	91	92	N/A	3,234	1,274	1,507
1999	Unlimited	176	162	N/A	4,316	1,689	965
2000	Unlimited	184	131	N/A	6,738	1,189	842
2001	Unlimited	207	176	N/A	7,697	1,754	570
2002	Unlimited	200	124	N/A	7,207	686	431
2003	Unlimited	177	119	N/A	7,111	892	425
2004	170 vessels or 680 vessel fishing months	202	172	627	7,551	2,125	266
2005	140 vessels or 560 vessel fishing months	154	196	410	5,309	2,940	315
2006	125 vessels or 500 vessel fishing months	139	148	396	4,500	1,401	342
2007	94 vessels or 376 vessel fishing months	119	191	368	4,809	2,081	12
2008	94 vessels or 376 vessel fishing months	122	79	338	4,993	360	420
2009	110	107	116	N/A	5,722	675	143
2010	110	109	153	N/A	3,848	2,887	559
2011	110	108	146	N/A	6,549	1,771	285
2012	0	0	174	N/A	0	5,084	890
2013	45 vessels	43	181	N/A	1,870	4,299	296
2014	45 vessels	44	156	N/A	1,774	2,944	27
2015	45 vessels	43	161	N/A	1,435	3,792	17
2016	45 vessels	43	151	N/A	1,892	3,407	60
2017	45 vessels	45	101	N/A	2,865	1,343	770
2018	45 vessels	45	118	N/A	2,228	1,924	44
2019	45 vessels	42	119	N/A	1,621	2,008	253
2020	45 vessels	34	104	N/A	573	2,542	187
2021	45 vessels	41	113	N/A	937	2,664	86
2022 [9]	45 vessels	39	117	N/A	1,134	2,849	90

Data Sources and Notes:

[1] Effort in different zones are based on logbook records, where locations are self-reported by vessels.

[2] Estimates of Canadian effort in boat fishing days are expanded using the methodology described in Stocker et al. (2007: CTRFAS 2701). 1995-2011 data from Canadian Tuna Database version 13.02.11

[3] Number of vessels that fished in US EEZ: 1995-2008 data from Canadian Tuna Database version 13.02.11, 2009-2011 data from DFO Pacific Licensing System

[4] Vessel Months during 1995-2011 used data from Canadian tuna database v. 13.02.11

[5] Number of vessels that fished in Canadian EEZ: 1995-2011 data from Tuna Database version 13.02.11

[6] Although the historical level of fishing effort for the US fleet was permitted in the Canadian EEZ during 2009-2011, the historical level of fishing effort is not presently quantified.

[7] Number of US vessels that fished in US or Canadian EEZs are not expanded.

[8] Number of US vessels that fished in US or Canadian EEZs refers to vessels that recorded fishing days in those zones in their logbooks and do not include vessels that only had transit days. Where logbook coverage rate is less than 100%, it is assumed that all US vessels that landed fish, had fished in the US EEZ

[9] Preliminary data subject to change. Canadian data from Canadian tuna database version 22.02.17

[10] Estimates of US effort in US EEZ, Canadian EEZ and high seas in boat fishing days are expanded and calculated by multiplying the proportion of reported logbook effort in each zone by the estimated annual effort. Estimation of annual effort has changed in 2017 (Documented in ISC working paper ISC17/STATWG/WP-1)

[11] Proportion of US effort in high seas zone was estimated from logbook data, and includes effort in U.S. EEZ off Alaska.

* = no data, ^ = confidential data (less than 3 vessels)

Table 3b. Distribution of U.S. Albacore Troll and Pole-and-Line Fleet Fishing Effort in the North Pacific Ocean. [1]

Year	U.S. Fleet[11]					
	Number of vessels allowed to fish in Canadian EEZ [6]	*Number of vessels that fished in US EEZ* [7,8]	*Number of vessels that fished in Canadian EEZ* [7, 8]	*Fishing Effort in US EEZ (boat fishing days)* [10]	*Fishing Effort in Canadian EEZ (boat fishing days)* [10]	*Fishing Effort on high seas (boat fishing days)* [10, 11]
1995	Unlimited	472	71	1,461	960	6,786
1996	Unlimited	658	6	3,574	14	10,229
1997	Unlimited	1160	46	4,520	570	10,838
1998	Unlimited	838	3	3,042	26	8,834
1999	Unlimited	772	19	12,560	273	7,859
2000	Unlimited	707	12	8,883	67	4,970
2001	Unlimited	929	15	9,280	75	5,560
2002	Unlimited	696	31	8,132	212	3,552
2003	Unlimited	782	9	10,919	126	2,395
2004	170 vessels or 680 vessel fishing months	727	21	11,079	213	1,184
2005	140 vessels or 560 vessel fishing months	552	31	9,943	316	914
2006	125 vessels or 500 vessel fishing months	615	32	9,883	96	1,043
2007	94 vessels or 376 vessel fishing months	651	14	10,713	135	233
2008	94 vessels or 376 vessel fishing months	477	39	7,947	327	1,031
2009	Historical level	655	27	12,002	262	719
2010	Historical level	609	51	10,542	342	1,961
2011	Historical level	640	30	13,619	117	941
2012	0	816	^	14,636	^	380
2013	Historical level	703	21	12,242	229	452
2014	Historical level	617	35	11,425	659	116
2015	Historical level	574	39	10,770	549	186
2016	Historical level	569	31	12,280	251	213
2017	Historical level	518	15	11,293	39	1,287
2018	Historical level	452	26	10,255	476	363
2019	Historical level	554	16	10,108	416	546
2020	Historical level	404	34	7,117	745	819
2021	Historical level	311	54	5,231	894	587
2022 [9]	Historical level	430	65	6,967	609	275

Data Sources and Notes:

[1] Effort in different zones are based on logbook records, where locations are self-reported by vessels.

[2] Estimates of Canadian effort in boat fishing days are expanded using the methodology described in Stocker et al. (2007: CTRFAS 2701).

[3] Number of vessels that fished in US EEZ: 1995-2008 data from Canadian Tuna Database version 13.02.11, 2009-2011 data from DFO

[4] Vessel Months during 1995-2011 used data from Canadian tuna database v. 13.02.11

[5] Number of vessels that fished in Canadian EEZ: 1995-2011 data from Tuna Database version 13.02.11

[6] Although the historical level of fishing effort for the US fleet was permitted in the Canadian EEZ during 2009-2011, the historical level of

[7] Number of US vessels that fished in US or Canadian EEZs are not expanded.

[8] Number of US vessels that fished in US or Canadian EEZs refers to vessels that recorded fishing days in those zones in their logbooks and

[9] Preliminary data subject to change. Canadian data from Canadian tuna database version 22.02.17

[10] Estimates of US effort in US EEZ, Canadian EEZ and high seas in boat fishing days are expanded and calculated by multiplying the

[11] Proportion of US effort in high seas zone was estimated from logbook data, and includes effort in U.S. EEZ off Alaska.

* = no data, ^ = confidential data (less than 3 vessels)