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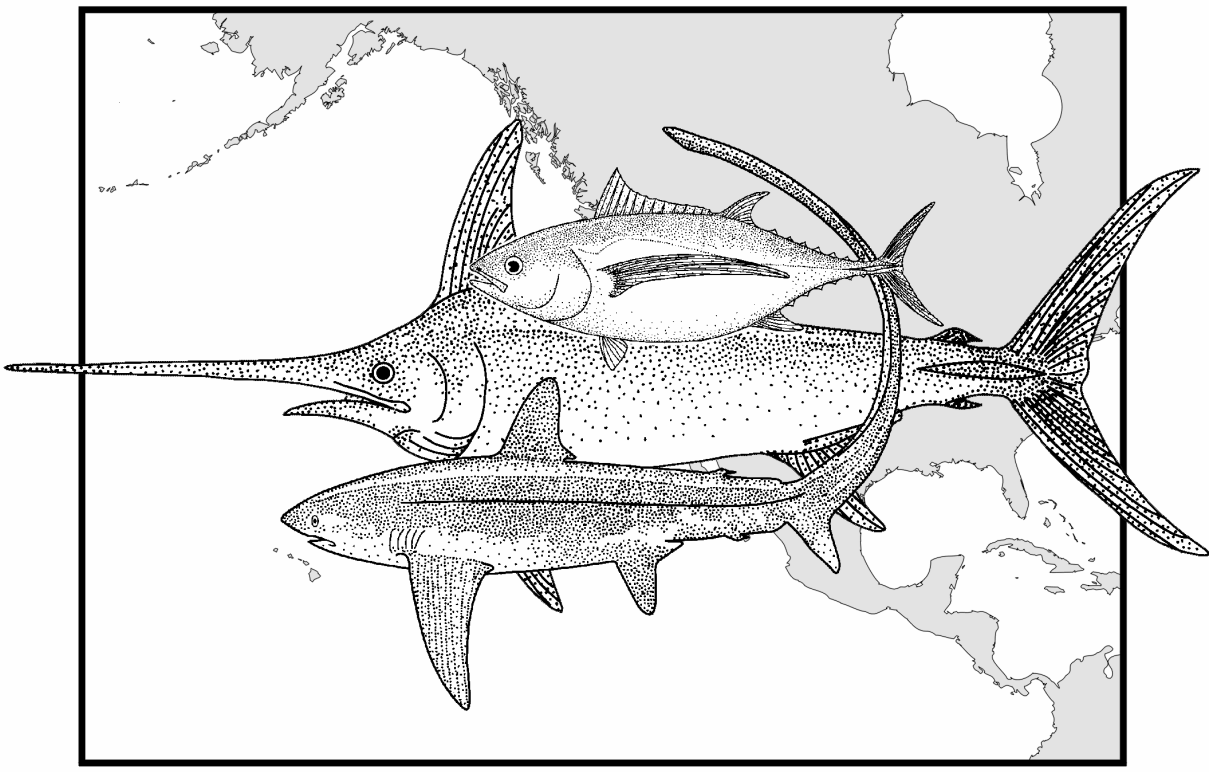
# STATUS OF THE U.S. WEST COAST FISHERIES FOR HIGHLY MIGRATORY SPECIES THROUGH 2021



## STOCK ASSESSMENT AND FISHERY EVALUATION

## JULY 2022

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

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

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# 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 |
| 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 |
| 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.

Consistent with the schedule described in the HMS FMP, a draft stock assessment and fishery evaluation (SAFE) document is produced from the website content to be submitted to the Council at its September meeting and a final version is delivered for the November Council meeting.

## 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 five 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), is currently in the implementation phase with regulations expected to be in place by the end of 2022 or early 2023. These measures include a limited entry permit program for use of DSBG in the Southern California Bight.

## 1.3. Management Unit Species and Ecosystem Component Species

The HMS currently managed under the FMP are:

- Striped marlin (*Kajikia audax**)
- Swordfish (*Xiphias gladius)*
- Common thresher shark (*Alopias vulpinus)*
- Shortfin mako shark (bonito shark) (*Isurus oxyrinchus)*
- Blue shark (*Prionace glauca)*

- North Pacific albacore (*Thunnus alalunga)*
- Yellowfin tuna (*Thunnus albacares)*
- Bigeye tuna (*Thunnus obesus)*
- Skipjack tuna (*Katsuwonus pelamis)*
- Pacific bluefin tuna (*Thunnus orientalis)*
- Dorado, a.k.a. mahi mahi or dolphinfish (*Coryphaena hippurus)*

*The scientific name for this species was previously *Tetrapturus audax.*

In addition, Amendment 2 added eight 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. The EC species are:

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

EC species are not considered "in the fishery" but Councils should consider measures to mitigate and minimize bycatch of these species, to the extent practicable, consistent with National Standard 9. 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*

The HMS FMP also establishes a process for the delivery of the SAFE report to the Council, intended to coincide with 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. Council meetings in 2006 initiated the first biennial management cycle under the HMS FMP with consideration of measures to be implemented during the April 1, 2007–March 31, 2009 biennium. In 2010 the Council considered management changes for the third biennial period, April 1, 2011–March 31, 2013. In 2012 the Council did not consider any regulatory changes for the April 1, 2013–March 31, 2015 biennium. 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. The final rule implementing this regulation was published in the Federal Register (80 FR 44887) on July 28, 2015 and became effective on July 30, 2015. In 2016, 2018, and 2020 the Council did not recommend any regulatory changes for the next biennial periods (2017/2019, 2019-2021, 2021-2023).

### *1.5. Highly Migratory Species Management Team*

As of June 2022 the HMSMT members were:

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

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

# 2. Council HMS Activities in 2021

The Council made the following HMS-related decisions in 2021. (These decision summaries may be found on the Council website.)

## *2.1. March 2021*

**Review of Essential Fish Habitat – Phase 2**

The Council adopted the Phase 2 Action Plan for developing potential revisions to highly migratory species (HMS) essential fish habitat provisions as part of a Fishery Management Plan amendment process. The Council directed the HMS Management Team (HMSMT), Southwest Fisheries Science Center, National Marine Fisheries Service (NMFS) West Coast Region, and Council staff to consider the recommendations of the HMSMT, in further development of the amendment process.

**Deep-Set Buoy Gear Permit Clarifications**

Based on questions and proposed interpretations in NMFS Reports 1 and 2, the Council adopted the following clarifications to its proposed measures for authorizing deep-set buoy gear (DSBG) adopted in September 2019:

1. Confirmed that a DSBG limited entry permit may be held by a person as defined 50 CFR 660.702, which includes corporations, partnerships, or other entities, but in all cases permit transfers are prohibited except for a one-time transfer to a family member upon the death of an individual permit holder. In cases where an entity holds a permit, transfers by means of changes in the ownership of the entity will be prohibited.
2. Clarified that for the purpose of limited entry DSBG permit qualification, "EFP holder" means vessel operators on board when DSBG was used or individuals identified as having managed the exempted fishing permit (EFP) including owners of vessels to which the EFP was assigned.
3. Supported the NMFS recommendation for a single qualification period but included Tier 8 (see description below). Ranking within tiers would be based on total swordfish landings for Tiers 1-5 and on a first come, first served basis for the remaining tiers.

The Council modified the DSBG limited entry permit qualification tiers so that they read as follows:

1. EFP holders, with at least 10 documented calendar days of DSBG fishing effort by December 31, 2018. Documentation shall consist of a West Coast Observer Program record indicating either:
    a. the EFP holder as vessel captain for that fishing day; or
    b. fishing effort for that day conducted on a vessel owned by or under the EFP managed by that individual.
2. California Drift Gillnet (DGN) Shark and Swordfish permit holders who made at least one large mesh DGN swordfish landing between the 2013-2014 and 2017-2018 fishing seasons and surrender their state or federal DGN permit as part of a DGN permit trade-in or buy-back program.
3. EFP holders approved by the Council prior to April 1, 2021 who conducted at least 10 calendar days of DSBG fishing effort or with 10 days of DSBG effort on their vessel or by vessels they manage under the EFP by the effective date of the Final Rule authorizing DSBG. Documentation shall consist of a NMFS West Coast Observer Program record or a properly submitted NMFS DSBG logbook indicating either:
    a. the EFP holder as vessel captain for that fishing day; or

   b. fishing effort for that day was conducted on a vessel owned by or under the EFP managed by that individual.
4. California General Swordfish permit holders who possessed a permit during the 2018-2019 fishing season and made at least one swordfish landing using harpoon gear between the 2013-2014 and 2017-2018 fishing seasons.
5. California DGN Shark and Swordfish permit holders who have made at least one large-mesh DGN swordfish landing between the 2013-2014 and 2017-2018 fishing seasons and who did not surrender their state or federal DGN permit as part of a trade-in or buy- back program.
6. California DGN Shark and Swordfish permit holders who have not made a swordfish landing with large-mesh DGN gear since March 31, 2013 and who surrender their state or federal DGN permit as part of a permit trade-in or buy-back program.
7. State or Federal DGN Limited Entry (LE) permit holders who have not made a swordfish landing with DGN gear since March 31, 2013 and did not surrender their DGN LE permit as part of a state or Federal DGN permit trade-in or buy-back program.
8. Any individual with documented commercial swordfish fishing experience between January 1, 1986 and the effective date of the final rule on a first come first served basis. The basis for documenting commercial swordfish fishing experience attributable to the applicant will be possession of a valid commercial fishing license on that date and either:
   a. A valid California Department of Fish and Wildlife fish landing receipt identifying the individual as the fisherman of record; or
   b. A valid state or federal logbook where swordfish were taken and identifying the individual as captain or crew on that day; or
   c. A signed affidavit from a vessel owner or captain identifying the individual as vessel captain or crew on the day that swordfish were taken.
9. Any individual on a first come first served basis.

**Biennial Harvest Specifications and Management Measures**

The Council approved the maximum fishing mortality threshold proxy and the second proxy proposed for minimum stock size threshold in Option 3 of NMFS Report 1 as applicable to status determinations for Eastern Pacific Ocean (EPO) yellowfin and bigeye tuna stocks based on the probabilistic framework in the 2020 benchmark assessments for those stocks as prepared by Inter-American Tropical Tuna Commission scientific staff. Resulting status determination criteria indicate EPO yellowfin are likely not overfished or subject to overfishing, and EPO bigeye are likely not overfished or subject to overfishing.

## *2.2. June 2021*

**International Management Activities**

The Council recommended that the Inter-American Tropical Tuna Commission (IATTC) adopt status quo catch limits for Pacific bluefin tuna in a one-year measure for 2022. This would allow a future multi-year IATTC resolution to align with the results from a new, benchmark stock assessment scheduled for completion in 2022. Any IATTC resolution would need to be coordinated with complementary measures in the Western and Central Pacific Fisheries Commission (WCPFC) Convention Area through the Joint Working Group process. The Sixth Session of the Joint IATTC and WCPFC-NC Working Group on Management of Pacific Bluefin Tuna is scheduled for July 27 to 29, in advance of the IATTC regular session in August.

The Council also recommended that further development of the interim harvest strategy for North Pacific albacore, based on the results of the recently-completed management strategy evaluation (MSE), be

deferred until 2022. This would give managers and stakeholders more time to consider MSE results and identify a preferred harvest control rule and any related management measures.

**Exempted Fishing Permits**

The Council recommended National Marine Fisheries Service (NMFS) issue exempted fishing permits (EFPs) for the seven applications received to test deep-set buoy gear (DSBG, see Attachments 1, 4, 5, 6, 7, 8, and 10). Three other applications (Attachments 2, 4, and 9) described activities other than testing conventional DSBG. (Attachment 9 is a request to use DSBG and night-set buoy gear in specific areas within California state waters, which is not part of current EFP terms and conditions.) The Council forwarded these applications for further consideration and final action at the September Council meeting, with the expectation that applicants will provide more detail about the requested activities. The Council also recommended that NMFS reissue expiring EFPs for 2022 and 2023 to current active permit holders. The Council recommended not reissuing the Hall short-line EFP, which is based on the application reviewed and approved by the Council in 2018, because the EFP recipient was unable to arrange a vessel to implement the EFP and no fishing occurred.

**Drift Gillnet Fishery Bycatch Performance Report**

The Council reviewed bycatch estimates for the California large mesh drift gillnet fishery against previously adopted performance metrics for certain finfish, marine mammal, and sea turtle species as reported by the HMSMT. None of the performance metrics were exceeded in calendar years 2018 or 2019. The Council also endorsed the continued work on the methods to estimate bycatch and detect trends in bycatch levels in the fishery as recommended by the HMSMT.

**Drift Gillnet Fishery Hard Caps**

The Council adopted the following revised purpose and need statement for the implementation of hard caps for selected protected species taken in the California large mesh drift gillnet (DGN) fishery:

*The purpose* is to incentivize fishing practices and tools in an effort to minimize bycatch and bycatch mortality, as well as to conserve other unmarketable non-target species, including Endangered Species Act-(ESA-) listed species and marine mammals, in the DGN fishery to the extent practicable. *The need* is to ensure that take and bycatch of unmarketable non-target species, including ESA-listed species and marine mammals, in the DGN fishery is minimized to the extent practicable and that such take and bycatch does not result in limitations on the economic viability of the west coast swordfish fishery.

The Council originally adopted hard caps for the fishery in 2015 but implementing regulations were vacated due to a court order.

The Council also directed its HMSMT to develop a final range of alternatives for adoption by the Council including:

- A no action alternative (as required by the National Environmental Policy Act).
- Hard caps as in the Council's original 2015 action, which were rolling two-year caps based on observed mortality/injury for five marine mammal and three sea turtle species.
- Annual hard caps based on the hard cap numbers in the original action with sub-options for different closure period durations.
- Hard caps that apply both to individual vessels and the fleet as a whole. When a vessel meets an individual cap, both that vessel and all unobservable vessels would have to stop fishing. All vessels in the fishery would have to stop fishing when a fleet-wide cap is reached. As above, sub-options

for different closure period durations will be included. The individual and fleet-wide caps under this alternative are:

| Species | Individual Cap | Two-Year Fleetwide Cap |
|---|---|---|
| Fin whale | 1 | 2 |
| Humpback whale | 1 | 2 |
| Sperm whale | 1 | 2 |
| Leatherback sea turtle | 1 | 2 |
| Loggerhead sea turtle | 1 | 2 |
| Olive-Ridley sea turtle | 1 | 2 |
| Green sea turtle | 1 | 2 |
| Short-fin pilot whale CA/OR/WA | 2 | 4 |
| Common bottlenose dolphin CA/OR/WA Offshore stock | 2 | 4 |

## 2.3. September 2021

**Exempted Fishing Permits**

The Council recommended that the National Marine Fisheries Service issue a single exempted fishing permit (EFP) covering the activities proposed in the applications submitted by Mr. John Bateman and Mr. Austen Brown. When issuing the EFP, associated Terms and Conditions should incorporate the protective measures described in the California Department of Fish and Wildlife Report, but with a maximum of 150 hooks per set (rather than the 75 hooks stated in the report), and the Enforcement Consultant Report, which were submitted under this agenda item.

The Council did not take action on the portion of the application submitted by Mr. Nathan Perez for fishing in selected areas in California state waters. A Federal EFP is not applicable for activities in state waters; however, the Council did recommend reissuance of his existing EFP for activities in Federal waters.

## 2.4. November 2021

**International Management Activities**

The Council made recommendations to NMFS on domestic management measures implementing 2022-2024 catch limits for Pacific bluefin tuna in IATTC Resolution C-21-05,which increases the 2021-2022 biennial catch limit to 739 mt (no more than 523 mt in 2022) and includes an increased 2023-2024 biennial catch limit of 1,017 mt (no more than 720 mt in any one year). The Council recommended trip limit regimes for each year similar to what is in place in 2021, with trip limit reductions tied to catch attainment during the year. For 2024, the Council recommended a range of cumulative catch limit triggers for trip limit

reductions, depending on the actual 2024 catch limit (currently uncertain because it is the second year in the biennium). NMFS will go through rulemaking to implement the trip limits for all three years.

The Council endorsed the recommendations of the Permanent Advisory Committee to the U.S. Section of the Western and Central Pacific Commission for consideration in developing U.S. positions at the 18th Regular Session of the WCPFC. Ms. Christa Svensson, WCPFC Commissioner in the Pacific Council designated seat, will advance positions in the U.S. delegation, as appropriate.

**Drift Gillnet Fishery Hard Caps**

The Council adopted the following range of alternatives for drift gillnet hard caps.

**Alternative 1:** No action

**Alternative 2:** The original 2015 Council preferred alternative for rolling 2-year hard caps

**Alternative 3:** A combination of individual and fleetwide annual ("fishing year": April 1-March 31) caps based on Table 1, below. Caps are based on observed interactions (serious injury/mortality), regardless of the level of observer coverage. In all cases, "ceasing fishing" shall be applied both inside and outside the U.S. EEZ. Closures are contiguous, even if they extend into, or beyond, an existing closure.

**Option A:**

If a vessel **reaches** an individual cap, that vessel and all unobservable vessels cease fishing for:

**Sub-option I:** 30 days if the cap is reached before November 1, or 14 days if the cap is reached between November 1 and January 31

**Sub-option II:** For the remainder of the fishing year

If a fleetwide cap is **reached**, the entire fleet ceases fishing for the remainder of the fishing year

**Option B**:

If a vessel **reaches** an individual cap, that vessel and all unobservable vessels cease fishing for 30 days if the cap is reached before November 1, or 14 days if the cap is reached between November 1 and January 31

If a vessel **exceeds** an individual cap, that vessel and all unobservable vessels cease fishing for the remainder of the fishing year

If a fleetwide cap is **exceeded**, the entire fleet ceases fishing for the remainder of the fishing year

**Option C**:

If a vessel **reaches** an individual hard cap, that vessel and all unobservable vessels cease fishing for 30 days if the cap is reached before November 1, or 14 days if the cap is reached between November 1 and January 31

If a vessel **exceeds** an individual cap, that vessel and all unobservable vessels cease fishing for the remainder of the fishing year, **AND** the remainder of the fleet ceases fishing for 30 days if the cap is exceeded before November 1, or 14 days if the cap is exceeded between November 1 and January 31

If a fleetwide cap is **reached**, the entire fleet ceases fishing for 30 days if the cap is reached before November 1, or 14 days if the cap is reached between November 1 and January 31

If a fleetwide cap is **exceeded**, the entire fleet ceases fishing until:

**Sub-option I:** the beginning of the following fishing year

**Sub-option II:** The following November 1, with cap counts beginning November 1 each year

**Table 1. Individual and fleetwide hard caps. Values that EXCEED the individual or fleetwide caps are in parenthesis.**

| Species | Individual Cap (exceedance) | Two-Year Fleetwide Cap (exceedance) |
|---|---|---|
| Fin whale | 1 (2) | 2 (3) |
| Humpback whale | 1 (2) | 2 (3) |
| Sperm whale | 1 (2) | 2 (3) |
| Leatherback sea turtle | 1 (2) | 2 (3) |
| Loggerhead sea turtle | 1 (2) | 2 (3) |
| Olive-Ridley sea turtle | 1 (2) | 2 (3) |
| Green sea turtle | 1 (2) | 2 (3) |
| Short-fin pilot whale CA/OR/WA | 3(4) | 4 (5) |
| Common bottlenose dolphin CA/OR/WA Offshore stock | 3 (4) | 4 (5) |

# 3. HMS Regulatory Framework

## *3.1. Changes to HMS FMP Regulations in 2021*

No rulemakings to modify HMS FMP regulations at 50 CFR 660 Subpart K occurred in 2021. Since implementation of the HMS FMP the following regulatory changes have been made:

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

| Effective Date | Title | Citation |
|---|---|---|
| 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 |

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## *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.

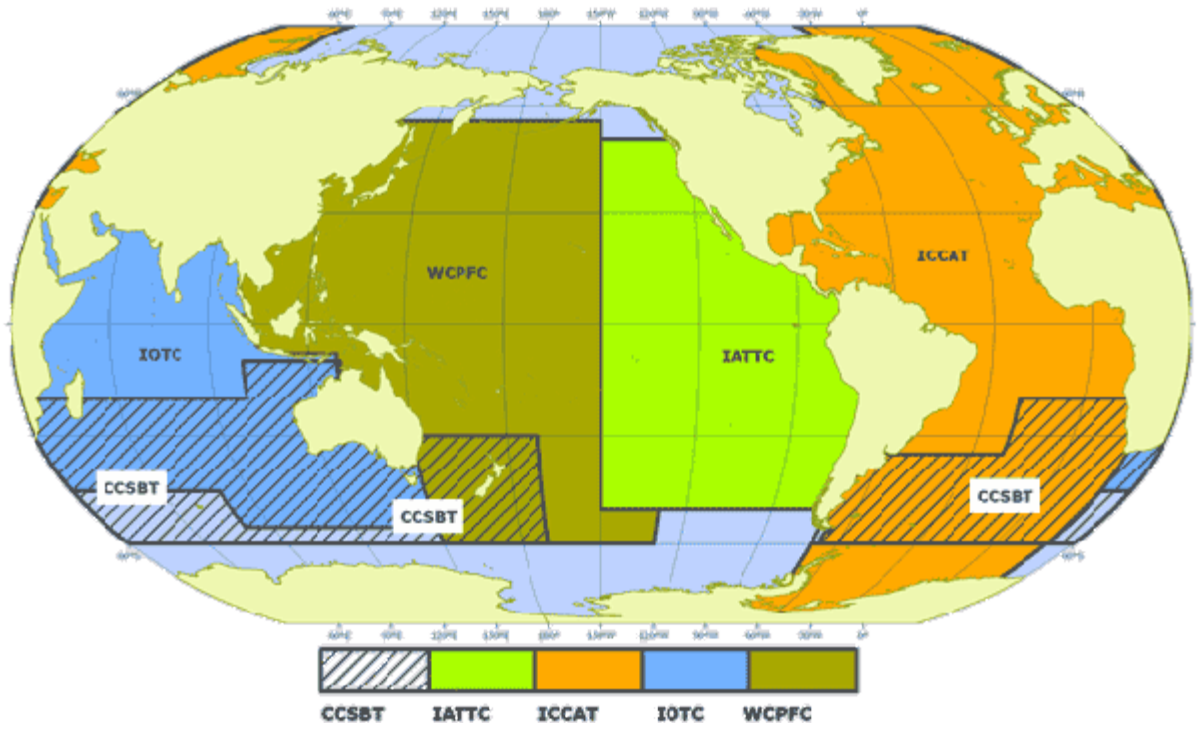


**Figure 3-1. Global map of tuna RFMO jurisdictions.**
**(Source: http://firms.fao.org/firms/fishery/459/en#FisheryArea).**

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° North latitude). In the case of Pacific bluefin tuna and North Pacific albacore, tuna 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. 2021 IATTC and WCPFC Outcomes

### 3.2.3. Resolutions adopted at the 98th Regular Meeting of the IATTC (August 23-27, resumed October 18-22, 2021)

- C-21-01 Pacific Bluefin Tuna (long-term)
- C-21-02 Terms of Reference EMS workshops
- C-21-03 Electronic Monitoring System (EMS) Definitions
- C-21-04 Tuna conservation in the EPO 2022-2024
- C-21-05 Pacific Bluefin Tuna
- C-21-06 Silky sharks (Replaces C-19-05)
- C-21-07 Port State measures
- C-21-08 Financing for FY 2022

### 3.2.4. Conservation measures adopted at the Eighteenth Session of the Western and Central Pacific Fisheries Commission (November 8-December 7, 2021)

- CMM 21-01 Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean
- CMM 21-02 Conservation and Management Measure for Pacific Bluefin Tuna
- CMM 21-03 Conservation and Management Measure on the Compliance Monitoring Scheme
- CMM 21-04 Conservation and Management Measure for Charter Notification Scheme

### 3.2.5. Regulations for International HMS Fisheries and Related Activities in the Pacific Published in 2021

The following regulations implementing RFMO decisions were published in 2021. For earlier years consult previous editions of the SAFE.

| Effective Date | Region | Title | Citation |
|---|---|---|---|
| September 1, 2021 | WCPO | Extension of Emergency Decisions of the Western and Central Pacific Fisheries Commission | 86 FR 48916 |
| August 8, 2021 | WCPO | Requirements To Safeguard Fishery Observers | 86 FR 35653 |
| June 11, 2021 | WCPO | Implementation of Emergency Decisions of the Western and Central Pacific Fisheries Commission (Interim Final Rule) | 86 FR 31178 |

| Effective Date | Region | Title | Citation |
|---|---|---|---|
| March 29, 2021 | EPO | Commercial Fishing Restrictions for Pacific Bluefin Tuna in the Eastern Pacific Ocean | 86 FR 16303 |
| March 23, 2021 | EPO, WCPO | Area of Overlap Between the Convention Areas of the Inter-American Tropical Tuna Commission and the Western and Central Pacific Fisheries Commission | 86 FR 15428 |
| January 19, 2021 | EPO | Fishing Restrictions for Tropical Tuna in the Eastern Pacific Ocean for 2021 | 86 FR 5033 |

# 4. Commercial Fisheries

## *4.1. Fishery Descriptions*

### 4.1.1. Surface hook-and-line fishery for albacore

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

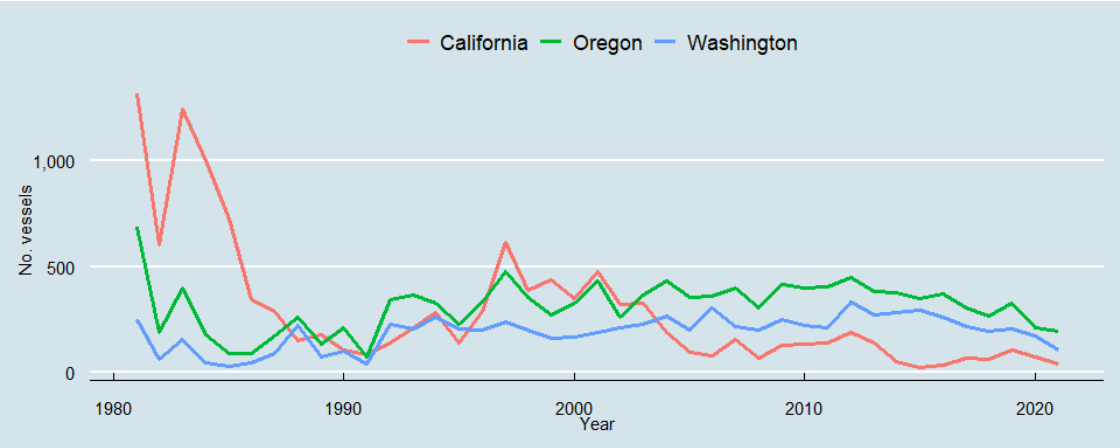


**Figure 4-1. Number of vessels participating in the albacore hook-and-line fishery by state, 1981-2021.**

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 2021 the fishery landed 3,491 mt valued at $15.54 million. This was less than 2020 when the fishery landed 6,858 mt valued at $24.09 million. Over the past 10 years the number of vessels participating in the fishery has varied from 293 in 2021 to 815 in 2012.

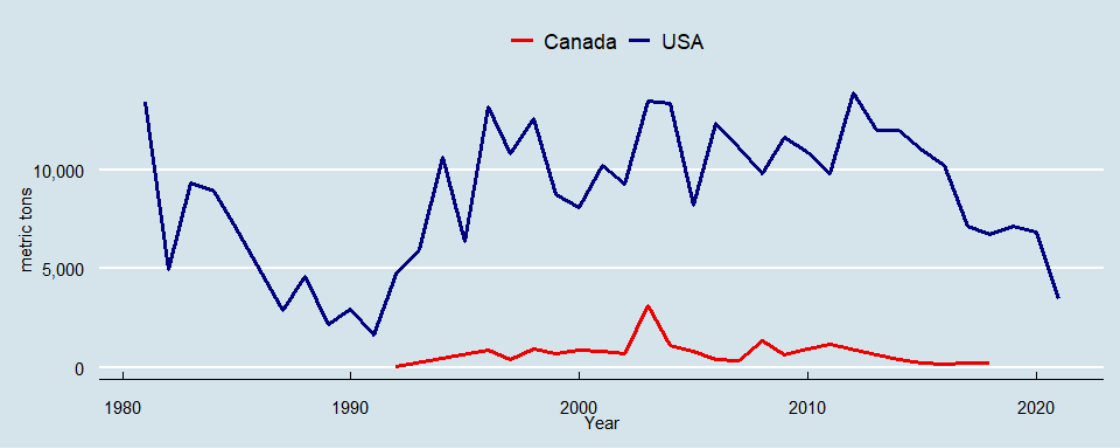


**Figure 4-2. Landings (mt) by U.S. and Canadian vessels in the albacore hook-and-line fishery, 1981-2021. Note that confidential data (i.e., landings with less than three vessels or processors) is excluded in this figure. Less than three Canadian vessels made landings, or less than three processors received landings from those vessels, throughout the 1980s.**

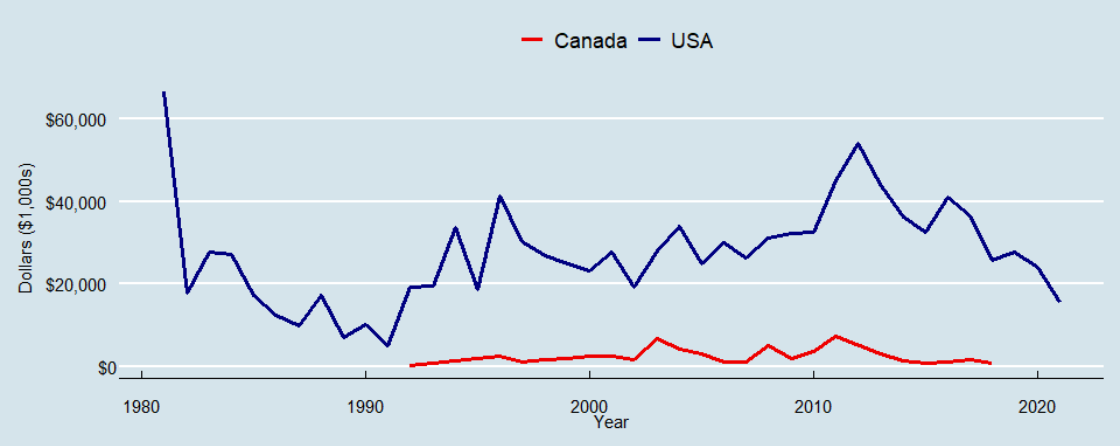


**Figure 4-3. Inflation-adjusted ex-vessel revenue in the albacore hook-and-line fishery, 1981-2021. (Confidential data is excluded.)**

### 4.1.2. Drift gillnet fishery for swordfish and shark

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

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

The fishery originally developed in the 1980s and has been in steady decline in terms of participation and catch since then. This decline is at least in part due to restrictions on the operation of the fishery to mitigate catch of marine mammals and sea turtles. Both Federal and California limited entry permits are required to participate. 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. Comparable Federal legislation is currently under consideration in Congress.

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.

The drift gillnet fishery is managed by California state and federal limited entry permits. 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 the last 10 years DGN landings have varied between 75 mt and 237 mt while inflation-adjusted ex-vessel revenue has varied between $389,683 and $1,410,697. In 2021 the fishery landed 75 mt valued at $536,897. This was less than 2020 when 97 mt was landed. During that period the number of vessels participating in the fishery varied between 6 in 2021 and 21 in several previous years.

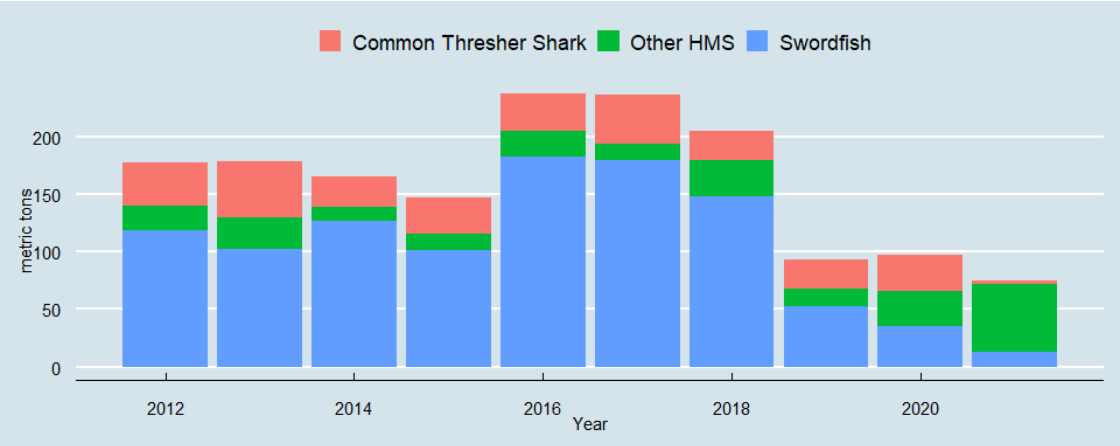


**Figure 4-4. Landings (mt) in the large mesh drift gillnet grouped by common thresher shark, swordfish, and other HMS, 2012-2021.**

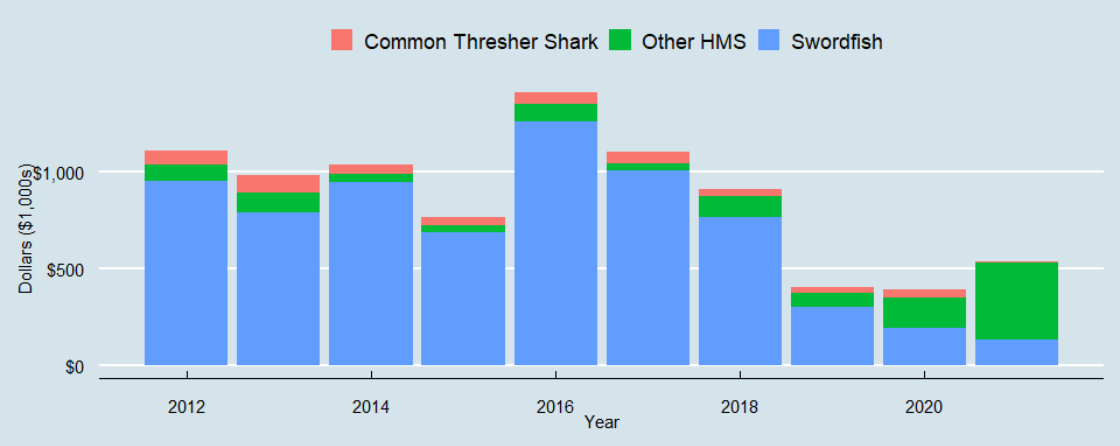


**Figure 4-5. Inflation-adjusted revenue in the large mesh drift gillnet grouped by common thresher shark, swordfish, and other HMS, 2012-2021.**

### 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 have varied between 5 mt and 28 mt while inflation-adjusted ex-vessel revenue has varied between $75,382 and $342,573. In 2021 the fishery landed 7 mt valued at $91,617 compared to 7 mt valued at $79,268 in 2020. During that period the number of vessels participating in the fishery varied between 10 in 2012 and 21 in 2017.

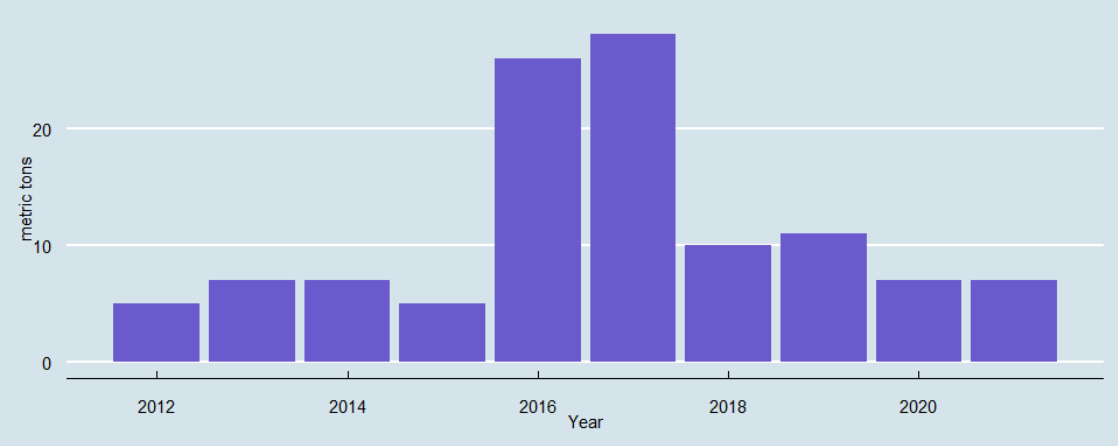


**Figure 4-6. Harpoon fishery landings (mt), 2012-2021.**

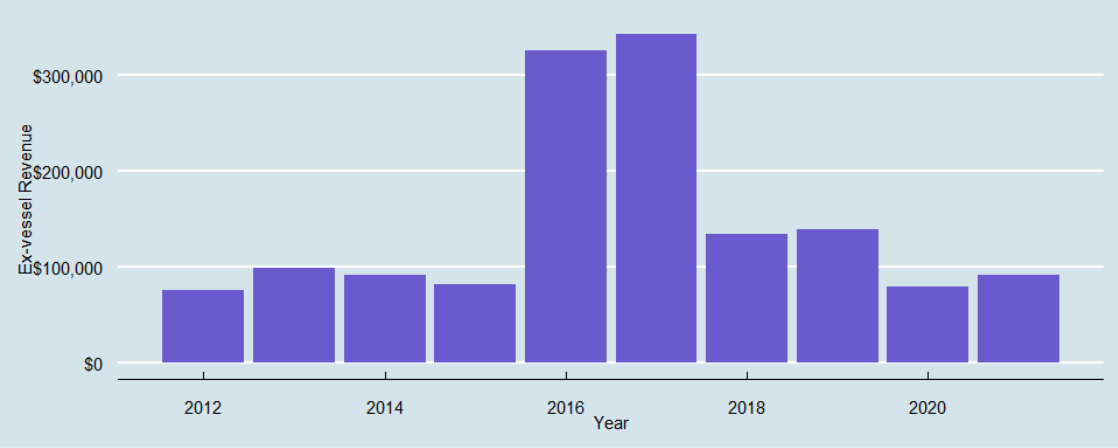


**Figure 4-7. Inflation-adjusted ex-vessel revenue in the harpoon fishery, 2012-2021.**

### 4.1.4. High seas longline fishery for swordfish and tuna

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 on the West Coast has varied from 8 to 23. Landings composition has shifted from swordfish to tunas and other species over the decade. In 2012 swordfish accounted for 68% and tunas 18% of the 411 mt in total landings made by this fishery. In 2021 swordfish accounted for 16% while tunas accounted for 61% of the 788 mt in total landings. Opah, which is not a management unit species in the HMS FMP, is also a significant component of landings. In

2021 at 143 mt it accounted for 18% of total landings. (Note that the totals reported here are greater than reported in Table 20, which only reports landings of management unit species.)

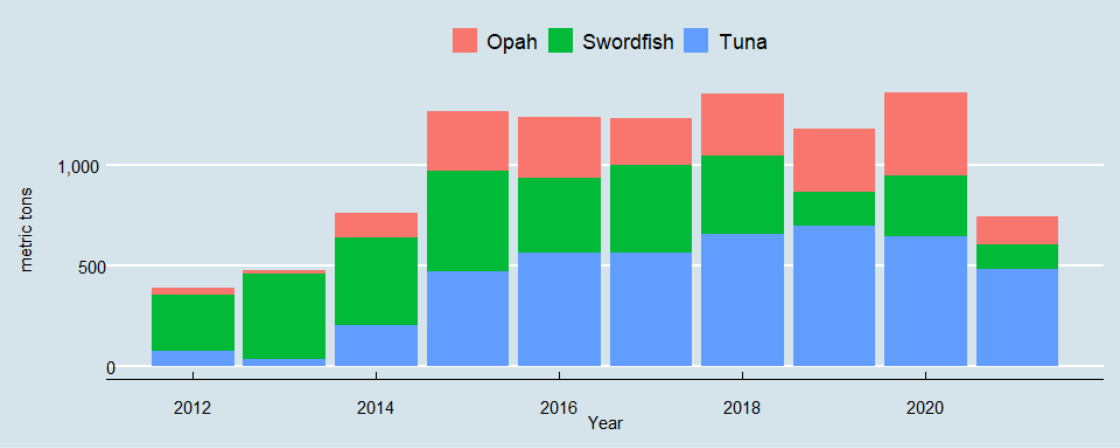


**Figure 4-8. Landings trends for opah, swordfish, and tun (mt) in the pelagic longline fishery, 2012-2021.**

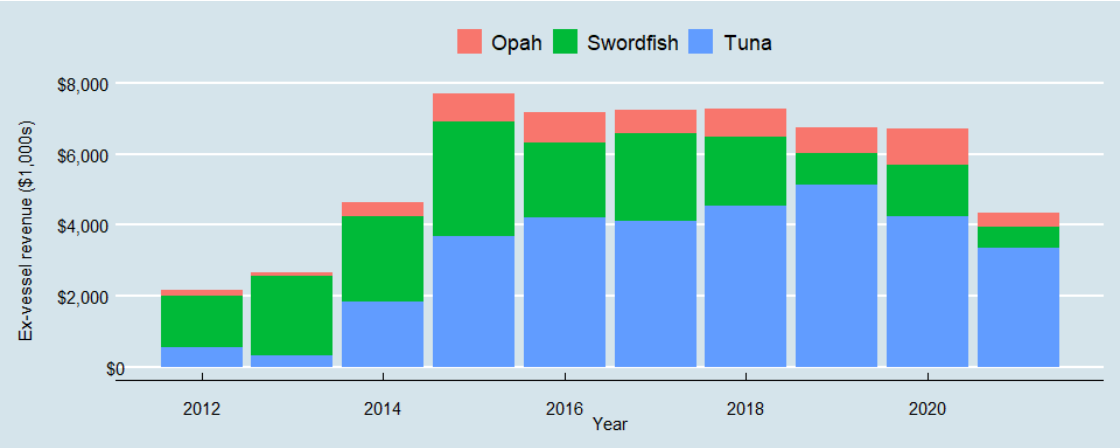


**Figure 4-9. Inflation-adjusted ex-vessel revenue for opah, swordfish, and tuna (mt) in the pelagic longline fishery, 2012-2021.**

### 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 2020 purse seine fishery HMS landings have varied between 598 mt and 2,500 mt while inflation-adjusted ex-vessel revenue has varied between $667,388 and $2,940,032. (Earlier years are excluded due to data confidentiality requirements.) In 2020 the fishery landed 1,882 mt valued at $2,129,971. This compares to 598 mt in 2019. During the past 10 years the number of vessels participating in the fishery varied between 1 in 2012 and 14 in 2018.

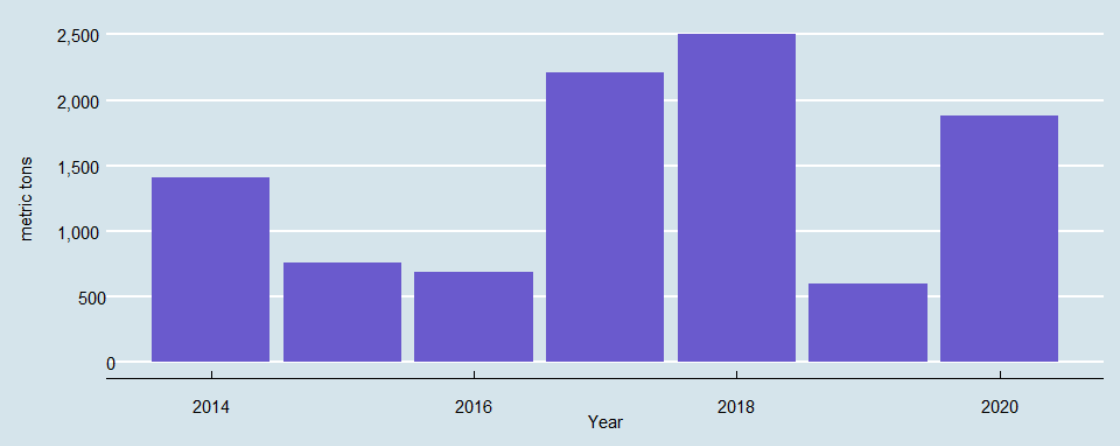


**Figure 4-10. Purse seine fishery landing (mt) between 2014 and 2020. (Earlier years are excluded due to data confidentiality requirements.)**

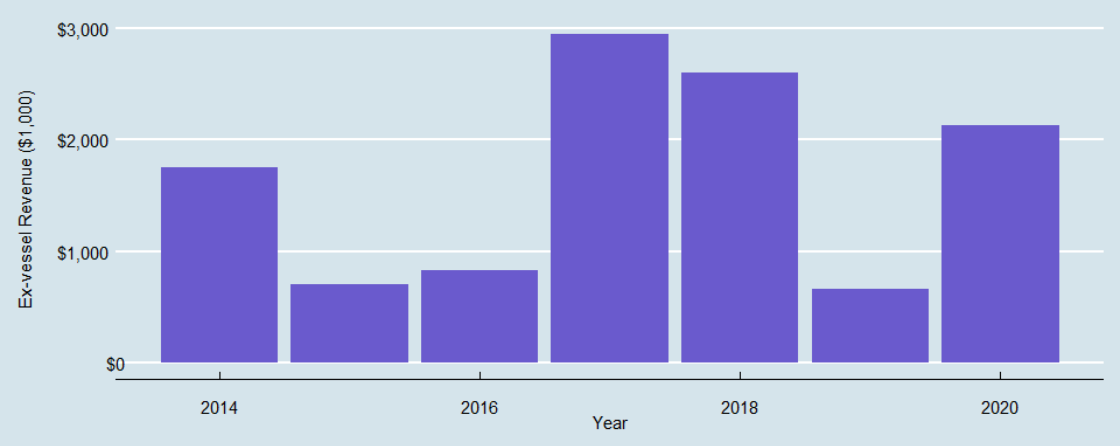


**Figure 4-11. Inflation-adjusted ex-vessel revenue for the purse seine fishery, 2012-2021.**

### 4.1.6. Deep-set buoy gear

Beginning in 2010 the Pfleger Institute of Environmental Research (PIER) began design and testing of deep-set buoy gear (DSBG) as a low bycatch method to catch swordfish. The design was inspired by gear used off the east coast of Florida, but both the gear and deployment method were modified to suit conditions on the West Coast. PIER first presented preliminary results to the Council in March 2012 after the first year of research trials. In March 2015 PIER submitted an exempted fishing permit (EFP) application for review by the Council. Under its proposal up to five commercial vessels would be authorized to test the gear with PIER researchers monitoring their activity. (Two other individuals independently applied for EFPs to test the gear type at this time.) While fishing under the PIER EFP continued, the Council began actively soliciting EFP applications to expand the number of vessels testing the gear. At the same time, the Council began scoping an FMP amendment to make DSBG a legal gear along with associated fishery management measures. Since then, the Council has reviewed and made recommendations on over 100 EFP applications to test DSBG and related gear configurations and NMFS has issued permits to more than 50 vessels. To date 34 vessels have made landings with the gear.

Two DSBG gear configurations have been tested. So-called standard DSBG consists of independently deployed pieces of gear. Each piece consists of a set of floats at the surface that allows fish strikes on the gear to be detected, a weighted vertical line that puts up to three hooks below surface waters where sea

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

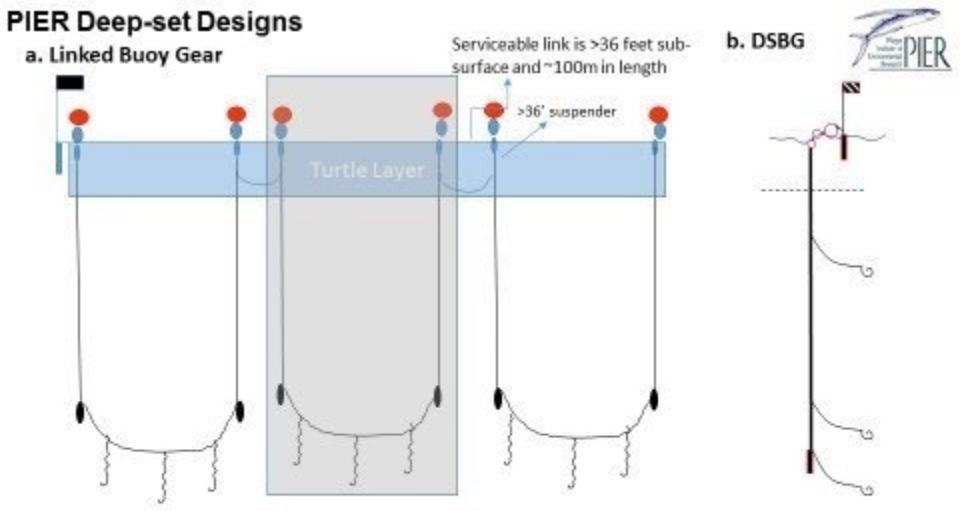


**Figure 4-12. Standard and linked DSBG configurations. (Source: Pfleger Institute of Environmental Research.)**

The Council took final action on a package of management measures in September 2019 including a limited entry permit program for vessels fishing in the Southern California Bight. The implementation process is ongoing and NMFS published an environmental impact statement evaluating the Council proposal in August 2021. Regulations authorizing the fishery should be in place by 2023.

Between 2015 and 2021 DSBG landings (including LBG) has varied from 12 mt in 2015 and 125 mt in 2020. Inflation adjusted ex-vessel revenue varied between $119,393 and $1,101,549.

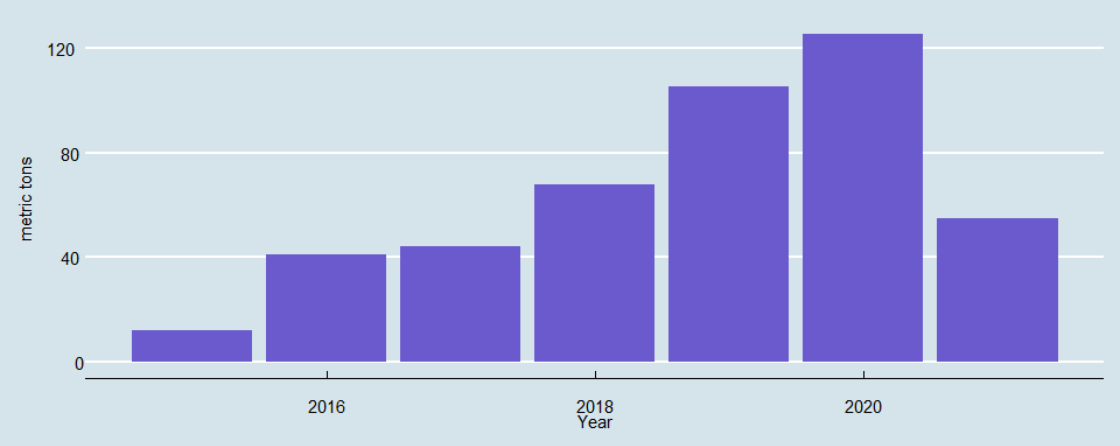


**Figure 4-13. Landings (mt) in the DSBG fishery, 2012.2021.**

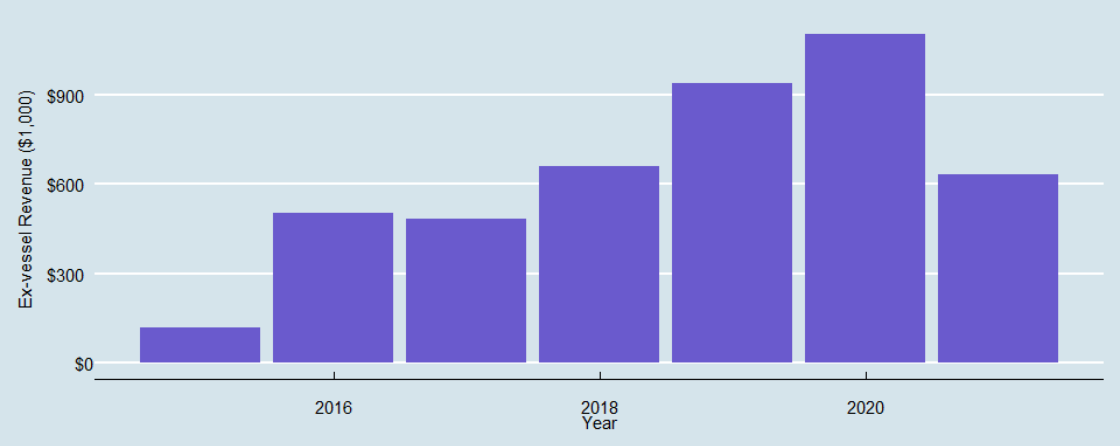


**Figure 4-14. Inflation adjusted ex-vessel revenue ($1,000s) in the DSBG fishery, 2012-2021..**

### 4.1.7. Participation by fishery

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

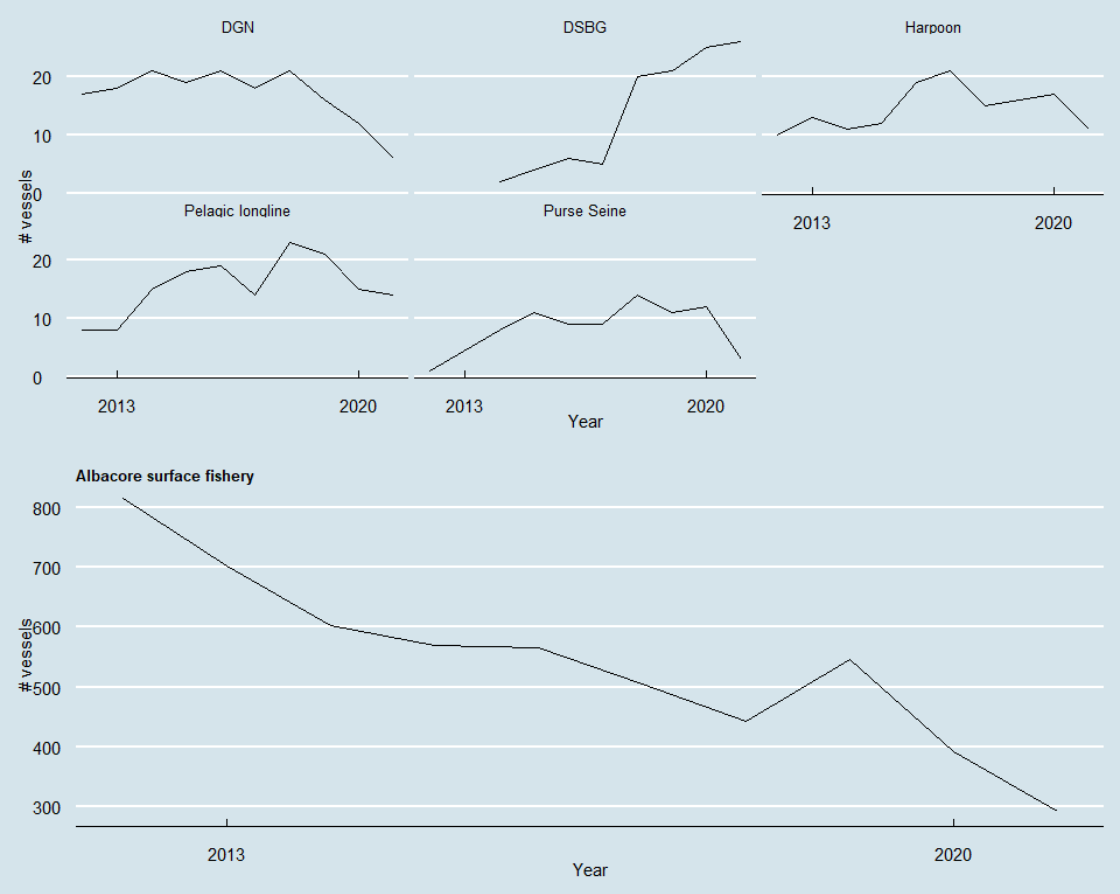


**Figure 4-15. Participation (no of vessels) by HMS fishery, 2012-2021.**

### 4.1.8. Seasonality of HMS landings

Landings in HMS fisheries vary throughout the year. This seasonal pattern 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 4,013 mt. and lowest in April at 96 mt.

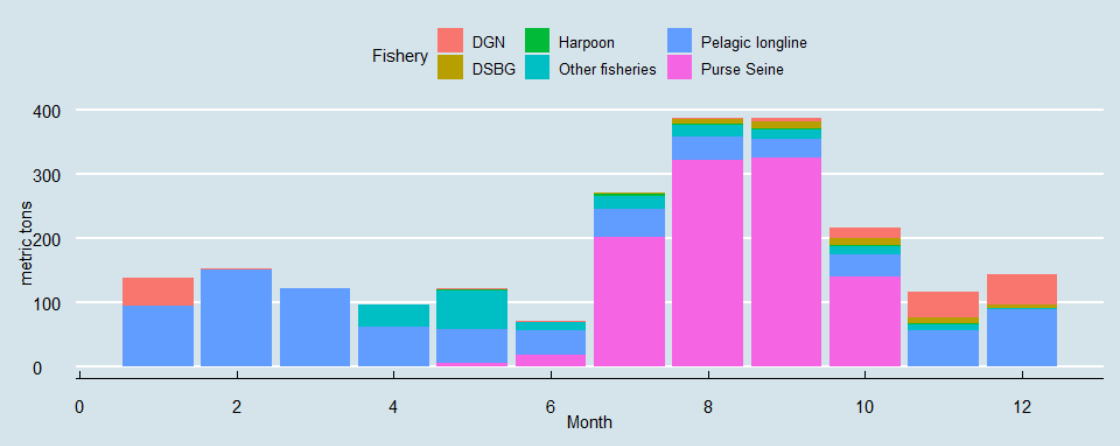


**Figure 4-16. Average monthly landings (mt) by HMS fishery (other than albacore), 2012-2021.**

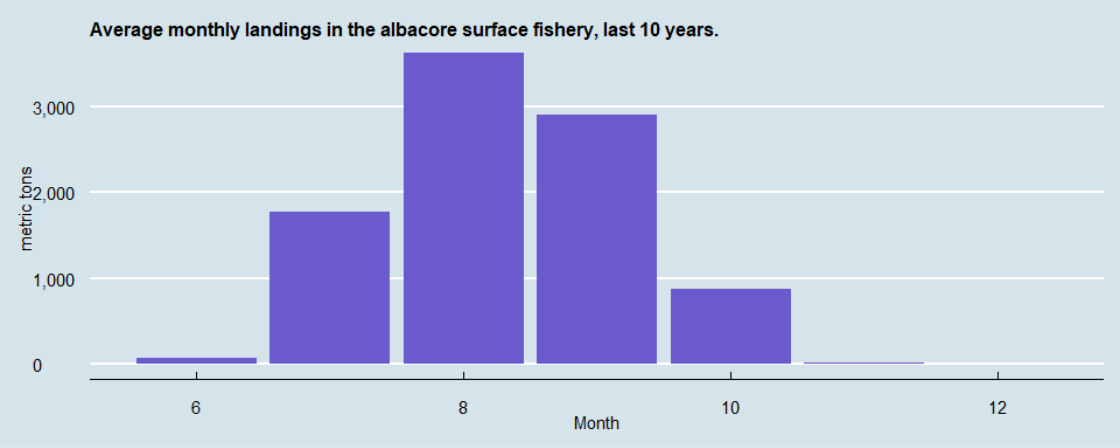


**Figure 4-17. Average monthly landings in the albacore hook-and-line fishery, 2012-2021.**

## *4.2. Commercial Fisheries Landings by Species*

### 4.2.1. 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 $23 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%.

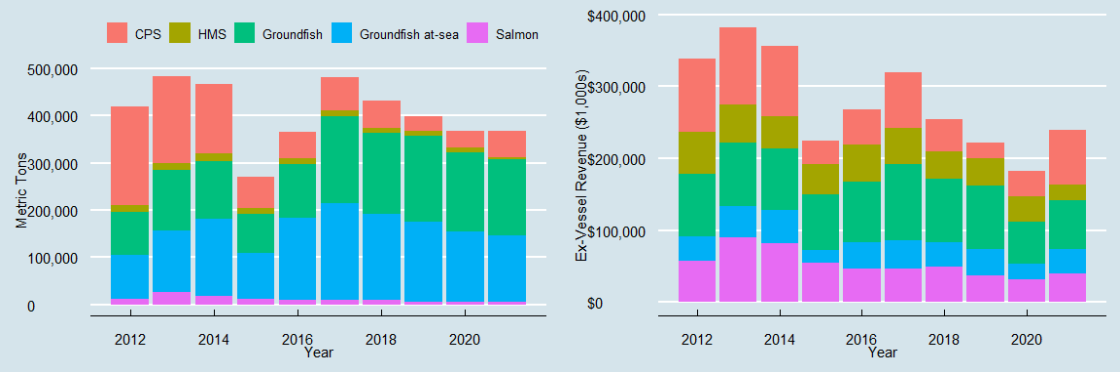


**Figure 4-18. Inflation-adjusted ex-vessel revenue by species group.**

### 4.2.2. North Pacific albacore tuna

In 2021 albacore landings totaled 3,591 metric tons worth $15,955,720 compared to 7,190 metric tons worth $25,201,440 in 2020. The following figure shows albacore landings (mt) and inflation-adjusted ex-vessel revenue ($1,000s) by year.


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

### 4.2.3. Swordfish

In 2021 swordfish landings totaled 146 metric tons worth $847,657 compared to 341 metric tons worth $1,763,487 in 2020. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue ($1,000s) by year.

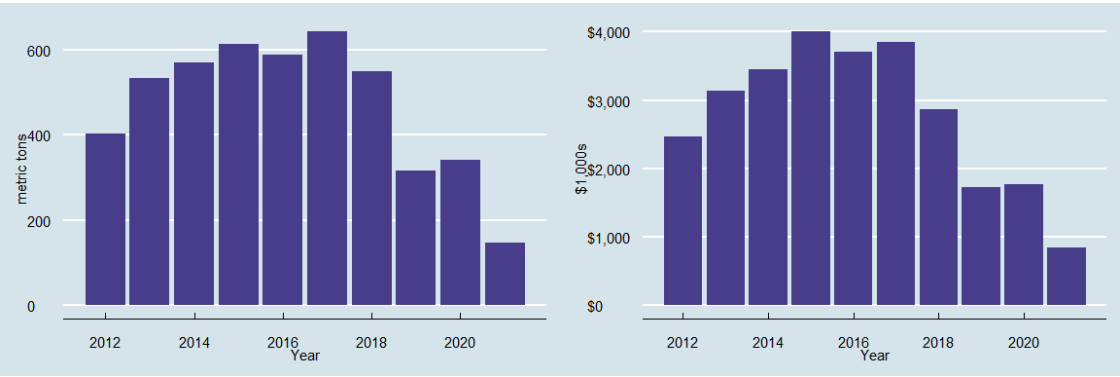


**Figure 4-20. Swordfish landings, mt (left), and revenue, current dollars, $1,000s (right).**

### 4.2.4. Tunas (other than albacore)

In 2021 landings of bigeye, bluefin, skipjack, and yellowfin tunas totaled 677 metric tons worth $4,984,823 compared to 2,603 metric tons worth $7,372,277 in 2020. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue ($1,000s) by year.

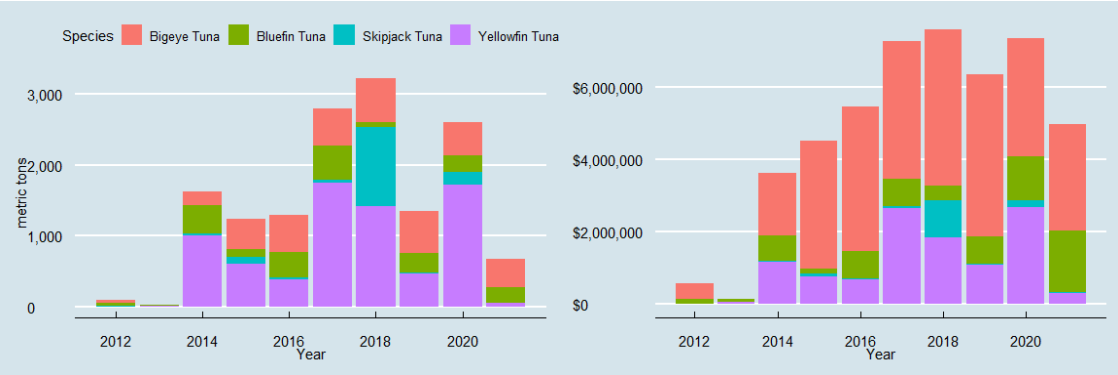


**Figure 4-21. Landings of tunas, excluding albacore, metric tons (left) and inflation-adjusted ex-vessel revenue (right).**

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 a Inter-American Tropical Tuna Commission Resolution. To address data confidentiality rules (less than 2 vessels or 2 processors) 2020 and 2021 data have been combined. During this period Purse seine has accounted for most landings, amounting to 68% of the total followed by HMS Hook and Line fishery at 23% and DGN at 9%.

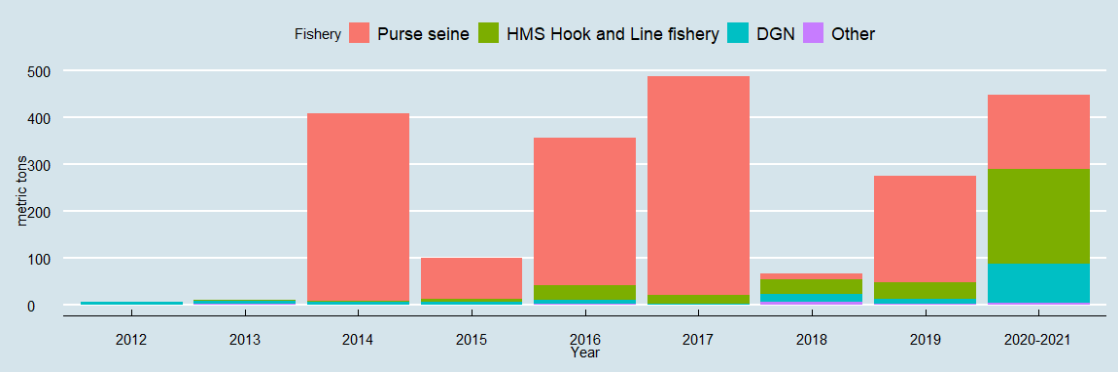


**Figure 4-22. Pacific bluefin tuna landings by selected gear types, 2012-2021**

### 4.2.5. Sharks

In 2021 landings of common thresher and shortfin mako sharks totaled 45 metric tons worth $76,462 compared to 78 metric tons worth $120,750 in 2020. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue for these species by year.

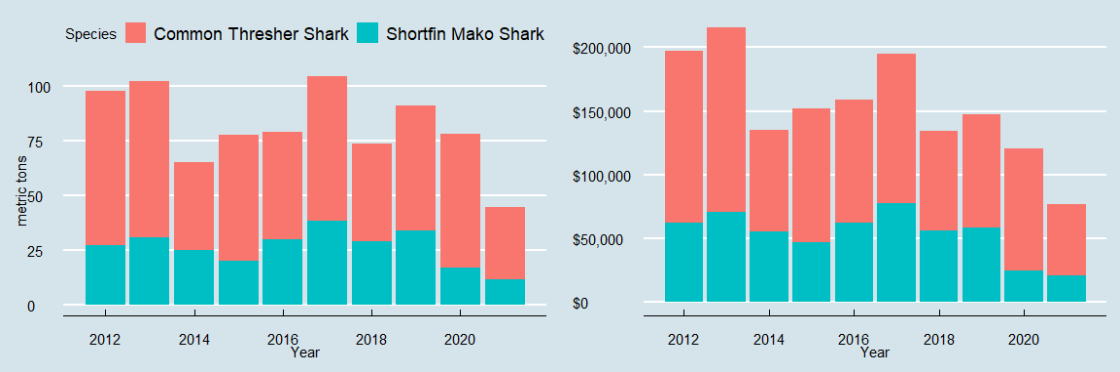


**Figure 4-23. Landings of common thresher and shortfin mako sharks, metric tons (left) and inflation-adjusted ex-vessel revenue (right)**

### 4.2.6. Other species

Blue shark and dorado landings are relatively modest in commercial fisheries compared to other HMS. In 2021 blue shark landings amounted to 2 metric tons worth $160 while dorado landings amounted 7 metric tons worth $35,970. This compares to landings of 3 metric tons worth $200 for blue shark and 13 metric tons worth $55,939 for dorado in 2020. The following figure shows landings (mt) and inflation-adjusted ex-vessel revenue for these species by year.

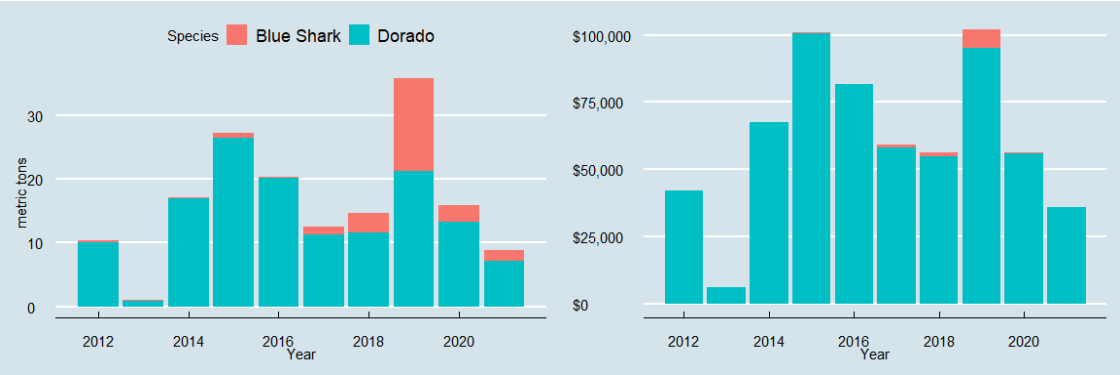


**Figure 4-24. Landings of blue shark and dorado, metric tons.**

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

Tables drawing from Pacific Fishery Information Network (PacFIN) data for historical fishery participation (number of vessels), landings (metric tons), and inflation-adjusted ex-vessel revenue in HMS fisheries are available on the Council website (last refreshed 03/22/22). Categorization of landings and revenue by HMS fishery uses procedures developed by Craig D'Angelo at NMFS West Coast Region. The first four tables in this series, providing an overview of landings and ex-vessel revenue. The HMSMT is currently working with PacFIN staff to develop a more flexible user interface for these data on the PacFIN website.

**Table 5-1. West Coast commercial HMS landings (round mt), nominal revenue ($1,000s), and average prices ($/lb) by species and year.**

| | | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | | Landings (mt) | Revenue ($1,000) | Average Price ($/lb) | Landings (mt) | Revenue ($1,000) | Average Price ($/lb) |
| Tunas | Albacore Tuna | 7,190 | 24,209 | $1.53 | 3,591 | 15,956 | $2.02 |
| | Bigeye Tuna | 473 | 3,142 | $3.01 | 405 | 2,939 | $3.29 |
| | Bluefin Tuna | 231 | 1,188 | $2.33 | 216 | 1,722 | $3.62 |
| | Skipjack Tuna | 179 | 168 | $0.42 | 3 | 8 | |
| | Yellowfin Tuna | 1,719 | 2,585 | $0.68 | 53 | 316 | $2.72 |
| Swordfish | Swordfish | 341 | 1,694 | $2.25 | 146 | 848 | $2.63 |
| Sharks | Blue Shark | 3 | 0.2 | | 2 | 0.2 | |
| | Common Thresher Shark | 61 | 92 | $0.68 | 33 | 56 | $0.76 |
| | Shortfin Mako Shark | 17 | 24 | $0.64 | 11 | 21 | $0.83 |
| Dorado | Dorado/Dolphinfish | 13 | 54 | $1.84 | 7 | 36 | $2.26 |
| **Total HMS** | | **10,228** | **33,155** | | **4,468** | **21,901** | |

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.
Average price per pound not reported for cells highlighted in orange because landings less than 5 mt.
Blank cells indicate null value (no data exist for that stratum).
Revenue and weight rounded to nearest whole unit. If revenue or weight was 1 it was rounded to nearest 0.1 of a unit.
Revenues are not adjusted for inflation.
Average prices are estimated as revenue divided by round pounds

**Table 5-2. West Coast commercial HMS landings (round mt), nominal revenue ($1,000s), and average prices by fisher.**

| | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|
| Fishery | Landings (mt) | Revenue ($1,000) | Average Price ($/lb) | Landings (mt) | Revenue ($1,000) | Average Price ($/lb) |
| Drift Gillnet | 97 | 374 | $1.75 | 76 | 537 | $3.21 |
| Harpoon | 7 | 76 | $5.04 | 7 | 92 | $5.83 |
| Longline | 971 | 5,549 | $2.59 | 618 | 3,996 | $2.93 |
| Other Fisheries | 412 | 1,967 | $2.17 | 221 | 1,708 | $3.51 |
| Purse Seine | 1,882 | 2,046 | $0.49 | | | |
| Surface Hook and Line | 6,859 | 23,142 | $1.53 | 3,491 | 15,539 | $2.02 |
| **Grand Total** | **10,228** | **33,155** | | **4,413** | **21,871** | |

Confidential values (less than 3 vessels or dealers) are not reported, and the cells are highlighted yellow.

If landings less than 5 mt average price per pound not reported and cell highlighted orange.
Revenues are not adjusted for inflation.
Average prices are estimated as revenue divided by round pounds
Data for Canadian surface hook-and-line vessels fishing in the U.S. EEZ are excluded from the table.

**Table 5-3. West Coast commercial landings (round mt) of HMS by all HMS and non-HMS gears, 1981-2021.**

| | Tunas | | | | | | Swordfish | Sharks | | | Dorado | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Albacore Tuna | Bigeye Tuna | Bluefin Tuna | Skipjack Tuna | Unspecified Tuna | Yellowfin Tuna | Swordfish | Blue Shark | Common Thresher Shark | Shortfin Mako Shark | Dorado/Dolphinfish | **Total** |
| 1981 | 13,712 | 1,168 | 868 | 57,869 | 40 | 76,090 | 749 | 92 | 1,521 | 182 | 4 | **152,296** |
| 1982 | 5,410 | 968 | 2,404 | 41,904 | 51 | 61,769 | 1,112 | 27 | 1,848 | 351 | 1 | **115,845** |
| 1983 | 9,578 | 21 | 764 | 44,995 | 55 | 55,740 | 1,763 | 7 | 1,331 | 217 | 0.6 | **114,472** |
| 1984 | 12,654 | 126 | 635 | 31,251 | 1,014 | 35,062 | 2,889 | 2 | 1,279 | 160 | 4 | **85,077** |
| 1985 | 7,301 | 7 | 3,254 | 2,977 | 468 | 15,024 | 3,418 | 1 | 1,190 | 149 | 0.2 | **33,789** |
| 1986 | 5,243 | 29 | 4,731 | 1,361 | 143 | 21,517 | 2,530 | 2 | 974 | 312 | | **36,841** |
| 1987 | 3,159 | 50 | 823 | 5,724 | 129 | 23,201 | 1,803 | 2 | 562 | 403 | | **35,855** |
| 1988 | 4,912 | 6 | 804 | 8,863 | 11 | 19,520 | 1,636 | 3 | 500 | 322 | 0.2 | **36,577** |
| 1989 | 2,214 | 0.6 | 1,019 | 4,505 | 77 | 17,615 | 1,358 | 6 | 504 | 255 | 0.4 | **27,555** |
| 1990 | 3,028 | 2 | 925 | 2,256 | 46 | 8,509 | 1,236 | 20 | 357 | 373 | 0.7 | **16,752** |
| 1991 | 1,676 | 7 | 104 | 3,407 | 11 | 4,177 | 1,029 | 0.7 | 584 | 219 | 0.3 | **11,216** |
| 1992 | 4,902 | 7 | 1,087 | 2,586 | 10 | 3,350 | 1,546 | 1 | 292 | 142 | 3 | **13,926** |
| 1993 | 6,166 | 26 | 559 | 4,539 | 16 | 3,795 | 1,767 | 0.5 | 275 | 122 | 17 | **17,281** |
| 1994 | 10,751 | 47 | 916 | 2,111 | 33 | 5,056 | 1,700 | 12 | 330 | 128 | 41 | **21,124** |
| 1995 | 6,530 | 49 | 714 | 7,037 | 1 | 3,038 | 1,162 | 5 | 270 | 95 | 5 | **18,906** |
| 1996 | 14,173 | 62 | 4,688 | 5,455 | 3 | 3,347 | 1,198 | 0.9 | 319 | 96 | 10 | **29,352** |
| 1997 | 11,292 | 82 | 2,251 | 6,070 | 11 | 4,775 | 1,459 | 0.6 | 320 | 132 | 5 | **26,397** |
| 1998 | 13,915 | 53 | 1,949 | 5,846 | 12 | 5,799 | 1,408 | 3 | 361 | 100 | 3 | **29,449** |
| 1999 | 9,782 | 108 | 186 | 3,758 | 12 | 1,353 | 2,033 | 0.3 | 321 | 63 | 17 | **17,634** |
| 2000 | 9,071 | 84 | 312 | 780 | 0.9 | 1,159 | 2,657 | 0.8 | 296 | 80 | 43 | **14,484** |
| 2001 | 11,194 | 53 | 196 | 58 | 0.6 | 655 | 2,205 | 2 | 373 | 46 | 16 | **14,798** |
| 2002 | 10,031 | 10 | 11 | 236 | 2 | 544 | 1,726 | 41 | 301 | 82 | 0.3 | **12,984** |
| 2003 | 16,668 | 35 | 36 | 349 | | 465 | 2,135 | 0.8 | 301 | 70 | 6 | **20,067** |
| 2004 | 14,540 | 22 | 10 | 307 | 9 | 488 | 1,184 | 0.5 | 115 | 54 | 1 | **16,732** |
| 2005 | 9,055 | | 207 | 523 | | 285 | 297 | 0.9 | 179 | 33 | 0.2 | **10,580** |

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| | Tunas | | | | | | Swordfish | Sharks | | | Dorado | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Albacore Tuna | Bigeye Tuna | Bluefin Tuna | Skipjack Tuna | Unspecified Tuna | Yellowfin Tuna | Swordfish | Blue Shark | Common Thresher Shark | Shortfin Mako Shark | Dorado/Dolphinfish | **Total** |
| 2006 | 12,786 | | 0.8 | 48 | | 77 | 541 | 0.4 | 160 | 46 | 3 | **13,662** |
| 2007 | 11,594 | | 45 | 5 | | 104 | 550 | 10 | 204 | 45 | 2 | **12,558** |
| 2008 | 11,137 | 27 | 0.8 | 3 | 0.6 | 65 | 531 | 0.2 | 148 | 35 | 2 | **11,950** |
| 2009 | 12,335 | | 415 | 5 | | 45 | 414 | 1 | 106 | 31 | 0.7 | **13,354** |
| 2010 | 11,856 | | 1 | | | 0.8 | 370 | 0.2 | 96 | 22 | 4 | **12,350** |
| 2011 | 11,050 | 46 | 118 | 1 | | 0.6 | 610 | 0.2 | 77 | 19 | 3 | **11,925** |
| 2012 | 13,935 | 49 | 43 | 1.0 | | 2 | 403 | 0.2 | 70 | 27 | 10 | **14,541** |
| 2013 | 12,938 | | 10 | 1.0 | | 6 | 533 | 0.1 | 71 | 31 | 0.9 | **13,591** |
| 2014 | 12,467 | 185 | 408 | 19 | 1 | 1,009 | 574 | 0.1 | 40 | 25 | 17 | **14,745** |
| 2015 | 11,313 | 440 | 98 | 110 | 0.8 | 596 | 624 | 0.8 | 58 | 20 | 26 | **13,287** |
| 2016 | 10,451 | 523 | 356 | 36 | 1 | 379 | 629 | 0.1 | 50 | 30 | 20 | **12,474** |
| 2017 | 7,462 | 520 | 486 | 42 | | 1,748 | 686 | 1 | 66 | 38 | 11 | **11,060** |
| 2018 | 6,951 | 615 | 65 | 1,124 | | 1,417 | 616 | 3 | 45 | 29 | 12 | **10,877** |
| 2019 | 7,585 | 597 | 274 | 19 | | 460 | 421 | 15 | 57 | 34 | 21 | **9,483** |
| 2020 | 7,190 | 473 | 231 | 179 | | 1,719 | 465 | 3 | 62 | 17 | 13 | **10,352** |
| 2021 | 3,591 | 405 | 216 | 3 | | 53 | 200 | 2 | 34 | 12 | 7 | **4,523** |

Blank cells indicate null value (no data exist for that stratum).
Weight rounded to the nearest mt. If less than 1 mt was landed, weight rounded to nearest 0.1 mt.
If a record is confidential (fewer than 3 vessels or dealers) data is suppressed and it is highlighted yellow.

**Table 5-4. West Coast real commercial ex-vessel revenues (inflation adjusted, 2021, $1,000s) from HMS landings by all HMS and non-HMS gears, 1981-2021.**

| | Tunas | | | | | | Swordfish | Sharks | | | Dorado | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Albacore Tuna | Bigeye Tuna | Bluefin Tuna | Skipjack Tuna | Unspecified Tuna | Yellowfin Tuna | Swordfish | Blue Shark | Common Thresher Shark | Shortfin Mako Shark | Dorado/Dolphinfish | **Total** |
| 1981 | 67,875 | 4,017 | 3,171 | 169,741 | 186 | 252,630 | 8,585 | 151 | 3,776 | 415 | 7 | **510,556** |
| 1982 | 19,368 | 2,913 | 6,486 | 97,663 | 239 | 179,543 | 12,335 | 45 | 4,775 | 818 | 2 | **324,187** |
| 1983 | 28,402 | 107 | 2,466 | 85,033 | 222 | 137,984 | 15,777 | 11 | 3,420 | 533 | 2 | **273,955** |
| 1984 | 38,530 | 390 | 2,026 | 55,506 | 5,800 | 82,929 | 26,021 | 6 | 3,677 | 425 | 10 | **215,319** |
| 1985 | 17,995 | 38 | 6,117 | 4,596 | 2,233 | 31,878 | 29,111 | 5 | 3,943 | 419 | 0.8 | **96,336** |
| 1986 | 13,141 | 192 | 9,862 | 1,924 | 422 | 38,455 | 27,069 | 3 | 3,596 | 911 | | **95,575** |
| 1987 | 10,645 | 366 | 4,271 | 9,190 | 931 | 57,876 | 23,077 | 4 | 2,458 | 1,485 | | **110,303** |
| 1988 | 18,281 | 52 | 4,151 | 18,546 | 161 | 54,195 | 19,488 | 5 | 1,965 | 1,303 | 1 | **118,148** |
| 1989 | 7,306 | 5 | 2,454 | 7,614 | 246 | 40,191 | 15,940 | 7 | 1,822 | 1,066 | 0.9 | **76,652** |
| 1990 | 10,455 | 16 | 2,138 | 3,532 | 106 | 17,453 | 13,293 | 19 | 1,188 | 1,375 | 4 | **49,579** |
| 1991 | 5,080 | 77 | 209 | 4,844 | 38 | 7,190 | 11,410 | 2 | 1,743 | 747 | 2 | **31,342** |
| 1992 | 20,199 | 79 | 1,987 | 2,481 | 37 | 6,469 | 13,310 | 3 | 816 | 406 | 11 | **45,799** |
| 1993 | 20,096 | 363 | 1,293 | 5,640 | 125 | 8,284 | 15,383 | 1 | 788 | 380 | 73 | **52,425** |
| 1994 | 33,958 | 517 | 2,816 | 2,946 | 93 | 7,607 | 16,141 | 27 | 983 | 416 | 126 | **65,627** |
| 1995 | 19,072 | 426 | 1,743 | 7,832 | 8 | 5,018 | 10,826 | 5 | 788 | 272 | 9 | **46,000** |
| 1996 | 44,046 | 421 | 6,529 | 6,450 | 46 | 5,228 | 9,811 | 0.9 | 976 | 270 | 16 | **73,793** |
| 1997 | 31,699 | 572 | 4,413 | 8,758 | 35 | 7,941 | 9,781 | 0.5 | 941 | 362 | 17 | **64,519** |
| 1998 | 29,722 | 428 | 4,665 | 8,200 | 97 | 9,221 | 9,409 | 9 | 984 | 277 | 17 | **63,029** |
| 1999 | 27,434 | 1,019 | 1,376 | 4,262 | 94 | 2,218 | 13,098 | 0.1 | 957 | 172 | 74 | **50,706** |
| 2000 | 26,063 | 860 | 820 | 733 | 3 | 1,877 | 17,886 | 1 | 867 | 200 | 96 | **49,408** |
| 2001 | 30,623 | 475 | 693 | 50 | 3 | 690 | 12,965 | 2 | 881 | 112 | 30 | **46,525** |
| 2002 | 20,815 | 125 | 61 | 187 | 9 | 860 | 9,360 | 27 | 735 | 181 | 1 | **32,362** |
| 2003 | 34,910 | 376 | 106 | 229 | | 642 | 11,244 | 0.6 | 695 | 165 | 15 | **48,383** |
| 2004 | 38,233 | 206 | 53 | 152 | 77 | 623 | 6,736 | 0.7 | 275 | 137 | 8 | **46,501** |
| 2005 | 28,174 | | 185 | 395 | | 427 | 2,570 | 0.6 | 368 | 78 | 2 | **32,199** |

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| | Tunas | | | | | | Swordfish | Sharks | | | Dorado | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Albacore Tuna | Bigeye Tuna | Bluefin Tuna | Skipjack Tuna | Unspecified Tuna | Yellowfin Tuna | Swordfish | Blue Shark | Common Thresher Shark | Shortfin Mako Shark | Dorado/Dolphinfish | **Total** |
| 2006 | 31,195 | | 5 | 53 | | 229 | 3,606 | 0.4 | 396 | 104 | 24 | **35,613** |
| 2007 | 27,669 | | 74 | 6 | | 191 | 4,002 | 3 | 432 | 100 | 13 | **32,490** |
| 2008 | 36,187 | 258 | 4 | 5 | 4 | 157 | 2,967 | 0.4 | 352 | 82 | 12 | **40,029** |
| 2009 | 34,454 | | 552 | 7 | | 208 | 2,432 | 3 | 246 | 68 | 5 | **37,974** |
| 2010 | 36,390 | | 8 | | | 8 | 2,712 | 0.2 | 194 | 40 | 20 | **39,372** |
| 2011 | 52,282 | 394 | 289 | 2 | | 1 | 4,003 | 0.1 | 123 | 46 | 14 | **57,154** |
| 2012 | 54,288 | 435 | 114 | 2 | | 16 | 2,475 | 0.0 | 135 | 62 | 42 | **57,568** |
| 2013 | 48,790 | | 80 | 4 | | 47 | 3,141 | 0.0 | 144 | 71 | 6 | **52,285** |
| 2014 | 37,724 | 1,734 | 717 | 17 | 4 | 1,170 | 3,503 | 0.0 | 79 | 56 | 67 | **45,070** |
| 2015 | 33,283 | 3,538 | 150 | 84 | 7 | 754 | 4,118 | 0.5 | 106 | 47 | 101 | **42,188** |
| 2016 | 42,197 | 3,981 | 765 | 38 | 2 | 673 | 4,211 | 0.0 | 98 | 62 | 82 | **52,107** |
| 2017 | 38,223 | 3,808 | 771 | 46 | | 2,655 | 4,335 | 0.8 | 117 | 78 | 58 | **50,093** |
| 2018 | 26,751 | 4,299 | 427 | 1,024 | | 1,839 | 3,521 | 1 | 79 | 57 | 55 | **38,054** |
| 2019 | 29,341 | 4,472 | 770 | 21 | | 1,088 | 2,666 | 7 | 90 | 59 | 95 | **38,609** |
| 2020 | 25,201 | 3,271 | 1,236 | 174 | | 2,691 | 2,864 | 0.2 | 96 | 25 | 56 | **35,616** |
| 2021 | 15,956 | 2,939 | 1,728 | 8 | | 316 | 1,471 | 0.2 | 57 | 21 | 36 | **22,532** |

Blank cells indicate null value (no data exist for that stratum).
Ex-vessel revenues rounded to the nearest $1,000. If less than $1,000 was landed Ex-vessel revenue rounded to nearest 0.1
If a record is confidential (fewer than 3 vessels or dealers) data is suppressed and it is highlighted yellow.

# 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.

## *5.2. Fishery performance*

The following tables show recreational albacore catch, fishing effort, and catch per unit of effort (tables updated 08/08/2022):

- Table R1. Recreational albacore catch (number of kept fish) for charter and private boats by year and port, 2019-2021.
- Table R2. Recreational albacore effort (angler days*) for charter and private boats by year and port, 2019-2021.
- Table R3. Recreational albacore catch per unit of effort (number of kept fish/angler day*) for charter and private boats by year and port, 2019-2021.

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 6-1 (Table R1). Recreational albacore catch (number of kept fish) for charter and private boats by year and port, 2019-2021.**

| | 2019 | | | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** |
| North Coast | 99 | 694 | 793 | 0 | 0 | 0 | 0 | 42 | 42 |
| Westport | 19,363 | 33,994 | 53,357 | 8,718 | 13,265 | 21,982 | 3,405 | 3,115 | 6,520 |
| Ilwaco | 4,722 | 28,746 | 33,468 | 965 | 4,465 | 5,431 | 928 | 3,242 | 4,170 |
| **Washington Subtotal** | **24,184** | **63,434** | **87,618** | **9,683** | **17,730** | **27,413** | **4,333** | **6,399** | **10,732** |
| Astoria | 0 | 1,929 | 1,929 | 0 | 85 | 85 | 0 | 53 | 53 |
| Garibaldi | 583 | 11,733 | 12,316 | 63 | 1,111 | 1,174 | 59 | 1,384 | 1,443 |
| Pacific City | 0 | 2,826 | 2,826 | 0 | 78 | 78 | 0 | 122 | 122 |
| Depoe Bay | 2,629 | 3,214 | 5,843 | 0 | 478 | 478 | 36 | 1,018 | 1,054 |
| Newport | 1,944 | 7,984 | 9,928 | 11 | 887 | 898 | 56 | 1,866 | 1,922 |
| Florence | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 186 | 186 |
| Winchester Bay | 0 | 14,984 | 14,984 | 0 | 15 | 15 | 0 | 4,626 | 4,626 |
| Coos Bay | 359 | 41,083 | 41,442 | 0 | 465 | 465 | 52 | 7,144 | 7,196 |
| Bandon | 450 | 2,248 | 2,698 | 0 | 0 | 0 | 83 | 243 | 326 |
| Gold Beach | 0 | 592 | 592 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brookings | 27 | 5,751 | 5,778 | 0 | 1,699 | 1,699 | 233 | 3,696 | 3,929 |
| **Oregon Subtotal** | **5,992** | **92,344** | **98,336** | **74** | **4,818** | **4,892** | **519** | **20,338** | **20,857** |

| | 2019 | | | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** |
| San Francisco District | 493 | 143 | 636 | 57 | 0 | 57 | 10 | 0 | 10 |
| Central District | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Channel District | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South District | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Redwood District | 1,656 | 8,173 | 9,829 | 844 | 5,644 | 6,488 | 373 | 9,269 | 9,642 |
| Wine District | 1,424 | 19,166 | 20,590 | 327 | 6,863 | 7,190 | 0 | 0 | 0 |
| **California Subtotal** | **3,573** | **27,482** | **31,055** | **1,228** | **12,507** | **13,735** | **383** | **9,269** | **9,652** |
| Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| **Mexico Subtotal** | **0** | **0** | **0** | **0** | **0** | **0** | **20** | **0** | **20** |
| **Oregon-Washington Total** | **30,176** | **155,778** | **185,954** | **9,757** | **22,548** | **32,305** | **4,852** | **26,737** | **31,589** |
| **U.S. Total** | **33,749** | **183,260** | **217,009** | **10,985** | **35,055** | **46,040** | **5,235** | **36,006** | **41,241** |
| **Coastwide Total** | **33,749** | **183,260** | **217,009** | **10,985** | **35,055** | **46,040** | **5,255** | **36,006** | **41,261** |

**Table 6-2 (Table R2). Recreational albacore effort (angler days*) for charter and private boats by year and port, 2019-2021.**

| | 2019 | | | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** |
| North Coast | 15 | 239 | 255 | 0 | 0 | 0 | 0 | 49 | 49 |
| Westport | 1,611 | 6469 | 8080 | 757 | 3735 | 4492 | 613 | 1944 | 2557 |
| Ilwaco | 983 | 5121 | 6103 | 571 | 1743 | 2314 | 630 | 1310 | 1940 |
| **Washington Subtotal** | **2,609** | **11829** | **14438** | **1,328** | **5478** | **6806** | **1,243** | **3303** | **4546** |
| Astoria | 0 | 415 | 415 | 0 | 63 | 63 | 0 | 61 | 61 |
| Garibaldi | 140 | 2044 | 2184 | 47 | 797 | 844 | 38 | 762 | 800 |
| Pacific City | 0 | 475 | 475 | 0 | 94 | 94 | 0 | 43 | 43 |
| Depoe Bay | 631 | 724 | 1355 | 0 | 264 | 264 | 33 | 260 | 293 |
| Newport | 574 | 1797 | 2371 | 23 | 521 | 544 | 10 | 536 | 546 |
| Florence | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 34 |
| Winchester Bay | 0 | 2002 | 2002 | 0 | 31 | 31 | 0 | 1117 | 1117 |
| Coos Bay | 68 | 5088 | 5156 | 0 | 317 | 317 | 31 | 1730 | 1761 |
| Bandon | 46 | 339 | 385 | 0 | 0 | 0 | 32 | 98 | 130 |
| Gold Beach | 0 | 96 | 96 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brookings | 10 | 862 | 872 | 0 | 409 | 409 | 38 | 984 | 1022 |
| **Oregon Subtotal** | **1,469** | **13842** | **15311** | **70** | **2496** | **2566** | **182** | **5625** | **5807** |

| | 2019 | | | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** |
| SAN FRANCISCO DISTRICT | 105 | NA | NA | 24 | NA | NA | 8 | NA | NA |
| CENTRAL DISTRICT | 0 | NA | NA | 0 | NA | NA | 0 | NA | NA |
| CHANNEL DISTRICT | 0 | NA | NA | 4 | NA | NA | 0 | NA | NA |
| SOUTH DISTRICT | 0 | NA | NA | 0 | NA | NA | 0 | NA | NA |
| REDWOOD DISTRICT | 396 | NA | NA | 203 | NA | NA | 47 | NA | NA |
| WINE DISTRICT | 217 | NA | NA | 101 | NA | NA | 0 | NA | NA |
| **California Subtotal** | **718** | **NA** | **NA** | **332** | **NA** | **NA** | **55** | **NA** | **NA** |
| Mex | 0 | NA | NA | 0 | NA | NA | 31 | NA | NA |
| **Mexico Subtotal** | **0** | **NA** | **NA** | **0** | **NA** | **NA** | **31** | **NA** | **NA** |
| **Oregon-Washington Total** | **4,078** | **25671** | **29749** | **1,398** | **7974** | **9372** | **1,425** | **8928** | **10353** |
| **U.S. Total** | **4,796** | **NA** | **NA** | **1,730** | **NA** | **NA** | **1,480** | **NA** | **NA** |
| **Coastwide Total** | **4,796** | **NA** | **NA** | **1,730** | **NA** | **NA** | **1,511** | **NA** | **NA** |

**Table 6-3 (Table R3). Recreational albacore catch per unit of effort (number of kept fish/angler day*) for charter and private boats by year and port, 2019-2021.**

| | 2019 | | | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** |
| North Coast | 6.5 | 2.9 | 3.1 | 0.0 | 0 | 0 | 0.0 | 0.8 | 0.8 |
| Westport | 12.0 | 5.3 | 6.6 | 11.5 | 3.6 | 4.9 | 5.6 | 1.6 | 2.5 |
| Ilwaco | 4.8 | 5.6 | 5.5 | 1.7 | 2.6 | 2.3 | 1.5 | 2.5 | 2.1 |
| **Washington Subtotal** | **23.3** | **13.8** | **15.2** | **13.2** | **6.2** | **7.2** | **7.1** | **4.9** | **5.4** |
| Astoria | 0.0 | 4.6 | 4.6 | 0.0 | 1.3 | 1.3 | 0.0 | 0.9 | 0.9 |
| Garibaldi | 4.2 | 5.7 | 5.6 | 1.3 | 1.4 | 1.4 | 1.6 | 1.8 | 1.8 |
| Pacific City | 0.0 | 5.9 | 5.9 | 0.0 | 0.8 | 0.8 | 0.0 | 2.8 | 2.8 |
| Depoe Bay | 4.2 | 4.4 | 4.3 | 0.0 | 1.8 | 1.8 | 1.1 | 3.9 | 3.6 |
| Newport | 3.4 | 4.4 | 4.2 | 0.5 | 1.7 | 1.7 | 5.6 | 3.5 | 3.5 |
| Florence | 0.0 | 0 | 0 | 0.0 | 0 | 0 | 0.0 | 5.5 | 5.5 |
| Winchester Bay | 0.0 | 7.5 | 7.5 | 0.0 | 0.5 | 0.5 | 0.0 | 4.1 | 4.1 |
| Coos Bay | 5.3 | 8.1 | 8 | 0.0 | 1.5 | 1.5 | 1.7 | 4.1 | 4.1 |
| Bandon | 9.8 | 6.6 | 7 | 0.0 | 0 | 0 | 2.6 | 2.5 | 2.5 |
| Gold Beach | 0.0 | 6.2 | 6.2 | 0.0 | 0 | 0 | 0.0 | 0 | 0 |
| Brookings | 2.7 | 6.7 | 6.6 | 0.0 | 4.2 | 4.2 | 6.1 | 3.8 | 3.8 |

| | 2019 | | | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** | **Charter** | **Private** | **Combined** |
| **Oregon Subtotal** | **29.6** | **60.1** | **59.9** | **1.8** | **13.2** | **13.2** | **18.7** | **32.9** | **32.6** |
| San Francisco District | 105.0 | NA | NA | 24.0 | NA | NA | 8.0 | NA | NA |
| Central District | 0.0 | NA | NA | 0.0 | NA | NA | 0.0 | NA | NA |
| Channel District | 0.0 | NA | NA | 4.0 | NA | NA | 0.0 | NA | NA |
| South District | 0.0 | NA | NA | 0.0 | NA | NA | 0.0 | NA | NA |
| Redwood District | 396.0 | NA | NA | 203.0 | NA | NA | 47.0 | NA | NA |
| Wine District | 217.0 | NA | NA | 101.0 | NA | NA | 0.0 | NA | NA |
| **California Subtotal** | **718.0** | **NA** | **NA** | **332.0** | **NA** | **NA** | **55.0** | **NA** | **NA** |
| Mexico | 0.0 | NA | NA | 0.0 | NA | NA | 31.0 | NA | NA |
| **Mexico Subtotal** | **0.0** | **NA** | **NA** | **0.0** | **NA** | **NA** | **31.0** | **NA** | **NA** |
| **Oregon-Washington Total** | **52.9** | **73.9** | **75.1** | **15.0** | **19.4** | **20.4** | **25.8** | **37.8** | **38** |
| **U.S. Total** | **4,796.0** | **NA** | **NA** | **1,730.0** | **NA** | **NA** | **1,480.0** | **NA** | **NA** |
| **Coastwide Total** | **4,796.0** | **NA** | **NA** | **1,730.0** | **NA** | **NA** | **1,511.0** | **NA** | **NA** |

### 5.3. 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 California Recreational Fisheries Survey (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 Ocean Recreational Boat Survey 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.

### 5.4. Fishery performance

The following tables present recreational catch in Southern California waters(tables updated 2022-08-08):

- Tables R-4 and R-5. Estimated number of highly migratory MUS kept and thrown back alive by recreational anglers fishing from California private vessels in U.S. EEZ waters (Table R-4) and Mexico waters (Table R-5), 2019-2021.
- Tables R-6 and R-7. 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 (Table R-6) and Mexico waters (Table R-7), 2019-2021.

NAs represent data that are not collected/able to be calculated. Zeros represent no catch. CONFID represents data excluded for confidentiality.

**Table 6-4 (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.**

| | 2019 | | 2020 | | 2021 | |
|---|---|---|---|---|---|---|
| | No. Fish | | No. Fish | | No. Fish | |
| **Species** | **Kept** | **Released** | **Kept** | **Released** | **Kept** | **Released** |
| **Tuna** | | | | | | |
| Tuna, albacore | 27,482 | 104 | 12,507 | 26 | 9,269 | 194 |
| Tuna, bigeye | 0 | 0 | 0 | 0 | 0 | 0 |
| Tuna, bluefin | 460 | 0 | 1,335 | 74 | 4,363 | 361 |
| Tuna, skipjack | 395 | 137 | 189 | 96 | 52 | 49 |
| Tuna, yellowfin | 3,460 | 160 | 397 | 10 | 373 | 0 |
| **Billfish** | | | | | | |
| Marlin, striped | 6 | 18 | 0 | 19 | 0 | 0 |
| Swordfish | 81 | 12 | 43 | 0 | 44 | 0 |
| **Sharks** | | | | | | |
| Shark, blue | 8 | 82 | 46 | 127 | 0 | 281 |
| Shark, shortfin mako | 148 | 142 | 23 | 70 | 10 | 60 |
| Shark, thresher | 180 | 540 | 127 | 319 | 396 | 678 |
| **Other Fish** | | | | | | |
| Dolphin (fish) | 65 | 0 | 2,196 | 545 | 3,418 | 351 |
| **Total** | **32,285** | **1,195** | **16,863** | **1,286** | **17,925** | **1,974** |

**Table 6-5 (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.**

| | 2019 | | 2020 | | 2021 | |
|---|---|---|---|---|---|---|
| | No. Fish | | No. Fish | | No. Fish | |
| **Species** | **Kept** | **Released** | **Kept** | **Released** | **Kept** | **Released** |
| **Tuna** | | | | | | |
| Tuna, albacore | 0 | 0 | 0 | 0 | 0 | 0 |
| Tuna, bigeye | 0 | 0 | 0 | 0 | 0 | 0 |
| Tuna, bluefin | 731 | 27 | 593 | 21 | 1,673 | 11 |
| Tuna, skipjack | 1,616 | 2,274 | 1,498 | 1,067 | 12 | 16 |
| Tuna, yellowfin | 16,939 | 1,006 | 3,556 | 298 | 670 | 11 |
| **Billfish** | | | | | | |
| Marlin, striped | 0 | 0 | 0 | 0 | 0 | 0 |
| Swordfish | 13 | 0 | 0 | 0 | 0 | 0 |
| **Sharks** | | | | | | |
| Shark, blue | 0 | 64 | 0 | 66 | 0 | 22 |
| Shark, shortfin mako | 42 | 40 | 11 | 23 | 11 | 23 |
| Shark, thresher | 0 | 0 | 0 | 41 | 0 | 0 |
| **Other Fish** | | | | | | |
| Dolphin (fish) | 120 | 11 | 2,547 | 769 | 815 | 785 |
| **Total** | **19,461** | **3,422** | **8,205** | **2,285** | **3,181** | **868** |

**Table 6-6 (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.**

| | 2019 | | 2020 | | 2021 | |
|---|---|---|---|---|---|---|
| | No. Fish | | No. Fish | | No. Fish | |
| **Species** | **Kept** | **Released** | **Kept** | **Released** | **Kept** | **Released** |
| **Tuna** | | | | | | |
| Tuna, albacore | 3,573 | 37 | 1,228 | 4 | 383 | 0 |
| Tuna, bigeye | 18 | 20 | 0 | 0 | 0 | 0 |
| Tuna, bluefin | 4,205 | 33 | 24,631 | 403 | 28,781 | 162 |
| Tuna, skipjack | 3,101 | 519 | 2,920 | 496 | 374 | 182 |
| Tuna, yellowfin | 25,428 | 162 | 9,249 | 67 | 2,883 | 19 |
| **Billfish** | | | | | | |
| Marlin, striped | 0 | CONFID | CONFID | CONFID | 3 | CONFID |
| Swordfish | 17 | 3 | 6 | 0 | 5 | 0 |
| **Sharks** | | | | | | |
| Shark, blue | 44 | 85 | CONFID | 42 | 0 | 40 |
| Shark, shortfin mako | 36 | 200 | 37 | 45 | 31 | 81 |
| Shark, thresher | 28 | 15 | 20 | 7 | 9 | CONFID |
| **Other Fish** | | | | | | |
| Dolphin (fish) | 65 | 3 | 9,172 | 727 | 6,245 | 95 |
| **Total** | **36,515** | **1,076** | **47,261** | **1,790** | **38,714** | **577** |

**Table 6-7 (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.**

| | 2019 | | 2020 | | 2021 | |
|---|---|---|---|---|---|---|
| | No. Fish | | No. Fish | | No. Fish | |
| **Species** | **Kept** | **Released** | **Kept** | **Released** | **Kept** | **Released** |
| **Tuna** | | | | | | |
| Tuna, albacore | 19 | 20 | 12 | 0 | 20 | 0 |
| Tuna, bigeye | 6 | 0 | 110 | 0 | 12 | 0 |
| Tuna, bluefin | 9,389 | 44 | 13,220 | 44 | 18,095 | 42 |
| Tuna, skipjack | 3,199 | 1,034 | 11,829 | 2,539 | 1,444 | 2,823 |
| Tuna, yellowfin | 33,631 | 2,434 | 90,815 | 3,951 | 34,120 | 1,849 |
| **Billfish** | | | | | | |
| Marlin, striped | CONFID | 153 | 6 | 47 | CONFID | CONFID |
| **Sharks** | | | | | | |
| Swordfish | 0 | 0 | 0 | 0 | CONFID | 0 |
| Shark, blue | 0 | 0 | 0 | CONFID | 0 | 0 |
| **Other Fish** | | | | | | |
| Shark, shortfin mako | 4 | CONFID | 3 | CONFID | CONFID | 3 |
| **Total** | **64,279** | **7,002** | **121,040** | **7,349** | **60,609** | **5,454** |

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 2019 to 2021. The Tuna species group accounted for the most catch at 87%. The CPFV fleet in Mexico waters accounted for 53% of catch followed by the CPFV fleet in US waters at 25%.

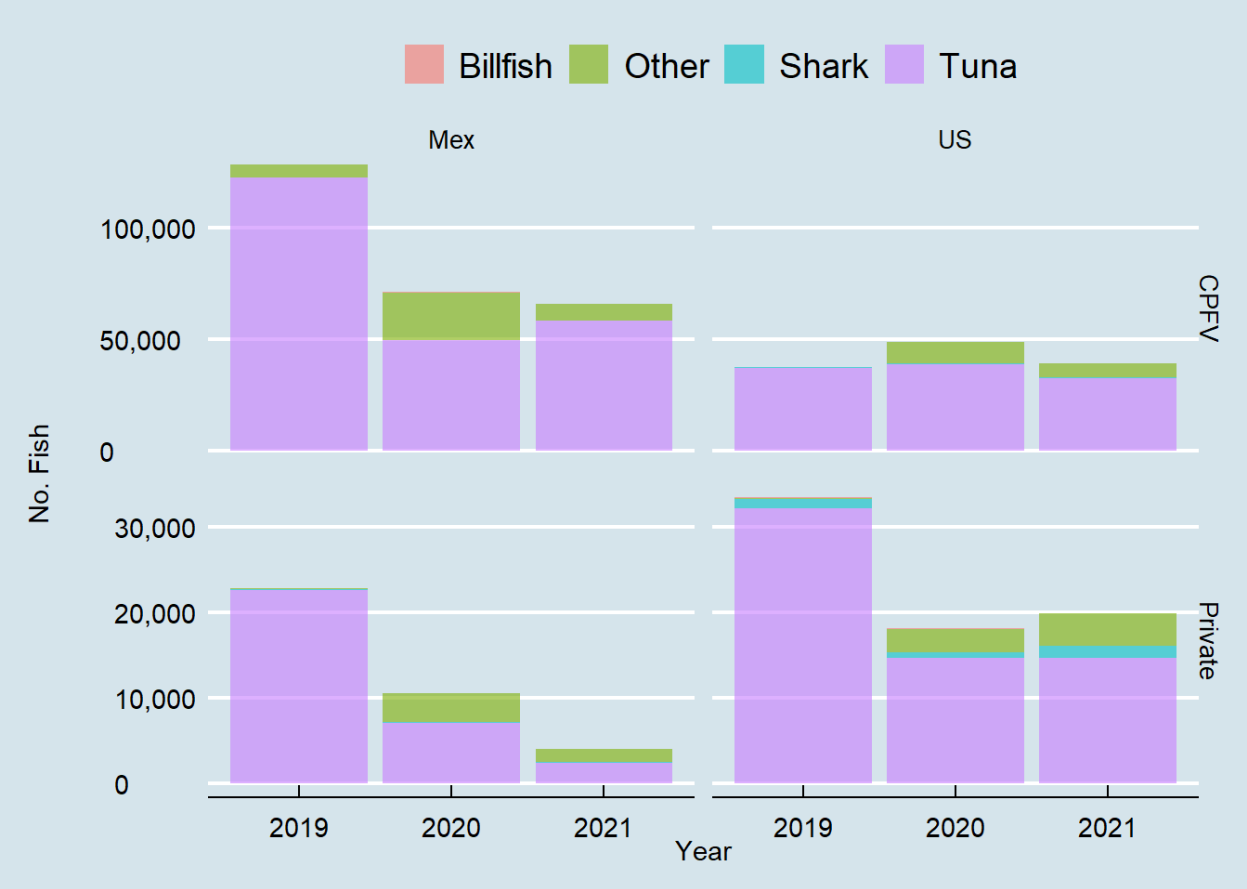


**Figure 5-1. Total recreational catch (retained plus discarded) by sector and zone.**

This figure shows catch by species (retained plus discarded) aggregated by fleet and zone, 2019 - 2021.

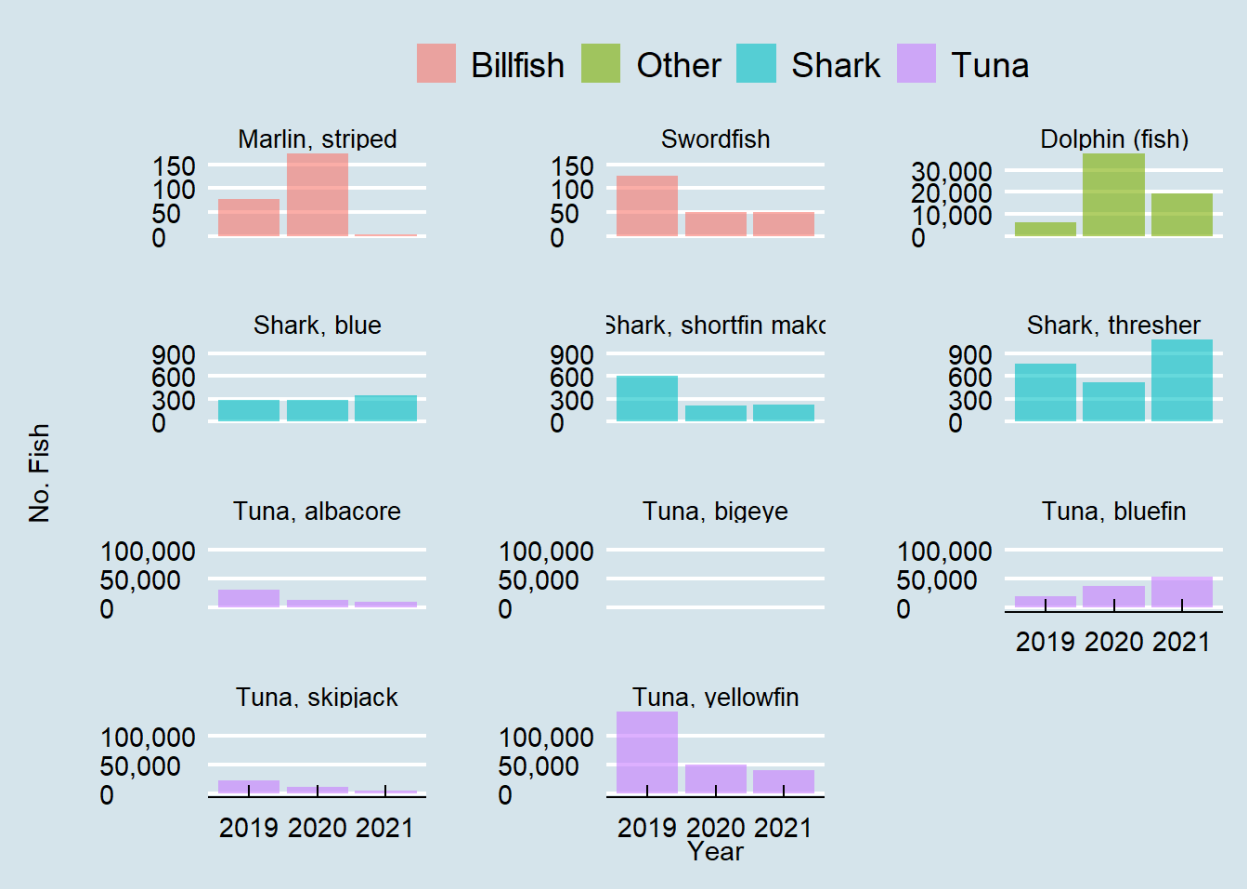


**Figure 5-2. Total catch (retained plus discarded) by species.**

# 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): 2011 - 2020*

### 7.1.1. Landings by Country

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

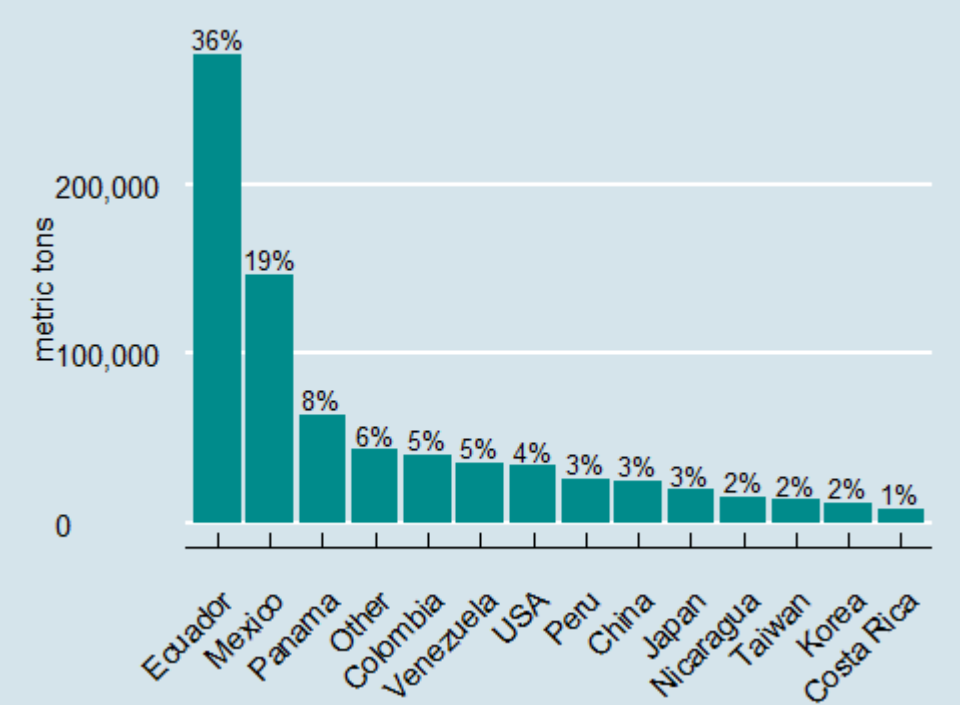


**Figure 7-1. Annual average landings (mt) in the EPO by country. The Other category includes Chile, Vanuatu, Canada, Belize, Unknown, Guatemala, El Salvador, each of which has landings less than 1% of the total, and others not specified in the source data.**

### 7.1.2. Landings by Species

During 2011-2020 Albacore accounted for 5.7% of total landings, Bigeye tuna for 14.2%, Skipjack tuna for 44.9%, and Yellowfin tuna for 35.2%.

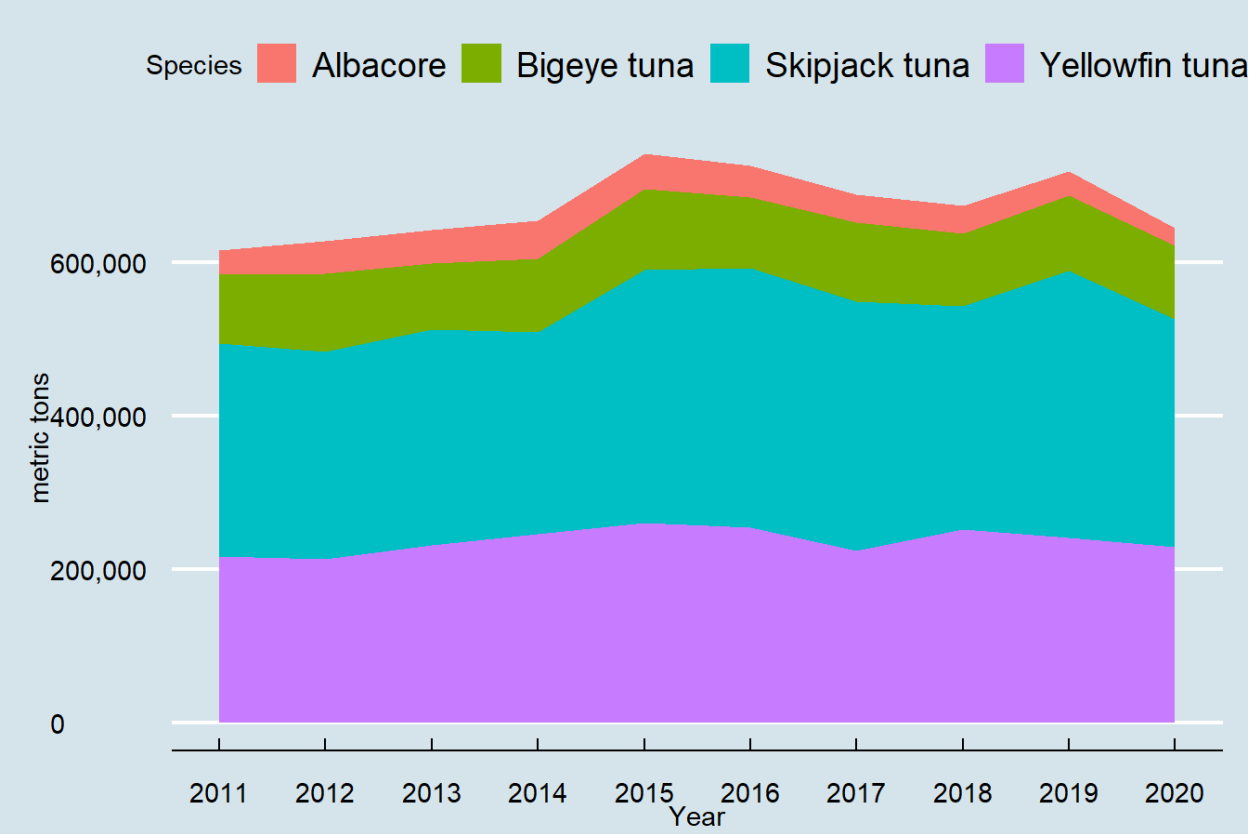


**Figure 7-2. Tuna landings (mt) in the EPO, 2011-2020.**

### 7.1.3. Landings by Gear

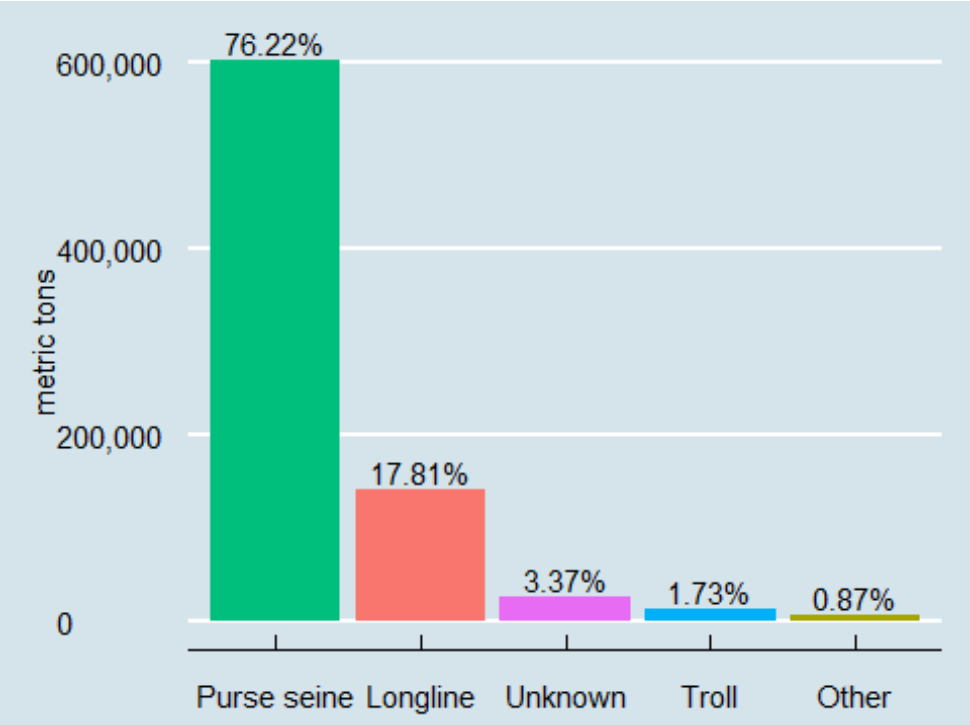


**Figure 7-3. Annual average landings (mt) in the EPO by gear type. The Other category includes Recreational, Gillnet, Pole-and-line, Harpoon and others not specified in the source data.**

## *7.2. Western and Central Pacific Ocean (WCPFC Data): 2011 - 2020*

### 7.2.1. Landings by Country

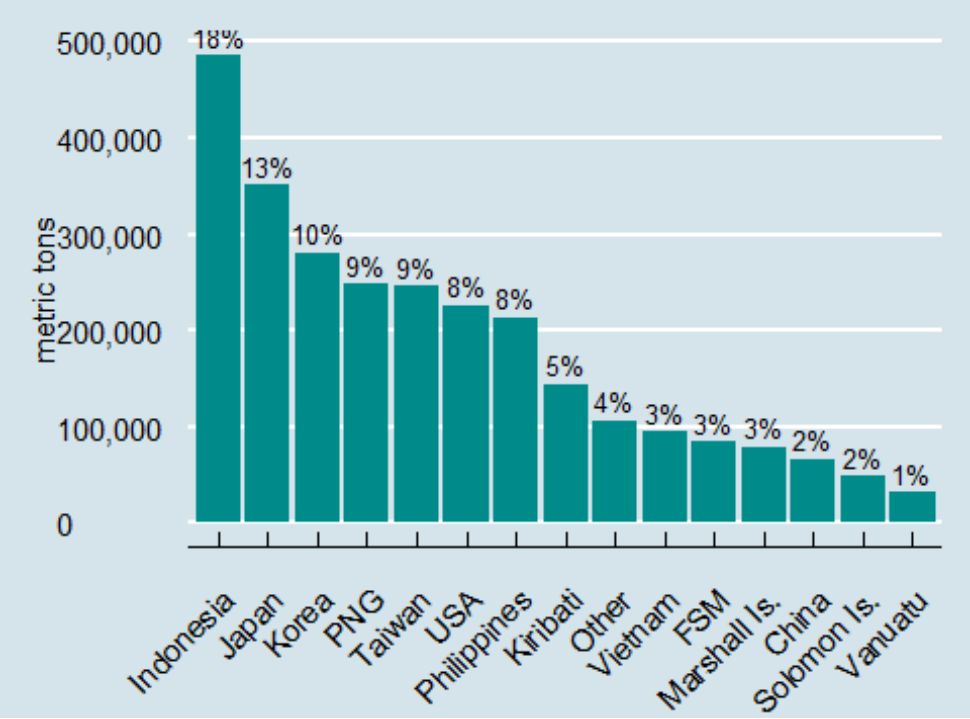


**Figure 7-4. Annual average landings (mt) in the WCPO by country. PNG: Papua New Guinea, FSM: Federated States of Micronesia; the Other category includes Spain, Ecuador, New Zealand, Fiji, El Salvador, Tuvalu, Australia, Cook Islands, New Caledonia, Samoa, French Polynesia, Palau, Tonga, Tokelau, Belize,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

### 7.2.2. Landings by Species

During the 2011- 2020 period, Albacore accounted for 4.1% of total landings, Bigeye Tuna accounted for 5.6%, Skipjack Tuna accounted for 66.4%, and Yellowfin Tuna accounted for 23.8%.

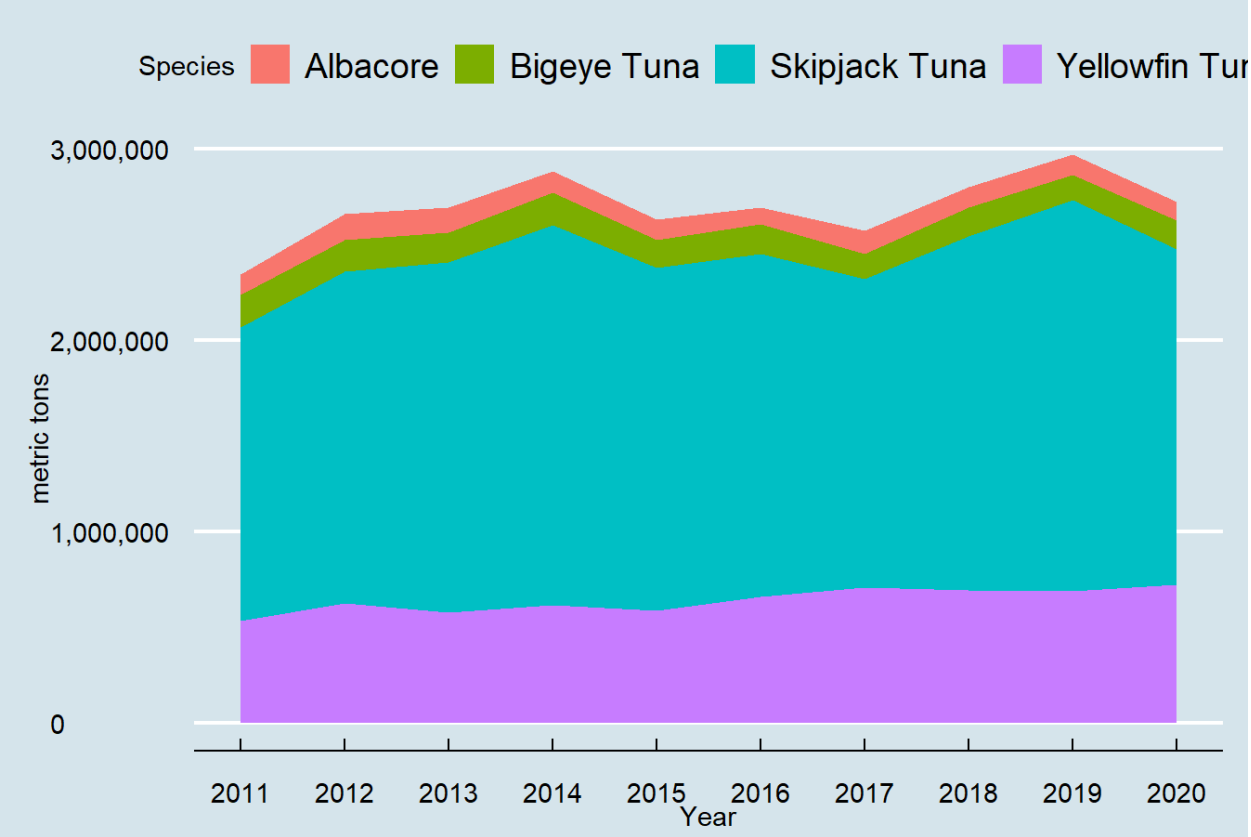


**Figure 7-5. Tuna landings (mt) in the WCPO, 2011-2020.**

### 7.2.3. Landings by Gear

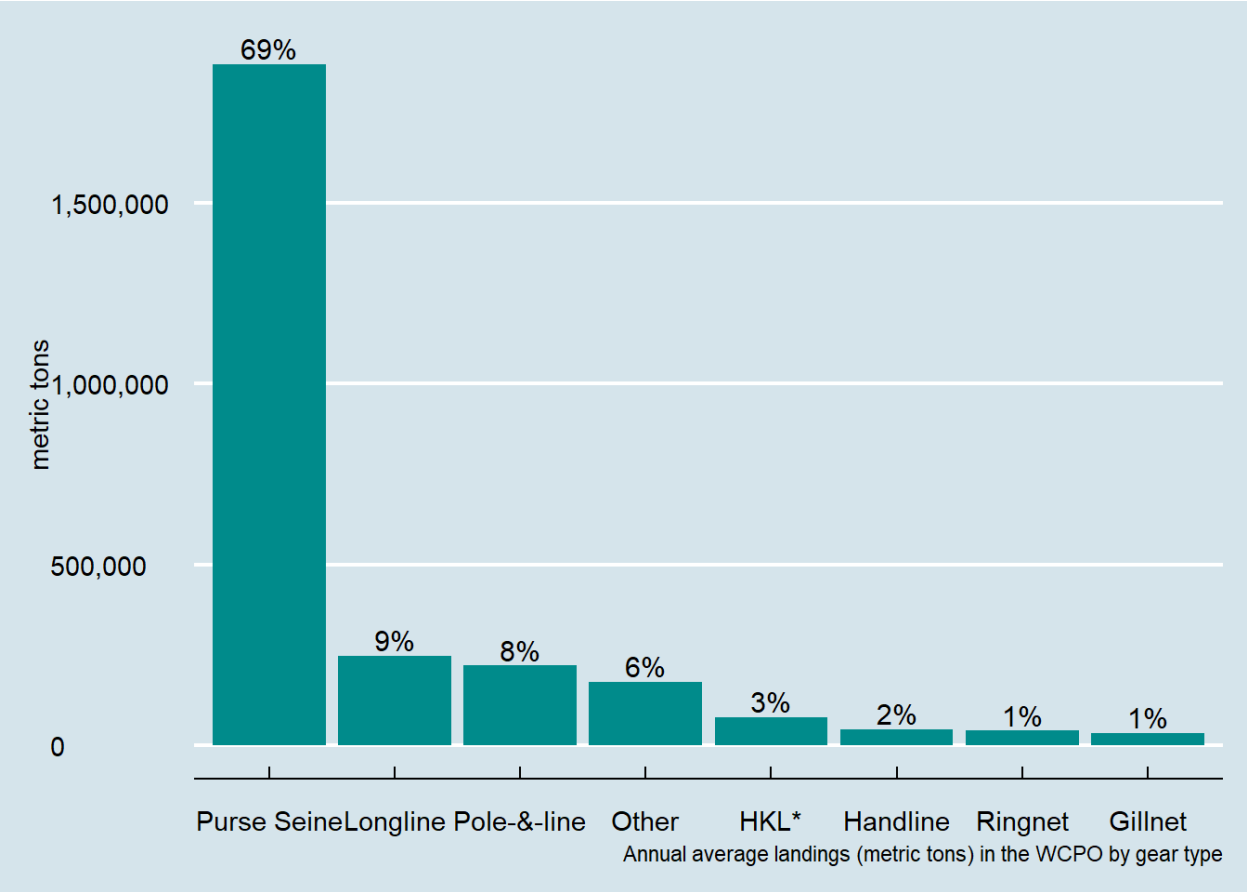


**Figure 7-6. Annual average landings (mt) in the WCPO by gear type. *Small-scale hook-and-line (Philippines and Indonesia). The Other category from source data.**

## *7.3. North Pacific (ISC Data): 2012 - 2021*

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 shortfin 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, 68%, averaging 58,536 metric tons annually during the 2012-2021 period. U.S. landings averaged 12,844 metric tons or 15% of total landings.

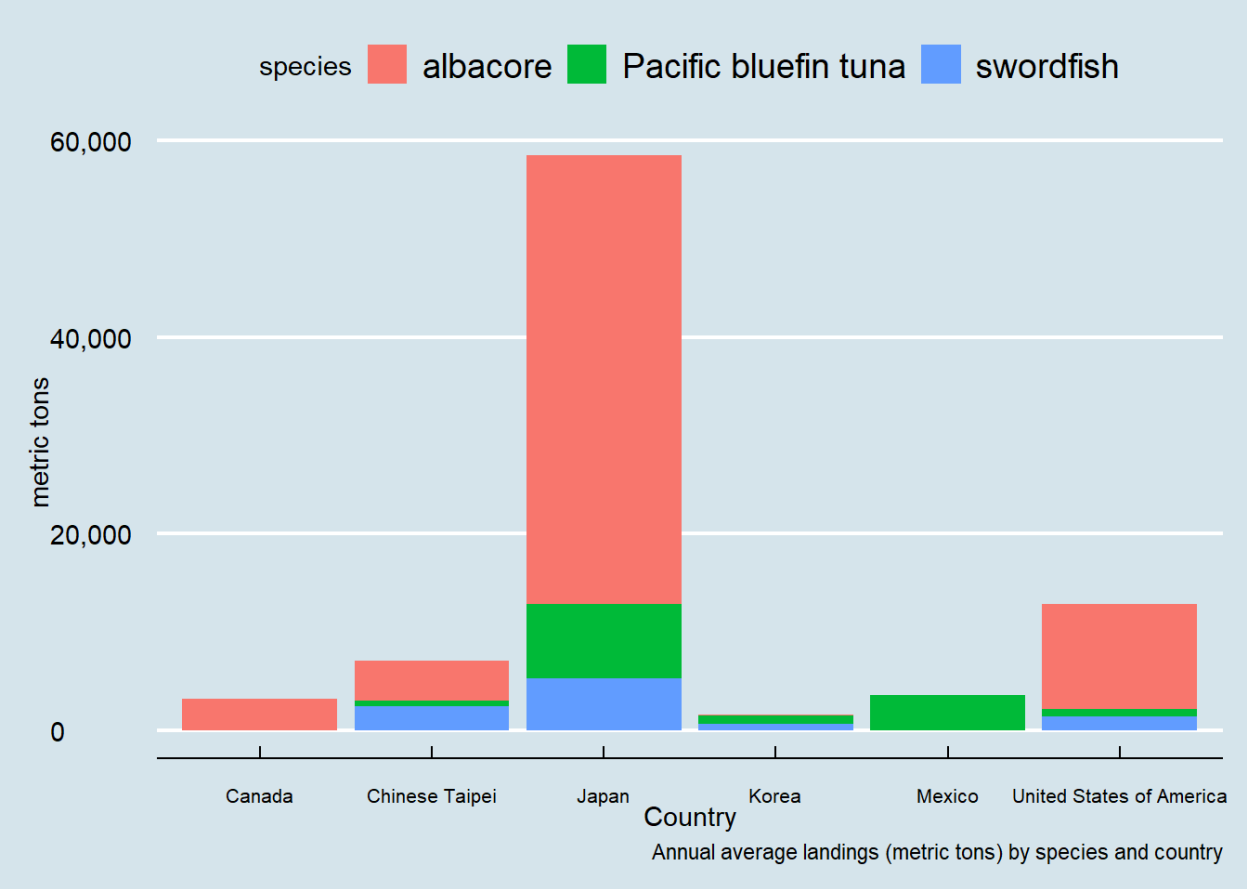


**Figure 7-7. Annual average landings (mt) by species and country.**

### 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 2019 at 39,631 mt, Pacific bluefin landings were lowest in 2018 at 10,201 mt, and swordfish landings were lowest in 2021 at 5,201 mt. The decline in Pacific bluefin landings may be partially attributable to the implementation of catch limits in the WCPFC Northern Committee's stock rebuilding plan.

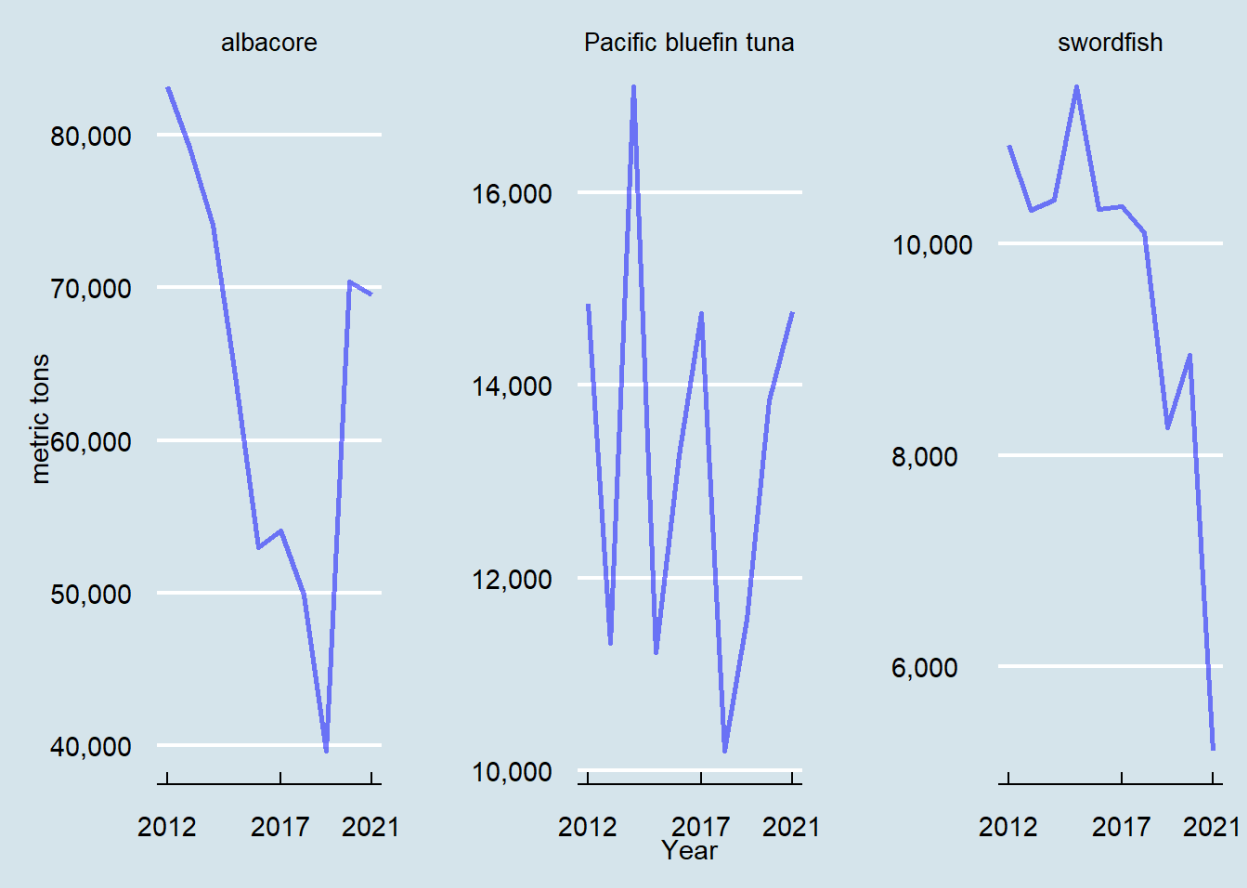


**Figure 7-8. Landings (mt) by species, 2021-2021.**

### 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.

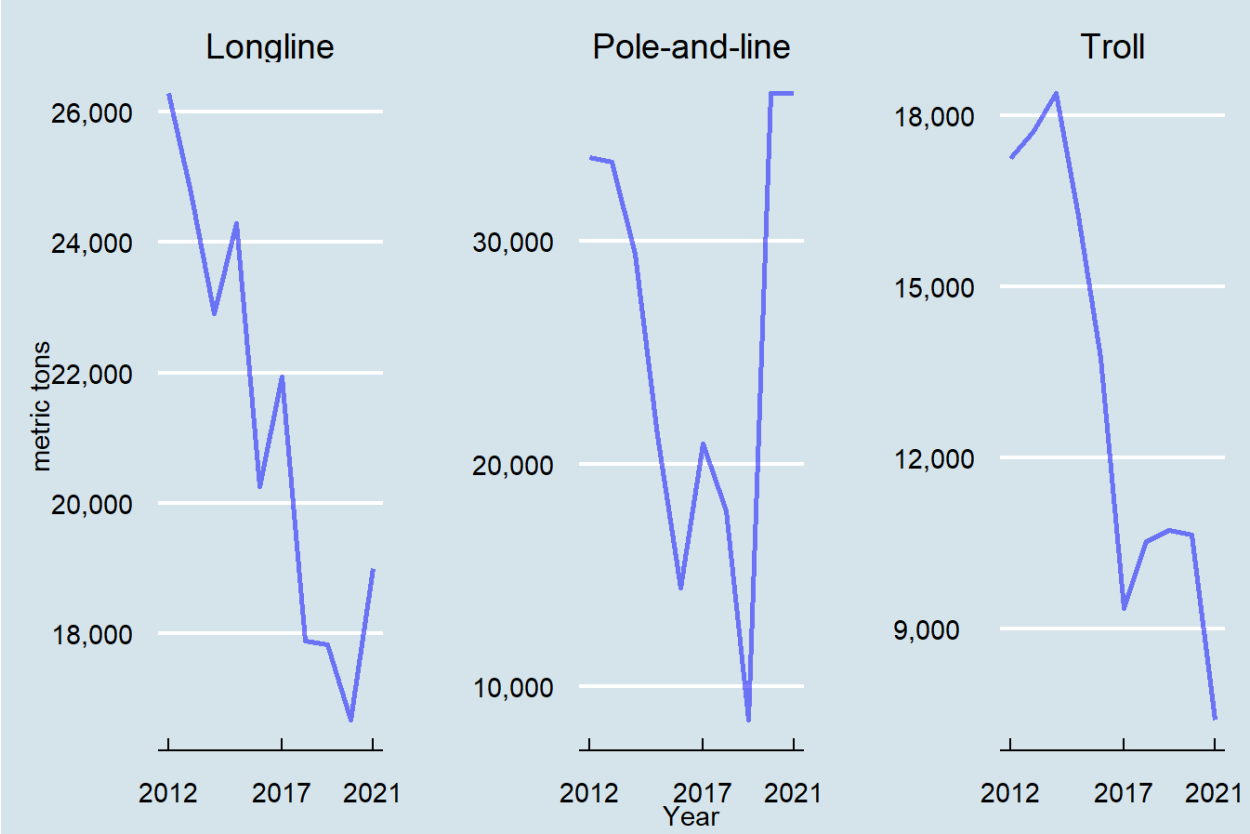


**Figure 7-9. Albacore landings (mt) by selected gear types, 2021-2021.**

### 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 86% of total Pacific bluefin landings. Setnet landings increased markedly in 2017. Setnet is a passive gear so this may reflect increasing stock abundance.

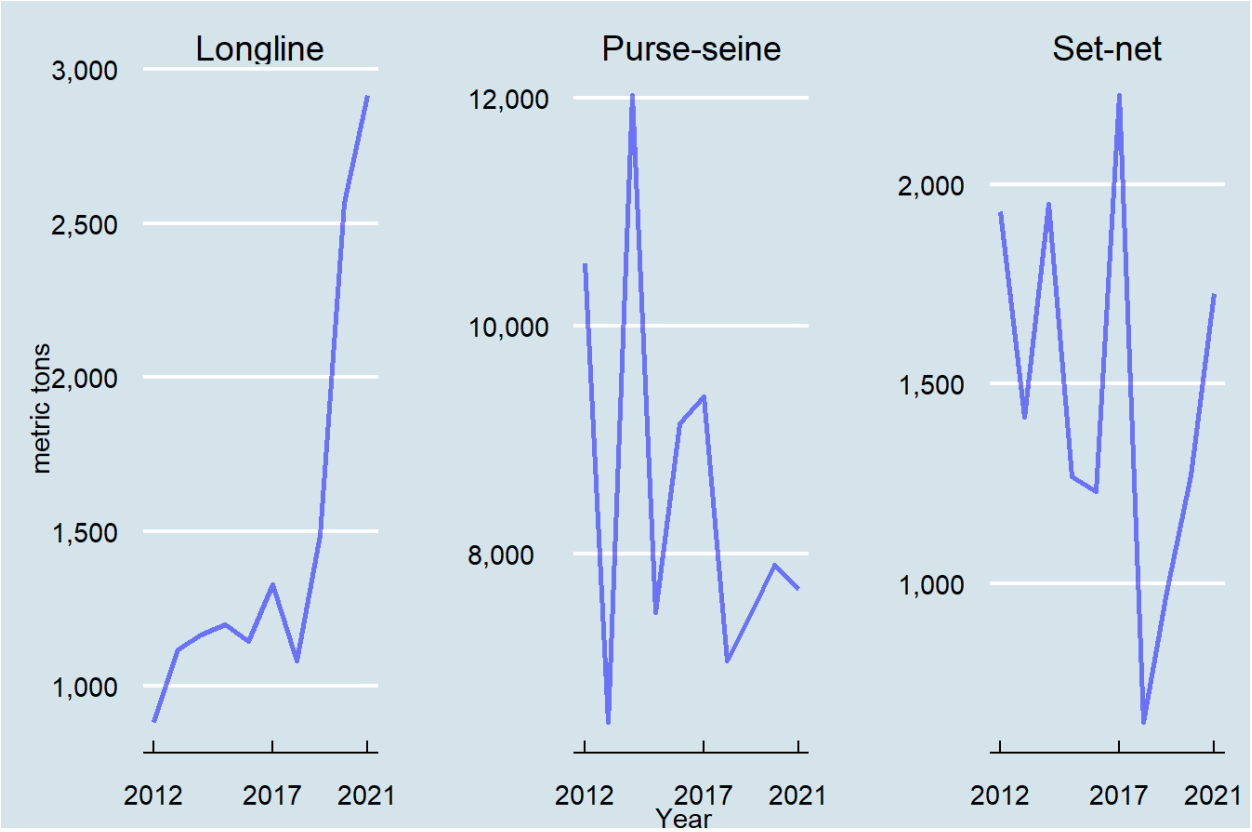


**Figure 7-10. Pacific bluefin landings (mt) by selected gear types, 2012-2021.**

### 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.

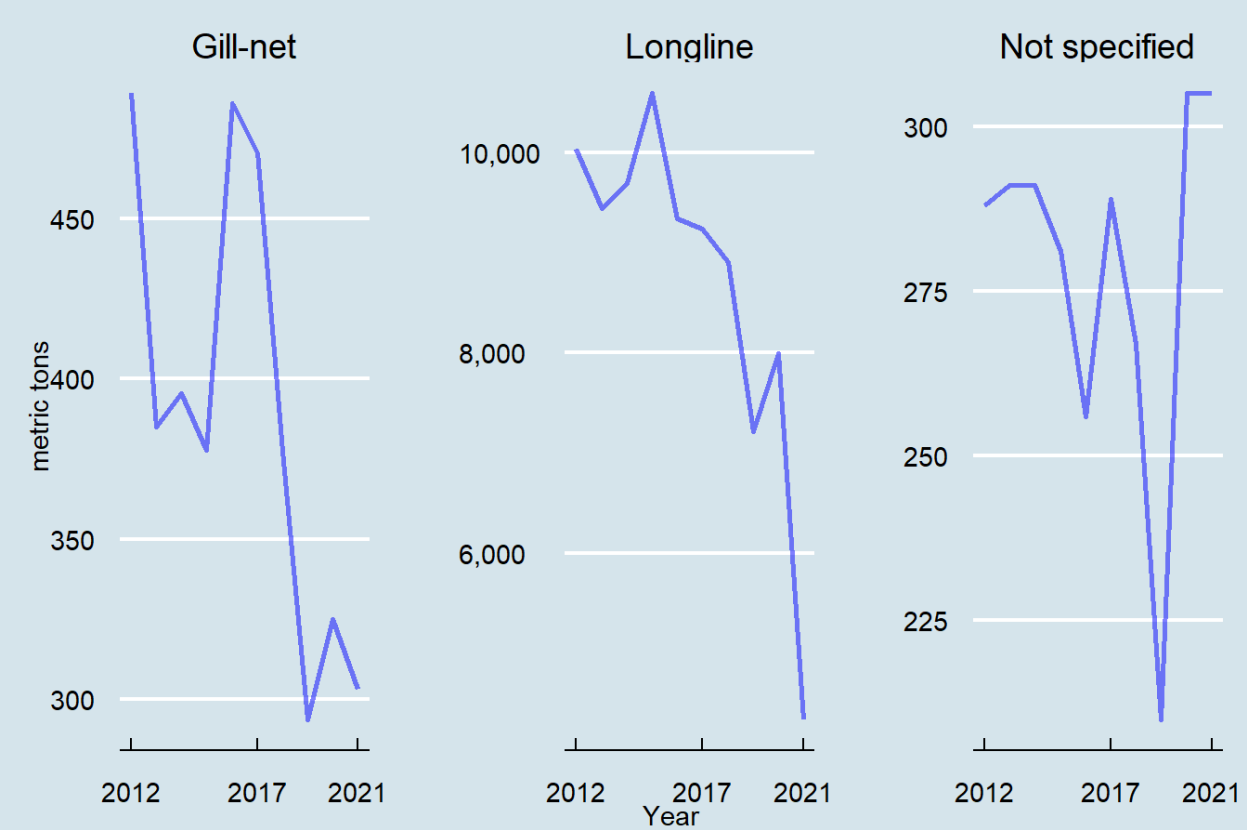


**Figure 7-11. Swordfish landings (mt) by selected gear types, 2021-2021.**

# 8. Status of HMS Stocks

Under the Magnuson-Stevens Act, Councils must identify status determination criteria which can be used to decide whether overfishing is occurring (fishing mortality is above a maximum fishing mortality threshold) or the stock is overfished (biomass is less than a minimum stock size threshold). Chapter 4 in the HMS FMP describes how these status determination criteria may be determined. 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 proxies approved by regional fishery management organizations to be the 'best available science.

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.

## *8.1. HMS Stock Assessments*

### 8.1.1. Organizations That Conduct HMS Stock Assessments

Stock status is most reliably determined from stock assessments that integrate fishery and life history information across the range of the stock. A list of current stock assessments is provided in Section 8.4.

**Inter-American Tropical Tuna Commission (IATTC)**

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 their 2018 Scientific Advisory Committee meeting page. All IATTC staff assessments and analyses are reviewed by the Scientific Advisory Committee.

In 2022 the IATTC scientific staff completed an interim stock assessment for EPO skipjack tuna tuna (SAC-13-07). It is an integrated statistical age-structured catch-at-length stock assessment similar to those conducted by IATTC scientific staff for bigeye and yellowfin tunas. Although termed interim, scientific staff consider the assessment reliable for management purposes.

**Secretariat of the Pacific Community Oceanic Fisheries Program (SPC-OFP)**

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 have also completed stock assessments for South Pacific albacore tuna and striped marlin. Their stock assessments may be accessed by visiting the WCPFC stock assessment webpage.

In 2021 SPC assessed South Pacific albacore tuna and Southwest Pacific swordfish.

In 2022 stock assessments were completed for WCPO skipjack tuna (WCPFC-SC18-2022/SA-WP-01 (REV3)) and Southwest Pacific shortfin mako shark (WCPFC-SC18-2022/SA-WP-02). (The mako shark assessment was completed by independent consultants.).

### International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC)

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 2021 the ISC Billfish Working Group completed an assessment for Pacific blue marlin (*Makaira nigricans*).

In 2022 ISC Working Groups completed benchmark stock assessments for Pacific bluefin tuna and North Pacific blue shark.

### National Marine Fisheries Service (NMFS)

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. This is the first assessment completed for this stock. This assessment was peer reviewed in 2017 and revised in 2018. NMFS has determined that the information presented in section 0 reflects BSIA for this stock, and a status determination is pending.

#### 8.1.2. Current stock assessments for species managed under the HMS FMP

The most current assessment for FMP MUS and the publication year are listed below.

## Tunas

- **North Pacific Albacore (2020):** Stock Assessment of Albacore Tuna in the North Pacific Ocean in 2020. Report of the Albacore Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean 15-20 July 2020.
- South Pacific Albacore (2021): Stock Assessment of South Pacific albacore tuna. C. Castillo Jordan, J. Hampton, N. Ducharme-Barth, H. Xu, T. Vidal, P. Williams, F.Scott, G. Pilling and P. Hamer. Oceanic Fisheries Programme, Pacific Community (SPC), Noumea, New Caledonia and Inter-American Tropical Tuna Commission, La Jolla, United States. WCPFC-SC17-2021/SA-WP-02 Rev. 2. August 10, 2021.

- **Pacific Bluefin (2020):** 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.
- **Bigeye (EPO) (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.
- **Bigeye (WCPO) (2020):** Stock assessment of bigeye tuna in the western and central Pacific Ocean. N. Ducharme Barth, M. Vincent, J. Hampton, P. Hamer, P. Williams, G. Pilling. Scientific Committee Sixteenth Regular Session, August 11-20, 2020. SC16-SA-WP-03.
- **Skipjack (EPO) (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.
- **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 (EPO) (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.
- **Yellowfin (WCPO) (2020):** Stock assessment of yellowfin tuna in the western and central Pacific Ocean. M. Vincent, N. Ducharme Barth, J. Hampton, P. Hamer, P. Williams, G. Pilling. Scientific Committee Sixteenth Regular Session, August 11-20, 2020. SC16-SA-WP-04.

**Billfishes**

- **Blue Marlin (2021)**. Stock Assessment Report for Pacific Blue Marlin (*Makaira nigricans*) through 2019. Report of the Billfish Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean. ISC/21/ANNEX/10.

- **Striped marlin (WCPO) (2019):** Stock Assessment Report for Striped Marlin *(Kajikia audax*) in the Western and Central North Pacific Ocean Through 2017. Report of the Billfish Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean, July 11-15, 2019, Taipei, Taiwan.
- **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 Fiftheenth Regular Session. Western and Central Pacific Fisheries Commission, August 12-19, 2019. WCPFC-SC15-2019/SA-WP-07.
- **Striped marlin (EPO) (2009)**: Assessment of Striped Marlin in the Eastern Pacific Ocean In 2008 and Outlook for the Future. Michael G. Hinton. Inter-American Tropical Tuna Commission. Stock Assessment Report 10. An update with data through October 30, 2010, is reported in Fishery Status Report No. 12, Tunas and Billfishes in the Eastern Pacific Ocean in 2013.
- **Swordfish (WCNPO) (2018):** Stock Assessment of Swordfish (*Xiphias gladius*) in the Western and Central North Pacific Ocean Through 2016. ISC Billfish Working Group. Prepared for the Eighteenth Meeting of the ISC, July 11-16, 2018, Yeosu, Republic of Korea.
- **Swordfish (EPO) (2011):** Status of Swordfish in the Eastern Pacific Ocean in 2010 and Outlook for the Future. Michael G. Hinton and Mark N. Maunder. Inter-American Tropical Tuna

Commission Scientific Advisory Committee 2nd Meeting. La Jolla, California (USA), 9-12 May 2011.

- **Swordfish (SWPO) (2021)**: Stock Assessment for southwest Pacific swordfish. N. Ducharme-Barth, C. Castillo-Jordan, J. Hampton, P. Williams1, G. Pilling, P. Hamer. WCPFC-SC17-2021/SA-WP-04. July 21, 2021.

**Sharks**

- **Blue shark (NPO) (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.
- **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.
- **Common Thresher Shark (EPO) (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
- **Shortfin Mako Shark (NPO) (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.
- **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.

**Others**

- **Dorado (SEPO) (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.

## *8.2. Assessment of Stock Status*

National Standard 2 requires using the best scientific information available in management. This requires periodic updating of stock status for comparing against status determination criteria. HMS FMP Chapter 4 describes the management reference points used to assess stock status and the methods for determining the values for these reference points. These reference points are:

Maximum sustainable yield (MSY): MSY is 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. For management purposes MSY is usually expressed in terms of the following reference points:

> MSY fishing mortality rate ($F_{MSY}$): The fishing mortality rate that, if applied over the long term, would result in MSY.

MSY stock size ($B_{MSY}$): The long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at $F_{MSY}$.

Status determination criteria (SDC) are quantifiable thresholds (or their proxies) that are used to determine if overfishing has occurred, or if the stock or stock complex is overfished. "Overfished" relates to biomass of a stock or stock complex, and "overfishing" pertains to a rate or level of removal of fish from a stock or stock complex. SDC are:

Maximum fishing mortality threshold (MFMT): The level of fishing mortality (F), on an annual basis, above which overfishing is occurring. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.

Overfishing limit (OFL): 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. The OFL is an estimate of the catch level above which overfishing is occurring.

Minimum stock size threshold (MSST): The level of biomass below which the stock or stock complex is considered to be overfished.

Optimum yield (OY): The amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

HMS FMP section 4.2 describes the considerations for determining MSY. As part of the biennial process, the HMSMT will review recent stock assessments or other information as described below, and submit a draft SAFE document for review at the September Council meeting containing MSY estimates, noting if they are a change from the current value. At the request of the Council, the Scientific and Statistical Committee (SSC) will review these estimates and make recommendations to the Council on their application in management decisions. Based on this advice, the Council may recommend revisions to MSY estimates to NMFS.

HMS FMP section 4.4 describes how SDC are computed. NMFS uses the following status determination criteria to identify stocks subject to overfishing or that have become overfished as specified at MSA section 304(e).

MFMT equals $F_{MSY}$. The OFL is the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish. Overfishing occurs when fishing mortality F is greater than the MFMT mortality or catch exceeds OFL for one year or more.

MSST is calculated as the greater of:

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

MSST or a reasonable proxy must be expressed in terms of spawning biomass or other reproductive potential. Should the estimated size of an HMS stock in a given year fall below this threshold, the stock is considered overfished.

In the case of species under international management, the Council should recommend that the appropriate RFMO consider adopting the SDCs determined pursuant to the HMS FMP as limit reference points for international management (see FMP Section 2.1).

## Current Status Determination Criteria for HMS FMP Stocks

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. The Pacific Islands Regional Office and Pacific Islands Fisheries Science Center (PIFISC) are the lead in making status and BSIA determinations for stocks occurring in the Western Pacific. Table 8-1 lists stock assessments used to make status determinations for the management unit species by the year the assessment was conducted, the organization conducting the assessment, and the lead NMFS Science Center for that stock. Table 8-2 and Table 8-3, provide estimates of the MSY, MFMT, MSST, any reference points adopted by RFMOs, and current status determinations. As noted above, NMFS uses these estimates as a basis for making status determinations. These tables were produced in 2020 for the 2021/2023 biennial process. (These tables to be updated in 2022 as part of the HMS FMP biennial management process.)

**Table 9-1. Current assessments for key stocks.**

| Stock | Assessment Year | Assessment Lead | Lead NMFS Science Center |
|---|---|---|---|
| North Pacific albacore tuna | 2017 | ISC | SWFSC |
| Blue shark in the NPO | 2017 | ISC | PIFSC/ SWFSC |
| Pacific bluefin tuna in the NPO | 2018 | ISC | SWFSC |
| Shortfin mako shark in the NPO | 2018 | ISC | PIFSC/ SWFSC |
| WCNPO swordfish | 2018 | ISC | PIFSC |
| Bigeye tuna in the EPO | 2017 | IATTC | SWFSC |
| Bigeye tuna in the EPO | 2018 | IATTC | SWFSC |
| Yellowfin tuna in the EPO | 2017 | IATTC | SWFSC |
| Yellowfin tuna in the EPO | 2018 | IATTC | SWFSC |
| Skipjack tuna in the EPO | 2018 | IATTC | SWFSC |
| Skipjack tuna in the EPO | 2017 | IATTC | SWFSC |
| Common thresher shark | 2018 | NMFS | SWFSC |
| Bigeye tuna in the WCPO | 2017 | SPC | PIFSC |
| Yellowfin tuna in the WCPO | 2017 | SPC | PIFSC |

**Table 9-2. Stock assessment information for the purposes of determining whether HMS stocks are subject to overfishing.**

| Stock | Assessment or Indicator Analysis | Assessment Year | Assessment Lead | MFMT (Fmsy or Proxy) | Current Fmsy or proxy quantity estimate | Current F quantity estimate | RFMO Ref. point (if adopted) | F/Fmsy ratio | Subject to Overfishing? |
|---|---|---|---|---|---|---|---|---|---|
| North Pacific albacore tuna | Assessment | 2017 | ISC | 1-SPRMSY | 0.84 | 1-SPR2012-14 = 0.51 | NA | 0.61 | No |
| North Pacific albacore tuna | Assessment | 2020 | ISC | FMSY | 0.83 | F2015-17= 0.5 | NA | 0.6 | No |
| Blue shark in the NPO | Assessment | 2017 | ISC | FMSY | 0.35 | F2002-14 = 0.13 | NA | 0.37 | No |
| Pacific bluefin tuna in the NPO | Assessment | 2018 | ISC | 1-SPRMSY | 0.788 | 1-SPR2015-16 = 0.921 | NA | 1.17 | Yes |
| Pacific bluefin tuna in the NPO | Assessment | 2020 | ISC | 1-SPRMSY | 0.79 | 1-SPR2016-18 = 0.86 | NA | 1.09 | pending |
| Shortfin mako shark in the NPO | Assessment | 2018 | ISC | 1-SPRMSY | 0.26 | 1-SPRmsy2013-15 = 0.16 | NA | 0.62 | No |
| WCNPO swordfish | Assessment | 2018 | ISC | FMSY | 0.68 | F2013-15 = 0.32 | NA | 0.47 | No |
| Bigeye tuna in the EPO | Assessment | 2017 | IATTC | FMSY | NA | F2014-16 = NA | NA | F2014-16/Fmsy = 0.87 | No |
| Bigeye tuna in the EPO | Assessment | 2020 | IATTC | FMSY | NA | NA | NA | median of F2017-19/Fmsy = 1.00 | No |
| Yellowfin tuna in the EPO | Assessment | 2018 | IATTC | FMSY | NA | F2015-17 = NA | NA | F2015-17/Fmsy = 1.01 | Yes |
| Yellowfin tuna in the EPO | Assessment | 2020 | IATTC | FMSY | NA | NA | NA | median of F2017-19/Fmsy = 0.65 | pending |
| Skipjack tuna in the EPO | Assessment | 2004 | IATTC | NA | NA | NA | NA | NA | No |

| Stock | Assessment or Indicator Analysis | Assessment Year | Assessment Lead | MFMT (Fmsy or Proxy) | Current Fmsy or proxy quantity estimate | Current F quantity estimate | RFMO Ref. point (if adopted) | F/Fmsy ratio | Subject to Overfishing? |
|---|---|---|---|---|---|---|---|---|---|
| Common thresher shark | Assessment | 2018 | NMFS | 1-SPRMSY | 0.45 | 1-SPR2012-14 = 0.097 | NA | 0.21 | No |
| Bigeye tuna in the WCPO | Assessment | 2020 | SPC | FMSY | 0.05 | F2018 = NA | NA | 0.74 | No |
| Bigeye tuna in the WCPO | Assessment | 2017 | SPC | FMSY | 0.05 | F2015= NA | NA | 0.83 | No |
| Yellowfin tuna in the WCPO | Assessment | 2020 | SPC | FMSY | 0.105 | F2018=NA | NA | 0.366 | No |
| Yellowfin tuna in the WCPO | Assessment | 2017 | SPC | FMSY | 0.12 | NA | NA | 0.74 | No** |
| EPO swordfish | Assessment | 2014 | ISC | U (exploitation rate = catch/biomass) | 0.18 | F2012 = 0.19 | NA | 1.11 | Yes |
| EPO striped marlin | Assessment | 2010 | IATTC | F | NA | NA | NA | 0.16 | No |
| Dorado | | | | | | | | | Unknown |
| WCNPO striped marlin | Assessment | 2019 | ISC | FMSY | 0.6 | F3-12 ages in 2015-2017 = 1.07 | NA | 1.78 | Yes |
| WCNPO striped marlin | Assessment | 2015 | ISC | FMSY | 0.63 | F2012 = 0.94 | NA | 1.49 | Yes |

**Table 9-3. Stock assessment information for the purposes of determining whether HMS stocks are overfished**

| Stock | Bmsy or proxy | Current Bmsy or proxy quantity estimate | Current B quantity estimate | MSST (1-M*Bmsy or 0.5Bmsy) | Current B/MSST | RFMO Ref. point (if adopted) | Overfished? |
|---|---|---|---|---|---|---|---|
| North Pacific albacore tuna | SSBmsy | 32,638 mt | SSB2015 = 80,618 mt | 16,972 mt | 4.75 | 20%SSBcurrent, F=0 =32,614 mt | No |
| North Pacific albacore tuna | SSBmsy | 19,535 mt | SSB2018 = 58,858 mt | 10,158 mt | 5.794250837 | 20%SSBcurrent, F=0 =25,590 mt | No |
| Blue shark in the NPO | SSBmsy | 179,539 mt | SSB2015 = 308,286 | 136,450-154,608 mt* | 2.0 - 2.3 | NA | No |
| Pacific bluefin tuna in the NPO | SSBmsy | 135,874 mt | SSB2016 = 21,331 mt | 101,905.5 mt | 0.21 | NA | Yes |
| Pacific bluefin tuna in the NPO | SSBmsy | 131,363 mt | SSB2018 = 28,228 mt | 98,522 mt | 0.29 | NA | pending |
| Shortfin mako shark in the NPO | SAmsy | 633,700 female sharks | SA2016 = 860,200 female sharks | (1-0.128)*633700 = 552,586 female sharks | 1.6 | NA | No |
| WCNPO swordfish | SSBmsy | 15,702 mt | SSB2016 = 29,403 mt | (1-0.22)*15702 = 12,248 mt | 2.4 | NA | No |
| Bigeye tuna in the EPO | B (biomass of age 3+ quarters old fish) at MSY | 96,360 mt | B (biomass of age 3+ quarters old fish at beginning of 2017) = 118,523 | 48,130 mt | 2.9 | NA | No |
| Bigeye tuna in the EPO | NA | NA | NA | NA | S2020/0.5*SMSY= 1.84 | NA | No |
| Yellowfin tuna in the EPO | SMSY (unitless index of spawning biomass at MSY) | 3,634 | S = 3,925 (S is an unitless index of spawning biomass) | 1,817 | 2.1 | NA | No |

| Stock | Bmsy or proxy | Current Bmsy or proxy quantity estimate | Current B quantity estimate | MSST (1-M*Bmsy or 0.5Bmsy) | Current B/MSST | RFMO Ref. point (if adopted) | Overfished? |
|---|---|---|---|---|---|---|---|
| Yellowfin tuna in the EPO | NA | NA | NA | NA | S2020/0.5*SMSY= 3.16 | NA | pending |
| Skipjack tuna in the EPO | NA | NA | NA | NA | NA | NA | No***** |
| Common thresher shark | SSBMSY | 101,500 mature females | SSB = 136,800 mature females | 97,500 mature females | 1.4 | NA | No |
| Bigeye tuna in the WCPO | SSBMSY | 320,162 mt | 544,162 mt | NA | NA | 20%SBF=0 where SBF=0 is average over 2008–2017 | Not overfished |
| Bigeye tuna in the WCPO | SSBmsy | 454,100 mt | 558,543 mt | NA | NA | NA | No |
| Yellowfin tuna in the WCPO | SSBmsy | 860,326 mt | 2,090.592 mt | NA | NA | 20%SBF=0 where SBF=0 is average over 2005–2014 | No |
| Yellowfin tuna in the WCPO | SBF=0 | 2,178,220 mt | NA | NA | NA | 20%SBF=0 where SBF=0 is average over 2005–2014 | No** |
| EPO swordfish | BMSY | 31,200 | B2012 = 58,590 mt | 20,280 mt | 3**** | NA | No |
| EPO striped marlin | SSBMSY | 1246 mt | SSB2009 = 1488 mt | 623 mt | 2.32 | NA | No |
| Dorado | | | | | | | Unknown |
| WCNPO striped marlin | SSBMSY | 2604 mt | SSB2017 = 981 mt | 1302 mt | 0.75 | NA | Yes |
| WCNPO striped marlin | SSBMSY | 2819 mt | SSB2013 = 1094 mt | 1410 mt | 0.77 | NA | Yes |

Notes:
Blimit = 136,450-154,608 because mortality changes with age and ranges from 0.24-0.14 for mature fish; females are 50% mature at age 5-6.
For WCPO Yellowfin tuna the status determination was made in 2014 and 2017 results reiterated same.

For the 2017 WCPO bigeye tuna assessment, the ratios of F/Fmsy and B/Bmsy were calculated, but the separate F, Fmsy, B, and Bmsy estimates were not available. No minimum stock size threshold (MSST)/overfished threshold could be calculated, but because the stock was above Bmsy, it had to be above MSST.

For EPO swordfish, looks like they actually used B2012/Bmsy = 1.87 for the status determination instead of B2012/Bmsst = 3; status is the same, not overfished

For EPO skipjack, no minimum stock size threshold (MSST) (or overfished threshold) was calculated, but because the stock was above Bmsy, it was above MSST.

### RFMO Consideration of Biological Reference Points and Harvest Strategies

The WCPFC has adopted harvest strategies for two stocks relevant to two HMS FMP management unit species for which status determination criteria have been established: North Pacific albacore and Pacific bluefin tuna. The North Pacific albacore harvest strategy includes a biomass-based limit reference point (LRP) of 20%SSBcurrent$_{F=0}$. The target reference point (TRP) for this stock will be determined following a comprehensive analysis under a management strategy evaluation (MSE) approach. The Pacific bluefin harvest strategy includes an initial rebuilding target of the median SSB estimated for the period 1952 through 2014, to be reached by 2024 with at least 60% probability, and a second rebuilding target of 20%SSB$_{F=0}$, to be reached by 2034, or 10 years after reaching the initial rebuilding target, whichever is earlier, with at least 60% probability. SSB$_{F=0}$ is the expected spawning stock biomass under average recruitment conditions without fishing. The Northern Committee will develop limit and target reference points through an MSE process.

The WCPFC maintains a webpage describing its current harvest strategies. The WCPFC intends to adopt harvest strategies for key stocks and fisheries in its Convention Area consistent with Conservation and Management Measure 2014-06.

The IATTC adopted the elements of the Pacific bluefin tuna harvest strategy in Resolution C-18-02. This harvest strategy is based on recommendations from the Joint IATTC/WCPFC Northern Committee Working Group, which met concurrently during the 2016, 2017, and 2018 Northern Committee meetings.

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

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

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

| Year | Canadian Fleet [2, 3] | | | | | U.S. Fleet [5, 9] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Canadian EEZ (%)* | *U.S. EEZ (%)* | *High Seas (%)* | *Total catch (metric tons)* | *Logbook coverage (%) [4]* | *U.S. EEZ (%)* | *Canadian EEZ (%)* | *High Seas (%)* | *Total catch (metric tons) [6]* | *Logbook coverage (%) [7]* |
| 1995 | 88 | 2.2 | 9.8 | 1,761 | 18 | 5.4 | 5.7 | 88.9 | 8,125 | *63* |
| 1996 | 16.9 | 45.8 | 37.3 | 3,321 | 24 | 13.5 | 0.1 | 86.4 | 16,962 | *42* |
| 1997 | 7.2 | 30.5 | 62.3 | 2,166 | 30 | 16.5 | 3.5 | 80.0 | 14,325 | 38 |
| 1998 | 7.3 | 43.6 | 49.1 | 4,177 | 50 | 14.8 | 0.1 | 85.1 | 14,489 | 35 |
| 1999 | 16.6 | 66.8 | 16.6 | 2,734 | 71 | 65.3 | 0.8 | 33.9 | 10,120 | 35 |
| 2000 | 9.6 | 73.1 | 17.4 | 4,531 | 68 | 69.6 | 0.2 | 30.2 | 9,714 | 41 |
| 2001 | 13.5 | 72.7 | 13.9 | 5,248 | 81 | 57.0 | 0.3 | 42.7 | 11,349 | 49 |
| 2002 | 7.8 | 86.2 | 5.9 | 5,379 | 74 | 63.9 | 2.0 | 34.0 | 10,768 | 38 |
| 2003 | 8.0 | 85.3 | 6.6 | 6,847 | 96 | 86.0 | 0.6 | 13.3 | 14,161 | 36 |
| 2004 | 16.9 | 80.7 | 2.4 | 7,857 | 92 | 92.9 | 1.2 | 5.9 | 13,473 | 47 |
| 2005 | 33.1 | 62.6 | 4.3 | 4,829 | 94 | 92.0 | 2.3 | 5.8 | 8,479 | 73 |
| 2006 | 18.5 | 70.1 | 11.3 | 5,833 | 95 | 82.5 | 1.0 | 16.5 | 12,547 | 93 |
| 2007 | 21.5 | 78.5 | 0.1 | 6,041 | 92 | 98.8 | 0.7 | 0.5 | 11,908 | 86 |
| 2008 | 4.5 | 86.4 | 9.1 | 5,464 | 93 | 78.5 | 6.0 | 15.5 | 11,761 | 79 |
| 2009 | 7.1 | 91.3 | 1.5 | 5,693 | 97 | 93.1 | 2.5 | 4.4 | 12,340 | 86 |
| 2010 | 35.9 | 51.2 | 12.9 | 6,526 | 96 | 72.1 | 2.1 | 25.9 | 11,689 | 76 |
| 2011 | 12.4 | 85.7 | 2.0 | 5,415 | 98 | 94.9 | 0.4 | 4.7 | 10,143 | 84 |
| 2012 | 83.0 | 0.0 | 17.0 | 2,484 | 100 | 99.2 | 0.0 | 0.8 | 14,149 | 81 |
| 2013 | 59.6 | 37.9 | 2.5 | 5,088 | 99 | 96.4 | 1.5 | 2.1 | 12,310 | 76 |
| 2014 | 55.3 | 44.6 | 0.1 | 4,780 | 100 | 94.6 | 5.2 | 0.2 | 13,398 | 84 |
| 2015 | 66.5 | 33.4 | 0.1 | 4,391 | 100 | 96.5 | 3.3 | 0.2 | 11,595 | 86 |
| 2016 | 54.8 | 44.4 | 0.8 | 2,842 | 100 | 97.9 | 1.4 | 0.7 | 10,777 | 79 |
| 2017 | 11.2 | 75.0 | 13.8 | 1,830 | 100 | 91.2 | 0.2 | 8.7 | 7,430 | 81 |
| 2018 | 30.8 | 68.9 | 0.3 | 2,717 | 100 | 95.4 | 3.8 | 0.8 | 7,728 | 72 |
| 2019 | 51.7 | 44.9 | 3.4 | 2,402 | 100 | 93.0 | 4.2 | 2.8 | 7,797 | 76 |
| 2020 | 71.5 | 19.6 | 8.9 | 2,375 | 100 | 77.8 | 9.5 | 12.7 | 7,516 | 73 |
| 2021 [8] | 69.8 | 28.2 | 2.0 | 2,399 | 100 | 79.6 | 14.0 | 6.4 | 4,209 | 83 |

Data Sources and Notes:

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

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

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

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

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

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

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

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

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

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

| | Canadian Fleet [1] | | | | | | | | | | US fleet[13] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Landings (metric tons) [2] | | | | | Number of Landings | | | Number of Landing Vessels | | | Landings (metric tons) | | | | | Number of Landings | | | Number of Vessels that landed fish [7] | | |
| Year | Canadian Ports | U.S. Ports (DFO estimates) [3] | U.S. Ports (NOAA estimates) [4] | Other Ports [5,8] | Total [10] | Canadian Ports | U.S. Ports (DFO estimates) [3] | U.S. Ports (NOAA estimates) [4] | Canadian Ports | U.S. Ports (DFO estimates) | U.S. Ports (NOAA estimates) [9] | Canadian Ports (DFO estimates) [6] | Canadian Ports (NOAA estimates) | U.S. Ports [9] | Other Ports [11] | Total [10] | Canadian Ports (DFO estimates) [6] | Canadian Ports (NOAA estimates) | U.S. Ports [9] | Canadian Ports (DFO estimates) [6] | Canadian Ports (NOAA estimates) | U.S. Ports [9] |
| 1995 | 230 | 67 | 67 | 104 | 401 | 76 | 4 | 7 | 53 | 3 | 4 | | | 6,407 | 1,753 | 8,160 | | | 1,000 | | | 472 |
| 1996 | 662 | 311 | 868 | 106 | 1,636 | 93 | 33 | 102 | 62 | 20 | 66 | | | 13,209 | 2,188 | 15,397 | | | 1,710 | | | 658 |
| 1997 | 563 | 294 | 399 | 147 | 1,109 | 67 | 25 | 54 | 51 | 14 | 32 | | | 10,831 | 3,009 | 13,840 | | | 3,674 | | | 1,160 |
| 1998 | 1,892 | 281 | 961 | 82 | 2,935 | 173 | 30 | 67 | 104 | 16 | 29 | | | 12,628 | 1,135 | 13,763 | | | 2,470 | | | 838 |
| 1999 | 1,574 | 484 | 713 | 193 | 2,480 | 274 | 69 | 106 | 158 | 35 | 52 | | | 8,809 | 1,422 | 10,231 | | | 2,619 | | | 772 |
| 2000 | 2,432 | 537 | 889 | 424 | 3,745 | 346 | 79 | 110 | 160 | 44 | 57 | | | 8,086 | 1,574 | 9,660 | | | 2,230 | | | 707 |
| 2001 | 3,474 | 617 | 806 | 364 | 4,644 | 520 | 51 | 92 | 193 | 31 | 52 | | | 10,263 | 972 | 11,235 | | | 3,453 | | | 929 |
| 2002 | 3,866 | 181 | 702 | 347 | 4,915 | 465 | 29 | 71 | 169 | 17 | 38 | | ^ | 9,298 | 163 | 9,461 | | <3 | 2,432 | | <3 | 696 |
| 2003 | 3,781 | 2,132 | 3,118 | 655 | 7,554 | 464 | 241 | 285 | 177 | 87 | 105 | | ^ | 13,491 | 487 | 13,978 | | <3 | 2,821 | | <3 | 782 |
| 2004 | 2,586 | 977 | 1,130 | 3,590 | 7,306 | 659 | 141 | 89 | 198 | 67 | 52 | | 444 | 13,367 | 24 | 13,835 | | 10 | 2,727 | | <3 | 727 |
| 2005 | 3,473 | 745 | 811 | 286 | 4,570 | 513 | 88 | 85 | 195 | 49 | 45 | | 83 | 8,217 | 9 | 8,309 | | 4 | 1,761 | | 3 | 552 |
| 2006 | 5,281 | 327 | 397 | 300 | 5,978 | 495 | 35 | 31 | 161 | 18 | 19 | | ^ | 12,374 | | 12,374 | | <3 | 2,163 | | <3 | 615 |
| 2007 | 5,596 | 283 | 357 | 73 | 6,025 | 559 | 29 | 35 | 191 | 20 | 22 | | 674 | 11,143 | | 11,817 | | 13 | 2,471 | | 9 | 651 |
| 2008 | 3,693 | 1,236 | 1,359 | 122 | 5,174 | 341 | 106 | 114 | 123 | 42 | 46 | 721 | 455 | 9,768 | | 10,489 | 19 | 9 | 1,700 | 11 | 6 | 477 |
| 2009 | 4,662 | 642 | 650 | 298 | 5,610 | 434 | 53 | 47 | 134 | 30 | 26 | 721 | 664 | 11,621 | | 12,342 | 16 | 12 | 2,596 | 11 | 8 | 655 |
| 2010 | 4,961 | 811 | 958 | 446 | 6,364 | 502 | 78 | 76 | 154 | 45 | 42 | 919 | 601 | 10,871 | | 11,790 | 24 | 17 | 2,339 | 16 | 9 | 609 |
| 2011 | 4,059 | 1,094 | 1,179 | 170 | 5,408 | 453 | 89 | 93 | 174 | 47 | 47 | 611 | 282 | 9,840 | | 10,451 | 21 | 12 | 2,560 | 13 | 8 | 640 |
| 2012 | 2,219 | 0 | 0 | 265 | 2,484 | 276 | 0 | 0 | 174 | 0 | 0 | 0 | 0 | 13,861 | | 13,861 | 0 | 0 | 3,309 | 0 | 0 | 816 |
| 2013 | 4,301 | 609 | 650 | 168 | 5,119 | 278 | 39 | 41 | 177 | 19 | 22 | 514 | 289 | 12,019 | | 12,533 | 16 | 9 | 2,559 | 12 | 6 | 684 |
| 2014 | 4,130 | 395 | 415 | 256 | 4,801 | 339 | 26 | 28 | 147 | 12 | 12 | 1459 | 1,290 | 12,108 | | 13,567 | 36 | 30 | 2,513 | 18 | 17 | 590 |
| 2015 | 3,978 | 244 | 245 | 160 | 4,383 | 408 | 19 | 19 | 160 | 11 | 11 | 756 | 557 | 11,038 | | 11,794 | 30 | 20 | 2,389 | 19 | 13 | 560 |
| 2016 | 2,634 | 186 | 189 | 22 | 2,845 | 388 | 17 | 17 | 150 | 9 | 9 | 482 | 511 | 10,266 | | 10,777 | 22 | 22 | 2,488 | 12 | 15 | 557 |
| 2017 | 1,583 | 248 | 236 | 0 | 1,831 | 240 | 21 | 20 | 121 | 12 | 11 | 659 | 328 | 7,102 | | 7,761 | 27 | 16 | 2,008 | 14 | 13 | 495 |
| 2018 | 2,483 | 234 | 221 | 0 | 2,717 | 275 | 20 | 19 | 121 | 9 | 8 | 680 | 855 | 6,873 | | 7,728 | 28 | 28 | 1,656 | 13 | 20 | 434 |
| 2019 | 2,235 | 139 | 136 | 28 | 2,402 | 269 | 12 | 12 | 122 | 7 | 7 | 367 | 578 | 7,188 | | 7,766 | 12 | 18 | 2,229 | 7 | 12 | 540 |
| 2020 | 2,375 | 0 | ^ | 0 | 2,375 | 247 | 0 | ^ | 104 | 0 | ^ | 282 | 648 | 6,868 | | 7,516 | 7 | 15 | 1,422 | 5 | 11 | 391 |
| 2021 [12] | 2,399 | 0 | ^ | 0 | 2,399 | 270 | 0 | ^ | 112 | 0 | ^ | 209 | 719 | 3,490 | | 4,209 | 8 | 22 | 845 | 3 | 17 | 292 |

Data Sources and Notes:

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

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

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

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

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

[6] DFO estimates of US landings in Canadian ports are of minimum bound (not expanded) and are based on incomplete fish slip data and reports from Canadian buyers/processors.

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

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

[9] U.S. DATA Source: Pacific Fisheries Information Network (PacFIN) retrieval dated , 03/22/2022. Number of landings estimated from unique vessel ID and Fish Ticket Dates

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

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

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

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

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

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

| Year | Canadian Fleet [1] | | | | | | | U.S. Fleet[11] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Number of vessels/months allowed to fish in US EEZ* | *Number of vessels that fished in US EEZ* [3] | *Number of vessels that fished in Canadian EEZ* [5] | *Vessel Months Used* [4] | *Fishing Effort in US EEZ (boat fishing days)* [2] | *Fishing Effort in Canadian EEZ (boat fishing days)* [2] | *Fishing Effort on high seas (boat fishing days)* [2] | *Number of vessels allowed to fish in Canadian EEZ* [6] | *Number of vessels that fished in US EEZ* [7,8] | *Number of vessels that fished in Canadian EEZ* [7, 8] | *Fishing Effort in US EEZ (boat fishing days)* [10] | *Fishing Effort in Canadian EEZ (boat fishing days)* [10] | *Fishing Effort on high seas (boat fishing days)* [10, 11] |
| 1995 | Unlimited | 9 | 175 | N/A | 191 | 5,535 | 197 | Unlimited | 472 | 71 | 1,461 | 960 | 6,786 |
| 1996 | Unlimited | 83 | 90 | N/A | 4,222 | 2,813 | 1,130 | Unlimited | 658 | 6 | 3,574 | 14 | 10,229 |
| 1997 | Unlimited | 59 | 67 | N/A | 1,972 | 1,010 | 1,339 | Unlimited | 1160 | 46 | 4,520 | 570 | 10,838 |
| 1998 | Unlimited | 91 | 92 | N/A | 3,234 | 1,274 | 1,507 | Unlimited | 838 | 3 | 3,042 | 26 | 8,834 |
| 1999 | Unlimited | 176 | 162 | N/A | 4,316 | 1,689 | 965 | Unlimited | 772 | 19 | 12,560 | 273 | 7,859 |
| 2000 | Unlimited | 184 | 131 | N/A | 6,738 | 1,189 | 842 | Unlimited | 707 | 12 | 8,883 | 67 | 4,970 |
| 2001 | Unlimited | 207 | 176 | N/A | 7,697 | 1,754 | 570 | Unlimited | 929 | 15 | 9,280 | 75 | 5,560 |
| 2002 | Unlimited | 200 | 124 | N/A | 7,207 | 686 | 431 | Unlimited | 696 | 31 | 8,132 | 212 | 3,552 |
| 2003 | Unlimited | 177 | 119 | N/A | 7,111 | 892 | 425 | Unlimited | 782 | 9 | 10,919 | 126 | 2,395 |
| 2004 | 170 vessels or 680 vessel fishing months | 202 | 172 | 627 | 7,551 | 2,125 | 266 | 170 vessels or 680 vessel fishing months | 727 | 21 | 11,079 | 213 | 1,184 |
| 2005 | 140 vessels or 560 vessel fishing months | 154 | 196 | 410 | 5,309 | 2,940 | 315 | 140 vessels or 560 vessel fishing months | 552 | 31 | 9,943 | 316 | 914 |
| 2006 | 125 vessels or 500 vessel fishing months | 139 | 148 | 396 | 4,500 | 1,401 | 342 | 125 vessels or 500 vessel fishing months | 615 | 32 | 9,883 | 96 | 1,043 |
| 2007 | 94 vessels or 376 vessel fishing months | 119 | 191 | 368 | 4,809 | 2,081 | 12 | 94 vessels or 376 vessel fishing months | 651 | 14 | 10,713 | 135 | 233 |
| 2008 | 94 vessels or 376 vessel fishing months | 122 | 79 | 338 | 4,993 | 360 | 420 | 94 vessels or 376 vessel fishing months | 477 | 39 | 7,947 | 327 | 1,031 |
| 2009 | 110 | 107 | 116 | N/A | 5,722 | 675 | 143 | Historical level | 655 | 27 | 12,002 | 262 | 719 |
| 2010 | 110 | 109 | 153 | N/A | 3,848 | 2,887 | 559 | Historical level | 609 | 51 | 10,542 | 342 | 1,961 |
| 2011 | 110 | 108 | 146 | N/A | 6,549 | 1,771 | 285 | Historical level | 640 | 30 | 13,619 | 117 | 941 |
| 2012 | 0 | 0 | 174 | N/A | 0 | 5,084 | 890 | 0 | 816 | ^ | 14,636 | ^ | 380 |
| 2013 | 45 vessels | 43 | 181 | N/A | 1,870 | 4,299 | 296 | Historical level | 703 | 21 | 12,242 | 229 | 452 |
| 2014 | 45 vessels | 44 | 156 | N/A | 1,774 | 2,944 | 27 | Historical level | 617 | 35 | 11,425 | 659 | 116 |
| 2015 | 45 vessels | 43 | 161 | N/A | 1,435 | 3,792 | 17 | Historical level | 574 | 39 | 10,770 | 549 | 186 |
| 2016 | 45 vessels | 43 | 151 | N/A | 1,892 | 3,407 | 60 | Historical level | 569 | 31 | 12,280 | 251 | 213 |
| 2017 | 45 vessels | 45 | 101 | N/A | 2,865 | 1,343 | 770 | Historical level | 518 | 15 | 11,293 | 39 | 1,287 |
| 2018 | 45 vessels | 45 | 118 | N/A | 2,228 | 1,924 | 44 | Historical level | 452 | 26 | 10,255 | 476 | 363 |
| 2019 | 45 vessels | 42 | 119 | N/A | 1,621 | 2,008 | 253 | Historical level | 554 | 16 | 10,108 | 416 | 546 |
| 2020 | 45 vessels | 34 | 104 | N/A | 573 | 2,541 | 187 | Historical level | 404 | 34 | 7,117 | 745 | 819 |
| 2021 [9] | 45 vessels | 41 | 112 | N/A | 937 | 2,637 | 86 | Historical level | 311 | 55 | 5,207 | 915 | 608 |

Data Sources and Notes:

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

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

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

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

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

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

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

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

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

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

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

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