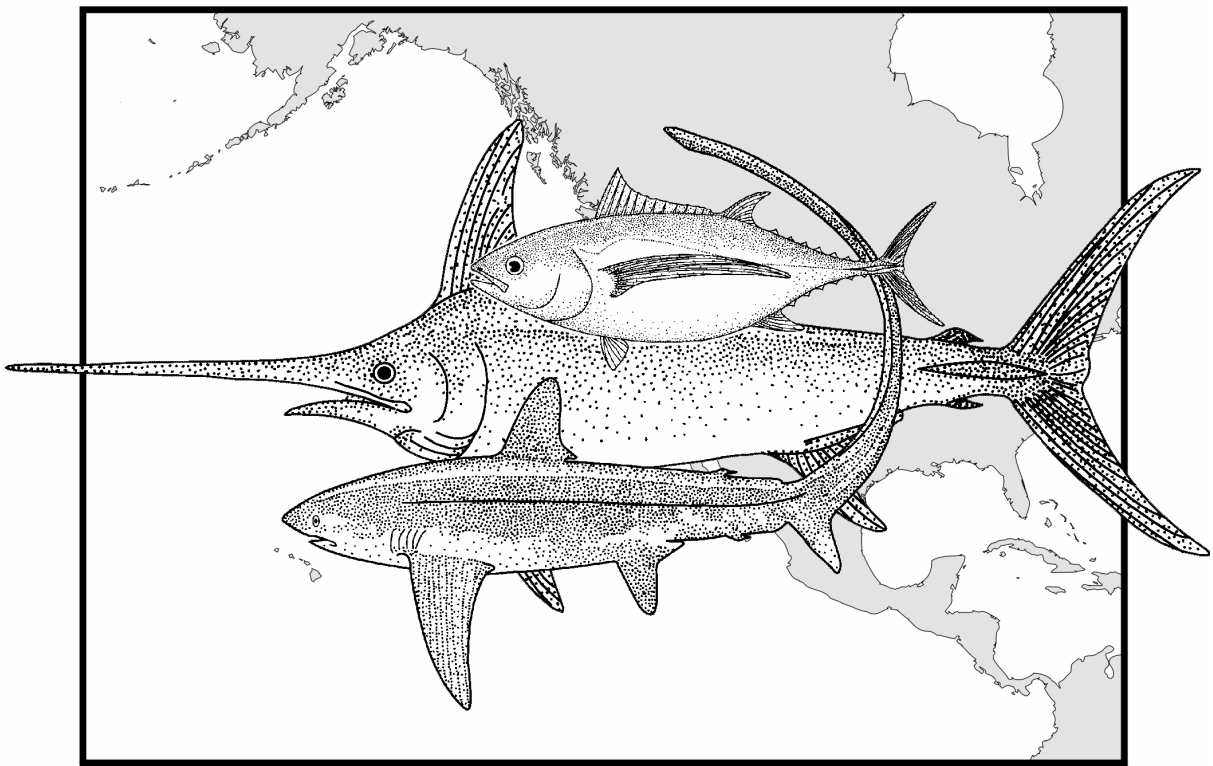


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STATUS OF THE U.S. WEST COAST FISHERIES FOR HIGHLY MIGRATORY SPECIES THROUGH 2023



STOCK ASSESSMENT AND FISHERY EVALUATION
SEPTEMBER 2024

PACIFIC FISHERY MANAGEMENT COUNCIL

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PORTLAND, OREGON

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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 2024).

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. Remaining permits were issued to all eligible applicants for the first eight qualification tiers in 2024. NMFS is preparing to continue annually issuing permits on a first come, first served basis up to the maximum number authorized by the Council (currently 300). [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 (*Dasyatis violacea*)
- Pelagic thresher shark (*Alopias pelagicus*)
- Wahoo (*Acanthocybium 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 [600.305\(c\)\(5\)](#) 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 2024 the HMSMT members were:

- Mr. Phillip Dionne, Washington Department of Fish and Wildlife
- Ms. Elizabeth Hellmers, California Department of Fish and Wildlife
- Ms. Amber Rhodes, NMFS West Coast Region
- Mr. Alan Sarich (Chair), Tribal Representative
- Dr. Owyn Snodgrass, NMFS Southwest Fisheries Science Center
- Dr. Stephen Stohs, NMFS Southwest Fisheries Science Center
- Ms. Jessica Watson (Vice-Chair), 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 2023

The Council made the following HMS-related decisions in 2023. (These decision summaries may be found on the [Council website](#).)

2.1. *March 2023*

2.1.1. International Management Activities

The Council adopted the Highly Migratory Species Advisory Subpanel's (HMSAS) recommendation to communicate the following priorities to NMFS for international decisions in 2023:

- North Pacific albacore: Adopt a harvest control rule at the Inter-American Tropical Tuna Commission (IATTC) and Western and Central Pacific Fisheries Commission (WCPFC) that completes measures passed in 2022 and ensures that management covers the full range of the species, including from 0° to 20° N. latitude throughout the Pacific.
- Pacific bluefin tuna: Acknowledging that the stock is approaching the second rebuilding target, the HMSAS recommended the Council continue to support a precautionary approach for Pacific bluefin tuna. The U.S. delegation should focus on making substantive progress on a comprehensive long-term harvest strategy and East-West allocation as a precondition to any discussions on revisions to current management measures.
- Swordfish: Propose and adopt a measure at WCPFC to cover management from 0° to 20° N. latitude and ensure it is consistent with the measure passed in 2022.
- Circle hooks: Advance a proposal to align guidance on circle hook sizes based on the best available science and advice from relevant working groups.
- North Pacific striped marlin: North Pacific striped marlin in the Western and Central Pacific Ocean is the primary source stock for West Coast Exclusive Economic Zone waters and is an important recreational fishery target. The U.S. delegation should continue to press hard for regional fishery management organization action to address the depleted status of the stock, as delay is likely to worsen the condition of the stock and transfer the conservation burden to future fisherman.

Additional detailed comments are included in [the HMSAS Report](#).

2.1.2. Drift Gillnet Hard Caps Update

In light of passage of the Driftnet Modernization and Bycatch Reduction Act, which amends the Magnuson–Stevens Fishery Conservation and Management Act to prohibit the use of large mesh gillnet gear by December 2027, the Council decided not to proceed with further action to implement hard caps. The Council recognized that hard caps would likely not provide any benefit in terms of reducing high priority protected species mortality/injury over the few seasons they would be in force. In addition, the Council decided its time would be better spent consulting with NMFS on the fishery transition program mandated by the Driftnet Act.

2.2. June 2023

2.2.1. International Management Activities

The Council adopted the following recommendations for U.S. position at upcoming regional fishery management organization meetings.

Eighth Inter-American Tropical Tuna Commission-Western and Central Pacific Fisheries Commission (IATTC-WCPFC) Joint Working Group on Pacific Bluefin Tuna

- Pacific bluefin tuna management strategy evaluation (MSE):
 - Evaluate a fishery impact ratio of 70:30 between the Western and Central Pacific Ocean and Eastern Pacific Ocean. Securing this allocation of opportunity in the long-term harvest strategy should be a key priority in future negotiations.
 - Narrow the list of evaluated reference points and harvest control rules according to U.S. proposal JWG08-DP13 ([Supplemental Attachment 2](#)).
 - Prioritize consideration of the safety, status, and stability management objectives and related performance indicators as identified in the [April 19, 2023, U.S. Stakeholder Meeting](#) on Harvest Strategy Components for a Management Strategy Evaluation for Pacific Bluefin Tuna.
- Oppose Korea's proposal (JWG08- DP-12, [Supplemental Attachment 1](#)) that would exempt fisheries that “do not target Pacific bluefin tuna, such as set net fisheries,” from catch limits and increases the percentage of small fish (<30 kg) quota that may be converted to large fish (≥30 kg) quota. These provisions reduce accountability and lack scientific justification.
- Secure adoption of an interim Pacific bluefin harvest strategy with measures to ensure overfishing cannot occur.

WCPFC Northern Committee

- Propose and seek adoption of a complementary measure for the area between equator and 20° N latitude that is consistent with [CMM 2022-02](#) for North Pacific swordfish in the area north of 20° N latitude.

101st Inter-American Tropical Tuna Commission meeting

- Support the recommendations of the General Advisory Committee (GAC) to the U.S. Section to the IATTC and the Scientific Advisory Subcommittee (SAS) to the GAC.

Other Issues

- Consistent with the IATTC SAS recommendation, support scientific studies to determine the stock boundaries of North Pacific striped marlin, noting the unassessed portion occurs in the eastern Pacific Ocean. This would help the U.S. to press for action to address the depleted status in both the eastern Pacific Ocean and Western and Central Pacific Ocean.

2.2.2. Exempted Fishing Permits – Preliminary

The Council made the following recommendations to NMFS on exempted fishing permit (EFP) applications submitted in 2023 and 2022 applications on which the Council had deferred a decision.

1. Do not issue EFPs to Mr. Hemstreet ([Attachment 4](#)) and Mr. Efhan ([Attachment 5](#)) for standard buoy gear in the Southern California Bight. These applications were for the use of standard deep-set buoy gear (DSBG), which is now authorized under the HMS FMP. The applicants should instead obtain a DSBG-endorsed General HMS Permit, apply for a limited entry permit to fish in the Southern California Bight, or both.
2. Extend Mr. Nathan Perez’s night-set buoy gear (NSBG) EFP for another two years ([Attachment 3](#)).
3. Approve the 2022 PIER EFP application ([Agenda Item I.3, Attachment 6](#)) for Extended-Linked Buoy Gear with 100 percent observer coverage until NMFS determines enough data have been collected, with a minimum of 10 observed sets per vessel.
4. Do not issue EFPs for testing simultaneous deployment of more than 10 pieces of DSBG or NSBG, including those applications submitted to the Council in 2022 for this purpose, which the Council deferred a recommendation on, and the application from Perez, Krebs, and Mintz considered at the June 2023 meeting ([Attachment 1](#)) until the authorized fishery has been operational for two seasons.

In addition, for consideration at the September 2023 Council Meeting, the Council requested Mr. Krebs clarify that his request (see [Attachment 2](#)) is for his own EFP rather than a modification of another EFP.

2.2.3. Drift Gillnet Bycatch Performance Report

The Council thanked the HMS Management Team for its report ([J.4.a, Supplemental HMSMT Report 1](#)). The HMSMT Report showed that in 2021 humpback whale take exceeded the monitoring threshold established by the Council, based on two observed takes. The Council will continue to monitor estimated bycatch to assess whether mitigation measures are warranted, recognizing that the fishery is currently scheduled to permanently close by the end of 2027.

2.2.4. Swordfish Fishery Management Workshop – Scoping

The Council acknowledged that the Swordfish Monitoring and Management Plan (SMMP) still has value but requires significant revision. Therefore, a new document should be developed to replace the SMMP that considers the range of species, in addition to swordfish, that have been economically important in the large mesh drift gillnet fishery. Because this fishery is slated to close, new fishing opportunities must be explored. This could be facilitated by developing priorities and methods for future EFPs.

To begin designing a potential workshop to further these objectives, the Council directed its HMSMT and HMSAS to hold a joint session coincident with the September Council meeting. In planning a workshop, these advisory bodies should consider as topics changes to plan goals reflecting the change in its scope, the design of EFPs addressing revised goals, transition of drift gillnet fishery participants to new gear types, timing and location of a workshop to facilitate stakeholder participation, and how an outside facilitator could help in the design and execution of such a workshop.

2.3. September 2023

2.3.1. NMFS Report

The Council endorsed NMFS's intent to continue observer coverage, as appropriate, for the limited entry deep-set buoy gear fishery in the Southern California Bight but recommended that after an initial period it cease requiring pre-trip notifications by fishery participants, recognizing that the fishery has demonstrated low bycatch through extensive testing under exempted fishing permits.

2.3.2. International Management Activities

The Council endorsed its HMSAS recommendation to communicate the following priorities to NMFS:

- Pacific bluefin tuna
 - Continue to prioritize progress on the long-term harvest strategy through development of the management strategy evaluation (MSE), including providing NMFS Southwest Fisheries Science Center (SWFSC) staff capacity and resources to support MSE analysis.
 - Adopt the Northern Committee (NC) recommendations at the upcoming December 4-8 WCPFC meeting and reject any attempts to negotiate outside of the Pacific Bluefin Joint Working Group (JWG) process.
 - If feasible given time constraints, consider a 2024 workshop with U.S. stakeholders once the preliminary stock assessment information is available (anticipated May 2024).
- North Pacific albacore tuna
 - Support adoption of the NC recommendation.
 - Consider further discussions with U.S. stakeholders regarding potential effort controls as part of the implementation of the new harvest strategy, after the International Scientific Committee/SWFSC does its work advising how fishing intensity should be interpreted to actual management measures under the harvest strategy.
- North Pacific swordfish
 - Adopt the NC recommendation and work with other countries to address the management gap (equator to 20° North) and data collection issues.
- North Pacific striped marlin
 - Adopt a more aggressive rebuilding plan to recover the stock to sustainable levels.

2.3.3. Exempted Fishing Permits – Final

The Council recommended issuance of an exempted fishing permit to Mr. Donald Krebs to test night-set buoy gear with the use of satellite-based electronic monitoring buoys based on his application ([Agenda Item J.3, Attachment 2, June 2023](#)) and clarification that he wishes to receive the permit in his own name ([Agenda Item I.3, Attachment 1, September 2023](#)).

2.3.4. Driftnet Modernization and Bycatch Reduction Act – Transition Update

The Council deferred engagement in development of the transition program mandated by the Act until NMFS receives funds to implement the program. It recommended adding an item to a 2024 Council meeting to begin scoping an amendment to the HMS FMP. This is necessary to address the prohibition of large mesh drift gillnet gear coming into force in December 2027.

2.3.5. Highly Migratory Species Essential Fish Habitat (EFH) Amendment – Preliminary

The Council adopted the proposed essential fish habitat (EFH) modifications for public review (see Agenda Item I.5, [Attachment 1](#) and [Attachment 2](#)). The EFH review team will address comments in Advisory Body reports and develop revised EFH documents and proposed FMP amendment language for final action at the November 2023 meeting.

2.3.6. Opah Stock Considerations

The Council directed its HMSMT to continue gathering information on opah biology, stock structure, status, landings, and any current or planned management by the WPFMC. The Council could then revisit the question of including opah in the HMS FMP at a future meeting.

2.4. November 2023

2.4.1. Highly Migratory Species Essential Fish Habitat (EFH) Amendment – Final

The Council adopted the proposed EFH modifications contained in [F.2, Attachment 2](#) and F.2, Supplemental Revised [Attachment 3](#) as final. These include updated life history summaries, modified spatial extent of HMS EFH, updated Research and Information Needs, and other minor updates. Council staff will compile the documents into a transmittal package to NMFS for Secretarial approval.

2.4.2. Highly Migratory Species Roadmap Workshop

The Council adopted the following goals for the HMS Roadmap:

1. Support innovation and development of multi-species fishing practices which catch swordfish along with a suite of other commercially valuable species (e.g., those in the DGN fishery) to meet the demand for a fresh high-quality product with locally-caught (within the West Coast Exclusive Economic Zone) domestic production.
2. Limit unmarketable, prohibited, and protected species bycatch in HMS fisheries to a predefined acceptable level relative to market species production through mitigation, gear innovation, and accountability measures, where necessary.
3. Support the economic viability of domestic West Coast fisheries that harvest swordfish and other HMS by promoting a wide range of harvest methods, giving due consideration to traditional participants, and increasing future participation.
4. Promote climate-ready HMS fisheries by supporting resilience in fishery operations and fishing communities, flexibility in management approaches, and consideration of climate impacts of fishing operations.

The Council noted that these goals could be further refined based on input received at the November Council meeting and additional HMS Management Team (HMSMT) and HMS Advisory Subpanel (HMSAS) discussion.

The Council directed the HMSMT and HMSAS to continue work on the design of a workshop to further Roadmap goals and report back in March 2024. As part of workshop design, it endorsed the recommendation that the Council should contract with a facilitator.

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. 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 (<i>Thunnus alalunga</i>) and bluefin tuna (<i>Thunnus orientalis</i>) 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.

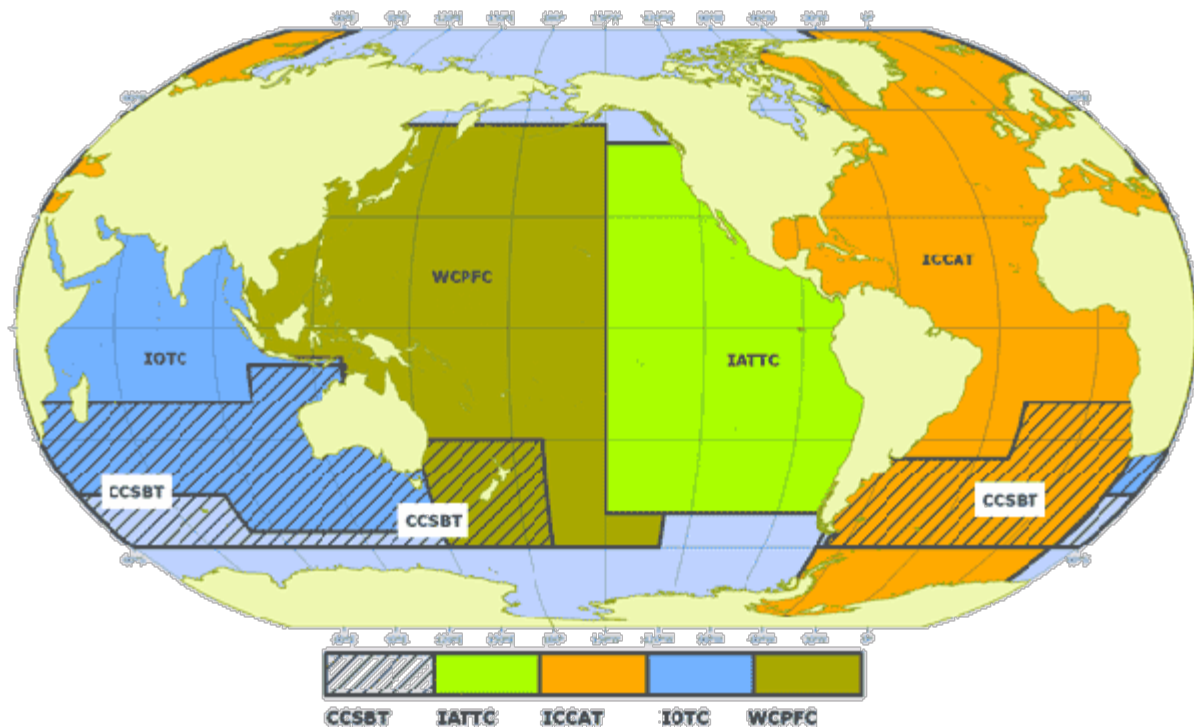


Figure 3-1. Global map of tuna RFMO jurisdictions. (Source: <http://firms.fao.org/firms/fishery/459/en#FisheryArea>).

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 101st Regular Meeting of the IATTC (August 7-11, 2023):

- [C-23-12 Financing FY 2024](#)
- [C-23-11 Vessel Monitoring System \(VMS\)](#) (replaces [C-14-02 Vessel Monitoring System](#))
- [C-23-10 Climate change](#)
- [C-23-09 Dolphinfinh \(Dorado\)](#)
- [C-23-08 Silky sharks](#) (replaces [C-21-06 Silky sharks](#))
- [C-23-07 Sharks](#)
- [C-23-06 Harvest Control Rules](#) (replaces [C-16-02 Harvest control rules](#))
- [C-23-05 FADs amends C-19-01](#)

- [C-23-04 FADS biodegradables](#)
- [C-23-03 FADs](#) (replaces [C-99-07 FADs](#))

Conservation measures adopted at the Twentieth Session of the Western and Central Pacific Fisheries Commission (December 4-8, 2023):

- [CMM 2023-04](#) Conservation and Management Measure for the Compliance Monitoring Scheme (Supersedes [CMM 2021-03](#))
- [CMM 2023-03](#) Conservation and Management Measure for North Pacific Swordfish (Supersedes [CMM 2022-02](#))
- [CMM 2023-02](#) Conservation and Management Measure for Pacific Bluefin Tuna (Supersedes [CMM 2021-02](#))
- [CMM 2023-01](#) Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna in the Western and Central Pacific Ocean (Supersedes [CMM 2021-01](#))

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 2023. For earlier years consult previous editions of the SAFE.

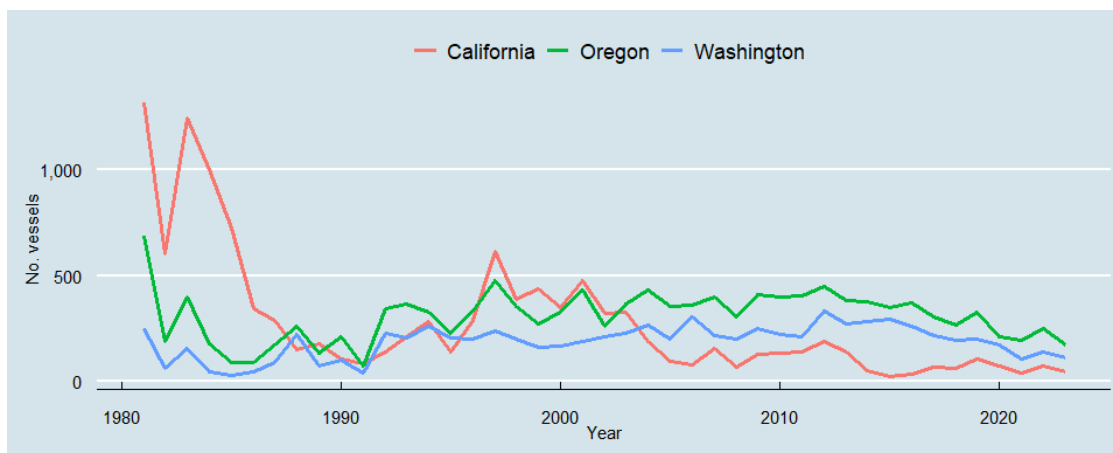
Effective Date	Region	Title	Citation
November 3, 2023	EPO	Inseason Action for 2023-2024 Commercial Pacific Bluefin Tuna Biennial Catch Limit in the Eastern Pacific Ocean	88 FR 69098
June 12, 2023	WCPO	Fish Aggregating Device Design Requirements in Purse Seine Fisheries, IMO Number Requirements, and Bycatch Restrictions	88 FR 30671
February 27, 2023	EPO	2022-2024 In-Season Action Announcement Procedures for Commercial Pacific Bluefin Tuna in the Eastern Pacific Ocean	88 FR 5273

4. Commercial Fisheries

4.1. HMS 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.



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.

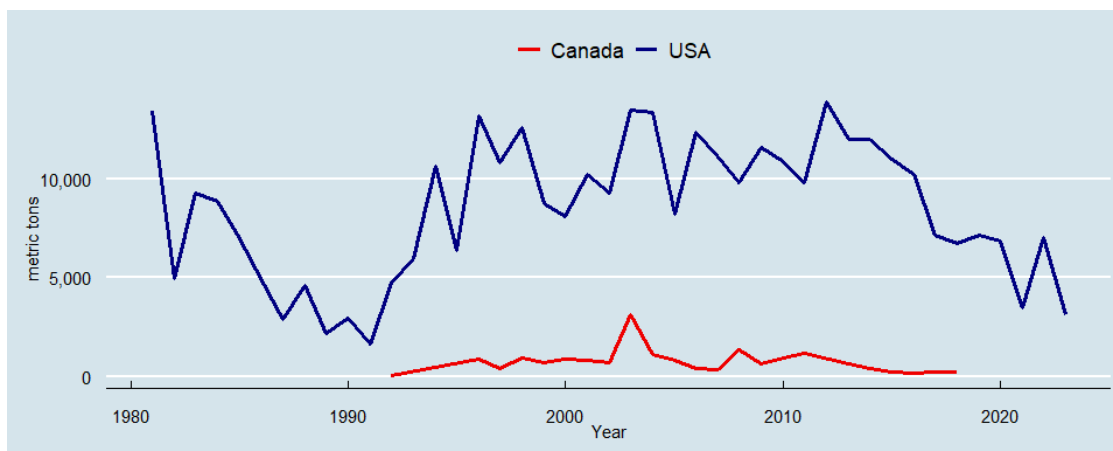
The HMS FMP requires a federal permit with a surface hook-and-line gear endorsement for all U.S. commercial and recreational charter fishing vessels that fish for HMS within the West Coast exclusive economic zone (EEZ, from 3– 200 nautical miles from the West Coast) and for U.S. vessels that pursue HMS 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.

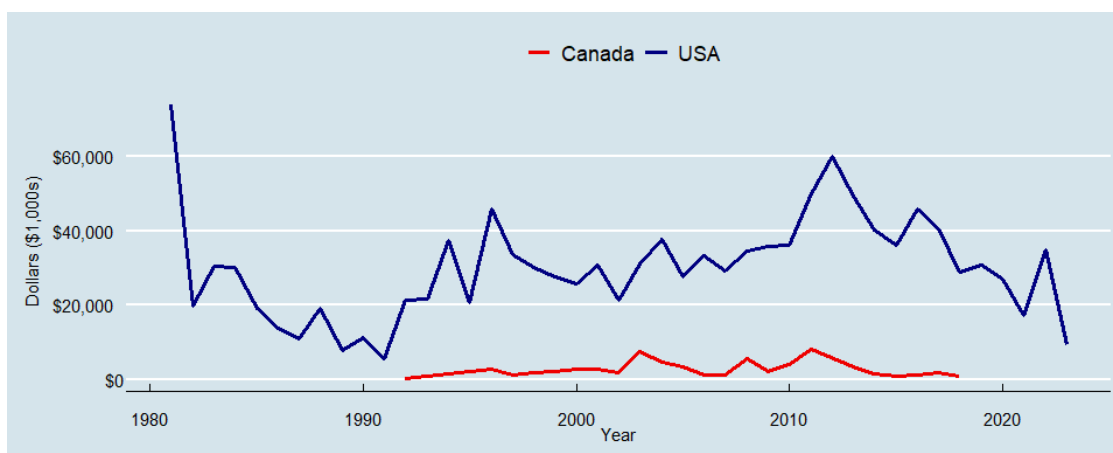
A treaty between the governments of the U.S. and Canada allows vessels from each country to fish in the other country's EEZ outside of 12 miles. Vessels also have port privileges and Canadian vessels may land albacore in designated ports. For more information, see the [NOAA Fisheries website](#).

In 2023 the fishery landed 3,161 mt of albacore valued at \$9.32 million. This was less than 2022 when the fishery landed 7,028 mt valued at \$34.73 million. Over the past 10 years the number of vessels participating in the fishery has varied from 294 to 604.

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.



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.



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.

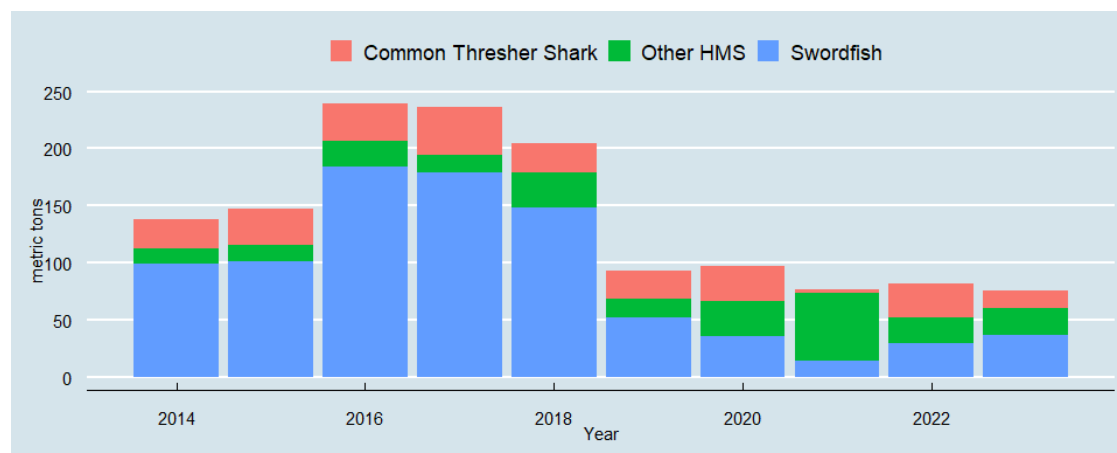
Both Federal and California limited entry permits are required to participate. The federal limited entry permit was implemented in 2018 through Amendment 5 to the HMS FMP. It mirrors many of the features of the state limited entry permit and is required to fish in federal waters. In addition to these 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 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.

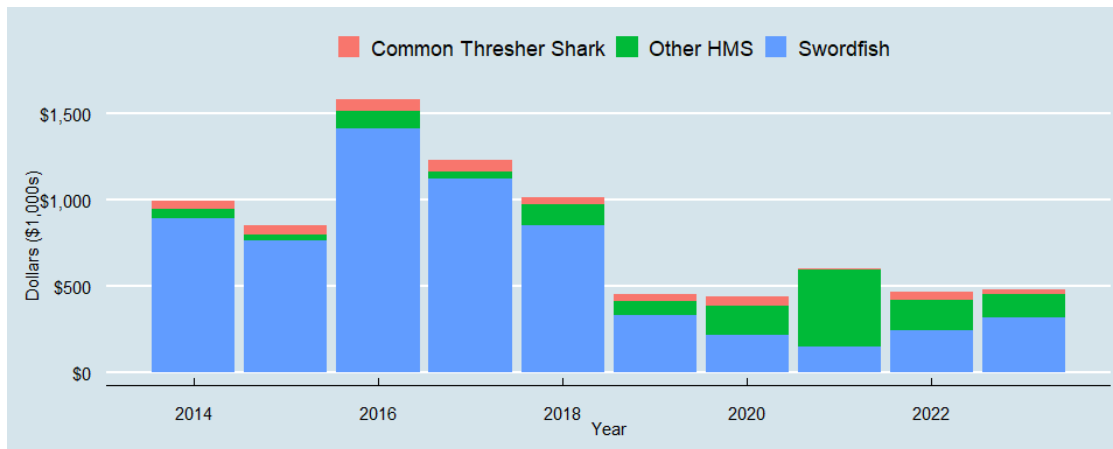
Seasonal temperature fronts that concentrate feed for swordfish are a major influence on fishing activity but regulatory time-area closures also have a big influence on seasonal patterns. The fishery is closed in the West Coast EEZ from February 1 to April 30 and closed within 75 nautical miles of the 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 75 mt and 239 mt while inflation-adjusted ex-vessel revenue has varied between \$435,342 and \$1,582,288. In 2023 the fishery landed 75 mt valued at \$477,517. This was less than 2022 when 82 mt, worth \$462,833 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.



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



4.1.3. Harpoon fishery for swordfish

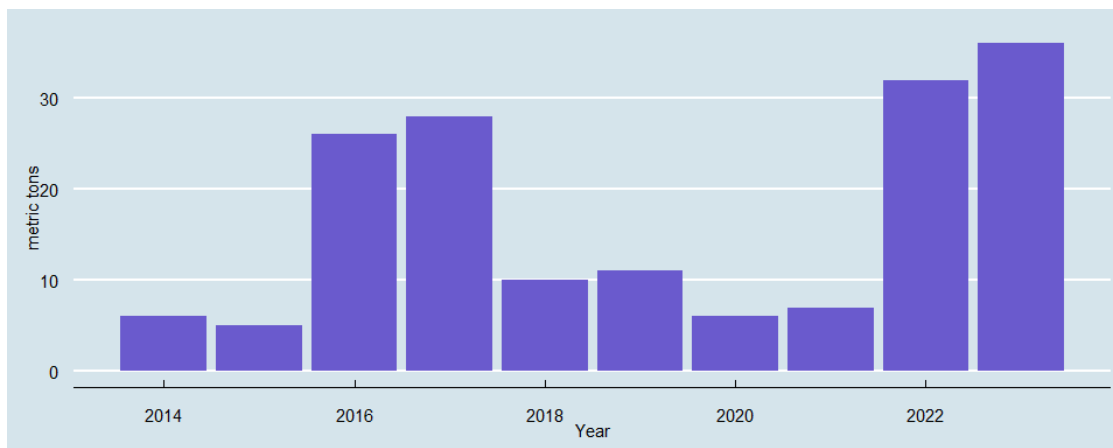
California’s modern harpoon fishery for swordfish developed in the early 1900s. Prior to 1980, harpoon and hook-and-line were the only legal gears for commercially harvesting swordfish. At that time, harpoon gear accounted for the majority of swordfish landings in California ports. But the development 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.

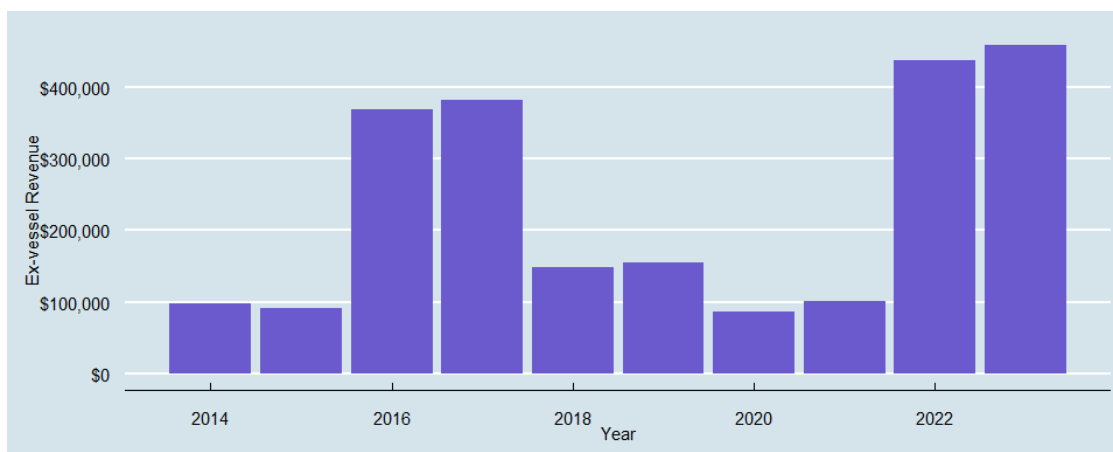
A state permit and logbook are required to participate in the harpoon fishery in addition to a general resident or non-resident commercial fishing license and a current CDFG vessel registration along with the federal general HMS permit.

In the past 10 years harpoon fishery landings of swordfish have varied between 5 mt and 36 mt while inflation-adjusted ex-vessel revenue has varied between \$87,381 and \$457,347. In 2023 the fishery landed 36 mt valued at \$457,347 compared to 32 mt valued at \$436,823 in 2022. 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.



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



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 9 to 23. Landings composition has shifted from swordfish to tunas and other species over the decade. In 2014 swordfish accounted for 54% and tunas 26% of the 763 mt in landings of HMS and opah made by this fishery. In 2023 swordfish accounted for 5% while tunas accounted for 86% of the 414 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 2023 at 31 mt it accounted for 7% of landings of HMS and opah.

Figure 4-1. Landings trends for tuna, swordfish, opah, and other HMS in metric tons, over the past 10 years.

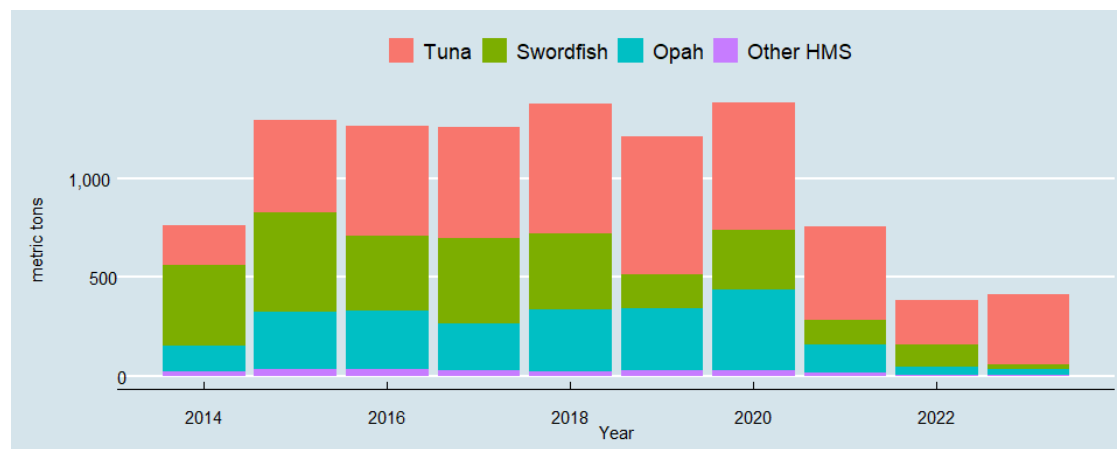
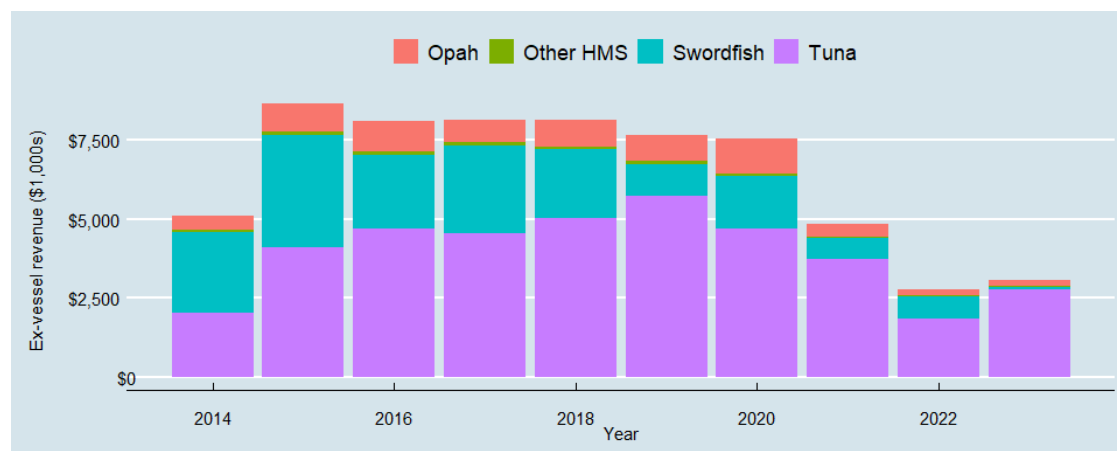


Figure 4-2. Inflation-adjusted ex-vessel revenue for tuna, swordfish, opah, and other HMS in \$1,000s, last 10 years.



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 2023 purse seine fishery HMS landings have varied between 167 mt and 2,500 mt while inflation-adjusted ex-vessel revenue has varied between \$200,761 and \$3,274,735. (Earlier years are excluded due to data confidentiality requirements.) In 2023 the fishery landed 167 mt valued at \$200,761. This compares to 602 mt in 2022. During the past 10 years the number of vessels participating in the fishery varied from 3 to 14.

Figure 4-3. Purse seine fishery landings of HMS tunas, in metric tons, between 2014 and 2023. (Some years are excluded due to data confidentiality requirements.)

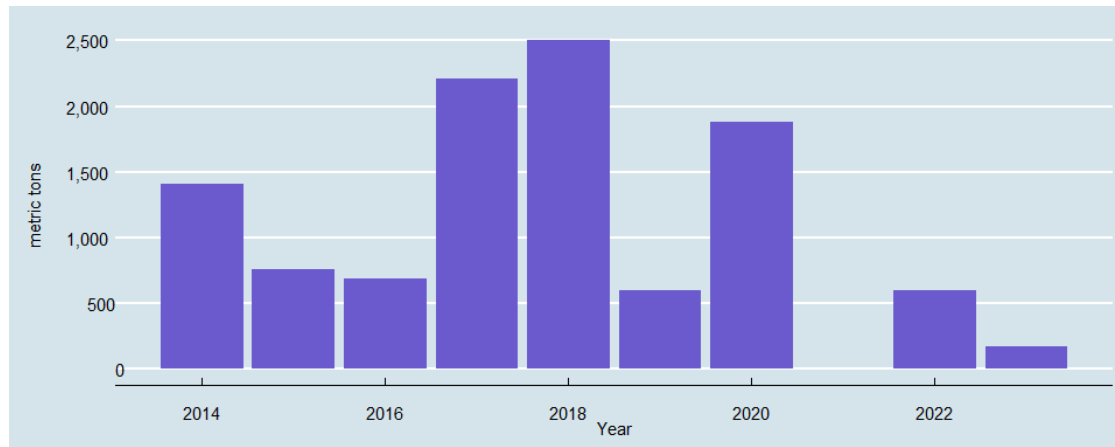
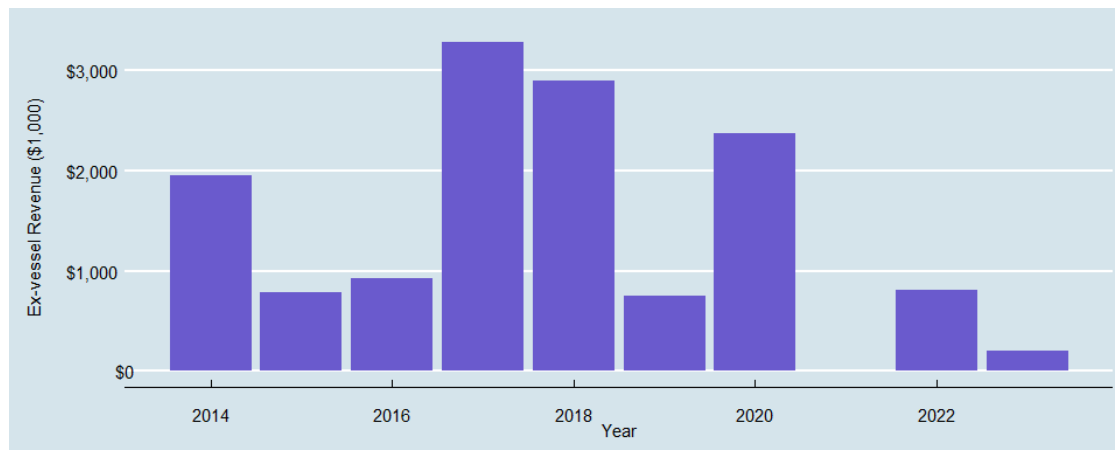


Figure 4-4. Inflation-adjusted ex-vessel revenue from HMS tunas for the fishery, between 2014 and 2023. (Some years are excluded due to data confidentiality requirements.)



4.1.6. Deep-set buoy gear

Beginning in 2010 the Pflieger 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. To date 42 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.

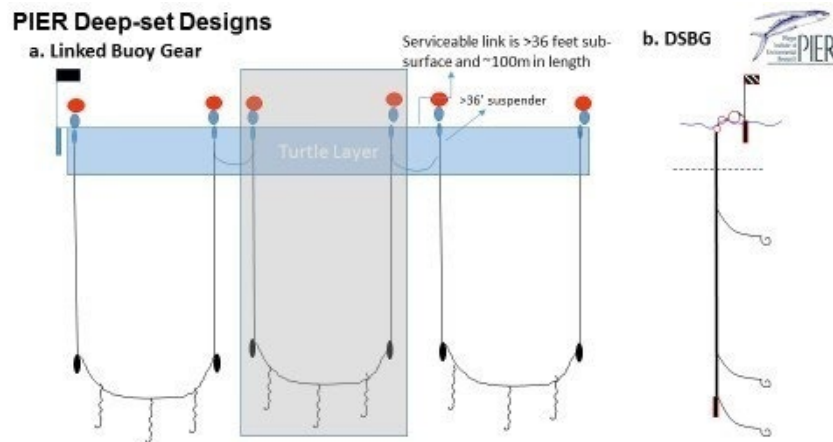


Figure 4-5. Standard and linked DSBG configurations

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 approved by NMFS for review and regulations authorizing the gear went into place in 2023. The process to issue limited entry permits began in September 2023. In the interim NMFS will renew current EFPs to allow fishing to continue in the Southern California Bight until these permits are issued.

Between 2015 and 2023 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 \$132,589 and \$1,227,470. During the past 10 years the number of vessels participating in the fishery varied from 2 to 26.

Figure 4-6. The following figure shows HMS landings in metric tons during this period.

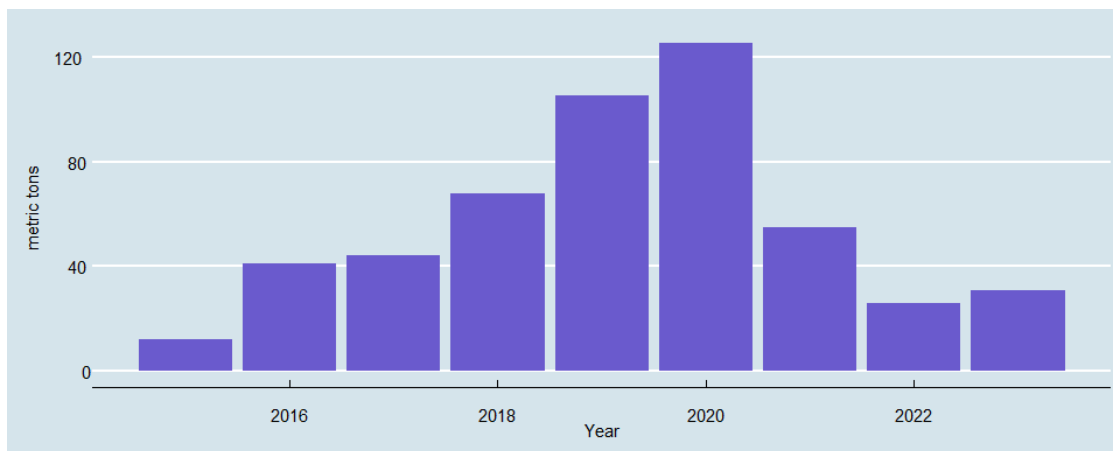
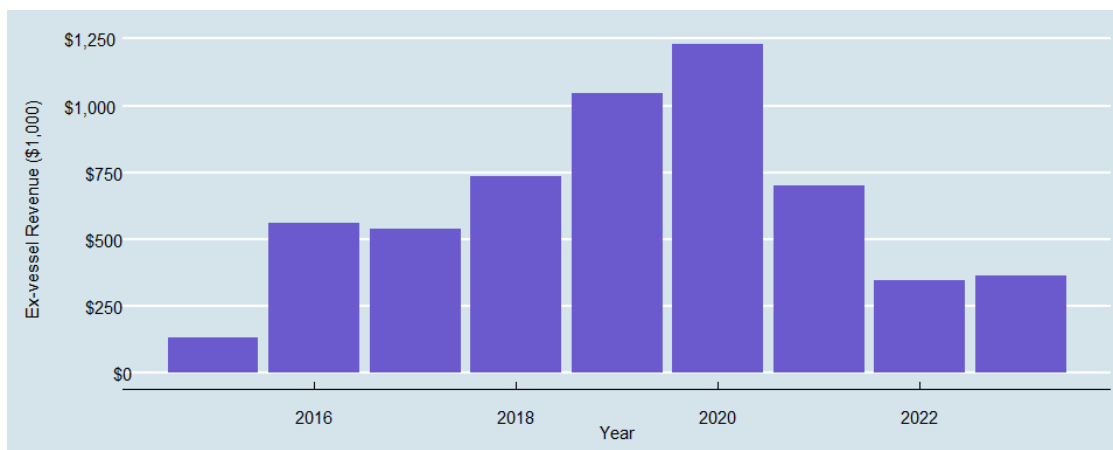


Figure 4-7. This figure shows the resulting inflation adjusted ex-vessel revenue (\$1,000s) from HMS for the same time period.



4.2. Participation by fishery

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

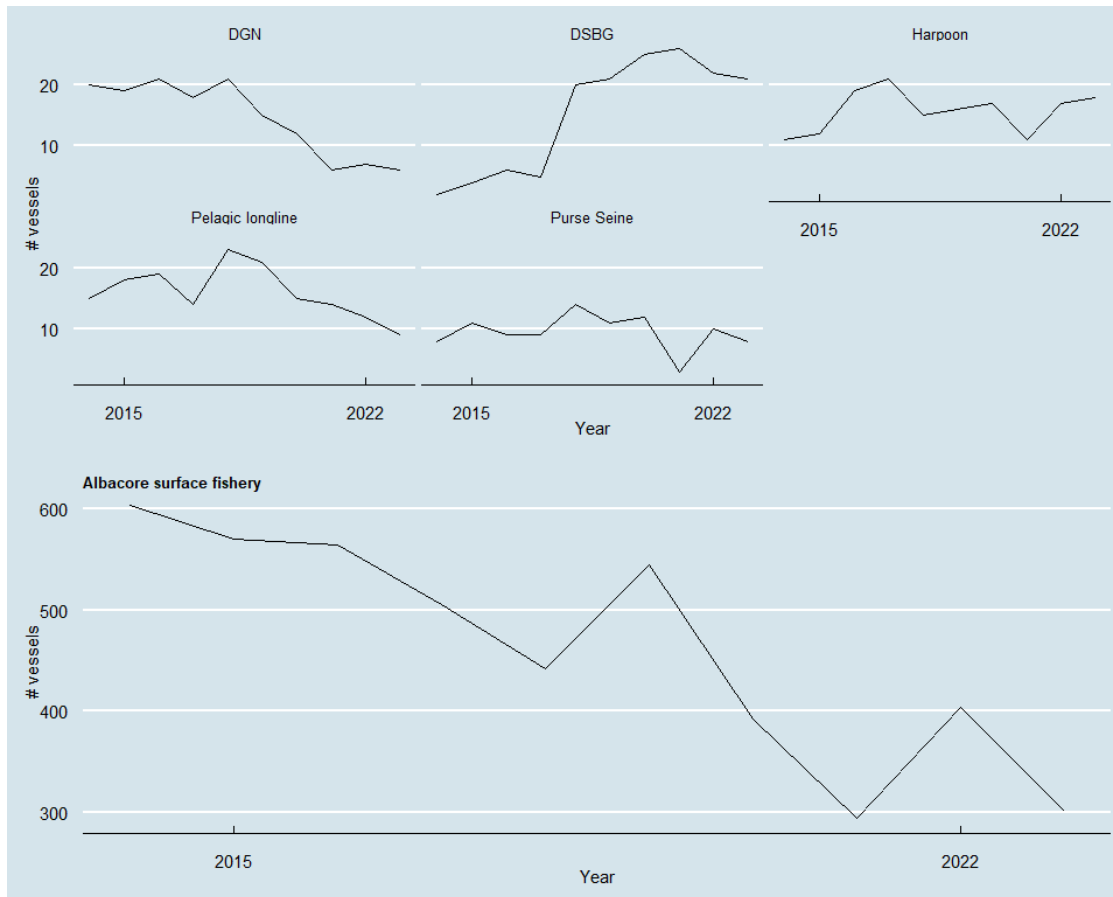


Figure 4-8.

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 3,419 mt. and lowest in May at 104 mt.

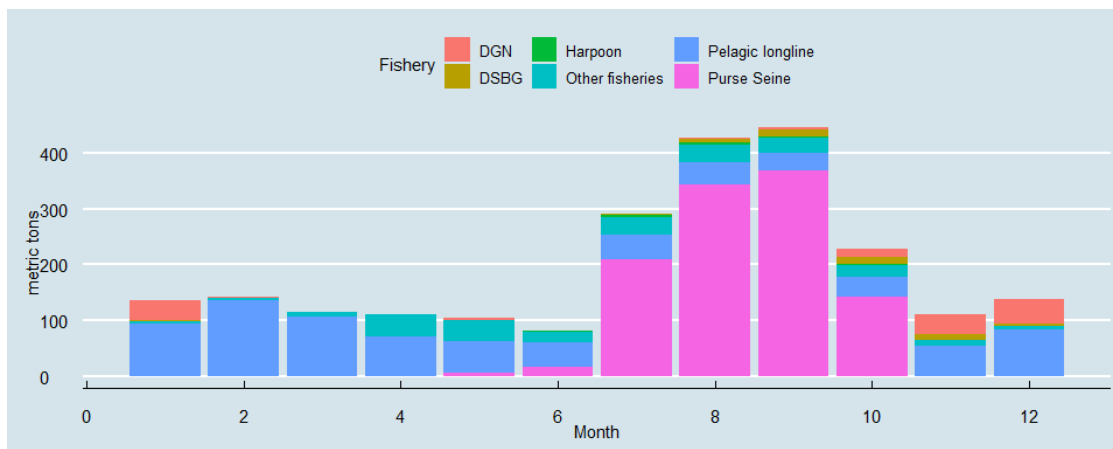


Figure 4-9. Average monthly landings by fishery, 2014-2023.

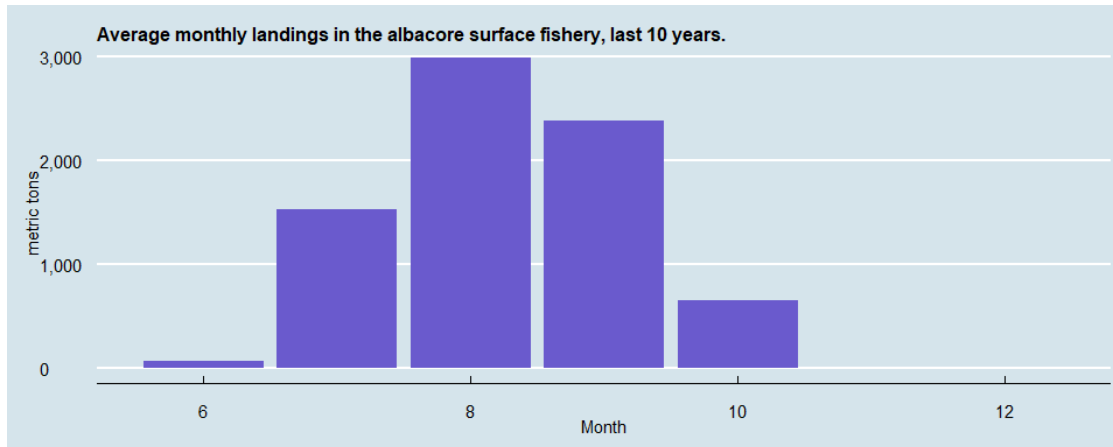


Figure 4-10. Average monthly landings in the albacore surface fishery, 2014-2023.

4.4. Commercial Fisheries Landings by Species

The figures on this page present information on HMS landings over the last 10 years, or 2014 - 2023. 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 \$18 million to \$58 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%.

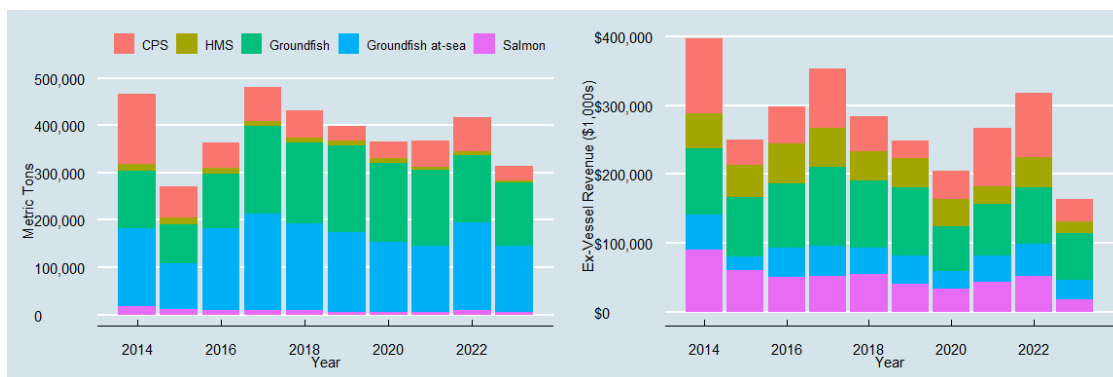


Figure 4-11. Inflation-adjusted ex-vessel revenue by species group.

4.5. North Pacific albacore tuna

In 2023 albacore landings totaled 3,298 metric tons worth \$9,609,997 compared to 7,212 metric tons worth \$35,707,971 in 2022. The following figure shows albacore landings (mt) and inflation-adjusted ex-vessel revenue (\$1,000s) by year.

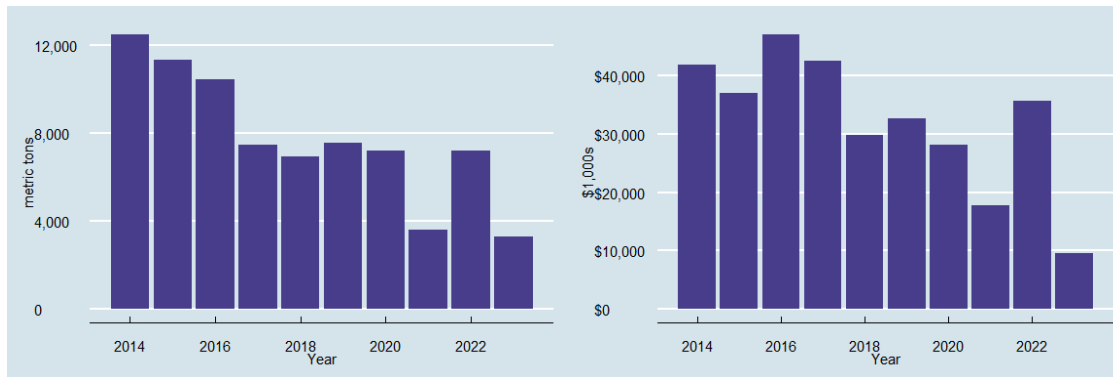


Figure 4-12. North Pacific albacore landings, mt (left), and revenue, current dollars, \$1,000s (right).

4.6. *Swordfish*

In 2023 swordfish landings totaled 97 metric tons worth \$874,928 compared to 179 metric tons worth \$1,440,224 in 2022. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue (\$1,000s) by year.

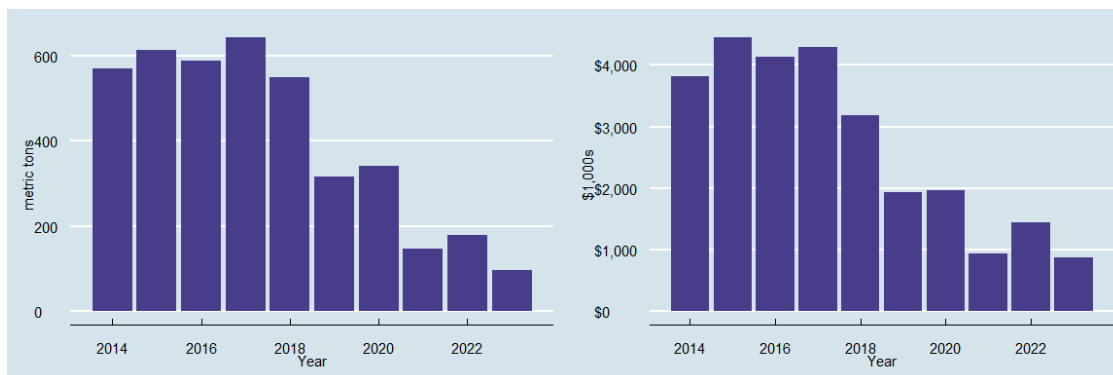


Figure 4-13. Swordfish landings, mt (left), and revenue, current dollars, \$1,000s (right).

4.7. *Tunas (other than albacore)*

In 2023 landings of bigeye, bluefin, skipjack, and yellowfin tunas totaled 850 metric tons worth \$6,756,426 compared to 1,088 metric tons worth \$5,484,895 in 2022. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue (\$1,000s) by year.

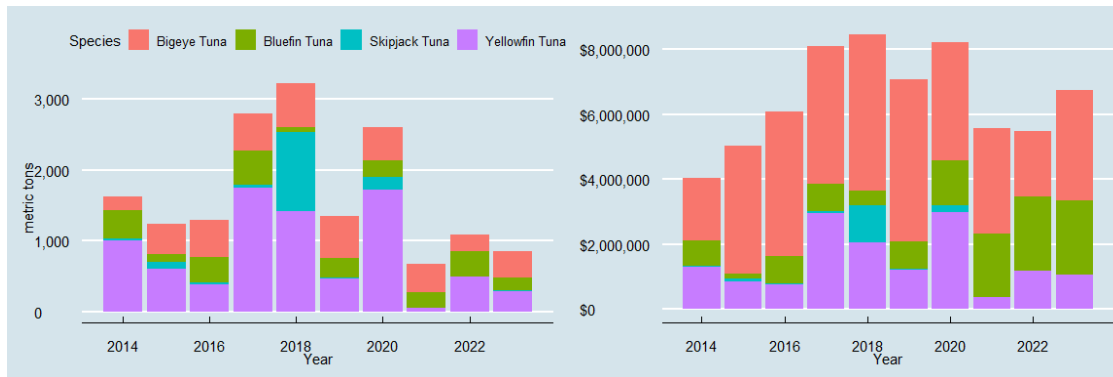


Figure 4-14. Landings of tunas, excluding albacore, metric tons (left) and inflation-adjusted ex-vessel revenue (right).

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 69% of the total followed by HMS Hook and Line fishery at 24% and DGN at 6%.

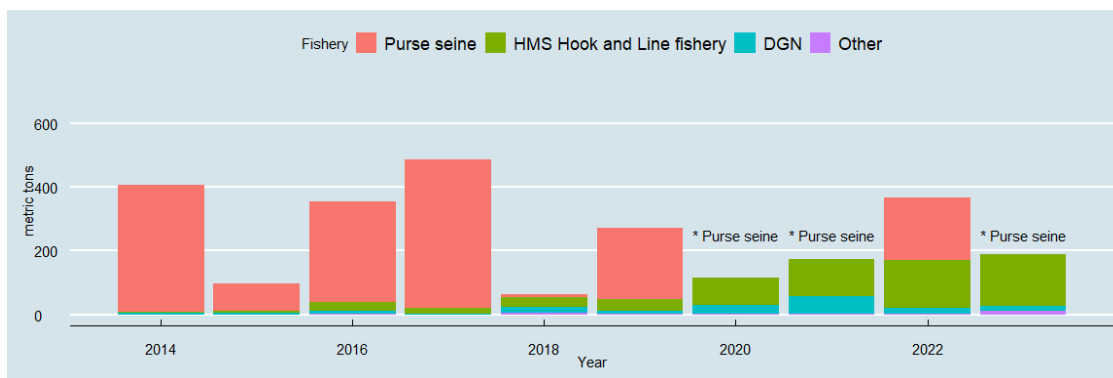


Figure 4-15

4.8. Sharks

In 2023 landings of common thresher and shortfin mako sharks totaled 43 metric tons worth \$83,189 compared to 50 metric tons worth \$88,813 in 2022. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue for these species by year.

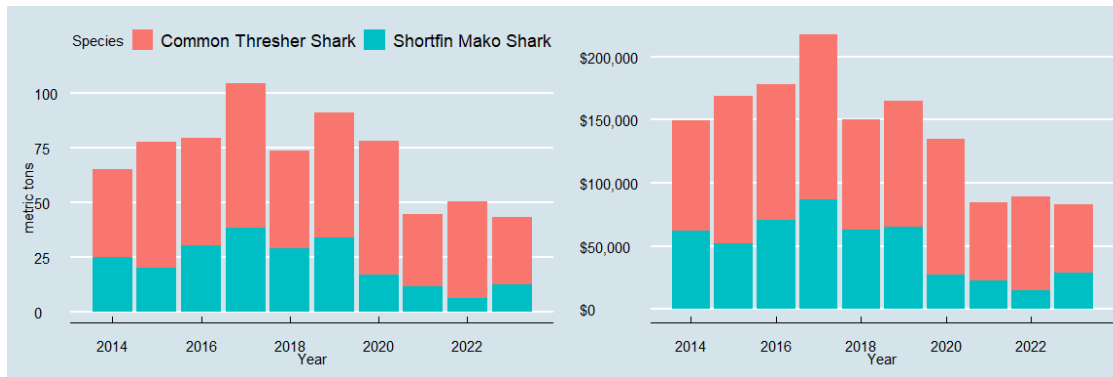


Figure 4-16. Landings of common thresher and shortfin mako sharks, metric tons (left) and inflation-adjusted ex-vessel revenue (right)

4.9. Other species

Blue shark and dorado landings are relatively modest in commercial fisheries compared to other HMS. In 2023 blue shark landings amounted to 2 metric tons worth \$373 while dorado landings amounted 10 metric tons worth \$65,272. This compares to landings of 3 metric tons worth \$614 for blue shark and 15 metric tons worth \$117,424 for dorado in 2022. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue for these species by year.

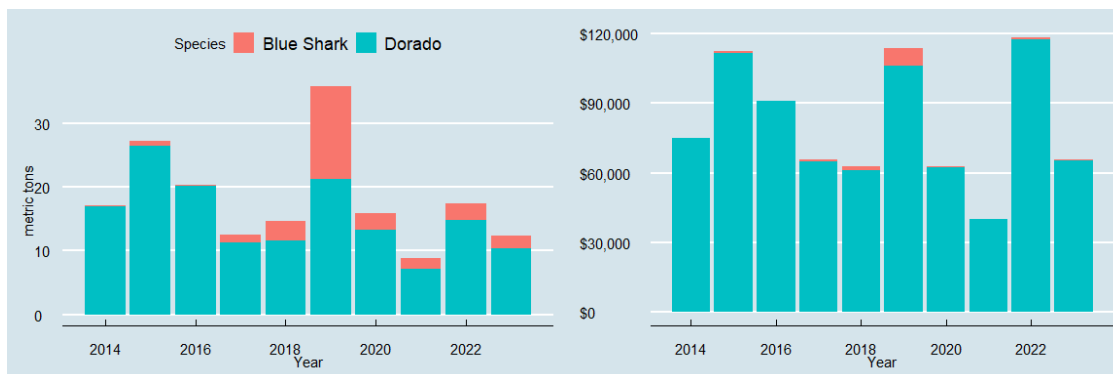


Figure 4-17. Landings of blue shark and dorado, metric tons.

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

4.10.1. 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).

4.10.2. Data for HMS Species

Table 4-1. West Coast commercial landings (round mt) of HMS by all HMS and non-HMS gears, 1981 - 2023.

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
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

Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/ Dolphinfin
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	12,310	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	11,316	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	6,953	615	65	1,124	1,417		616	3	45	29	12
2019	7,563	598	274	19	460		421	15	57	34	21
2020	7,183	473	231	179	1,719		465	3	62	17	13
2021	3,592	405	217	3	53		200	2	34	12	7
2022	7,212	232	368	C	488	C	205	3	44	6	15
2023	3,298	367	191	1	291		127	2	31	13	10

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, 1981-2023.

Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/ Dolphinfin
1981	\$75,249	\$4,453	\$3,515	\$188,181	\$280,075	\$206	\$9,518	\$168	\$4,186	\$461	\$8
1982	\$21,464	\$3,228	\$7,188	\$108,236	\$198,979	\$264	\$13,670	\$50	\$5,292	\$906	\$3
1983	\$31,475	\$118	\$2,733	\$94,233	\$152,912	\$246	\$17,483	\$12	\$3,790	\$591	\$2
1984	\$42,711	\$433	\$2,246	\$61,531	\$91,929	\$6,429	\$28,845	\$6	\$4,076	\$471	\$11
1985	\$19,952	\$43	\$6,783	\$5,096	\$35,344	\$2,475	\$32,277	\$5	\$4,372	\$464	\$1
1986	\$14,568	\$213	\$10,933	\$2,133	\$42,631	\$467	\$30,009	\$3	\$3,987	\$1,010	C
1987	\$11,799	\$406	\$4,734	\$10,186	\$64,149	\$1,031	\$25,578	\$4	\$2,725	\$1,646	C
1988	\$20,268	\$58	\$4,603	\$20,562	\$60,088	\$179	\$21,606	\$5	\$2,178	\$1,445	\$1
1989	\$8,097	\$5	\$2,720	\$8,438	\$44,543	\$272	\$17,666	\$7	\$2,020	\$1,182	\$1
1990	\$11,590	\$18	\$2,370	\$3,915	\$19,349	\$117	\$14,737	\$21	\$1,317	\$1,524	\$4
1991	\$5,631	\$85	\$232	\$5,369	\$7,970	\$42	\$12,647	\$2	\$1,932	\$828	\$2
1992	\$22,393	\$87	\$2,203	\$2,751	\$7,171	\$41	\$14,755	\$4	\$905	\$451	\$12
1993	\$22,284	\$403	\$1,433	\$6,254	\$9,185	\$138	\$17,057	\$1	\$873	\$422	\$80
1994	\$37,652	\$573	\$3,122	\$3,266	\$8,434	\$103	\$17,897	\$30	\$1,090	\$461	\$140
1995	\$21,132	\$472	\$1,932	\$8,678	\$5,560	\$9	\$11,996	\$5	\$873	\$302	\$10
1996	\$48,837	\$467	\$7,240	\$7,151	\$5,796	\$51	\$10,878	\$1	\$1,082	\$300	\$18
1997	\$35,126	\$634	\$4,890	\$9,704	\$8,799	\$39	\$10,838	\$1	\$1,042	\$401	\$19

Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1998	\$32,953	\$474	\$5,172	\$9,092	\$10,223	\$108	\$10,432	\$10	\$1,091	\$307	\$18
1999	\$30,406	\$1,130	\$1,525	\$4,724	\$2,458	\$104	\$14,516	\$0	\$1,061	\$191	\$82
2000	\$28,881	\$953	\$909	\$812	\$2,080	\$4	\$19,820	\$1	\$961	\$222	\$106
2001	\$33,948	\$526	\$768	\$55	\$765	\$3	\$14,373	\$2	\$977	\$124	\$33
2002	\$23,066	\$139	\$68	\$208	\$953	\$10	\$10,372	\$30	\$815	\$201	\$1
2003	\$38,713	\$417	\$118	\$254	\$712	C	\$12,469	\$1	\$771	\$183	\$16
2004	\$42,371	\$228	\$59	\$169	\$690	\$85	\$7,465	\$1	\$305	\$152	\$9
2005	\$31,214	C	\$205	\$438	\$473	C	\$2,847	\$1	\$407	\$87	\$2
2006	\$34,571	C	\$6	\$59	\$254	C	\$3,997	\$0	\$439	\$116	\$26
2007	\$30,657	C	\$82	\$6	\$212	C	\$4,434	\$3	\$478	\$111	\$14
2008	\$40,083	\$285	\$5	\$5	\$174	\$5	\$3,287	\$0	\$389	\$91	\$13
2009	\$38,100	C	\$611	\$7	\$230		\$2,695	\$3	\$272	\$76	\$6
2010	\$40,322	C	\$8	C	\$9	C	\$3,005	\$0	\$216	\$44	\$22
2011	\$57,917	\$436	\$321	\$2	\$18	C	\$4,476	\$0	\$137	\$51	\$15
2012	\$60,157	\$482	\$126	\$2	\$17		\$2,742	\$0	\$149	\$69	\$47
2013	\$54,134	C	\$89	\$4	\$53	C	\$3,484	\$0	\$160	\$79	\$7
2014	\$41,889	\$1,925	\$796	\$19	\$1,299	\$5	\$3,889	\$0	\$88	\$62	\$75
2015	\$36,988	\$3,929	\$167	\$94	\$837	\$8	\$4,573	\$1	\$118	\$52	\$112
2016	\$46,948	\$4,430	\$851	\$42	\$749	\$2	\$4,685	\$0	\$109	\$69	\$91
2017	\$42,586	\$4,241	\$859	\$52	\$2,957	C	\$4,829	\$1	\$131	\$87	\$65
2018	\$29,802	\$4,787	\$470	\$1,141	\$2,048		\$3,921	\$2	\$88	\$63	\$61
2019	\$32,646	\$4,990	\$859	\$23	\$1,214		\$2,975	\$8	\$100	\$65	\$106
2020	\$28,055	\$3,645	\$1,378	\$195	\$2,998		\$3,192	\$0	\$107	\$28	\$62
2021	\$17,704	\$3,259	\$1,960	\$9	\$362		\$1,631	\$0	\$64	\$23	\$40
2022	\$35,708	\$2,012	\$2,296	C	\$1,178	C	\$1,787	\$1	\$74	\$15	\$118
2023	\$9,610	\$3,423	\$2,262	\$4	\$1,070		\$1,238	\$0	\$54	\$30	\$65

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

Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1981	\$2.49	\$1.73	\$1.84	\$1.48	\$1.67	\$2.36	\$8.35	\$0.82	\$2.12	\$1.66	\$0.95
1982	\$1.80	\$1.51	\$1.36	\$1.17	\$1.46	\$2.36	\$8.08	\$0.85	\$2.21	\$1.70	\$1.02
1983	\$1.49	\$2.51	\$1.62	\$0.95	\$1.24	\$2.01	\$6.52	\$0.81	\$2.20	\$1.79	\$1.37
1984	\$1.53	\$1.56	\$1.60	\$0.89	\$1.19	\$2.87	\$6.57	\$1.55	\$2.46	\$1.94	\$1.36
1985	\$1.24	\$2.91	\$0.95	\$0.78	\$1.07	\$2.40	\$6.21	\$2.01	\$2.83	\$2.05	\$2.14
1986	\$1.26	\$3.36	\$1.05	\$0.71	\$0.90	\$1.48	\$7.80	\$0.88	\$3.17	\$2.13	C
1987	\$1.69	\$3.70	\$2.61	\$0.81	\$1.25	\$3.63	\$9.33	\$1.09	\$3.54	\$2.69	C
1988	\$1.87	\$4.10	\$2.60	\$1.05	\$1.40	\$7.40	\$8.68	\$0.70	\$3.41	\$2.95	\$3.10
1989	\$1.66	\$3.76	\$1.21	\$0.85	\$1.15	\$1.61	\$8.56	\$0.55	\$3.08	\$3.04	\$1.25
1990	\$1.74	\$3.67	\$1.16	\$0.79	\$1.03	\$1.15	\$7.84	\$0.49	\$2.85	\$2.69	\$2.64
1991	\$1.52	\$5.30	\$1.01	\$0.71	\$0.87	\$1.67	\$8.08	\$1.21	\$2.55	\$2.49	\$3.26

Year	Albacore	Bigeye Tuna	Bluefin Tuna	Skipjack Tuna	Yellowfin Tuna	Unsp. Tuna	Swordfish	Blue Shark	Common Thresher Shark	Shortfin Mako Shark	Dorado/Dolphinfish
1992	\$2.07	\$5.93	\$0.92	\$0.48	\$0.97	\$1.84	\$6.28	\$1.15	\$2.38	\$2.09	\$1.71
1993	\$1.64	\$7.16	\$1.16	\$0.62	\$1.10	\$3.93	\$6.35	\$1.17	\$2.44	\$2.27	\$2.16
1994	\$1.59	\$6.88	\$1.55	\$0.70	\$0.76	\$1.46	\$6.93	\$1.20	\$2.55	\$2.37	\$1.70
1995	\$1.47	\$5.53	\$1.23	\$0.56	\$0.83	\$3.55	\$6.78	\$0.62	\$2.46	\$2.08	\$0.91
1996	\$1.56	\$4.21	\$0.70	\$0.59	\$0.79	\$7.31	\$5.92	\$0.58	\$2.59	\$2.05	\$0.90
1997	\$1.41	\$3.80	\$0.99	\$0.73	\$0.84	\$1.65	\$4.87	\$0.45	\$2.50	\$1.99	\$1.82
1998	\$1.08	\$4.72	\$1.21	\$0.72	\$0.80	\$4.51	\$4.79	\$1.73	\$2.30	\$2.00	\$2.63
1999	\$1.42	\$5.22	\$3.77	\$0.57	\$0.82	\$4.22	\$4.68	\$0.24	\$2.23	\$1.99	\$2.30
2000	\$1.44	\$6.14	\$1.34	\$0.47	\$0.81	\$1.95	\$4.91	\$0.72	\$2.26	\$1.82	\$1.32
2001	\$1.38	\$5.27	\$1.79	\$0.43	\$0.53	\$2.85	\$4.29	\$0.45	\$1.97	\$1.76	\$0.98
2002	\$1.04	\$6.72	\$2.80	\$0.40	\$0.80	\$2.85	\$3.95	\$0.49	\$2.09	\$1.61	\$1.98
2003	\$1.05	\$5.55	\$1.48	\$0.33	\$0.69	C	\$3.84	\$0.34	\$1.97	\$1.73	\$1.25
2004	\$1.32	\$5.03	\$2.84	\$0.25	\$0.66	\$4.21	\$4.15	\$0.66	\$2.04	\$1.83	\$3.57
2005	\$1.56	C	\$0.45	\$0.38	\$0.75	C	\$6.31	\$0.33	\$1.75	\$1.70	\$3.93
2006	\$1.23	C	\$3.28	\$0.56	\$1.55	C	\$4.85	\$0.52	\$2.11	\$1.66	\$4.24
2007	\$1.20	C	\$0.83	\$0.55	\$0.92	C	\$5.31	\$0.13	\$1.81	\$1.64	\$3.41
2008	\$1.63	\$4.73	\$2.57	\$0.78	\$1.22	\$3.53	\$4.07	\$0.89	\$2.03	\$1.70	\$3.23
2009	\$1.40	C	\$0.67	\$0.65	\$2.39		\$4.29	\$1.48	\$1.97	\$1.63	\$3.94
2010	\$1.54	C	\$2.97	C	\$5.72	C	\$5.34	\$0.45	\$1.72	\$1.34	\$2.93
2011	\$2.38	\$5.40	\$1.23	\$0.93	\$2.41	C	\$4.75	\$0.42	\$1.37	\$1.73	\$2.32
2012	\$1.96	\$5.39	\$1.33	\$1.01	\$5.06		\$4.48	\$0.02	\$1.57	\$1.66	\$2.28
2013	\$1.90	C	\$3.94	\$2.03	\$4.04	C	\$4.30	\$0.19	\$1.73	\$1.69	\$3.53
2014	\$1.52	\$4.72	\$0.88	\$0.44	\$0.58	\$1.90	\$4.46	\$0.05	\$1.67	\$1.65	\$2.00
2015	\$1.48	\$4.14	\$0.77	\$0.39	\$0.64	\$4.78	\$4.82	\$0.36	\$1.56	\$1.69	\$1.92
2016	\$2.04	\$3.86	\$1.09	\$0.54	\$0.90	\$0.83	\$4.90	\$0.08	\$1.69	\$1.52	\$2.05
2017	\$2.59	\$3.70	\$0.80	\$0.56	\$0.77	C	\$4.63	\$0.33	\$1.52	\$1.49	\$2.62
2018	\$1.94	\$3.54	\$3.36	\$0.46	\$0.66		\$4.19	\$0.24	\$1.51	\$1.42	\$2.38
2019	\$1.96	\$4.04	\$1.44	\$0.56	\$1.22		\$4.64	\$0.27	\$1.33	\$1.27	\$2.39
2020	\$1.77	\$3.77	\$2.76	\$0.49	\$0.80		\$4.52	\$0.04	\$1.34	\$1.09	\$2.30
2021	\$2.24	\$4.01	\$4.26	\$1.17	\$3.26		\$5.38	\$0.05	\$1.43	\$1.33	\$2.64
2022	\$2.25	\$4.16	\$2.88	C	\$1.10	C	\$5.72	\$0.11	\$1.27	\$1.66	\$3.65
2023	\$1.32	\$4.34	\$5.52	\$1.84	\$1.68		\$6.40	\$0.08	\$1.35	\$1.55	\$2.96

4.10.3. Data for HMS Fisheries

Table 4-4. West Coast commercial HMS landings (round mt) by HMS fishery, 1990-2023. (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

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
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
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	11,624	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	6,719	205	10	1,069	2,500	68	73
2019	7,162	93	11	897	598	105	197
2020	6,851	97	7	971	1,882	125	137
2021	3,493	76	7	618	C	55	216
2022	7,028	83	32	342	602	26	377
2023	3,160	74	36	383	167	31	452

Table 4-5. West Coast commercial HMS ex-vessel revenue (inflation adjusted, 2023, \$1,000s) by HMS fishery, 1990-2023. (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	\$11,370	\$14,692	\$1,124	C	\$13,869		\$13,398
1991	\$5,550	\$13,376	\$363	C	\$11,768		\$2,595
1992	\$21,352	\$13,852	\$1,156	\$599	\$8,839		\$3,838
1993	\$21,609	\$14,876	\$2,162	\$2,071	\$8,901		\$8,276
1994	\$37,315	\$9,828	\$2,377	\$7,676	\$9,972		\$5,121
1995	\$20,744	\$9,413	\$1,395	\$2,642	\$13,449		\$2,648
1996	\$45,733	\$8,630	\$1,141	\$2,992	\$18,055		\$1,966
1997	\$33,683	\$7,442	\$1,214	\$4,449	\$20,130		\$3,029
1998	\$29,956	\$8,227	\$705	\$4,068	\$18,441		\$5,460

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
1999	\$27,480	\$5,486	\$1,058	\$9,593	\$5,869		\$4,114
2000	\$25,760	\$4,608	\$1,263	\$15,018	\$3,341		\$1,602
2001	\$30,898	\$2,969	\$772	\$12,231	\$1,149		\$579
2002	\$21,320	\$2,961	\$1,096	\$6,980	C		\$377
2003	\$31,084	\$2,303	\$1,335	\$9,774	\$989		\$429
2004	\$37,537	\$1,723	\$1,040	\$5,297	\$827		\$270
2005	\$27,742	\$2,188	\$1,066	C	\$1,071		\$67
2006	\$33,198	\$3,258	\$996	C	C		\$129
2007	\$29,293	\$3,988	\$848	C	\$408		\$90
2008	\$34,615	\$2,673	\$636	\$518	C		\$181
2009	\$35,823	\$1,689	\$649	\$864	\$646		\$118
2010	\$36,093	\$674	\$500	\$2,351			\$86
2011	\$49,791	\$1,257	\$339	\$3,686	C		\$52
2012	\$59,880	\$1,234	\$84	\$2,282	C		\$93
2013	\$49,177	\$1,094	\$110	\$2,856			\$89
2014	\$40,197	\$997	\$99	\$4,659	\$1,946	C	\$389
2015	\$36,057	\$853	\$92	\$7,779	\$785	\$133	\$242
2016	\$45,732	\$1,582	\$368	\$7,139	\$922	\$560	\$441
2017	\$40,573	\$1,232	\$382	\$7,438	\$3,275	\$540	\$421
2018	\$28,704	\$1,014	\$150	\$7,300	\$2,899	\$736	\$480
2019	\$30,715	\$449	\$156	\$6,843	\$745	\$1,047	\$1,107
2020	\$26,818	\$435	\$88	\$6,437	\$2,373	\$1,227	\$1,208
2021	\$17,242	\$599	\$102	\$4,431	C	\$700	\$1,873
2022	\$34,729	\$463	\$437	\$2,581	\$804	\$348	\$3,293
2023	\$9,310	\$478	\$457	\$2,894	\$201	\$366	\$3,948

Table 4-6. Average price-per-pound (inflation adjusted dollars, 2023) from HMS landings by fishery, 1990-2023. (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	\$1.73	\$6.40	\$10.98	C	\$0.97		\$1.12
1991	\$1.52	\$6.19	\$11.43	C	\$0.80		\$1.04
1992	\$2.06	\$5.40	\$9.71	\$6.94	\$0.70		\$1.32
1993	\$1.65	\$4.87	\$8.37	\$5.99	\$0.72		\$1.12
1994	\$1.59	\$5.76	\$9.91	\$5.44	\$0.84		\$0.84
1995	\$1.47	\$5.65	\$9.29	\$4.72	\$0.69		\$0.66
1996	\$1.57	\$4.85	\$9.11	\$4.33	\$0.67		\$0.72
1997	\$1.41	\$4.20	\$9.18	\$3.71	\$0.79		\$0.89
1998	\$1.08	\$3.99	\$9.49	\$4.29	\$0.81		\$0.81
1999	\$1.43	\$4.06	\$8.49	\$4.32	\$0.66		\$1.19
2000	\$1.45	\$4.07	\$9.18	\$4.62	\$0.70		\$3.03
2001	\$1.37	\$3.26	\$9.62	\$3.93	\$0.65		\$1.74
2002	\$1.04	\$4.09	\$7.97	\$3.30	C		\$2.08
2003	\$1.05	\$3.52	\$8.21	\$3.44	\$0.52		\$2.42

Year	Albacore hook-and-line	Drift gillnet	Harpoon	Pelagic longline	Purse seine	Deep-set buoy gear	Other HMS landings
2004	\$1.27	\$4.18	\$9.80	\$3.55	\$0.50		\$1.63
2005	\$1.53	\$3.79	\$9.10	C	\$0.48		\$2.03
2006	\$1.22	\$3.79	\$8.79	C	C		\$2.42
2007	\$1.19	\$4.02	\$9.38	C	\$0.83		\$2.29
2008	\$1.60	\$3.44	\$8.62	\$3.14	C		\$2.61
2009	\$1.40	\$3.45	\$8.40	\$3.61	\$0.64		\$2.07
2010	\$1.50	\$3.84	\$8.69	\$4.61			\$2.14
2011	\$2.30	\$3.97	\$8.93	\$4.22	C		\$2.03
2012	\$1.96	\$4.56	\$10.09	\$3.82	C		\$1.76
2013	\$1.85	\$4.07	\$10.97	\$3.96			\$2.67
2014	\$1.52	\$4.80	\$10.20	\$4.18	\$0.62	C	\$3.10
2015	\$1.48	\$3.90	\$11.17	\$4.22	\$0.47	\$7.49	\$2.81
2016	\$2.03	\$4.36	\$9.22	\$3.83	\$0.61	\$8.95	\$4.10
2017	\$2.56	\$3.51	\$8.92	\$3.80	\$0.67	\$8.06	\$3.40
2018	\$1.94	\$3.19	\$9.72	\$3.51	\$0.53	\$7.13	\$3.44
2019	\$1.95	\$3.19	\$9.15	\$3.90	\$0.57	\$6.55	\$3.38
2020	\$1.78	\$2.78	\$8.48	\$3.53	\$0.57	\$6.48	\$4.56
2021	\$2.24	\$4.08	\$9.38	\$3.75	C	\$8.39	\$4.28
2022	\$2.24	\$3.55	\$8.85	\$3.95	\$0.61	\$8.73	\$4.18
2023	\$1.34	\$3.97	\$8.31	\$3.54	\$0.55	\$7.75	\$4.17

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, 2021-2023 for trips targeting tuna.

Port Area	2021			2022			2023		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
North Coast	0	42	42	0	942	942	0	282	282
Westport	3,405	3,115	6,520	10,350	24,389	34,739	7,210	16,086	23,296
Ilwaco	928	3,242	4,170	3,046	12,636	15,682	1,700	8,535	10,235
Washington Subtotal	4,333	6,399	10,732	13,396	37,967	51,363	8,910	24,903	33,813
Astoria	0	53	53	0	1,841	1,841	0	560	560
Pacific City	0	122	122	0	182	182	0	403	403
Garibaldi	59	1,437	1,496	0	5,446	5,446	365	5,359	5,724
Depoe Bay	36	1,045	1,081	396	2,494	2,890	912	1,784	2,696
Newport	56	2,157	2,213	168	4,369	4,537	786	11,976	12,762
Florence	0	186	186	0	0	0	0	0	0
Winchester Bay	0	4,948	4,948	0	619	619	0	1,295	1,295
Coos Bay	52	7,144	7,196	0	3,268	3,268	20	12,218	12,238

Port Area	2021			2022			2023		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
Bandon	83	243	326	0	0	0	163	369	532
Gold Beach	0	0	0	0	0	0	0	0	0
Brookings	245	3,730	3,975	167	2,873	3,040	126	166	292
Oregon Subtotal	531	21,065	21,596	731	21,092	21,823	2,372	34,130	36,502
Redwood District	373	9,269	9,642	2,036	4,738	6,774	253	2,257	2,510
Wine District	55	0	55	377	24,940	25,317	1,270	14,653	15,923
San Francisco District	10	0	10	15	270	285	266	57	323
Central District	0	0	0	0	0	0	12	0	12
Channel District	0	0	0	0	0	0	0	0	0
South District	0	0	0	7	0	7	66	0	66
California Subtotal	438	9,269	9,707	2,435	29,948	32,383	1,867	16,967	18,834
Mex	0	0	0	0	0	0	0	0	0
Mexico Subtotal	0	0	0	0	0	0	0	0	0
Oregon-Washington Total	4,864	27,464	32,328	14,127	59,059	73,186	11,282	59,033	70,315
U.S. Total	5,302	36,733	42,035	16,562	89,007	105,569	13,149	76,000	89,149
Coastwide Total	5,302	36,733	42,035	16,562	89,007	105,569	13,149	76,000	89,149

Table 5-2 (Table R1b). Recreational albacore catch (number of kept fish) for charter and private boats by year and port, 2021-2023 regardless of trip type. (Note: For California, there is no equivalent target category between CPFV and private effort. Therefore, all catch is listed in table R1a)

Port Area	2021			2022			2023		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
North Coast	0	42	42	0	705	705	0	248	248
Westport	3356	3034	6390	10219	23667	33886	7151	15664	22814
Ilwaco	928	3188	4117	3046	12152	15198	1700	8241	9941
Washington Subtotal	4284	6264	10549	13265	36524	49789	8851	24153	33003
Astoria	0	53	53	0	1670	1670	0	484	484
Pacific City	0	122	122	0	182	182	0	403	403
Garibaldi	59	1384	1443	0	5066	5066	365	5079	5444
Depoe Bay	36	1018	1054	396	2407	2803	893	1642	2535
Newport	56	1866	1922	168	4134	4302	786	11006	11792
Florence	0	186	186	0	0	0	0	0	0
Winchester Bay	0	4626	4626	0	592	592	0	1243	1243
Coos Bay	52	7144	7196	0	2967	2967	20	12030	12050
Bandon	83	243	326	0	0	0	163	282	445
Gold Beach	0	0	0	0	0	0	0	0	0
Brookings	233	3696	3929	167	2852	3019	126	164	290
Oregon Subtotal	519	20338	20857	731	19870	20601	2353	32333	34686
Redwood District	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wine District	NA	NA	NA	NA	NA	NA	NA	NA	NA
San Francisco District	NA	NA	NA	NA	NA	NA	NA	NA	NA
Central District	NA	NA	NA	NA	NA	NA	NA	NA	NA
Channel District	NA	NA	NA	NA	NA	NA	NA	NA	NA
South District	NA	NA	NA	NA	NA	NA	NA	NA	NA

Port Area	2021			2022			2023		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
California Subtotal	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mex	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mexico Subtotal	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oregon-Washington Total	4803	26602	31406	13996	56394	70390	11204	56486	67689
U.S. Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Coastwide Total	NA	NA	NA	NA	NA	NA	NA	NA	NA

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

Port Area	2021			2022			2023		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
North Coast	0	49	49	5	149	154	0	94	94
Westport	613	1944	2557	863	4962	5825	856	4043	4899
Ilwaco	630	1310	1940	936	2682	3618	592	2485	3078
Washington Subtotal	1,243	3303	4546	1,804	7793	9597	1,448	6622	8071
Astoria	0	61	61	0	413	413	0	210	210
Pacific City	0	43	43	0	73	73	0	74	74
Garibaldi	38	762	800	0	1207	1207	136	1230	1366
Depoe Bay	33	260	293	236	535	771	314	376	690
Newport	10	536	546	104	1003	1107	246	2324	2570
Florence	0	34	34	0	4	4	0	0	0
Winchester Bay	0	1117	1117	0	226	226	0	474	474
Coos Bay	31	1730	1761	7	1093	1100	25	3198	3223
Bandon	32	98	130	0	0	0	66	139	205
Gold Beach	0	0	0	0	0	0	0	0	0
Brookings	38	984	1022	36	385	421	29	91	120
Oregon Subtotal	182	5625	5807	383	4939	5322	816	8116	8932
Redwood District	47	NA	NA	488	NA	NA	41	NA	NA
Wine District	5	NA	NA	130	NA	NA	283	NA	NA
San Francisco District	8	NA	NA	29	NA	NA	108	NA	NA
Central District	0	NA	NA	0	NA	NA	7	NA	NA
Channel District	0	NA	NA	0	NA	NA	0	NA	NA
South District	0	NA	NA	4	NA	NA	65	NA	NA
California Subtotal	60	NA	NA	651	NA	NA	504	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	1,425	8928	10353	2,187	12732	14919	2,264	14738	17003
U.S. Total	1,485	NA	NA	2,838	NA	NA	2,768	NA	NA
Coastwide Total	1,485	NA	NA	2,838	NA	NA	2,768	NA	NA

*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 5-4 (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, 2021-2023.

Port Area	2021			2022			2023		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
North Coast	0.0	0.9	0.9	0.0	4.7	4.6	0.0	2.6	2.6
Westport	5.5	1.6	2.5	11.8	4.8	5.8	8.4	3.9	4.7
Ilwaco	1.5	2.4	2.1	3.3	4.5	4.2	2.9	3.3	3.2
Washington Subtotal	3.5	1.9	2.4	7.4	4.9	5.4	6.2	3.8	4.2
Astoria	0.0	0.9	0.9	0.0	4	4	0.0	2.3	2.3
Pacific City	0.0	2.8	2.8	0.0	2.5	2.5	0.0	5.4	5.4
Garibaldi	1.6	1.8	1.8	0.0	4.2	4.2	2.7	4.1	4
Depoe Bay	1.1	3.9	3.6	1.7	4.5	3.6	2.8	4.4	3.7
Newport	5.6	3.5	3.5	1.6	4.1	3.9	3.2	4.7	4.6
Florence	0.0	5.5	5.5	0.0	0	0	0.0	0	0
Winchester Bay	0.0	4.1	4.1	0.0	2.6	2.6	0.0	2.6	2.6
Coos Bay	1.7	4.1	4.1	0.0	2.7	2.7	0.8	3.8	3.7
Bandon	2.6	2.5	2.5	0.0	0	0	2.5	2	2.2
Gold Beach	0.0	0	0	0.0	0	0	0.0	0	0
Brookings	6.1	3.8	3.8	4.6	7.4	7.2	4.3	1.8	2.4
Oregon Subtotal	2.9	3.7	3.7	1.9	4.3	4.1	2.9	4.2	4.1
Redwood District	7.9	NA	NA	4.2	NA	NA	6.2	NA	NA
Wine District	11.0	NA	NA	2.9	NA	NA	4.5	NA	NA
San Francisco District	1.2	NA	NA	0.5	NA	NA	2.5	NA	NA
Central District	0.0	NA	NA	0.0	NA	NA	1.7	NA	NA
Channel District	0.0	NA	NA	0.0	NA	NA	0.0	NA	NA
South District	0.0	NA	NA	1.8	NA	NA	1.0	NA	NA
California Subtotal	7.3	NA	NA	3.7	NA	NA	3.7	NA	NA
Mex	0.0	NA	NA	0.0	NA	NA	0.0	NA	NA
Mexico Subtotal	0.0	NA	NA	0.0	NA	NA	0.0	NA	NA
Oregon-Washington Total	3.4	3.1	3.1	6.5	4.6	4.9	5.0	4	4.1
U.S. Total	3.6	NA	NA	5.8	NA	NA	4.8	NA	NA
Coastwide Total	3.6	NA	NA	5.8	NA	NA	4.8	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

Species	2020		2021		2022	
	No. Fish		No. Fish		No. Fish	
	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%.

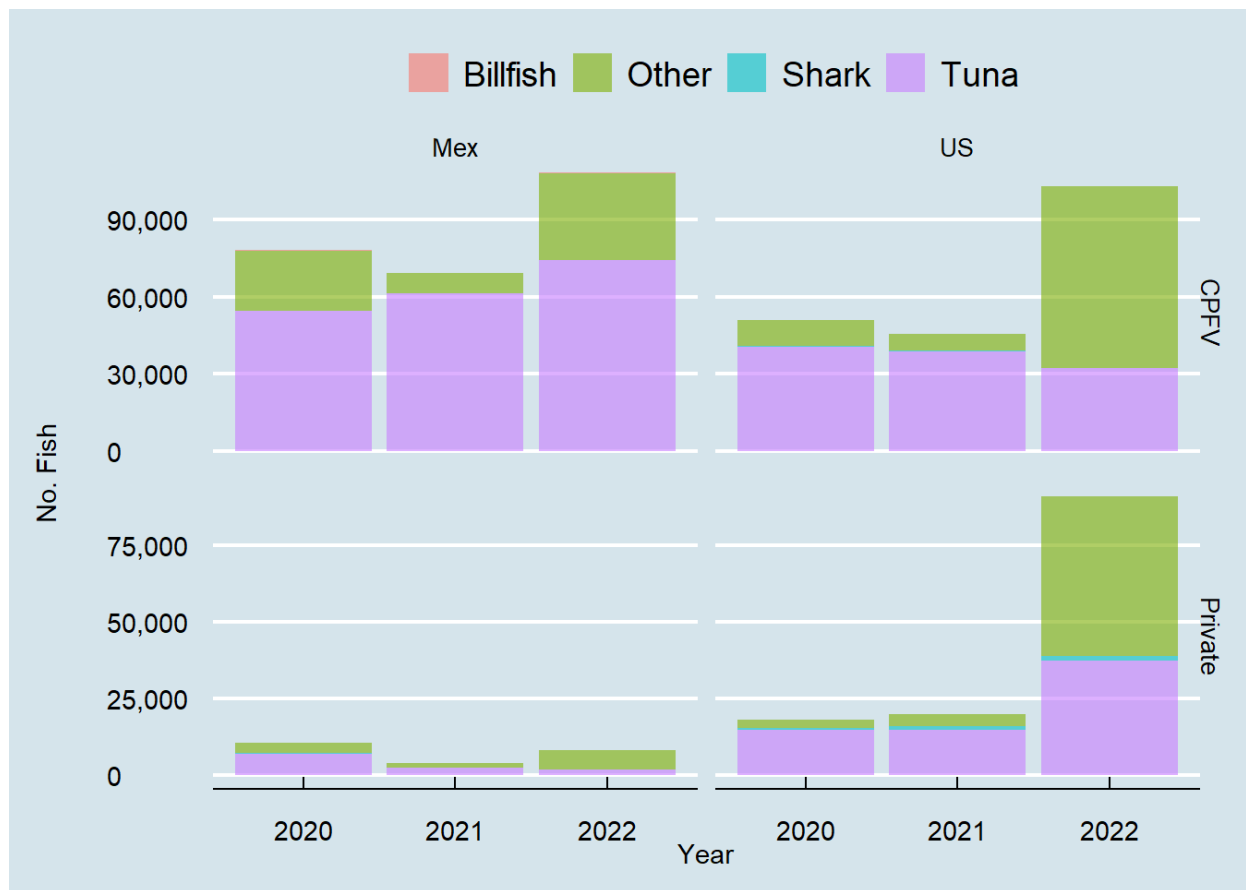


Figure 5-1. Total recreational catch (retained plus discarded) by sector and zone.

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

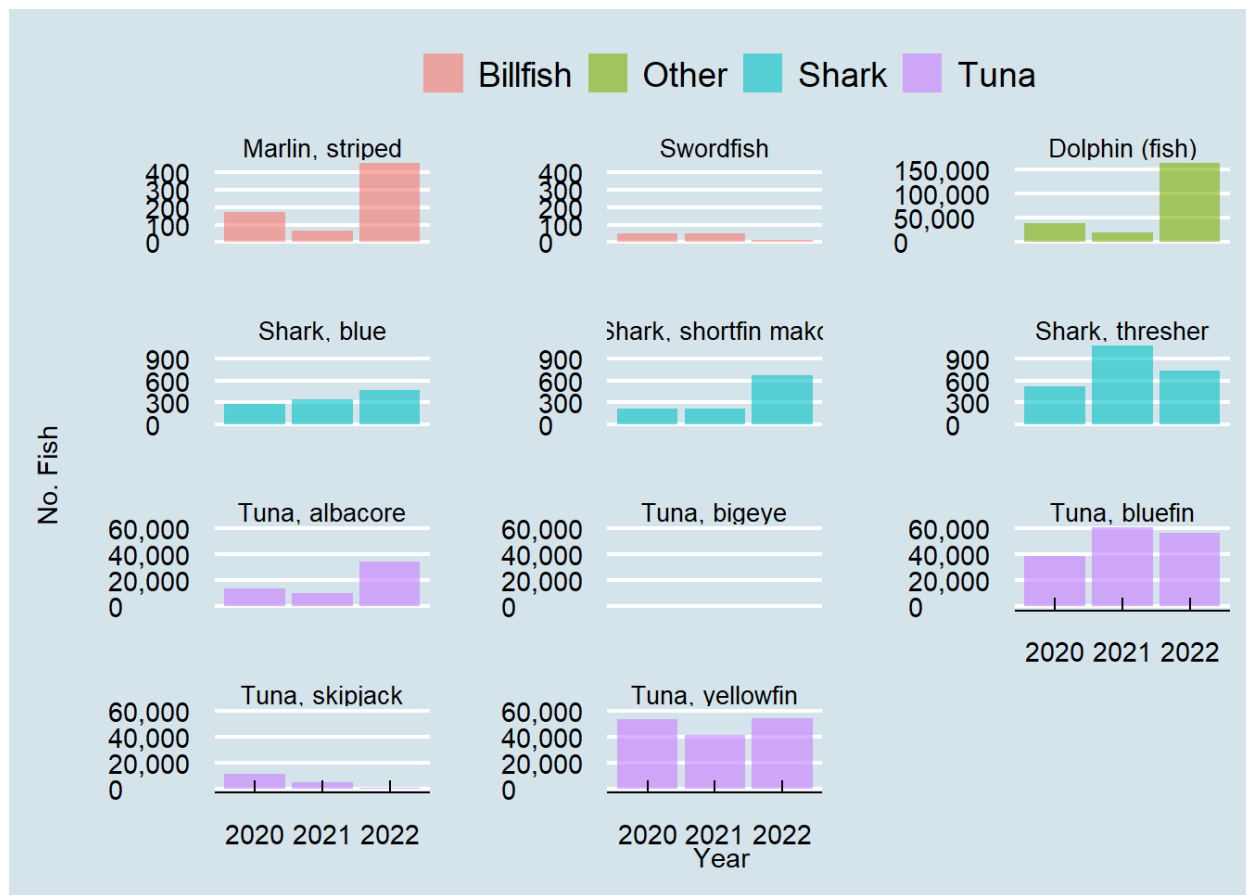


Figure 5-2. Total catch (retained plus discarded) by species.

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.

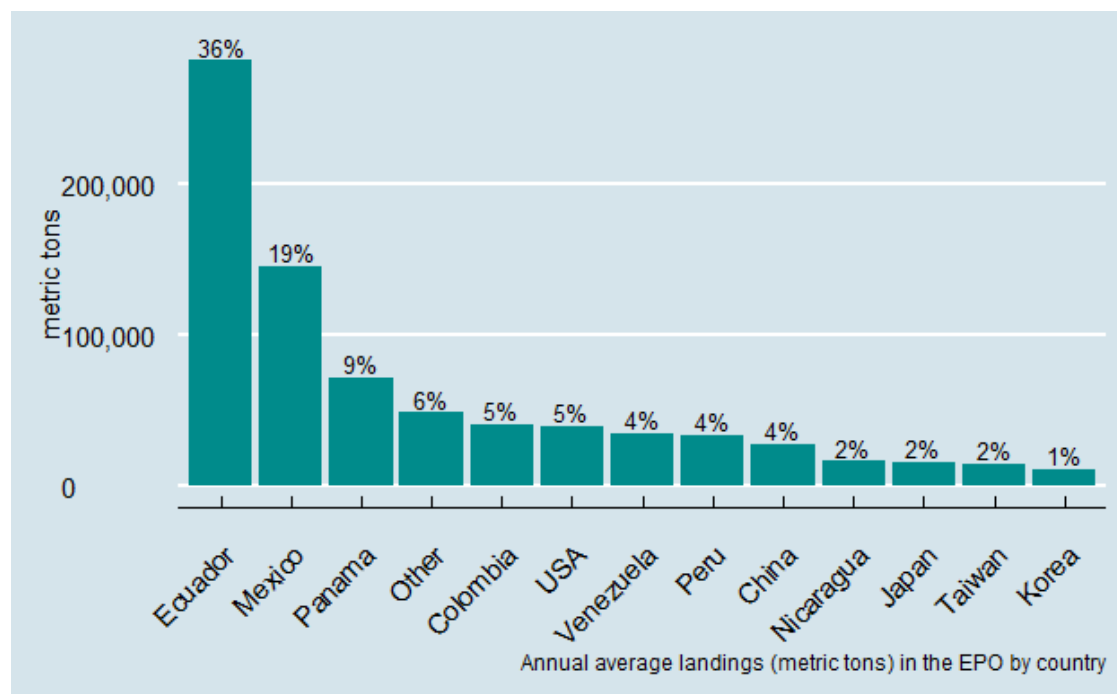
7. Pacific-Wide Catch

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): 2013 - 2022

7.1.1. Landings by Country

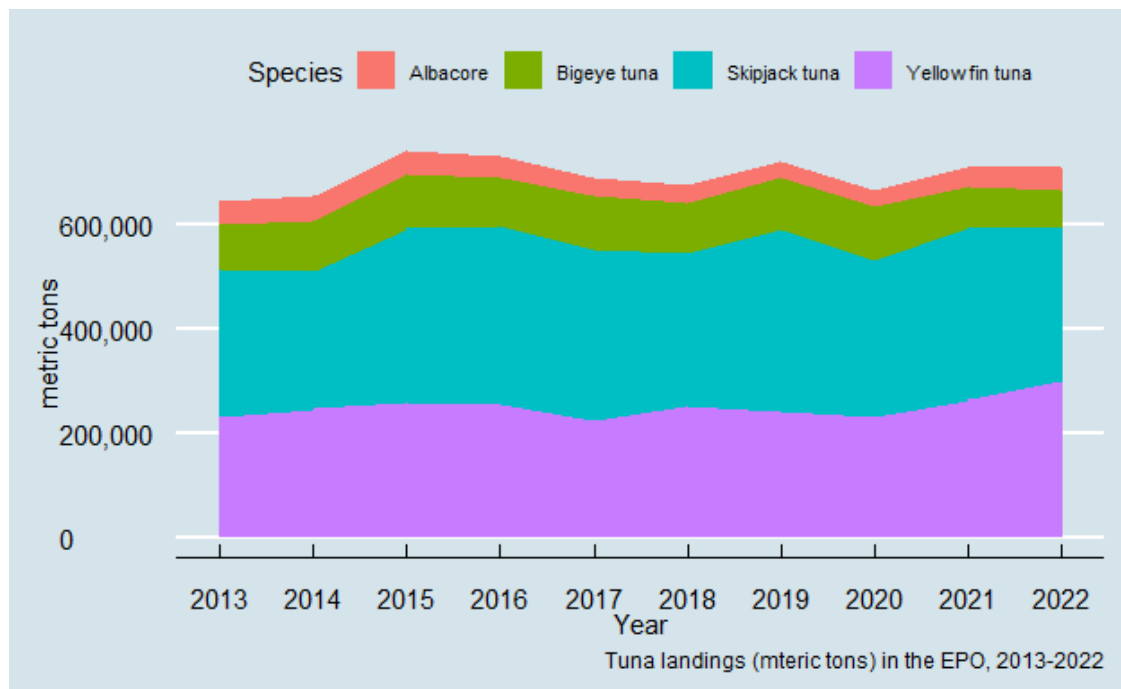
The plot below shows average annual landings by country for all species recorded in IATTC data.



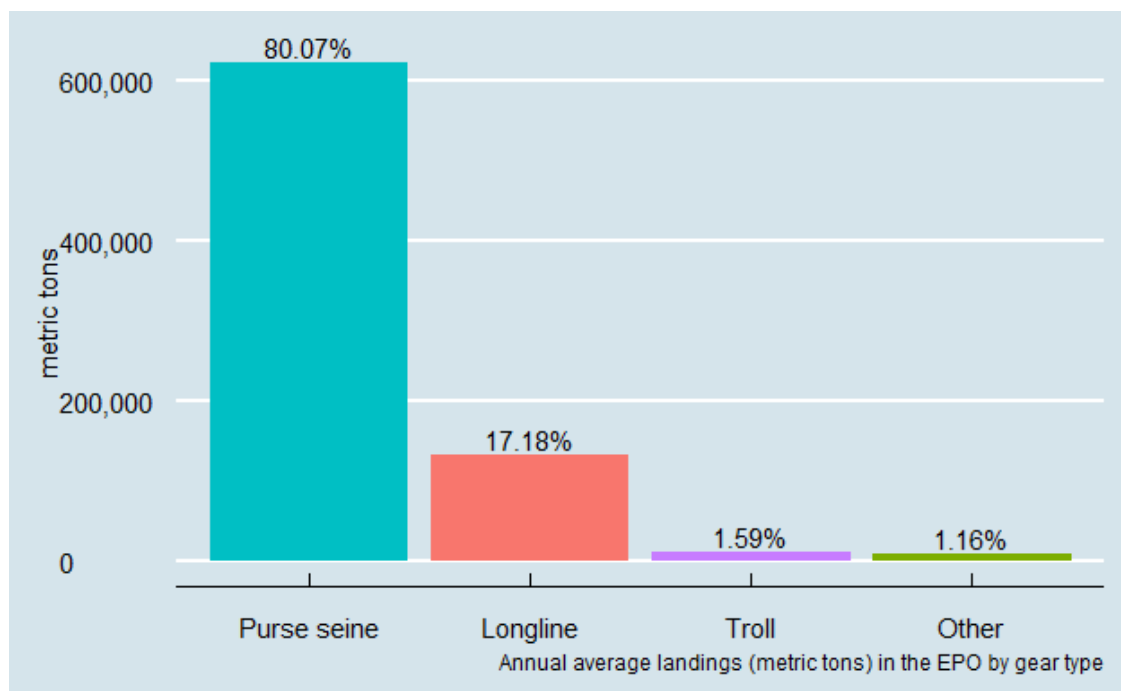
The Other category includes Costa Rica, Chile, Vanuatu, Canada, Belize, Unknown, Guatemala, El Salvador, each of which has landings less than 1% of the total, and others not specified in the source data.

7.1.2. Landings by Species

During 2013-2022 Albacore accounted for 5.8% of total landings, Bigeye tuna for 13.3%, Skipjack tuna for 44.7%, and Yellowfin tuna for 36.1%.



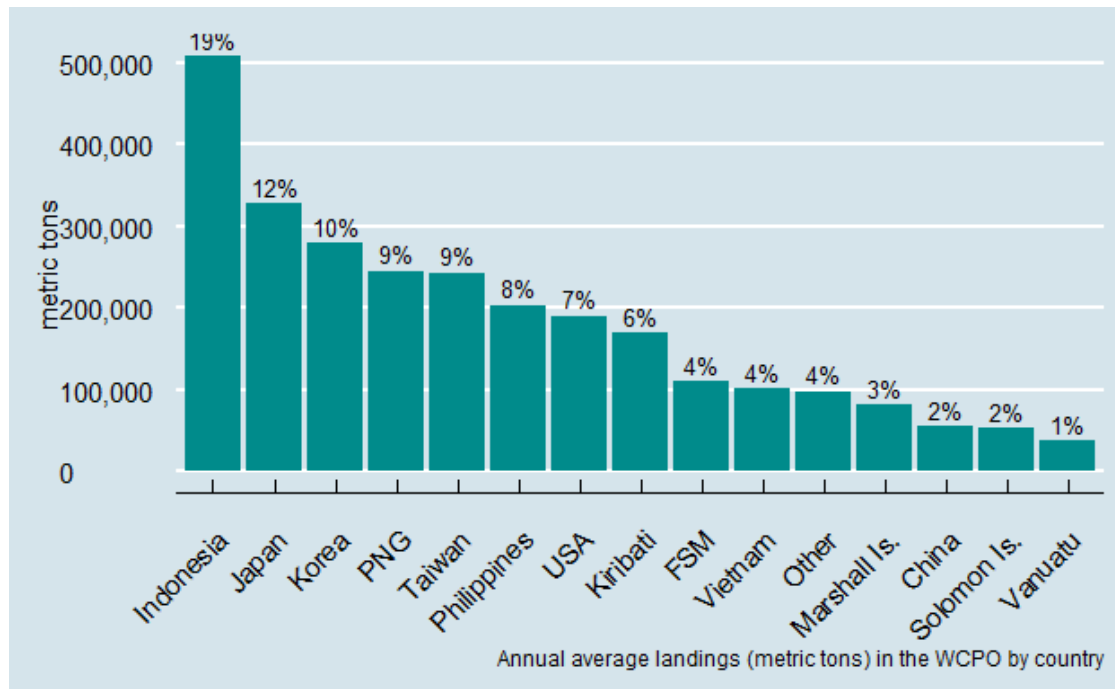
7.1.3. Landings by Gear



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): 2013 - 2022

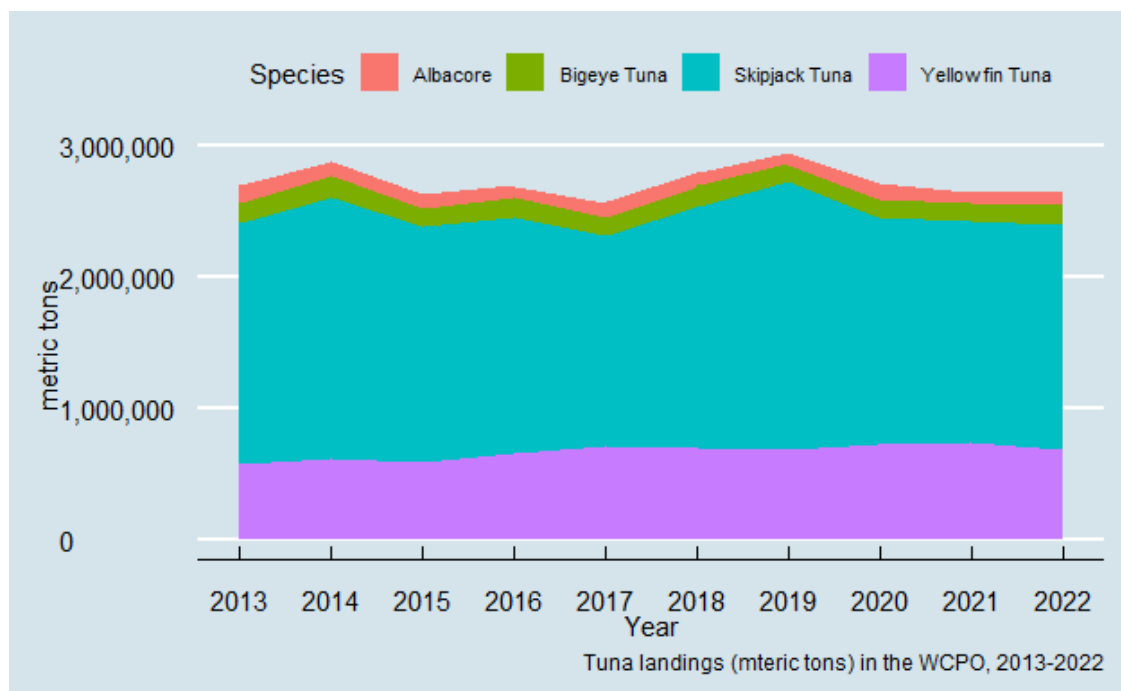
7.2.1. Landings by Country



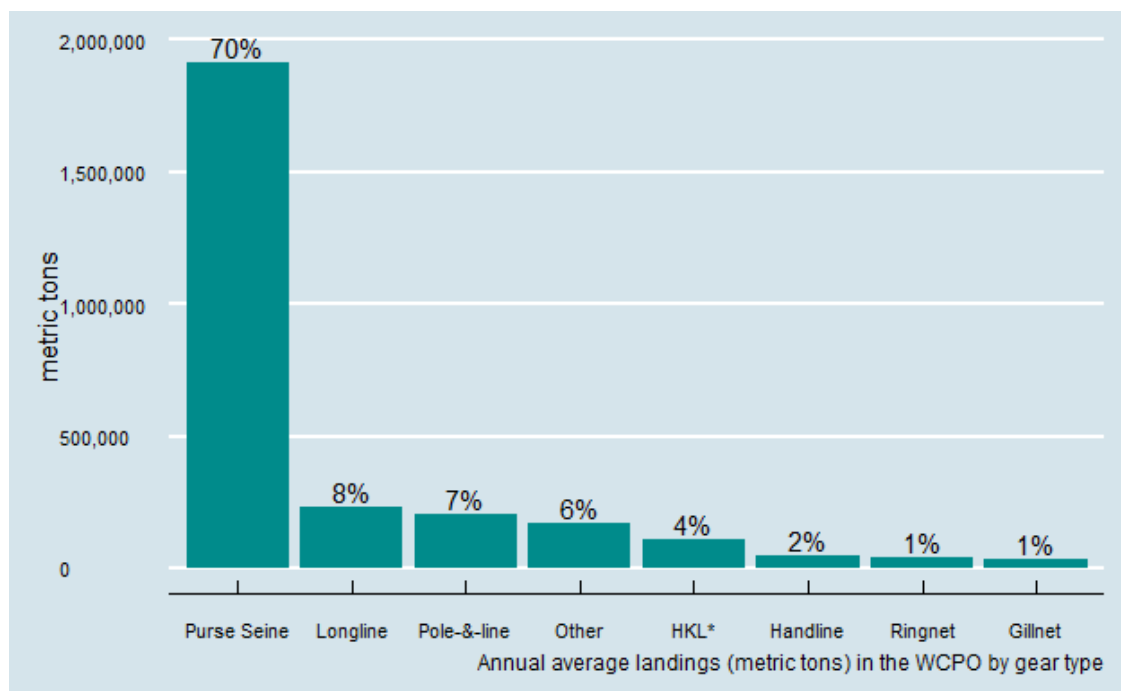
PNG: Papua New Guinea, FSM: Federated States of Micronesia; the Other category includes Ecuador, Spain, New Zealand, Tuvalu, Fiji, El Salvador, Australia, Cook Islands, New Caledonia, Samoa, French Polynesia, Palau, Tonga, Tokelau, Belize, Canada, Niue, each of which has landings less than 1% of the total.

7.2.2. Landings by Species

During the 2013- 2022 period, Albacore accounted for 3.8% of total landings, Bigeye Tuna accounted for 5.4%, Skipjack Tuna accounted for 66.2%, and Yellowfin Tuna accounted for 24.6%.



7.2.3. Landings by Gear



*Small-scale hook-and-line (Philippines and Indonesia). The Other category from source data.

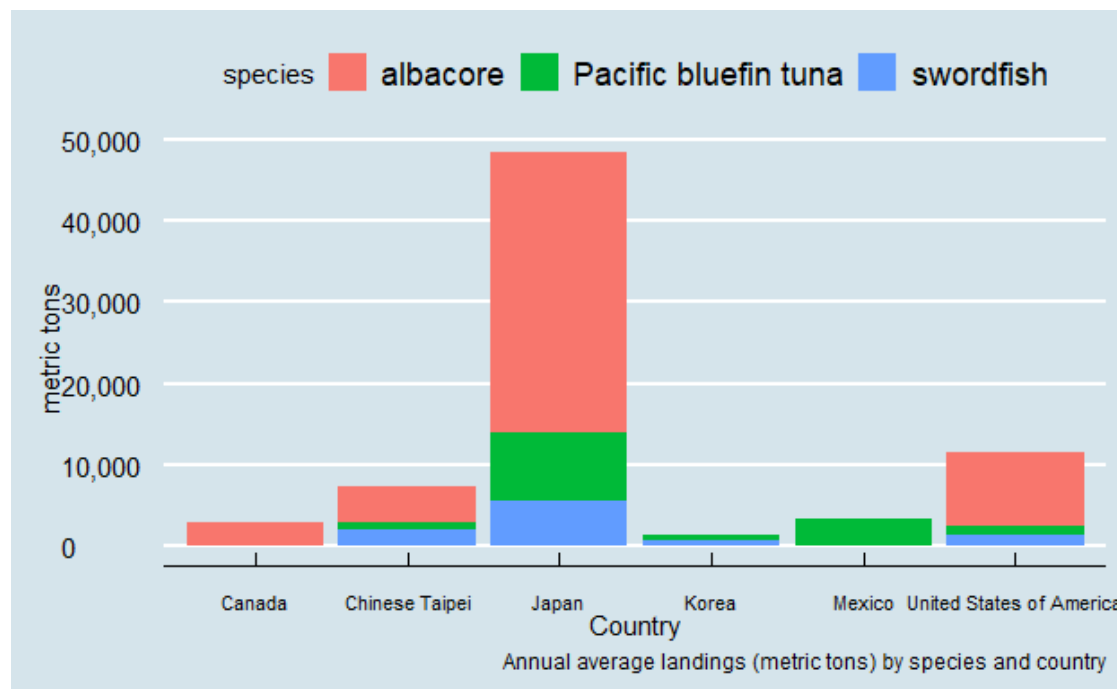
7.3. North Pacific (ISC Data): 2014 - 2023

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.

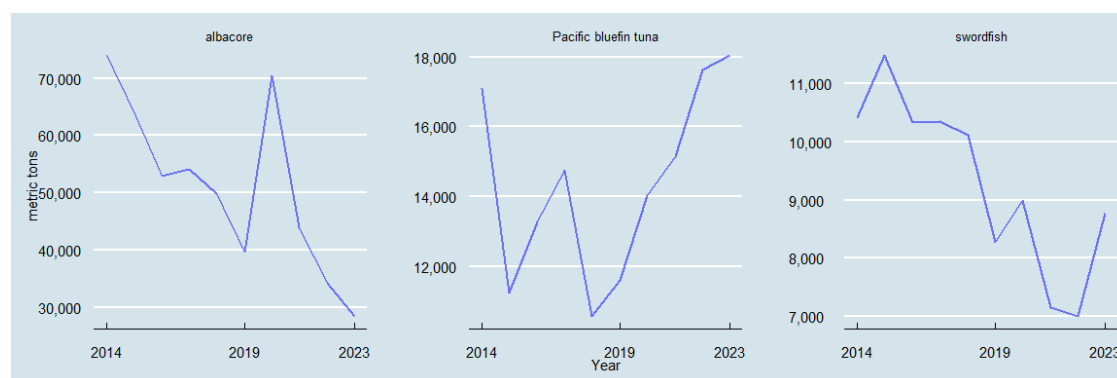
7.3.1. Landings by Country

Japan accounts for the largest proportion of these three species landings, 65%, averaging 48,495 metric tons annually during the 2014-2023 period. U.S. landings averaged 11,412 metric tons or 15% of total landings.



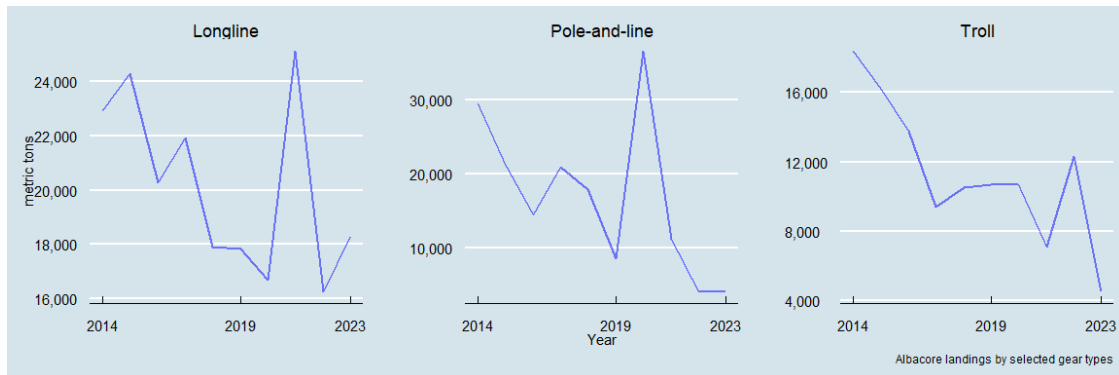
7.3.2. Landings by Species

As depicted below, landings of albacore, Pacific bluefin, and swordfish have declined over this 10-year period. Albacore landings were lowest in 2023 at 28,442 mt, Pacific bluefin landings were lowest in 2018 at 10,565 mt, and swordfish landings were lowest in 2022 at 7,004 mt. Note that Pacific bluefin is managed by catch limits pursuant to the WCPFC Northern Committee's stock rebuilding plan.



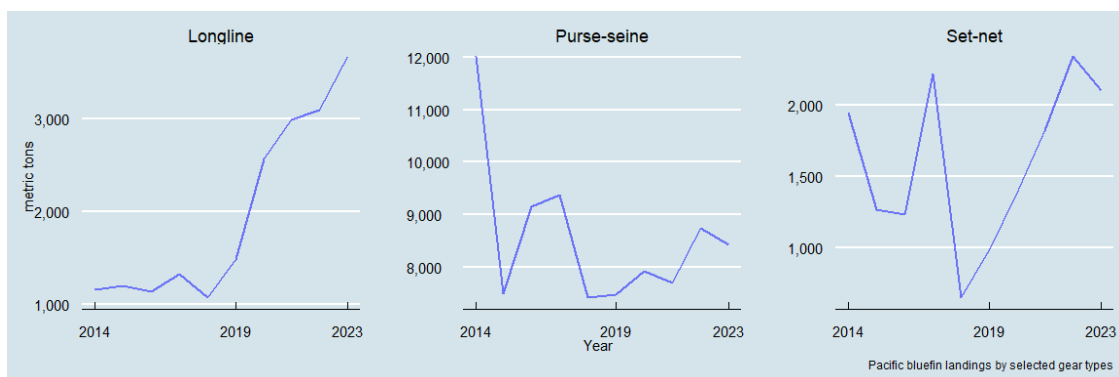
7.3.3. Albacore Landings by Gear Type

The gear types depicted below are the three top ranked in terms of landings and accounted for 94% of total albacore landings.



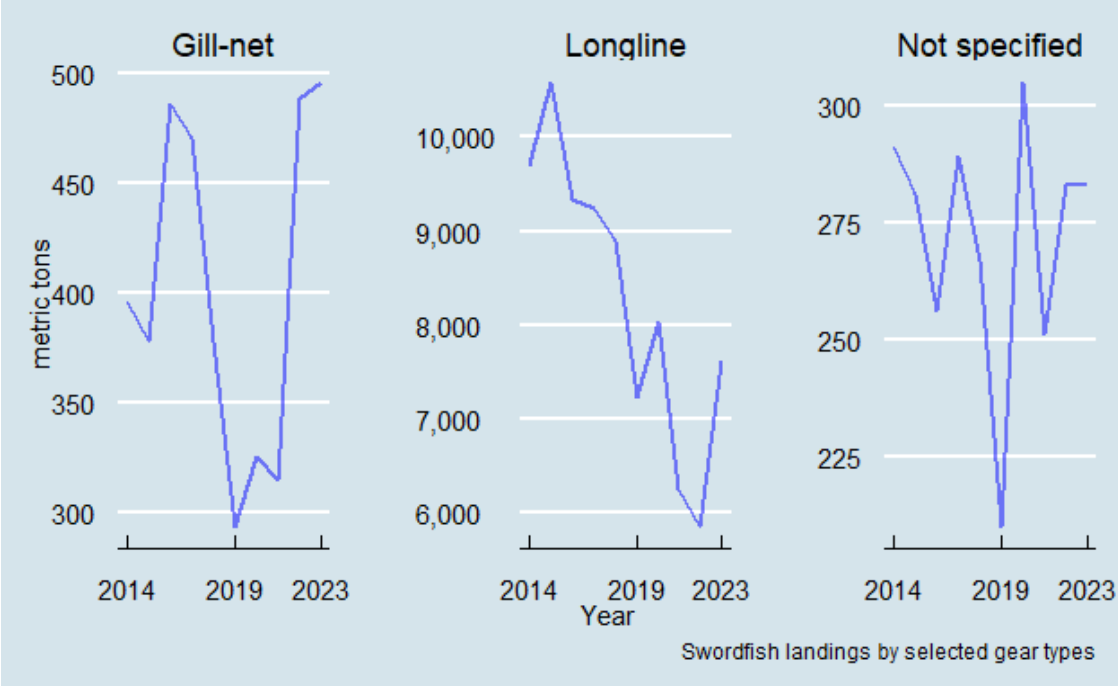
7.3.4. Pacific Bluefin Tuna Landings by Gear Type

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



7.3.5. Swordfish Landings by Gear Type

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



8. Status of HMS Stocks

Note: This chapter reports status determinations made during the previous biennial cycle and will be updated as part of the final SAFE Report.

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:

$$B_{MSST} = (1-M)B_{MSY} \text{ when } M \text{ (natural mortality)} \leq 0.5, \text{ or} \\ B_{MSST} = 0.5B_{MSY} \quad \text{when } M > 0.5$$

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%SSB_{current}, F=0) and limit (14%SSB_{current}, 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 ₂₀₁₅₋₁₇ = 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%SSB _{current} , 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%SSB₀) adopted for other tuna species by the IATTC and WCPFC. On the other hand, SSB reached its initial rebuilding target (SSB_{MED} = 6.3%SSB₀) 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%SSB_{F=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-SPR ₂₀₁₈₋₂₀ = .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 $F_{\text{current}}/F_{\text{Btarget}} = 0.25$ (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 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 $B_{\text{target}} = 0.3 \text{ SSB}_0$	NA	NA		0.25	No
Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1- $M \times B_{\text{MSY}}$ or $0.5B_{\text{MSY}}$)	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
30%SSB0	NA	$SB_{2021} = 26,871$	NA	Greater than 1 since $SB_{\text{current}} > 30\% \text{SSB}_0$ (or B_{MSY} proxy)	B_{MSY} 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 WCP0 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., $1-M \cdot B_{MSY}$, 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 $F_{2017-19}/F_{MSY} = 0.65$	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	$MSST$ ($1-M \cdot B_{MSY}$ or $0.5B_{MSY}$)	Current $B/MSST$	RFMO Ref. point (if adopted)	Overfished?
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S_{MSY} (S = unitless spawning biomass index)	3,634	$S = 3,925$ (S = unitless spawning biomass index)	1,817	2.1	NA	No
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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-Mx B_{MSY} or 0.5 B_{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 F_{MSY} 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-Mx B_{MSY} or 0.5 B_{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)
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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 $(1-SPR_{12-14})/(1-SPR_{MSY})$ 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- SPR_{MSY}	0.45	1- $SPR_{2012-14}$ = 0.097	NA	0.21	No	
Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1- $M \times B_{MSY}$ or 0.5 B_{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/ F_{MSY} ratio	Subject to Overfishing?	
1-SPR MSY	0.26	1-SPR $msy_{2013-15} = 0.16$	NA	0.62	No	
Overfished						
B_{MSY} or proxy	Current B_{MSY} or proxy estimate	Current B quantity estimate	MSST (1- $M \times B_{MSY}$ or 0.5 B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
SA_{MSY}	633,700 female sharks	SA2016 = 860,200 female sharks	(1-0.128) \times 633700 = 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. Williams, 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.