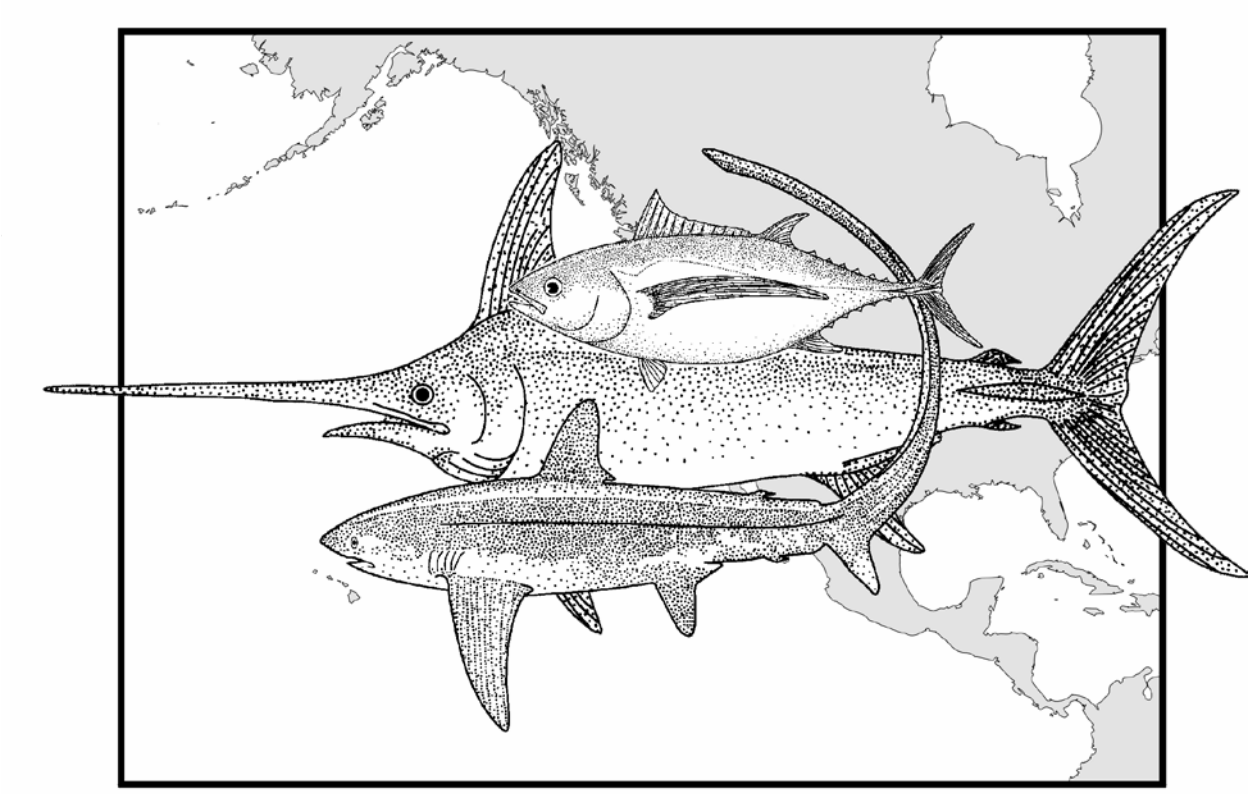
STATUS OF THE U.S. WEST COAST FISHERIES FOR HIGHLY MIGRATORY SPECIES THROUGH 2019



STOCK ASSESSMENT AND FISHERY EVALUATION

JANUARY 2020

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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

The HMS FMP describes a schedule under which a final stock assessment and fishery evaluation (SAFE) document is delivered in November each year, containing information through the preceding year. However, since 2014 the SAFE has been maintained on the Council website with regular updates throughout the year. An "archive copy" (like this document) is then produced in January of the following year. This makes it possible to include information for all of the preceding year. The exception is the tables and figures reporting landings and participation for commercial and recreational fisheries, which are lagged by a year due to the time it takes for the data to flow into relevant databases. (These data tables are only maintained online and not reproduced in this archive copy but summary statistics are reported in Chapters 8 and 9.) Thus, this archive copy, produced in January 2019, covers the calendar year 2018.

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 four times since its implementation (with a fifth amendment in process as of January 2017). 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.

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 and 2018 the Council did not recommend any regulatory changes for the next biennial periods (April 1, 2017–March 31, 2021).

1.5. Highly Migratory Species Management Team

Current members of the HMSMT may be found in the Roster on the Council website.

2. Council HMS Activities in 2019

The Council made the following HMS-related decisions in 2019.

2.1. November (briefing book)

2.1.1. Recommend International Management Activities

The Council endorsed the recommendations to National Marine Fisheries Service of the Enforcement Consultants and the Highly Migratory Species Advisory Subpanel. Specifically, the United States government should:

- Strengthen or seek adoption of regional fishery management organization measures to require vessels comply with a garbage plan to prevent discarding of waste at sea
- Seek adoption of RFMO measures to require vessels to carry and deploy boarding ladders that allow safe boarding during high seas inspections
- Establish a catch attribution system for Canadian North Pacific albacore catch within the U.S. Exclusive Economic Zone (EEZ) and vice versa
- Work with Canada Department of Fisheries and Oceans to harmonize paperwork requirements for EEZ and port access
- Investigate and provide information on the source of cheap albacore imported into Canada and re-exported to the U.S. under the label "Product of Canada"
- Support Permanent Advisory Committee recommendations on South Pacific albacore conservation and management by the Western and Central Pacific Fisheries Commission (WCPFC)
- Work through the WCPFC to determine if unreported North Pacific albacore catch is occurring in the Convention Area and to better understand the impact of incidental catch of North Pacific albacore, especially by Small Island Developing State) fleets, not bound by current fishing effort limits.

2.1.2. Scoping an Amendment Authorizing Shallow-Set Longline Gear Outside of the Exclusive Economic Zone

The Council chose not to proceed with further scoping or consideration of an amendment to establish a west coast permit to use shallow-set longline fishing gear outside the U.S. EEZ at this time. The Council directed the HMSMT to analyze the following issues in support of the Swordfish Monitoring and Management Plan and report back to the Council at the June 2020 meeting in San Diego, California:

1. Analyze effort, catch, and bycatch in subsets of Hawaii shallow-set longline observer data for potential action area delineations.
2. Document all sources of swordfish supply to the U.S. West Coast, including both foreign and domestic (west coast and Hawaii) caught.
3. Estimate related conservation impacts to characterize the relationship between domestic and foreign sources of swordfish supply and the potential to mitigate conservation impacts and reduce the Nation's seafood trade deficit through increased west coast production.

2.2. September (briefing book)

2.2.1. Recommend International Management Activities

The Council made the following recommendations on U.S. positions for the Permanent Advisory Committee to advise the U.S. Commissioners to the Western Central Pacific Fisheries Commission:

- Negotiate an equitable allocation of harvest opportunity for Pacific bluefin tuna between the Eastern Pacific Ocean and the Western and Central Pacific Ocean.
- Seek a change in the proportion of Western Central Pacific Fisheries Commission Northern Committee members that must be present for its meeting to achieve a quorum. The current threshold is too high, such that the Northern Committee did not reach a quorum when members met in September 2019.

2.2.2. Exempted Fishing Permits – Final Recommendations

The Council approved the Exempted Fishing Permit application submitted by Nathan Perez and Thomas Carson to fish a modified configuration of both standard and linked night-set buoy gear (fishing the gear at night) and recommended that National Marine Fisheries Service issue the permit with a 100 percent observer coverage requirement.

2.2.3. Deep-Set Buoy Gear Authorization – Final Action

The Council adopted its Preliminary Preferred Alternative for authorization of a Deep-Set Buoy Gear Fishery as its Final Preferred Alternative with the following clarifications:

1. Permit issuance is intended to be cumulative, adding 25 permits each year to the prior year total until a maximum of 300 is reached. Any permits issued in previous years that were not issued or renewed would also be available for issuance each year.
2. National Marine Fisheries Service (NMFS) will provide updates to the Council on permit issuance, though the number of additional permits issued by NMFS each year need not be reconsidered nor approved by the Council annually.
3. A cessation or temporary halt ("pause") in permit issuance before 300 permits are issued is possible and would be considered by the Council in order to address concerns identified by NMFS or the Council.
4. The end-date for demonstrated swordfish experience found in the Limited Entry Permit issuance criterion (Suboption 4) number 8 is removed.

The Council also adopted draft proposed FMP amendment language (Amendment 6 to the Highly Migratory Species Fishery Management Plan) with some modest changes.

The Council's preliminary preferred alternative (now final preferred) is described in the Preliminary Draft Environmental Impact Statement as Alternative 3 (see section 2.3 beginning on page 8).

2.3. June (briefing book)

2.3.1. Recommend International Management Activities

The Council reiterated its support of US stakeholder participation in the North Pacific albacore and Pacific bluefin management strategy evaluation processes. Furthermore, these processes should provide equitable opportunity for U.S. stakeholder participation by holding workshops in the U.S. (as well as the Asia-Pacific region) and facilitating U.S. stakeholder participation in meetings outside the U.S.

With regard to the upcoming 94th Inter-American Tropical Tuna Commission (IATTC) meeting (July 22-26), the Council took note of:

- The U.S. proposal to strengthen the existing sea turtle bycatch resolution (C-07-03), recognizing that this would implement mitigation requirements on foreign fleets comparable to measures currently required by U.S. pelagic longline vessels (e.g., circle hooks, finfish bait).

- A proposal presented in Agenda Item I.2.a, Supplemental HMSAS Report 2 to address fishing effort by longline vessels fishing for North Pacific albacore in the EPO. While not taking a position on whether the U.S. should submit such a proposal, the Council endorses the goal of this proposal to prevent any substantial increase in fishing effort directed at North Pacific albacore.

  The Council supports the appropriate international entity (whether the International Scientific Committee or IATTC) conducting a new assessment of the EPO swordfish stock to better understand current stock status.

  The Council agreed to fund travel costs for two Highly Migratory Species (HMS) Management Team (HMSMT) members and four HMS Advisory Subpanel members to attend the Pacific bluefin Inter-American Tropical Tuna Commission-(IATTC) Northern Committee Joint Working Group and Northern Committee meetings the week of September 2, 2019 in Portland, Oregon. This will allow advisory bodies to better understand the Regional Fishery Management Organization process and communicate those lessons to the Council.

2.3.2. Yellowfin Tuna Overfishing Response

On November 2, 2018, National Marine Fisheries Service (NMFS) notified the Council that the Eastern Pacific Ocean (EPO) stock of yellowfin tuna is subject to overfishing, and the Council must make recommendations within one year of that date to address the status of the stock pursuant to section 304(i) of the Magnuson-Stevens Act within one year. The Council had concerns about the quality or the most recent stock assessment and recognized the small impacts of West Coast fisheries to this stock and recommended no changes to domestic regulations to address the relative impact of fishing vessels of the U.S. at this time. The Council also requested that IATTC scientific staff prioritize tasks intended to improve the EPO yellowfin benchmark assessment to be completed in 2020, including examining the sensitivity of the model to the 2018 catch-per-unit-effort longline data and obtaining the necessary additional data to explore spatial and temporal factors (e.g., fleet behavior). This recommendation will be submitted to the Secretary of State and Congress.

2.3.3. Drift Gillnet Performance Metrics Review

In Agenda Item J.4.a, Supplemental HMSMT Report 1 the HMSMT presented drift gillnet performance metrics for the 2017 calendar year and described an alternative, multi-annual method for assessing bycatch performance in the fishery. The Council directed the HMSMT to present an assessment of fishery performance using this method at the June 2020 Council meeting. (This assessment will cover the species of interest identified in Motion 11 from the September 2018 Council Meeting.) In further developing this method, the HMSMT will include an additional assessment threshold for detecting exceptionally high bycatch rates.

2.3.4. Exempted Fishing Permits

The Council reviewed 18 deep-set buoy gear (DSBG) exempted fishing permit (EFP) applications submitted by the May 23 deadline and:

1. Approved 16 applications for EFP issuance by NMFS
2. Preliminarily approved the Perez/Carson EFP for night set buoy gear (Attachment 17) under 100 percent observer coverage. The Council will make a final recommendation on this EFP at its September 2019 meeting
3. Recommended that NMFS prioritize issuance of these EFPs over previously approved applications for which EFPs have not yet been issued, within the limits in the existing protected resources consultation,

recommended that NMFS extend currently issued DSBG EFPs through 2020 (see Attachment 21), and recommended that NMFS consider any EFP applications previously approved by the Council but not issued by December 31, 2019, due to inaction by the applicant, as ineligible for issuance.

2.3.5. Deep-Set Buoy Gear Authorization

NMFS presented its preliminary analysis of the biological impacts of authorizing a DSBG fishery. The Council noted the potential socioeconomic effects stemming from the number of limited entry permits issued to fish in the Southern California Bight and asked that the analysis of the range of alternatives to be provided in September include information to facilitate an informed final Council decision on the permit issuance process. The Council is scheduled to choose a final preferred alternative at its September 2019 meeting.

2.4. March (briefing book)

2.4.1. Drift Gillnet Performance Metrics Review

The Council directed the HMSMT to continue work on its proposed method for reporting annual performance metrics and for evaluating multi-year trends in fishery performance using a bycatch rate approach. The Council also asked the HMSMT to consider how performance metrics can incentivize bycatch reduction by fishery participants. The HMSMT is slated to provide annual estimates against performance metrics at the June Council meeting and detail the methodology for a multi-annual bycatch rate approach along with results from the proposed method.

3. HMS Regulatory Framework

3.1. Changes to HMS FMP Regulations in 2018

There were no modifications to HMS FMP regulations at 50 CFR 660 Subpart K in 2019. A list of regulations since implementation of the FMP may be found in online SAFE or previous archive versions.

3.2. Monitoring and Enforcement

3.2.1. Status of HMS Permits

The reporting and recordkeeping requirements of the HMS FMP became effective February 10, 2005, and formalized the requirement for an HMS permit. Title 50, Section 660.707 of the Code of Federal Regulations outlines the required HMS permit with an endorsement for a specific gear for all U.S. commercial and recreational charter fishing vessels fishing for HMS within the U.S. EEZ off the States of California, Oregon, and Washington. The permit requirements also apply for U.S. commercial fishing vessels that land or transship HMS shoreward of the outer boundary of the U.S. EEZ off the States of California, Oregon, and Washington. The permit must be on board the vessel and available for inspection by an authorized officer. The following table shows the number of valid HMS permits by year.

HMS permits recorded in the permit database for each year since the regulation became effective on February 10, 2005. The permit data presented reflects valid permits and does not necessarily reflect total number of active vessels (i.e., vessels with catch and effort history in a given fishery year).

Table 3-1. HMS permits recorded in the permit database for each year since the regulation became effective on February 10, 2005. The permit data presented reflects valid permits and does not necessarily reflect total number of active vessels (i.e., vessels with catch and effort history in a given fishery year).

Year	California	Oregon	Washington	Other	Total
2005	677	626	298	135	1,736
2006	800	684	339	152	1,975
2007	785	561	318	108	1,772
2008	826	569	331	84	1,810
2009	903	650	381	54	1,988
2010	887	620	383	80	1,970
2011	862	650	340	106	1,958
2012	826	625	348	113	1,912
2013	842	647	378	140	2,007
2014	851	597	433	75	1,956
2015	867	608	441	86	2,002
2016	828	576	414	77	1,895

Notes: The permits are issued to the vessel owner(s) not to the vessels themselves. The totals indicate the number of valid permits in each year and cannot be added across years. The “Other” column includes non-west coast home ports/states and permits issued with no home port/state designated.

3.2.2. HMS Fisheries Data Collections

Catch, effort, size composition, and landings data are critical for monitoring HMS fisheries and assessing the status of HMS stocks. The SWFSC monitors seven Pacific Ocean HMS fisheries. Logbook, observer, landing, and size composition data from these fisheries come from various sources, as shown in the table below.

Table 3-2. Summary of fisheries data collections.

Fishery	Logbooks	Observer	Landings	Size Composition
North Pacific Albacore Troll	F		P/S/I	D
Large Mesh Drift Gillnet	S	F	P	O
Harpoon	S		P	
EPO Purse Seine	I	I	C/P	D
California Longline	F	F	H	H
California HMS Sport	S			D (PBF)
Albacore Sport (OR/WA)	F			

LEGEND
Logbooks/Observer: F – federal; S – state; I – international
Landings monitored by: P – PacFIN; C – cannery; H – Hawaii
Size composition: O – observer; D – dock-side

All HMS permit holders, including HMS recreational charter vessels, are required to maintain logbooks. All information specified on the logbook forms must be recorded on the forms within 24 hours after the completion of each fishing day. The original logbook form for each fishing trip must be submitted to NMFS within 30 days of the end of each trip. Each form must be signed and dated by the fishing vessel operator.

The CDFW implemented a harpoon logbook and permit program in 1974. Logbooks are submitted to CDFW and forwarded to SWFSC for editing and keypunching.

The gillnet logbook program was implemented in 1980 by the CDFW. Logbooks are submitted to CDFW and forwarded to SWFSC for editing and keypunching.

Purse-seine vessels based on the west coast primarily target CPS but occasionally target HMS (albacorer bluefin tuna) when they are available and market conditions are favorable. Logbook data are required to be submitted to NMFS when these vessels target HMS.

Participants in the west-coast based longline fisheries submit logbook data to SWFSC. Logbook data are maintained at SWFSC and are combined with Hawaii longline data for international reporting. PacFIN data are not used in the estimation of total annual catch estimates for Pacific HMS pelagic longline fisheries.

CPFV vessel owners based in California submit logbook data to CDFW who in turn make the data available to SWFSC. SWFSC staff extracts and summarize the HMS component of the data for reporting purposes. CPFV fisheries in Washington and Oregon occasionally target albacore during the summer months when fish are close enough to shore. When targeting albacore, CPFV vessel owners complete a CPFV logbook

and submit the data to SWFSC where the data are maintained and combined with summarized CPFV data from California.

3.3. Protected Resources Regulations

3.3.1. HMS FMP Endangered Species Act Consultations

Longline and drift gillnet vessels on rare occasions encounter endangered and threatened species of sea turtles and marine mammals while targeting HMS. HMS longline vessels also infrequently encounter a number of sea birds. Endangered and threatened marine species are protected through a number of Federal laws, including the ESA and the MMPA. The HMS FMP final rule (69 FR 18444) adopted measures to minimize interactions of HMS gears with protected species and to ensure that the HMS fisheries are operating consistent with Federal laws. These measures include time and area closures, gear requirements, and safe handling and release techniques for protected seabirds and sea turtles. Refer to 50 CFR 660.712, 713, and 720 and 50 CFR 229.31 and 223.206 for the complete list and text of the regulations.

Impacts of HMS FMP fisheries on species listed under the Endangered Species Act (ESA) (including marine mammals and sea turtles) have been analyzed in section 7 consultations and biological opinions (BOs), which are listed below. BOs include an Incidental Take Statement with anticipated mortalities and entanglements of ESA-listed marine mammals and sea turtles that are likely to interact with vessels targeting HMS fish species.

The 2004 BO for the HMS FMP considered the impacts of the proposed shallow-set longline fishery and found that the fishery was likely to jeopardize the continued existence of threatened loggerhead sea turtles. As a result, the shallow-set longline HMS fishery was prohibited when the FMP was implemented.

The US Fish and Wildlife Service also conducted a section 7 consultation on the HMS FMP for the endangered short-tailed albatross and brown pelican. (The brown pelican has subsequently been de-listed.)

More information on the ESA and endangered and threatened species under NMFS' jurisdiction may be found the NMFS website.

The table below lists BOs prepared for west coast HMS fisheries managed under the HMS FMP through 2015.

Table 3-3. Biological opinions for west coast HMS fisheries

Date	Title
2/4/04	Biological Opinion on Highly Migratory Species FMP (NMFS)
N/D	Biological Opinion on Highly Migratory Species FMP (USFWS)
10/23/06	Issuance of an Exempted Fishing Permit to allow the use of drift gillnet gear in an area and time that is currently prohibited under the Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species. Issuance of a Marine Mammal Protection Act section 101(a)(5)(E) permit, authorizing take of endangered fin, humpback, and sperm whales
11/28/07	Shallow-set Longline exempted fishing permit under the U.S. West Coast Highly Migratory Species Fisheries
7/29/08	Updated Shallow-set Longline exempted fishing permit under the FMP for West Coast Highly Migratory Species Fisheries
4/8/11	Authorization of (1) the deep-set tuna longline fishery managed under the Fishery Management Plan for U.S. West Coast Highly Migratory Species, and (2) continued operation of Highly Migratory Species fishery vessels in the deep-set tuna longline fishery under permits pursuant to the High Seas Fishing Compliance Act
5/2/13	Re-initiation of ESA Section 7 Consultation on the Effects of the U.S. West Coast Highly Migratory Species Drift Gillnet Fishery on ESA Listed Species
8/18/16	Continued operation of the west coast based deep-set longline fishery managed under the Fishery Management Plan for U.S. West Coast Highly Migratory Species Fisheries

3.3.2. Sea Turtles Listed Under the ESA

Takes of green, olive ridley and loggerhead sea turtles are uncommon in the California drift gillnet fishery except under certain environmental conditions (e.g., El Niño or higher than usual sea surface temperatures) when turtles may move into the areas of drift gillnet fishing. Takes of leatherbacks are also rare, likely due to the time/area closure which has been in effect since the 2001 season and subsequent reductions in fishing effort. Since 2001, only two leatherbacks have been observed taken (released alive) in the drift gillnet fishery, one in 2009 and another in October 2012.

On April 6, 2016, NMFS and the USFWS published a final rule to list 11 DPSs of green turtles (*Chelonia mydas*) under the ESA (81 FR 20057). Green sea turtles found off the U.S. west coast comprise the East Pacific DPS, which is listed as threatened. NMFS is currently in the process of the consideration of designating critical habitat for green sea turtles in the marine environment off the U.S. west coast.

On January 29, 2012 NMFS published a final rule that designates areas off the U.S. west coast as critical habitat for endangered leatherback sea turtles (77 FR 4170). The final rule designates as critical habitat an area of approximately 41,914 square miles from Point Arguello to Point Arena, California, and from Cape Blanco in Oregon to Cape Flattery, Washington.

On September 22, 2011, NMFS and the U.S. Fish and Wildlife Service published a final rule to list nine distinct population segments (DPSs) of the loggerhead turtle (*Caretta caretta*) pursuant to the ESA. After considering designation of critical habitat for the two DPSs that occur within the EEZ of the United States, the North Pacific DPS (listed as endangered) and the Northwest Atlantic DPS (listed as threatened), in 2014 NMFS published a final rule (79 FR 39855) concluding "No marine areas meeting the definition of critical habitat were identified within the jurisdiction of the United States for the North Pacific Ocean DPS, and therefore we are not designating critical habitat for that DPS."

3.3.3. Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) establishes a general prohibition on the "take" of any marine mammal (note that the MMPA "take" definition is somewhat different from the ESA definition). An exemption may be granted if the activity meets certain standards pursuant to MMPA Section 101. For example, section 101(a)(5)(E) provides that NMFS shall allow, for a period of up to three years, the incidental taking of marine mammal species listed under the Endangered Species Act (ESA) by persons using vessels of the United States with valid fishing permits, if NMFS makes certain determinations. NMFS must first determine, after notice and opportunity for public comment, that: 1) the incidental mortality and serious injury from commercial fisheries will have a negligible impact on the affected species or stock; 2) a recovery plan has been developed or is being developed for such species or stock under the ESA; and 3) where required under section 118 of the MMPA, a monitoring program has been established, vessels engaged in such fisheries are registered in accordance with section 118 of the MMPA, and a take reduction plan has been developed or is being developed for such species or stock.

In order to make a negligible impact determination, NMFS must consider the total human-related mortality and serious injury to the affected stock of marine mammals. This includes the known or estimated takes from all human sources, such as commercial fisheries and ship strikes. There are five criteria that NMFS adopted in 1999 to make negligible impact determinations for MMPA 101(a)(5)(E) permits (64 FR 28800; May 27, 1999). Criterion 1 is the starting point for analysis. If Criterion 1 is not satisfied, NMFS may use one of the other criteria as appropriate.

The threshold for initial determination will remain at 0.1 PBR. If total human-related serious injuries and mortalities are less than 0.1 PBR, all fisheries may be permitted.

If total human-related serious injuries and mortalities are greater than PBR, and fisheries-related mortality is less than 0.1 PBR, individual fisheries may be permitted if management measures are being taken to address non-fisheries-related serious injuries and mortalities. When fisheries-related mortality and serious injury is less than 10 percent of the total, the appropriate management action is to address components that account for the major portion of the total.

If total fisheries-related serious injuries and mortalities are greater than 0.1 PBR and less than PBR and the population is stable or increasing, fisheries may be permitted subject to individual review and certainty of data. Although the PBR level has been set up as a conservative standard that will allow recovery of a stock, there are reasons for individually reviewing fisheries if serious injuries and mortalities are above the threshold level. First, increases in permitted serious injuries and mortalities should be carefully considered. Second, as serious injuries and mortalities approach the PBR level, uncertainties in elements such as population size, reproductive rates, and fisheries-related mortalities become more important.

If the population abundance of a stock is declining, the threshold level of 0.1 PBR will continue to be used. If a population is declining despite limitations on human-related serious injuries and mortalities below the PBR level, a more conservative criterion is warranted.

If total fisheries-related serious injuries and mortalities are greater than PBR, permits may not be issued.

On January 10, 2017, NMFS issued a Federal Register notice proposing to issue a 3-year permit to authorize the incidental take of ESA-listed humpback whales and sperm whales by the California thresher shark/swordfish drift gillnet fishery (and the WA/OR/CA sablefish pot fishery) (82 FR 2955). Public comments must be received by February 9, 2017. Regulations implementing the Plan require fishermen participating in the California drift gillnet fishery targeting swordfish and thresher shark to use pingers in a staggered configuration on their nets and a minimum length of buoy lines The Pacific Offshore Take Reduction Plan and regulations (satisfying requirement 3, above) were finalized in 1997. The Pacific Offshore Take Reduction **Team** meets periodically to assess the effectiveness of the Plan and, if necessary, develop recommendations for reducing marine mammal incidental serious injury and mortality in the California drift gillnet fishery.

The MMPA mandates that each commercial fishery be classified by the level of mortality and serious injury of marine mammals occurring incidental to each fishery. The List of Fisheries classifies U.S. commercial fisheries into one of three categories according to the level of incidental mortality or serious injury of marine mammals. This classification is based on the rate, in numbers of animals per year, of incidental mortality and serious injury of marine mammals due to commercial fishing operations relative to a stock's Potential Biological Removal (PBR) level, defined (50 CFR 229.2) as the maximum number of animals, not including natural mortality, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The DGN fishery is currently categorized as a Category I fishery (annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50 percent of the PBR level) due to interactions with sperm whales in 2010.

3.4. Marine Mammals of Concern for West Coast HMS Fisheries

As discussed above, PBR is an important threshold for making the negligible impact determination. PBR is calculated as 0.5 times the maximum potential population growth rate (Rmax) times the minimum estimate of abundance (Nmin) times a recovery factor (Fr). Marine mammal stocks may be defined as "strategic" if human-caused mortality exceeds PBR, the species is listed under the ESA, the population is estimated to be declining, or the stock is designated as "depleted" under the MMPA. Table 3-4 below is taken from the 2018 U.S. Pacific Marine Mammal Stock Assessment Report (June 2019). It shows estimates of these parameters for stocks for which the Council established bycatch performance metrics. In 2015 the Council identified these bycatch performance metrics for the California large mesh drift gillnet (DGN) fishery including take levels for selected marine mammals. At that time the Council recommended hard caps for sea turtles and selected marine mammals. In 2017 NMFS determined that the use of hard caps in this instance was unwarranted but the Council decided that take of these species should also be included as performance metrics.

Table 3-4. Stock status indicators from the 2018 U.S. Pacific Marine Mammal Stock Assessment Report. Reports revised in 2018 are highlighted. S=strategic stock, N=non-strategic stock. unk=unknown, undet=undetermined, n/a=not applicable.

Species (Stock Area)	N est	CV N est	N min	R max	Fr	PBR	Total Annual Mortality + Serious Injury	Annual Fishery Mortality + Serious Injury	Status	Revised
Minke whale (California/Oregon/Washington)	636	0.72	369	0.04	0.48	3.5	≥ 1.3	≥ 1.3	N	2005
Common dolphin, short-beaked (California/Oregon/Washington)	969,861	0.17	839,325	0.04	0.5	8393	≥40	≥40	N	2016
Common dolphin, long-beaked (California)	101,305	0.49	68,432	0.04	0.48	657	≥35.4	≥32.0	N	2016
Risso's dolphin (California/Oregon/Washington)	6,336	0.32	4,817	0.04	0.48	46	≥3.7	≥3.7	N	2016
California sea lion (U.S.)	257,606	n/a	233,515	0.12	1	14011	≥321	≥197	N	2018
Northern Elephant Seal (California Breeding)	179,000	n/a	81,368	0.12	1	4,882	8.8	4	N	2014
Northern right whale dolphin (California/Oregon/Washington)	26,556	0.44	18,608	0.04	0.48	179	3.8	3.8	N	2016
Gray whale (Eastern N Pacific)	26,960	0.05	25,849	0.062	1	801	139	9.6	N	2018
Pacific white-sided dolphin (California/Oregon/Washington)	26,814	0.28	21,195	0.04	0.45	191	7.5	1.1	N	2016
Sperm whale (California/Oregon/Washington)	1,997	0.57	1,270	0.04	0.1	2.5	0.9	0.7	S	2017
Humpback whale (California/Oregon/Washington)	2,900	0.05	2784	0.08	0.3	16.7	≥ 40.2	≥ 15.7	S	2018
Fin whale (California/Oregon/Washington)	9,029	0	8127	0.04	0.5	81	≥ 43.5	≥ 0.5	S	2018
Short-finned pilot whale (California/Oregon/Washington)	836	0.79	466	0.04	0.48	4.5	1.2	1.2	N	2016
Common Bottlenose dolphin (California Coastal)	453	0.06	346	0.04	0.48	2.7	≥2.0	≥1.6	N	2016

3.5. International Management

3.5.1. RFMOs

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.

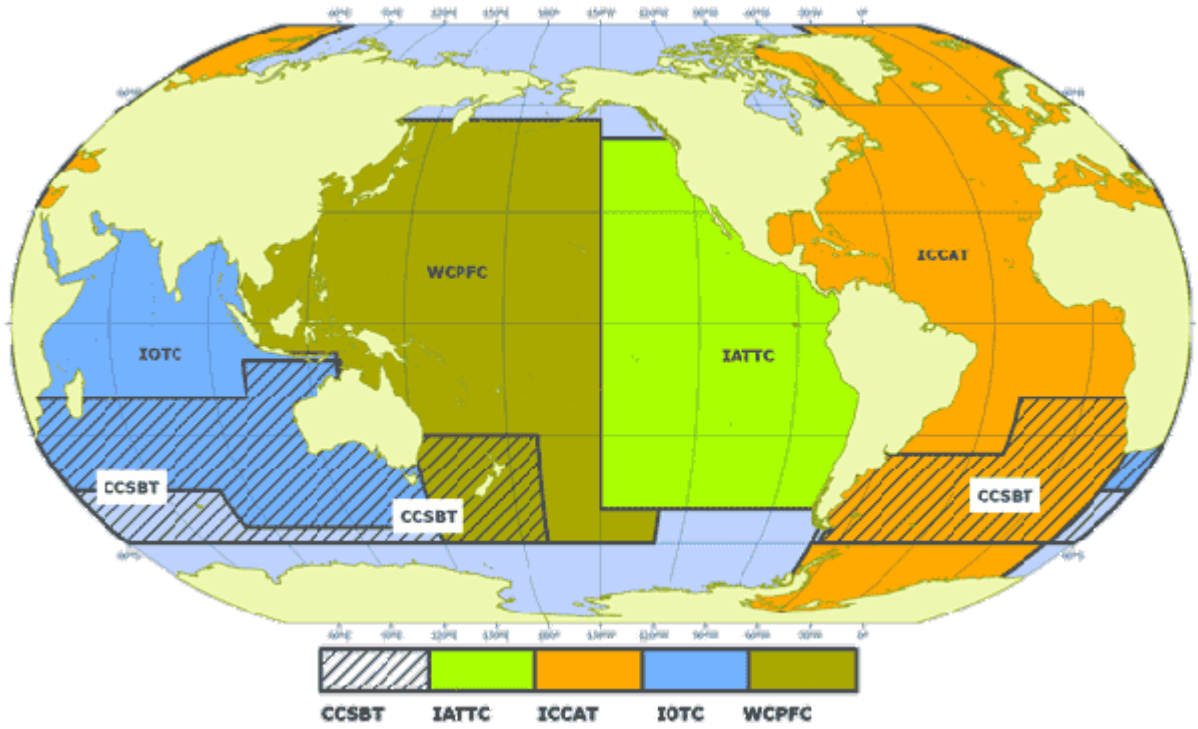


Figure 6-1. Global map of tuna RFMO jurisdictions. (Source: http://www.fao.org/fishery/topic/16917/en).

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.

3.5.2. 2018 IATTC and WCPFC Outcomes

Resolutions adopted at the 94th meeting of the IATTC (July 22-26, 2019)

- C-19-01: *Amends and replaces* C-18-05 FADs
- C-19-02: *Amends and replaces* C-15-01 IUU Vessel list

- C-19-03: Financing FY 2020
- C-19-04: *Amends and replaces* C-07-03 Sea turtles y amends C-04-05 (rev. 3)
- C-19-05: Silky shark
- C-19-06: Whale sharks
- C-19-07: Management Strategy Evaluation workshops
- C-19-08: *Amends and replaces* C-11-08 Observers on longliners

Resolutions and Conservation measures adopted at the sixteenth regular session of the Western and Central Pacific Fisheries Commission (December 5-11, 2019)

- CMM 2019-01 Cooperating Non-Members
- CMM 2019-02 Pacific Bluefin
- CMM 2019-03 North Pacific Albacore
- CMM 2019-04 Sharks
- CMM 2019-05 Mobulid Rays caught in association with fisheries in the WCPFC Convention Area
- CMM 2019-06 Compliance Monitoring Scheme
- CMM 2019-07 WCPFC IUU Vessel List
- CMM 2019-08 Charter Notification Scheme.
- Resolution 2019-01 Climate Change as it relates to the Western and Central Pacific Fisheries Commission

3.5.3. Regulations for International HMS Fisheries and Related Activities in the Pacific Published in 2019

The following *Federal Register* Final Rule Notices modifying the Code of Federal Regulations, Title 50, Chapter III were published in 2019. For earlier years consult previous editions of the SAFE.

84 FR 70040. Procedures for the Active and Inactive Vessel Register (EPO). Effective date: 01/21/20.

84 FR 52035. Closure of Purse Seine Fishery in the ELAPS in 2019 (WCPO). Effective date: 10/09/19.

84 FR 37145.. Fishing Restrictions in Purse Seine Fisheries (WCPO). Effective date: 07/31/19.

84 FR 18409. 2019 and 2020 Commercial Fishing Restrictions for Pacific Bluefin Tuna in the Eastern Pacific Ocean (EPO). Effective date: 05/08/19.

4. Commercial Fisheries

4.1. Fishery Descriptions

Tables referenced below can be found in Appendix A as well as online.

4.1.1. Surface hook-and-line fishery for albacore

Albacore is an economically valuable fishery in all three West Coast states and has been a target of commercial fishermen for more than 100 years. Troll and bait boat (live bait) are the principal commercial gears, although some albacore is caught using purse seine, longline, and drift gillnet gear as well. The fishing season varies from year to year, depending on oceanographic conditions, which strongly influence the occurrence of fish within range of the West Coast fleet, and economics. A typical season runs July through October, with landings peaking in August-September. 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.

In 2001, the last operational cannery in the Port of Los Angeles closed its doors, ending a West Coast tuna-canning dynasty. Changing global market conditions and a dynamic raw material/finished goods supply environment forced the plants to close. Without domestic-based cannery operations, a majority of the albacore are landed fresh or frozen, then exported to overseas markets for processing. Comparing the 1980s to the 2000s, participation in California (measured by the number of surface hook-and-line vessels annually landing albacore) declined by 64% while participation in Oregon and Washington increased by 62% and 130% respectively. Overall, the coastwide decline was 13% based on this metric.

These trends likely reflect a shift in fishing effort into waters off Oregon and Washington where albacore have been more available due to favorable oceanographic conditions. In recent years lower operating costs and better landing facilities in Oregon and Washington compared to California may also have contributed to this shift.

Information on recent landings and revenue in this fishery may be found in the following tables:

- Table 6. Real (inflation adjusted) ex-vessel revenue for the West Coast albacore surface hook-and-line (troll and baitboat) fishery, Canadian vessels included, since 1990.
- Table 7. Monthly landings (number, weight in round mt) and real (inflation adjusted) ex-vessel revenue for albacore by the surface hook-and-line (troll and baitboat) fishery, by state, Canadian vessels included, last three years.
- Table 8. Annual landings (number, weight in round mt) and real (inflation adjusted) ex-vessel revenue for albacore by the surface hook-and-line (troll and baitboat) fishery, by port group, Canadian vessels included, last three years.
- Table 9. Number of vessels, landings (round mt), and ex-vessel revenue (inflation adjusted) of albacore and in the West Coast albacore surface hook-and-line (troll and baitboat) fishery (in U.S. west coast ports), Canadian and US vessels compared since 1990.
- Table 10. Number of vessels, landings (round mt), and real (inflation adjusted) ex-vessel revenue for albacore in the West Coast albacore surface hook-and-line (troll and baitboat) fishery by state, Canadian vessels included, since 1990.
- Table 11. Average nominal price-per-pound ($/lb) for albacore by month and by state, last three years, Canadian vessels included.

4.1.2. Drift gillnet fishery for swordfish and shark

California's swordfish fishery transformed from primarily a harpoon fishery to a drift gillnet fishery in the early 1980s; landings soared to a historical high of 2,198 mt by 1985. Initial development of the drift gillnet fishery in the late 1970s was founded on catches of common thresher shark. The thresher shark fishery rapidly expanded, with 228 vessels landing more than 1,000 mt of shark in 1985. Following 1985, swordfish replaced thresher shark as the primary target species because there was a greater demand for swordfish which commanded a higher price-per-pound and possibly also due to the 1986 establishment of a shark conservation measure. Annual thresher shark landings declined in subsequent years because of the switch to swordfish to maximize economic returns and the implementation of management measures to protect the thresher shark resource.

Both participation and fishing effort (measured by the number of sets) have declined over the years. Industry representatives attribute the decline in vessel participation and annual effort to regulations implemented to protect marine mammals, endangered sea turtles, and seabirds. In addition, if oceanic or other conditions are unfavorable for swordfish, permittees may concentrate on more favorable fisheries, such as albacore; however, permittees may return to swordfish fishing once conditions improve.

Historically, the California drift gillnet fleet operated within EEZ waters adjacent to the state and as far north as the Columbia River, Oregon, during El Niño years. In addition, some Oregon-based vessels participated in this fishery. In Oregon, the DGN fishery for swordfish had been managed under the Developmental Fisheries Program, which authorized up to ten annual permits to fish for swordfish with DGN gear. For the past several years, the fishery was inactive, and no one applied for permits. As part of a substantial reduction in the Developmental Fisheries Program, the Oregon Fish and Wildlife Commission removed swordfish from the program, beginning in 2009. Consequently, state permits to fish with DGN gear off Oregon are no longer allowed.

Fishing activity is highly dependent on seasonal oceanographic conditions that create temperature fronts which concentrate feed for swordfish. Because of the seasonal migratory pattern of swordfish and seasonal fishing restrictions, over 90% of the fishing effort in recent years has occurred from August 15 through January 31.

The drift gillnet fishery is managed by California state and federal limited entry permit systems, with mandatory gear standards and seasonal area closures used to address various conservation concerns. The federal limited entry permit was implemented in 2018 through Amendment 5 to the HMS FMP. It is intended mirror 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.

Both the state and federal limited entry permits are issued to an individual fisherman, rather than a vessel, and are only transferable under very restrictive conditions; thus, the value of the vessel does not become artificially inflated. To keep these permits active, current permittees are required to renew their permit from one consecutive year to the next; however, they are not required to make landings using drift gillnet gear. In order to receive a Federal limited entry DGN permit, state limited entry permit holders had to have renewed their state limited entry DGN permit by March 31, 2018. About 150 state limited entry DGN permits were initially issued when the program began in 1980 and peaked at 251 permits in 1986. The number of these permits has steadily declined since then. To date, 6o federal limited entry DGN permits have been issued.

In addition to these limited entry permits, 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. The California limited entry permit may only be transferred to an individual who already possesses a general gillnet permit.

Consistent with the HMS FMP, DGN vessel operators must also maintain a logbook recording catch and operational data such as the time and location of fishing.

The drift gillnet fishery has been subject to a number of seasonal closures over the years. Since 1982, the drift gillnet fishery has been closed inside the entire West Coast EEZ from February 1 to April 30. In 1986, a closure was established within 75 miles of California mainland from June 1 through Aug 14 to conserve common thresher sharks; this closure was extended to include May in 1990 and later years. In 2001, NMFS implemented two Pacific sea turtle conservation areas on the West Coast with seasonal drift gillnet restrictions to protect endangered leatherback and loggerhead turtles. The larger of the two closures spans the EEZ north of Point Conception, California (34°27' N. latitude) to mid-Oregon (45° N. latitude) and west to 129° W. longitude. Drift gillnet fishing is prohibited annually within this conservation area from August 15 to November 15 to protect leatherback sea turtles. A smaller closure was implemented to protect Pacific loggerhead turtles from drift gillnet gear during a forecasted or concurrent El Niño event, and is located south of Point Conception, California and west of 120° W. longitude from June 1 – August 31 (72 FR 31756).

In September 2018 California enacted Senate Bill 1017, which directs the California Department of Fish and Wildlife to develop a program by March 31, 2020 to allow payment to permit holders for the voluntary surrender of drift gillnet permits. After March 31, 2019 California state drift gillnet permits cannot be transferred, and all permits must be surrendered or revoked by January 31 of the fourth year after $2 million in funding for the program is received by the state.

Information on recent landings and revenue in this fishery may be found in the following tables:

- Table 12. Number of vessels and landings (round mt) in the West Coast drift gillnet fishery since 1990.
- Table 13. Real (inflation adjusted) ex-vessel revenue for the West Coast drift gillnet fishery since 1990.
- Tables 14 a & b. Monthly landings (number, weight in round mt) and real (inflation adjusted) ex-vessel revenue for common thresher shark and swordfish in the drift gillnet fishery, last three years.
- Tables 15 a & b. Annual landings (number, weight in round mt) and ex-vessel revenue (inflation adjusted) for common thresher shark and swordfish landings in California port groups in the drift gillnet fishery, last three years.

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. In the early 1980s, a limited entry drift gillnet fishery was authorized by the State Legislature and soon afterward drift gillnets replaced harpoons as the primary method for catching swordfish. The number of harpoon permits subsequently decreased from a high of 1,223 in 1979 to a low of 25 in 2001. Fishing effort typically occurs in the Southern California Bight from May to December, 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. (DGN permit holders are entitled to obtain a harpoon permit free of charge.) Additionally, the HMS FMP requires a federal permit with a harpoon gear endorsement for all U.S. vessels that fish for HMS within the West Coast EEZ 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.

Information on recent landings and revenue in this fishery may be found in the following tables:

- Table 16. Number of vessels and landings (round mt) in the West Coast harpoon fishery since 1990.
- Table 17. Real (inflation adjusted) ex-vessel revenue for the West Coast harpoon fishery since 1990.
- Table 18. Monthly landings (number, weight in round mt) and real (inflation adjusted) ex-vessel revenue for swordfish by the harpoon fishery, by state, last three years.
- Table 19. Annual landings (number and weight in round mt) and real (inflation adjusted) ex-vessel revenue for swordfish by port group in the harpoon fishery, last three years.

4.1.4. High seas longline fishery for swordfish and tuna

California prohibits pelagic longline fishing within the EEZ and the retention of striped marlin. Both these prohibitions are incorporated in the Council's HMS FMP. Longline vessels fishing outside the West Coast EEZ intermittently land swordfish and tuna in West Coast ports.

Vessels operating outside of the EEZ can land fish in West Coast ports if the operator has the necessary state and Federal permits. The operator must comply with the High Seas Fishing Compliance Act, which requires U.S. vessel operators to maintain logbooks if they fish beyond the EEZ. Additionally, the HMS FMP requires a federal permit with a pelagic longline gear endorsement for all U.S. vessels that pursue HMS on the high seas (seaward of the EEZ) and land their catch in California, Oregon, or Washington.

With implementation of the HMS FMP in 2004, federal regulations were promulgated to protect endangered sea turtles east and west of 150° W longitude and north of the equator, prohibiting West Coast-based shallow-set longline fishing to target swordfish. Vessels permitted under the Western Pacific Fishery Management Council's Pelagics FMP may use shallow-set longline gear to target swordfish and may land their catch on the West Coast. West Coast swordfish landings by Hawaii-based vessels have trended upward since the fishery reopened in 2004. Landings have occurred almost exclusively in California ports.

Targeting tunas with deep-set longline gear is permitted outside the EEZ under the HMS FMP.

The number of pelagic longline vessels making landings on the West Coast has increased from six in 2010 to 22 in 2018. Landings composition has also shifted from swordfish to tunas and other species over the decade. In 2010 swordfish accounted for 82% and tunas just 13% of the 331 mt in total landings made by this fishery. In 2018 swordfish had declined to 28% while tunas accounted for 46% of the 1,411 mt in total landings. Opah, which is not a management unit species in the HMS FMP, is also a significant component of landings: in 2018 this species accounted for 22% of landings, amounting to 310 mt. (Note that the totals reported here are greater than reported in Table 20, which only reports landings of management unit species.)

Information on recent landings and revenue in this fishery may be found in the following tables:

- Table 20. Number of vessels and landings (round mt) by Hawaii permitted longline vessels in West Coast ports since 1990.
- Table 21. Real (inflation adjusted) ex-vessel revenue by Hawaii permitted longline vessels in West Coast ports since 1990.

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

U.S. West Coast catch of yellowfin, skipjack, and bluefin tuna represents a relatively minor component of overall eastern Pacific Ocean (EPO) tuna catch, on average equaling approximately less than 1% of EPO-

wide landings. More than 90% of the catch for these species in the U.S. EEZ EPO is made by small coastal purse seine vessels operating in the Southern California Bight (SCB) from May to October. These vessels primarily target small pelagic species, especially Pacific mackerel, Pacific sardine, anchovy, and market squid. However, they will target the tropical yellowfin and skipjack tunas when intrusions of warm water from the south, typically during periodic El Niño episodes, bring these species within range of the coastal purse seine fleet. Similarly, purse seine vessel operators will target the higher-valued temperate water bluefin tuna when they enter the coastal waters of the SCB. The number of purse seine vessels that landed tuna in California averaged 197 annually 1981-90 but subsequently declined substantially to an annual average of 4 in the 2003-2012 period.

The decline in the number of domestic vessels is correlated with the relocation of large cannery operations. Increased labor costs for cannery operations contributed to these facilities being moved overseas, where labor costs are less. Currently there are no canneries in California functioning as primary offloaders of tuna.

The HMS FMP requires a logbook and federal permit with a purse seine gear endorsement for all U.S. vessels that use purse seine gear to fish for HMS within the West Coast EEZ and for U.S. purse seine vessels that pursue HMS on the high seas (seaward of the EEZ) and land their catch in California, Oregon, or Washington.

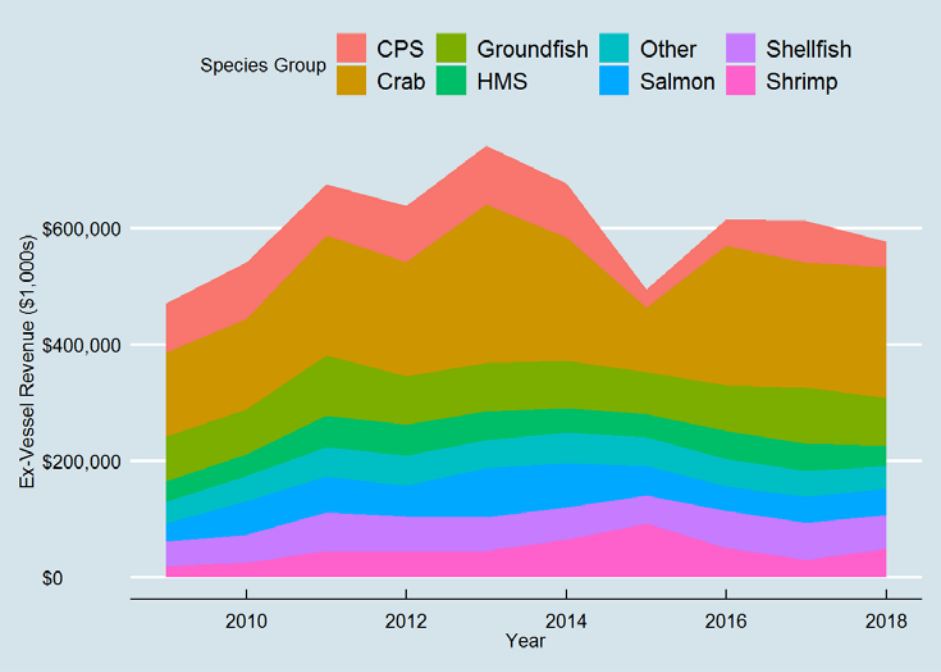
Information on recent landings and revenue in this fishery may be found in the following tables:

- Table 22. Number of vessels and landings (round mt) for HMS tunas in the West Coast purse seine fishery since 1990.
- Table 23. Real (inflation adjusted) ex-vessel revenue from HMS tunas in the West Coast purse seine fishery since 1990.

4.2. Commercial Fishery Performance

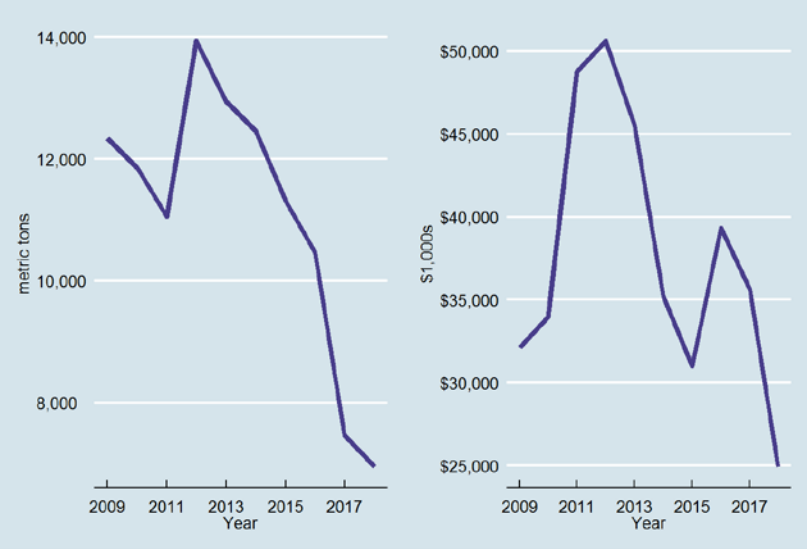
4.2.1. HMS landings and revenue compared to other species groups

The graph below shows ex-vessel revenue by species groups over the last 10 years. For HMS this has varied from $35 million to $54 million during this period. This equates to between 6.13% and 8.38% of total ex-vessel revenue from all species.



4.2.2. North Pacific albacore tuna landings and ex-vessel revenue

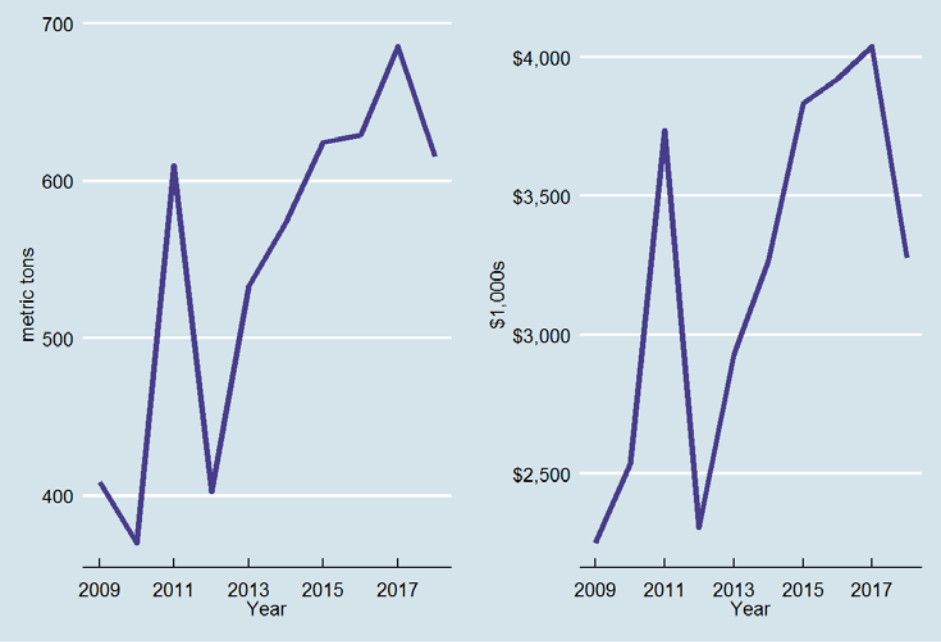
In 2018 albacore landings totaled 6,951 metric tons compared to 7,467 metric tons in 2017 while ex-vessel revenue was $24,930,773 and $35,635,642 respectively.



North Pacific albacore landings, mt (left), and revenue, current dollars, $1,000s (right)

4.2.3. Swordfish landings and ex-vessel revenue

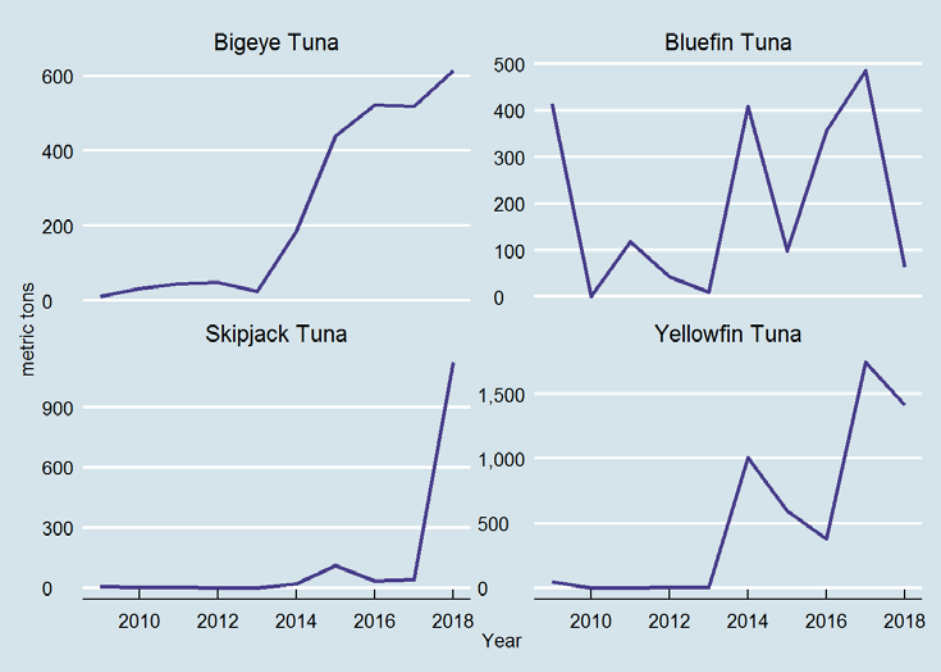
In 2018 swordfish landings totaled 615 metric tons compared to 686 metric tons in 2017 while ex-vessel revenue was $3,279,572 and 4,038,912 respectively.



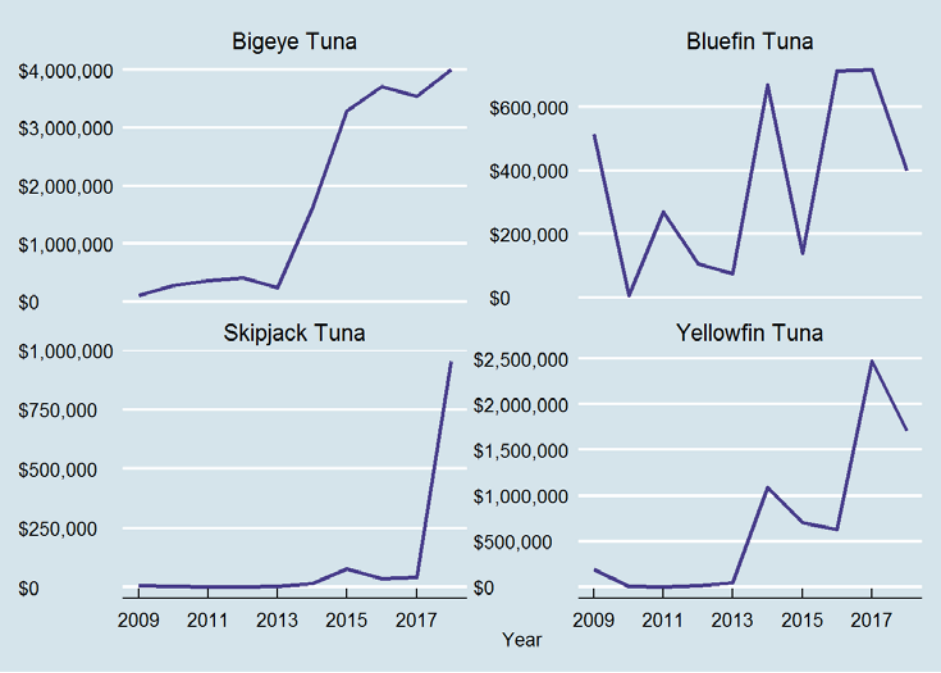
Swordfish landings, mt (left), and revenue, current dollars, $1,000s (right)

4.2.4. Tunas (other than albacore)

In 2018 landings of bigeye, bluefin, skipjack, and yellowfin tunas totaled 3,221 metric tons compared to 2,795 metric tons in 2017.

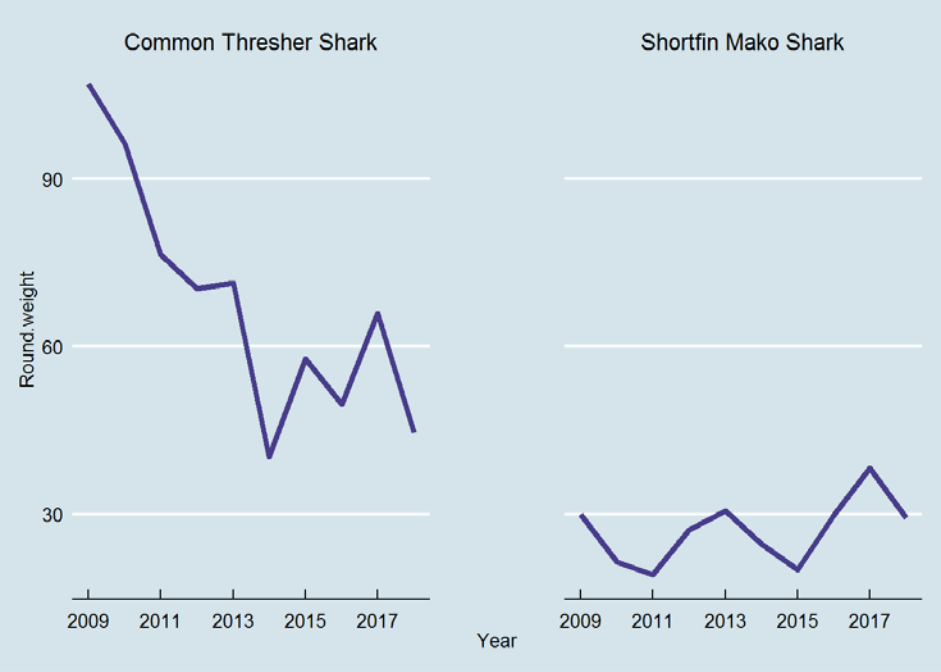


In 2018 bigeye, bluefin, skipjack, and yellowfin tuna ex-vessel revenues totaled $7,073,542 compared to $6,779,563 metric tons in 2017.



4.2.5. Sharks

In 2018 landings of common thresher and shortfin mako sharks totaled 74 metric tons compared to 104 metric tons in 2017.

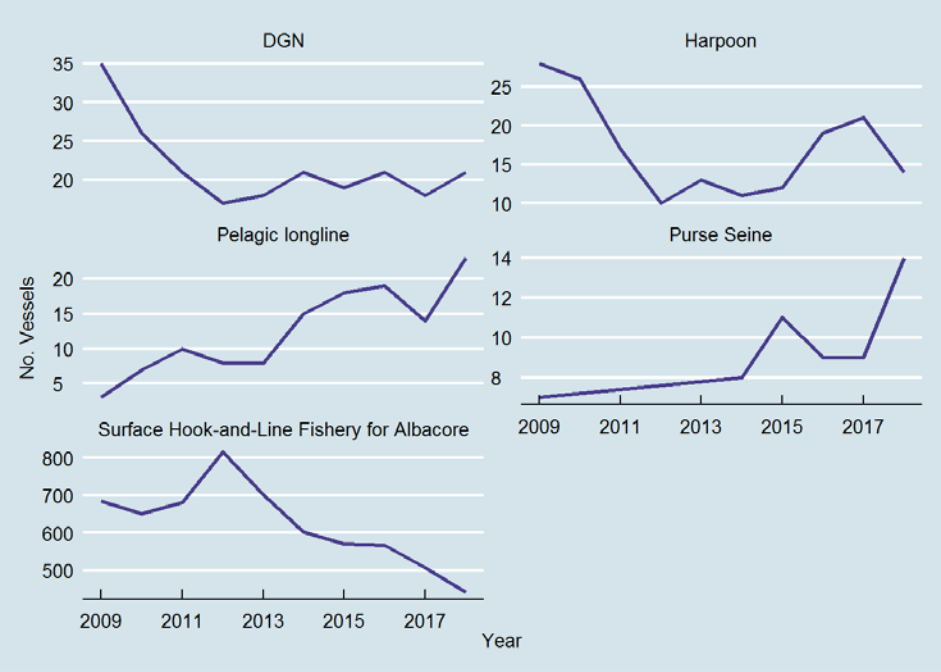


In 2018 ex-vessel revenue from common thresher and shortfin mako sharks totaled $125,599 compared to $181,736 in 2017.

4.2.6. Landings and participation by fishery

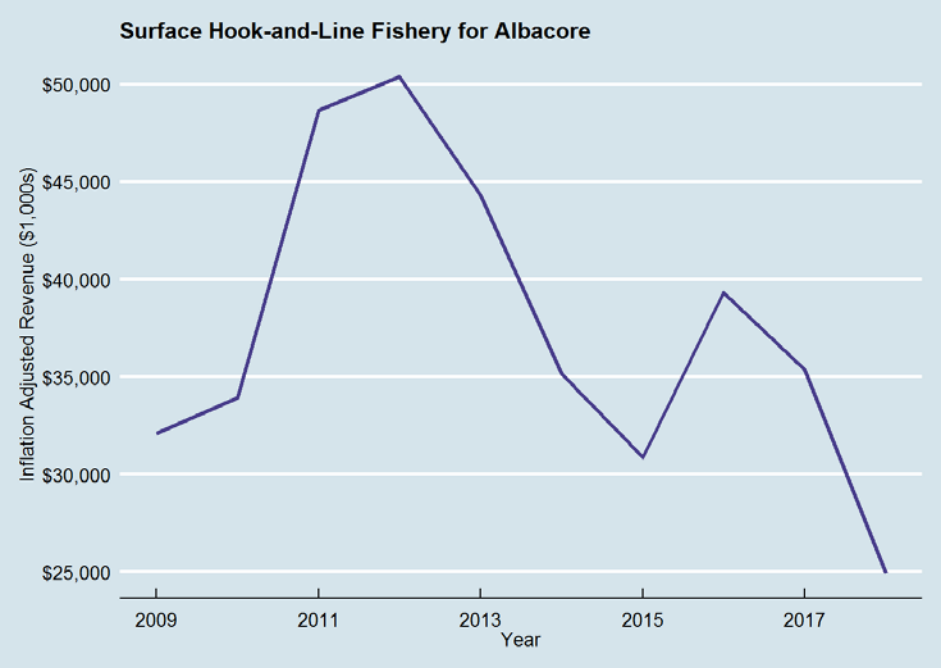
Participation (number of vessels)

For this 10-year period the annual average numbers of vessels participating in these fisheries are DGN: 22, Harpoon: 17, Pelagic longline: 12, Purse Seine: 10, Surface Hook-and-Line Fishery for Albacore: 622.



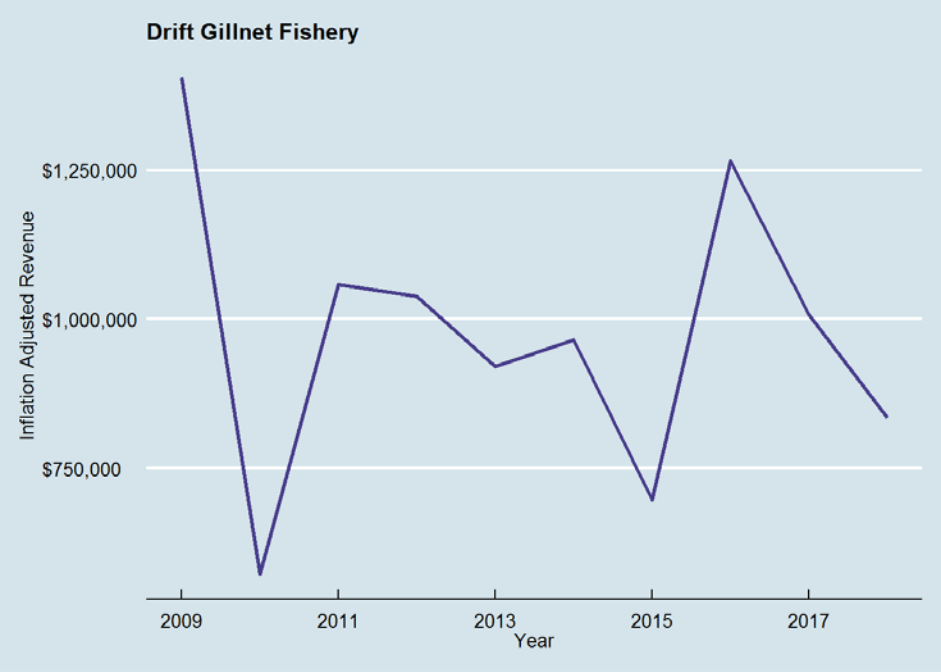
Surface hook-and-line fishery for albacore

Inflation adjusted ex-vessel revenue in 2018 was $24,929,536 compared to $35,372,920 in 2017.



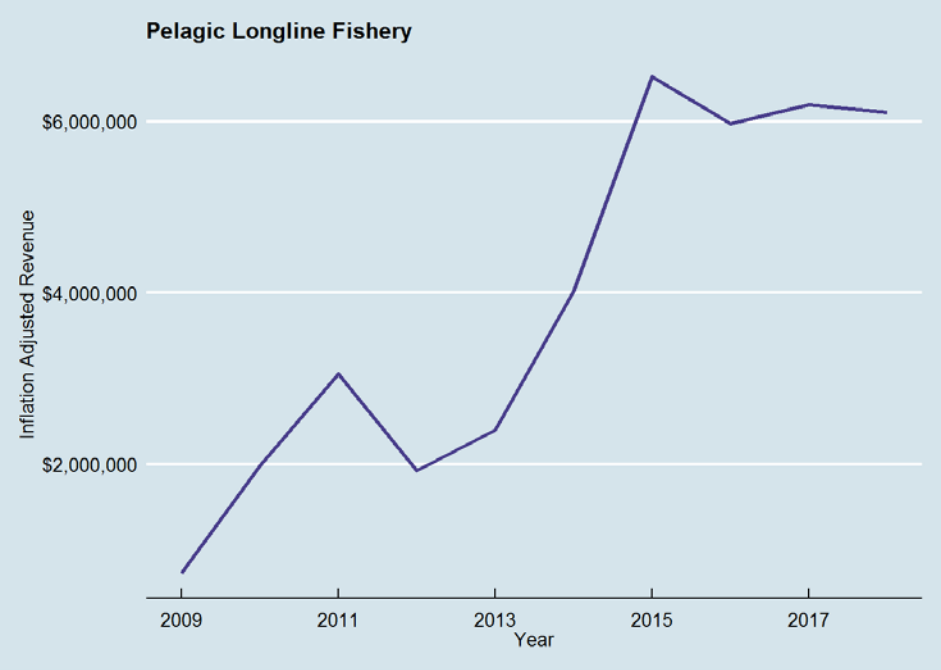
Large mesh drift gillnet fishery

Inflation adjusted ex-vessel revenue in 2018 was $834,173 compared to $1,007,447 in 2017.



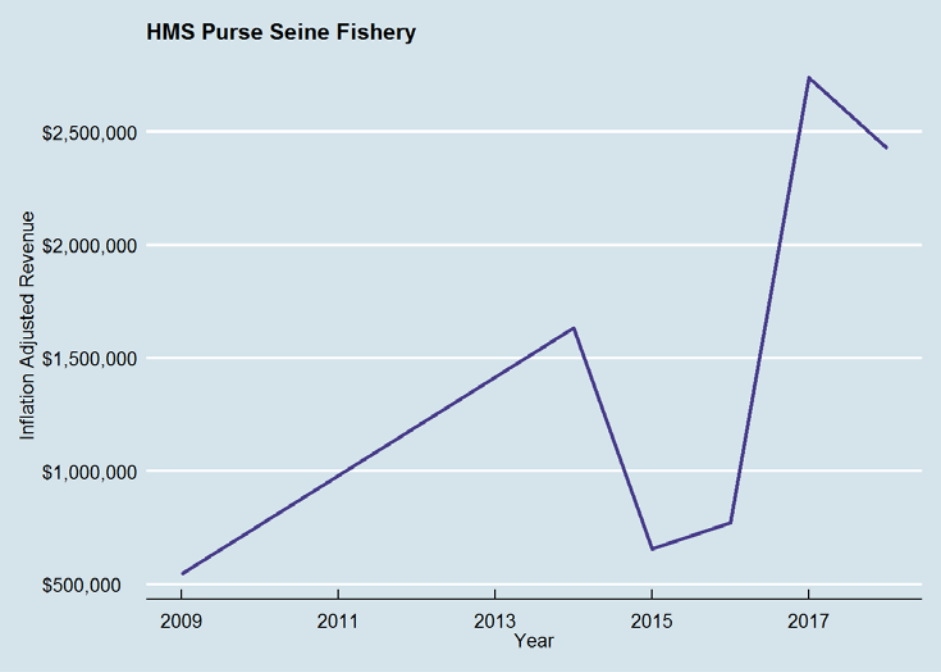
Pelagic longline fishery

Inflation adjusted ex-vessel revenue in 2018 was $6,109,164 compared to $6,191,178 in 2017.



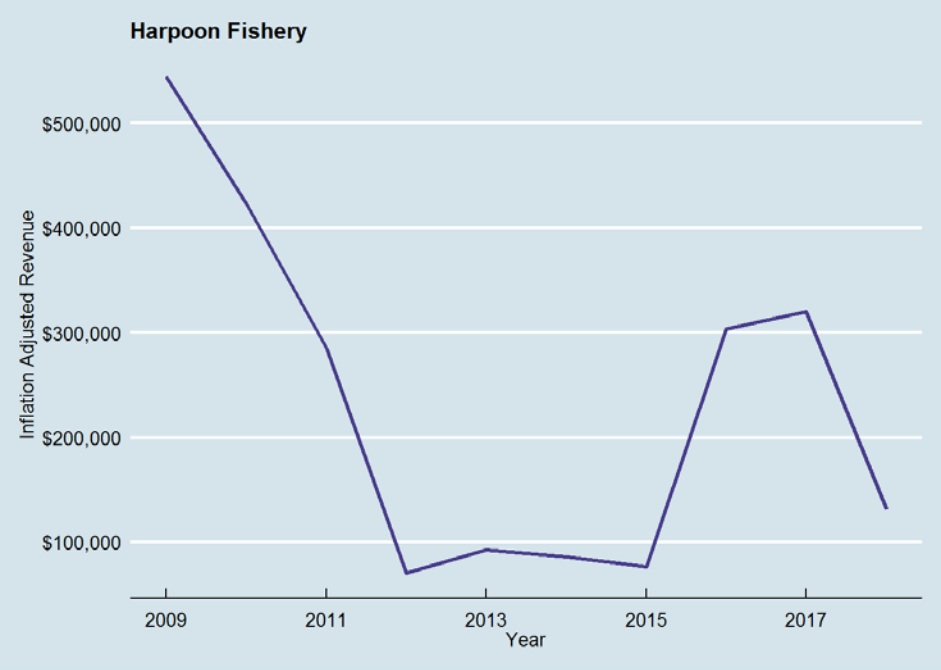
HMS purse seine fishery

Inflation adjusted ex-vessel revenue in 2018 was $2,426,006 compared to $2,739,210 in 2017.



Harpoon fishery

Inflation adjusted ex-vessel revenue in 2018 was $6,109,164 compared to $320,174 in 2017.



5. Recreational Fisheries

Recreational fishery catch tables are found in Appendix B as well as online.

5.1. Fishery Descriptions

5.1.1. Albacore

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

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

5.1.2. Other HMS (Southern California)

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

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

Coastwide fishery statistics are available from both PSMFC, through their Recreational Fisheries Information Network (RecFIN) website. The RecFIN provides estimates based on fieldsampling of catch and a telephone survey for effort.

California data are provided by the California Recreational Fisheries Survey (CRFS) program while the state's logbook program provides a record of fishing activity for most 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.

5.2. Recreational Fishery Performance

5.2.1. Albacore

- In Washington recreational catch of albacore declined from 30,428 fish in 2017 to 25,284 fish in 2018.
- In Oregon recreational catch of albacore increased from 15,996 fish in 2017 to 25,506 fish in 2018

- In California recreational catch of albacore increased from 10,868 fish in 2017 to 13,392 fish in 2018.

5.2.2. Other HMS (Southern California

Compared to 2017, HMS estimated catch by:

- private anglers in Southern California waters increased in 2018 with 20,200 fish kept and 3,574 released alive.
- private anglers in Mexican waters increased in 2018 with 5,852 fish kept and 2,789 released alive.
- CPFVs in Southern California waters increased in 2018 with 44,569 fish kept and 2,807 released.
- CPFVs in Mexican waters increased in 2018 with 130,497 fish kept and 16,447 released.

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 C 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 harvestors 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.

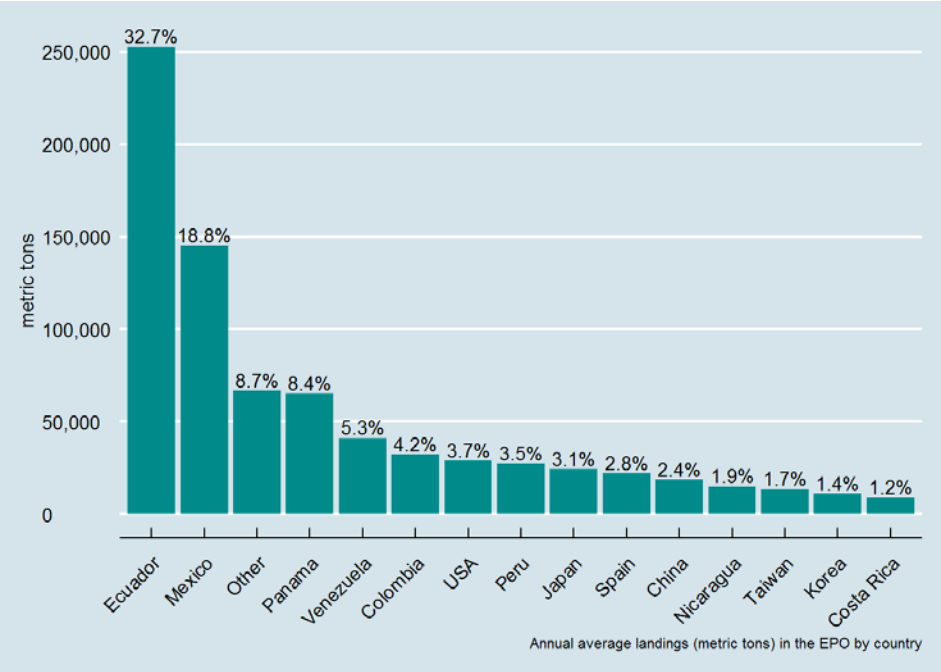
7. Pacific-Wide HMS Catch, 2008-2017

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)

7.1.1. Landings by country

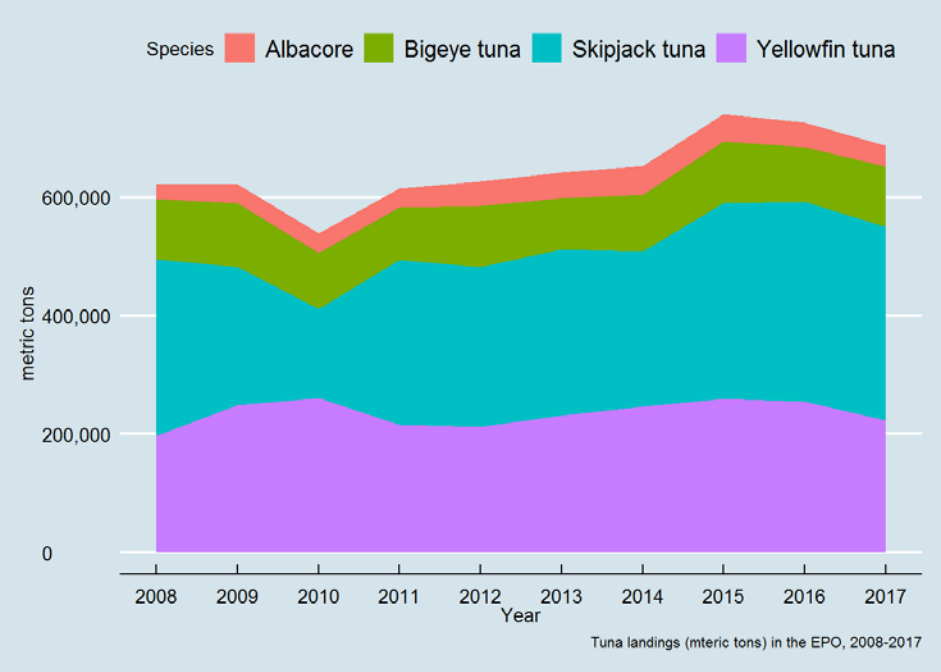
The plot below shows average annual landings by country for all species recorded in IATTC data.



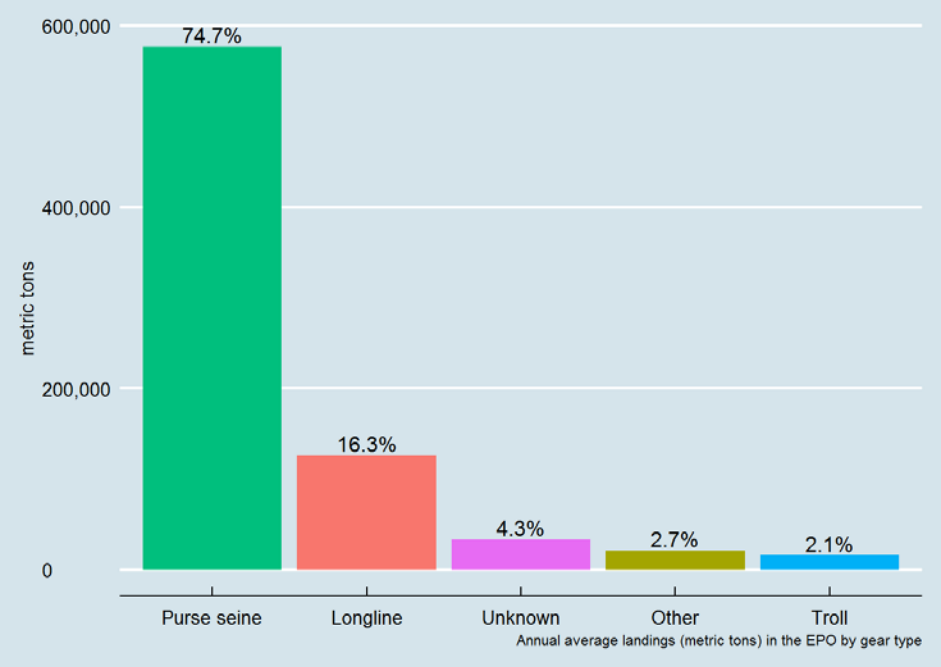
The Other category includes French Polynesia, Vanuatu, Chile, Canada, Belize, and Guatemala, each of which has landings less than 1% of the total, and others not specified in the source data.

7.1.2. Landings by species

During 2008-2017 Albacore accounted for 5.9% of total landings, Bigeye tuna for 15.1%, Skipjack tuna for 42.8%, and Yellowfin tuna for 36.3%.



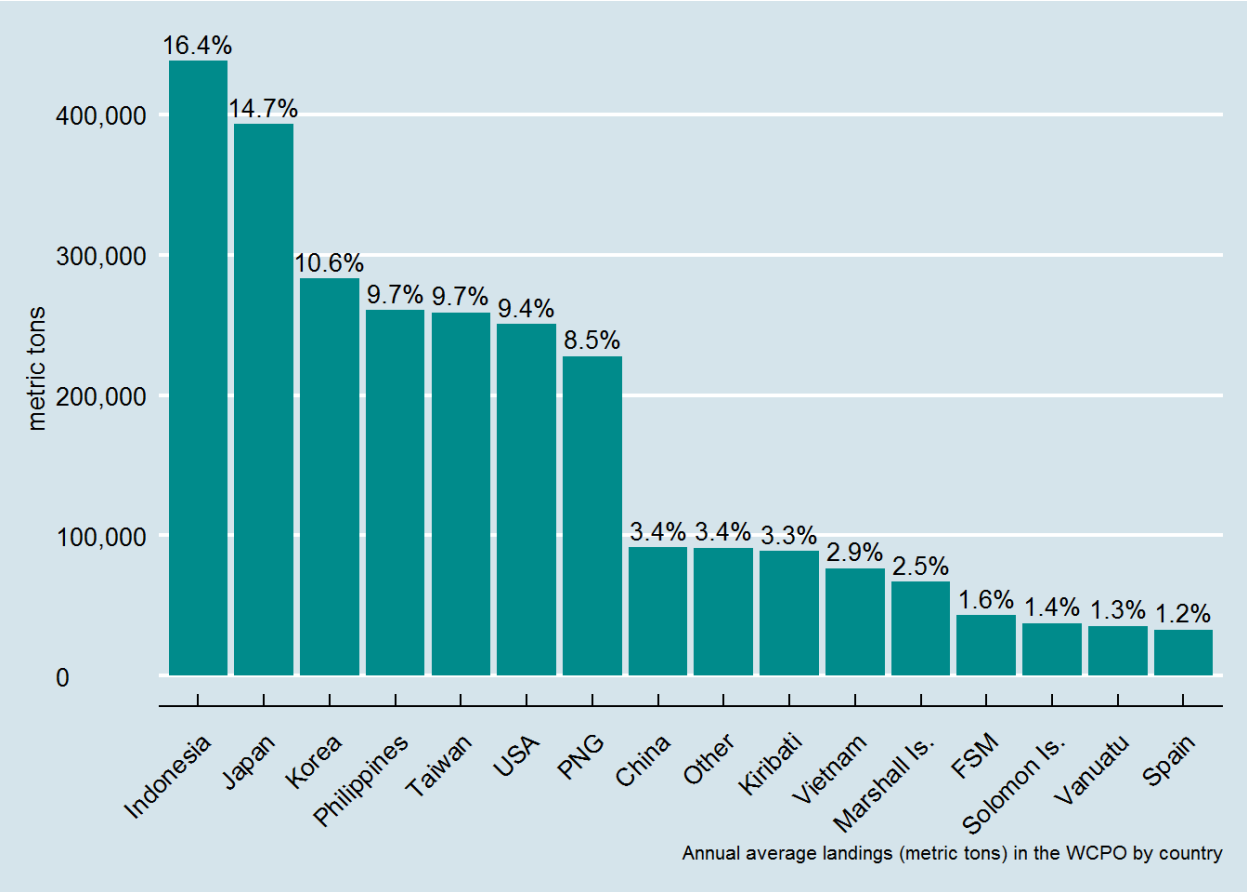
7.1.3. Landings by gear



The Other category includes Recreational, Pole-and-line, Gillnet, Harpoon and others not specified in the source data.

7.2. Western and Central Pacific Ocean (WCPFC Data)

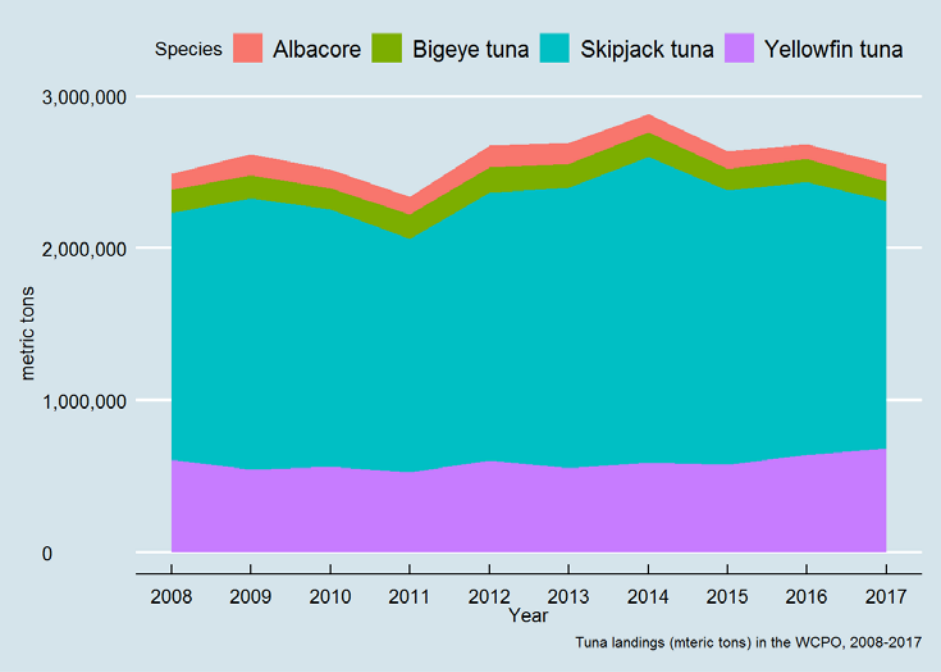
7.2.1. Landings by country



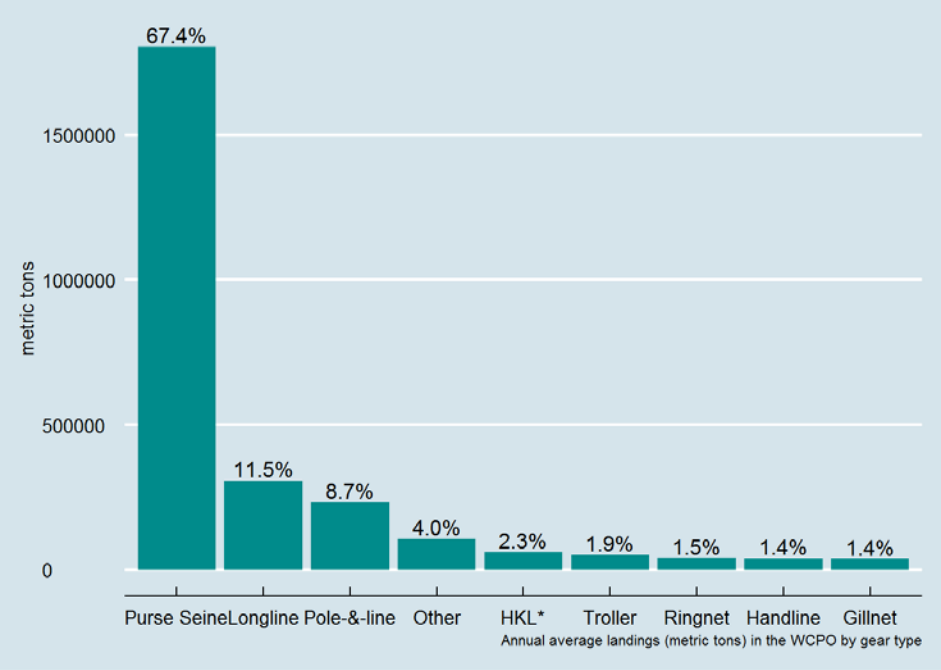
PNG: Papua New Guinea, FSM: Federated States of Micronesia; the Other category includes New Zealand, Fiji, Ecuador, El Salvador, Tuvalu, French Polynesia, Australia, Cook Islands, New Caledonia, Samoa, Tonga, Eastern Pacific US Purse Seine Fleet, Palau, Belize, Tokelau, Niue, Canada, and Senegal, each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

7.2.2. Landings by species

During the 2008- 2017 period, Albacore accounted for 4.7% of total landings, Bigeye tuna accounted for 5.8%, Skipjack tuna accounted for 67.0%, and Yellowfin tuna accounted for 22.6%.



7.2.3. Landings by gear



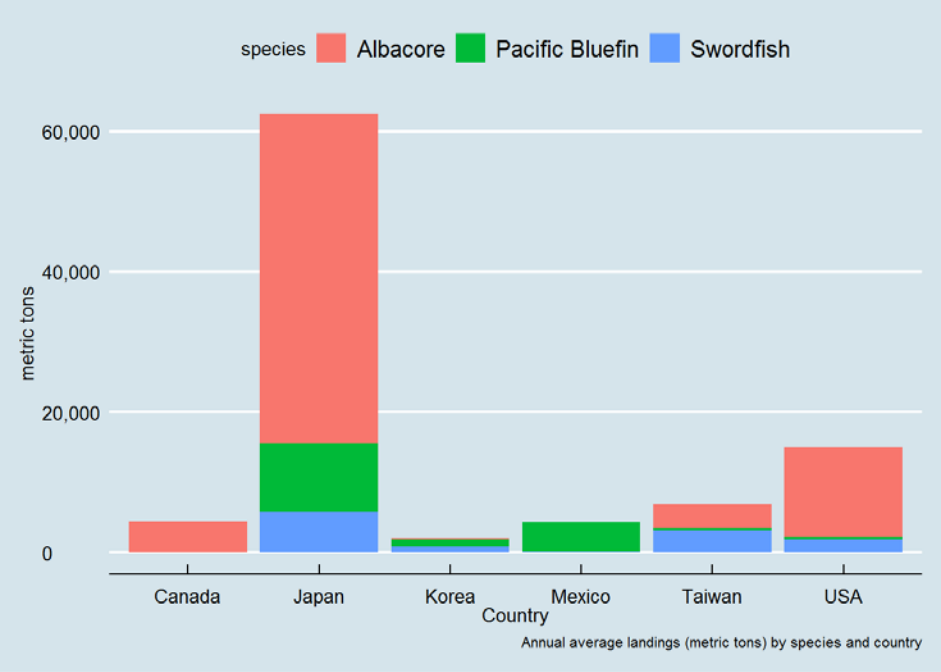
*Small-scale hook-and-line (Philippines and Indonesia). The Other category from source data.

7.3. North Pacific (ISC Data)

The ISC provides member country catch data for the species it assesses. Of these, landings of North Pacific albacore, Pacific bluefin tuna, and swordfish are summarized here. (The other assessed species are blue and short-fin mako sharks, and striped and blue marlins.)

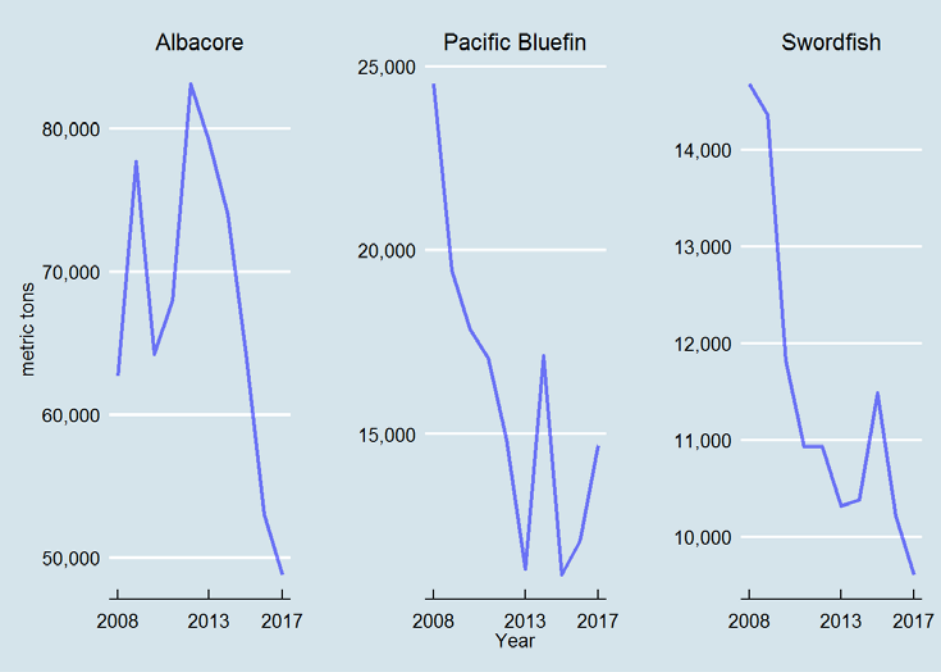
7.3.1. Landings by country

Japan accounts for the largest proportion of these three species landings, 65.8%, averaging 62,504 metric tons annually during the 2008-2017 period. U.S. landings averaged 14,967 metric tons or 15.8% of total landings.



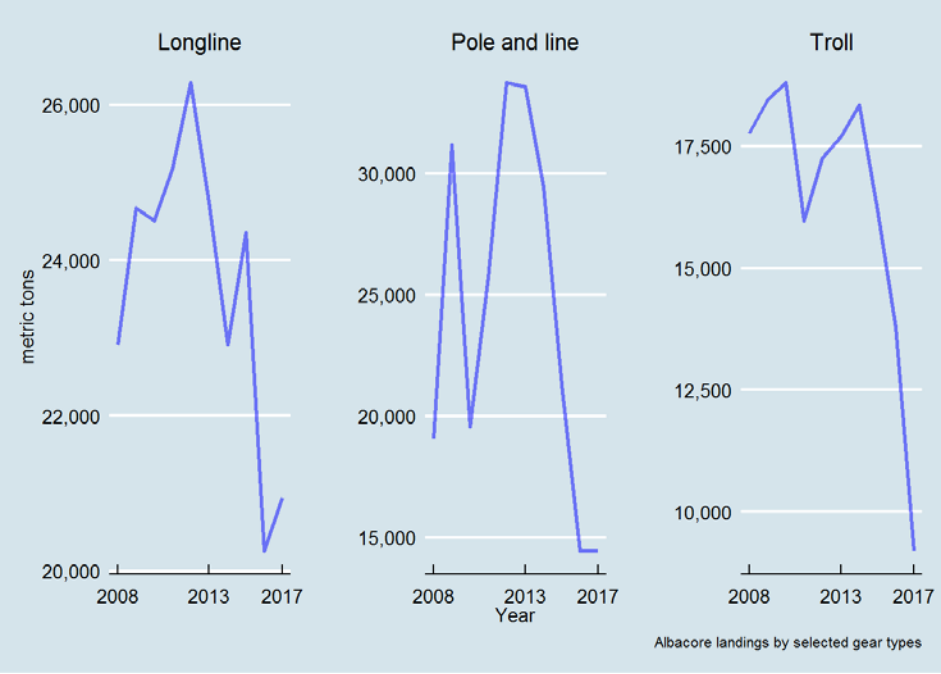
7.3.2. Landings by species

As depicted below, landings of albacore, Pacific bluefin, and swordfish have declined over this 10-year period. The decline in Pacific bluefin landings may be partially attributable to the implemention of a stock rebuilding plan by the WCPFC, which established catch limits. However, catches have fluctuated since the low observed in 2013.



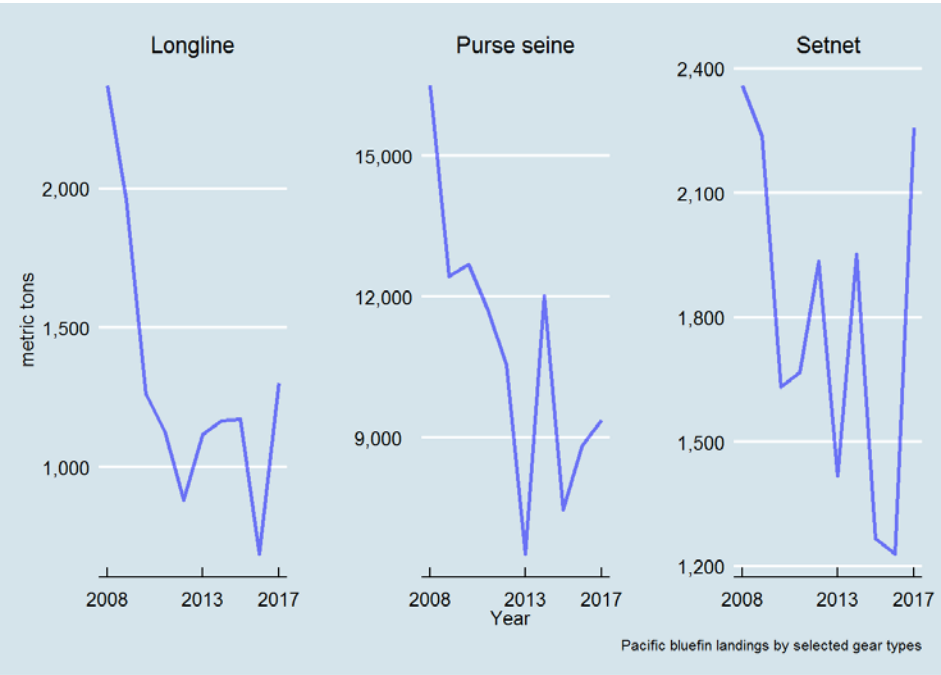
7.3.3. Albacore landings by gear type

The gear types depicted below are the three top ranked in terms of landings and accounted for 95.2% of total albacore landings.



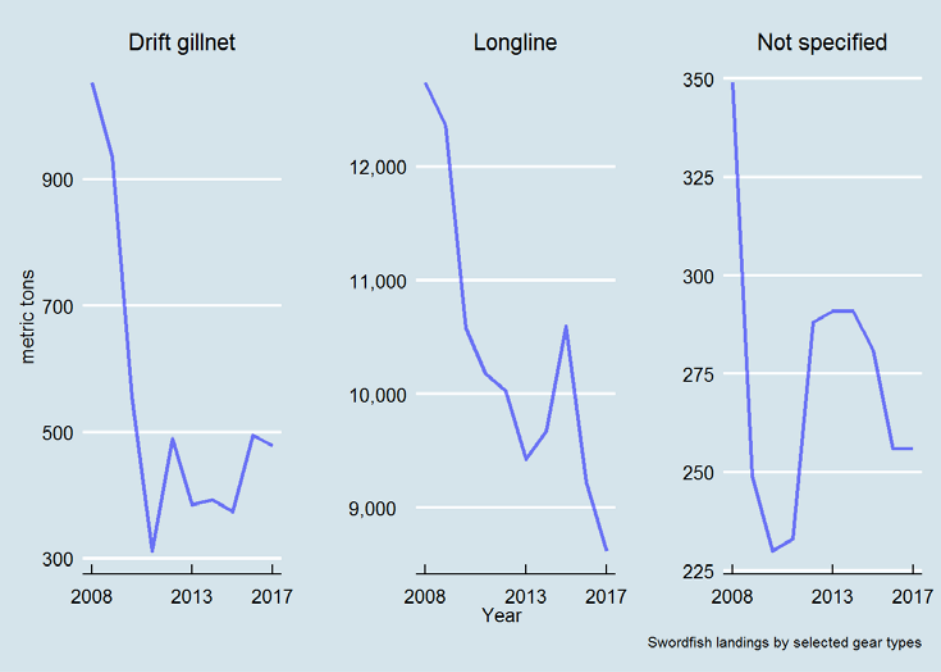
7.3.4. Pacific bluefin tuna landings by gear type

The gear types depicted below are the three top ranked in terms of landings and accounted for 86.9% of total Pacific bluefin landings. Setnet landings increased markedly in 2017. Setnet is a passive gear so this may reflect increasing stock abundance.



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 97.3% of total swordfish landings.



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 13.3.

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 2017, the IATTC Scientific Staff assessed stocks of bigeye tuna (*T. obesus*) and yellowfin tuna (*T. albacares*) in the eastern Pacific Ocean (EPO), and completed an indicator analysis for the EPO stock of skipjack tuna (*Katsuwonus pelamis*). NMFS determined that the EPO bigeye and yellowfin stocks were not subject to overfishing and not overfished based on BSIA, which is included in Table 1 and Table 2. The last status determination for skipjack was in 2011, and it was not subject to overfishing and not overfished.

In 2018, IATTC Scientific Staff assessed the EPO stock of yellowfin tuna and completed another indicator analysis for the EPO stock of skipjack tuna. The results from these stock analyses are considered BSIA and provided in Table 1 and Table 2, and NMFS' status determinations are pending.

The IATTC Scientific Staff also assessed and conducted an indicator analysis for the stock of bigeye tuna in the EPO in 2018. However, the IATTC Scientific Staff determined, and their Scientific Advisory Committee agreed, that uncertainties identified in the assessment raise questions about its use for management purposes. Therefore, the IATTC Scientific Staff completed an indicator analysis, which suggests that the stock is under increasing fishing pressure. NMFS considers the indicator analysis BSIA and its status determination is pending. The 2018 analyses were considered by the IATTC when it met in August 2018.

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 2017, SPC staff assessed the WCPO stocks of bigeye tuna and yellowfin tuna. Both stocks were determined to not to be overfished and not subject to overfishing based on the BSIA presented in Table 1 and Table 2. SPC staff also conducted an assessment of the southwest Pacific swordfish stock; however, NMFS does not make status determinations for this stock.

In 2018, SPC staff assessed the South Pacific stock of albacore. This assessment is now under review by the WCPFC Scientific Committee. NMFS does not make status determinations for this stock. The 2018 assessment will be considered by the WCPFC when it meets in December 2018.

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 2017, ISC Working Groups assessed stocks of albacore (*Thunnus alalunga*) and blue shark (*Prionace glaucas*) in the North Pacific Ocean (NPO). NMFS determined that neither stock was overfished nor subject to overfishing based on the BSIA.

In 2018, ISC Working Groups assessed Pacific bluefin tuna (*T. orientalis*) and shortfin mako shark (*Isurus oxyrinchus*) in the NPO, and the swordfish stock (*Xiphias gladius*) in the Western Central North Pacific Ocean (WCNPO). NMFS determined that the bluefin assessment is BSIA and status the determinations are pending for the WCNPO swordfish and shortfin mako stock. The 2018 assessments were considered by the

Western and Central Pacific Fisheries Commission (WCPFC) Northern Committee (NC) in September 2018.

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 13.1.1 reflects BSIA for this stock, and a status determination is pending.

13.1 *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) ≤ 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 10-1 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 10-2 and Table 10-3, 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.

Table 10-1. 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 10-2. 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
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
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
Yellowfin tuna in the EPO	Assessment	2018	IATTC	FMSY	NA	F2015-17 = NA	NA	F2015-17/Fmsy = 1.01	Yes - 2
Skipjack tuna in the EPO	Assessment	2004	IATTC	NA	NA	NA	NA	NA	No
Common thresher shark	Assessment	2018	NMFS	1-SPRMSY	0.45	1-SPR2012-14 = 0.097	NA	0.21	No
Bigeye tuna in the WCPO - 4	Assessment	2017	SPC	FMSY	0.5	F2015= NA	NA	0.83	No
Yellowfin tuna in the WCPO - 5	Assessment	2017	SPC	FMSY	0.12	NA	NA	0.74	No - 4
EPO swordfish - 6	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 - 7	Assessment	2015	ISC	F	0.63	F2012 = 0.94	NA	1.49	Yes

1 Blimit = 136,450-154-608 b/c mortality changes w/ age and ranges from 0.24-0.14 for mature fish; females are 50% mature at age 5-6.

2 Status determination was made in 2011; assessment results since then reiterate same status.

3 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.

4 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.
5 For EPO swordfish, looks like they actually used B2012/Bmsy = 1.87 for the status determtion instead of B2012/Bmsst = 3; status is the same, not overfished.
6 Status determination was made in 2014 and 2017 results reiterated same. B2012/Bmsy = 1.87 was used for the status determtion instead of B2012/Bmsst = 3; Status is the same using either, not overfished.
7 Information and status determination based on 2019 assessment is pending.

Table 10-3. 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
Blue shark in the NPO	SSBmsy	179,539 mt	SSB2015 = 308,286	136,450-154,608 mt - 1	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
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
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 - 2
Skipjack tuna in the EPO	NA	NA	NA	NA	NA	NA	No - 3
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 - 4	SSBmsy	454,100 mt	558,543 mt	NA	NA	NA	No
Yellowfin tuna in the WCPO - 5	SBF=0	2,178,220 mt	NA	NA	NA	20%SBF=0 where SBF=0 is average over 2005–2014	No
EPO swordfish - 6	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 - 7	SSBMSY	2819 mt	SSB2013 = 1094 mt	1410 mt	0.77	NA	Yes

1 Blimit = 136,450-154-608 b/c mortality changes w/ age and ranges from 0.24-0.14 for mature fish; females are 50% mature at age 5-6.

2 Status determination was made in 2011; assessment results since then reiterate same status.

3 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.
4 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.
5 For EPO swordfish, looks like they actually used B2012/Bmsy = 1.87 for the status determtion instead of B2012/Bmsst = 3; status is the same, not overfished.
6 Status determination was made in 2014 and 2017 results reiterated same. B2012/Bmsy = 1.87 was used for the status determtion instead of B2012/Bmsst = 3; Status is the same using either, not overfished.
7 Information and status determination based on 2019 assessment is pending.

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.

13.2 *Catches of HMS Management Unit Species in West Coast Fisheries*

Table 13-4 compares estimates of stockwide and U.S. West Coast catch of HMS management unit species. This information 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.

Table 10-4. Stockwide and regional catches for HMS management unit species (x1,000 mt round weight), 2012–16.

Species (stock)	Stockwide Catch	U.S. West Coast Catch		Average Annual Fractional Catch
		Commercial	Recreational[6]	
TUNAS				
Albacore (NPO)	53–83[1]	10–14	0.7-1	0.20
Bluefin (NPO)	11–15[1]	<0.4	0.1-0.3	0.05
Bigeye (EPO)	85–105[2]	<0.05-0.5	<0.01	<0.01
Skipjack (EPO)	270–338[2]	<0.1	<0.01–0.1	<0.01
Yellowfin (EPO)	231–260[2]	0.01-1	0.1–0.8	<0.01
BILLFISHES				
Striped Marlin (EPO)	1.3–2.8[2]	<0.01[3]	0.02[4]	0.01
Swordfish (EPO)	10–11[1]	0.5–0.7	<0.01	0.14
SHARKS				
Common Thresher	Unknown	<0.1	0.01-0.03	
Shortfin Mako	Unknown	<0.05	0.01-0.02	
Blue (NPO)	18-31[1]	<0.06[3]	<0.01	<0.01
OTHER				
Dorado	4.5–5.5[5]	<0.01	0.01–0.2	0.01

Notes:

Data are from updated commercial (HMS SAFE Table 3), CPFV and private recreational catches (HMS SAFE Tables R-1, R-4, R-6) with weight conversions of 8.7 kg/albacore, 8.7 kg/bluefin, 10.0 kg/bigeye tuna, 3.0 kg/skipjack, 4.9 kg/yellowfin, 57.9 kg/striped marlin, 113 kg/swordfish, 29.2 kg/common thresher, 16.8 kg/mako, 8 kg/blue shark, and 5.6 kg/dorado.

1 International Scientific Committee Eighteenth Plenary Report Catch Tables, July 2018.

2 IATTC public domain data, EPO total estimated catch by year, flag, gear, species (Oct. 2017).

3 Striped marlin and blue shark commercial catches include estimates from the drift gillnet observed catch.

4 Striped marlin recreational catch is estimated at 300 fish/year based on club records plus CPFV logbook recorded catch.

5 FAO Area 77 catch FAO global fishery production dataset. Extracted October 1, 2018

6. 2014-2016, U.S. EEZ.

13.3 *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 (2017):** Stock Assessment of Albacore Tuna in the North Pacific Ocean in 2017. Report of the Albacore Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean 12-17 July 2017, Vancouver, Canada.
- **South Pacific Albacore (2018)**: Stock Assessment of South Pacific albacore tuna. Tremblay-Boyer L., J. Hampton, S. McKechnie and G. Pilling. Oceanic Fisheries Programme, The Pacific Community (SPC). WCPFC-SC14-2018/ SA-WP-05 Rev. 2. August 2, 2018.
- **Pacific Bluefin (2018):** Stock Assessment of Pacific Bluefin Tuna in the Pacific Ocean in 2018. ISC Pacific Bluefin Tuna Working Group. Prepared for the Eighteenth Meeting of the ISC, July 11-16, 2017, Yeosu, Republic of Korea.
- **Bigeye (EPO) (2019)**: Status Status Indicators for Bigeye Tuna in the Eastern Pacific Ocean. Haikun Xu, Maunder, Cleridy E. Lennert-Cody and Marlon H. Román. Prepared for the Tenth Meeting of the Inter-American Tropical Tuna Commission (IATTC) Scientific Advisory Committee, May 13-17, 2019, La Jolla, California, USA. Doc SAC-10-06.
- **Bigeye (WCPO) (2017):** Stock Assessment of Bigeye Tuna in the Western and Central Pacific Ocean. S. McKechnie, G. Pilling, and J. Hampton. Scientific Committee Thirteenth Regular Session, Rarotonga, Cook Islands, August 9-17, 2017. WCPFC-SC13-2017/SA-WP-05.
- **Skipjack (EPO) (2019):** Updated Indicators Of Stock Status for Skipjack Tuna in the Eastern Pacific Ocean. Maunder, M. Prepared for the Tenth Meeting of the IATTC SAC, May 13-17, 2019, La Jolla, California USA. Doc SAC-10-09.
- **Skipjack (WCPO) (2019):** Stock assessment of skipjack tuna in the western and central Pacific Ocean (25July) – Rev.02. Vincent, M., G. Pilling and J. Hampton. Scientific Committee Fifteenth Regular Session. Western and Central Pacific Fisheries Commission, August 12-19, 2019. WCPFC-SC15-2019/SA-WP-05.
- **Yellowfin (EPO) (2019):** Status Indicators for Yellowfin Tuna in the Eastern Pacific Ocean. Carolina Minte-Vera, Haikun Xu and Mark N. Maunder. Prepared for the Tenth Meeting of the Inter-American Tropical Tuna Commission (IATTC) Scientific Advisory Committee, May 13-17, 2019, La Jolla, California, USA. Doc SAC-10-08.
- **Yellowfin (WCPO) (2017):** Stock Assessment of Yellowfin Tuna in the Western and Central Pacific Ocean Rev 1 (August 4, 2017). L. Trembaly-Boyer, S. McKechnie, and J. Hampton. Scientific Committee Thirteenth Regular Session, Rarotonga, Cook Islands, August 9-17, 2017. WCPFC-SC13-2017/SA-WP-06.

Billfishes

- **Striped marlin (WCPO) (2015):** Stock Assessment Update for Striped Marlin *(Kajikia audax*) in the Western and Central North Pacific Ocean Through 2013. Report of the Billfish Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean, July 15-20, 2015, Kona, Hawaii, USA.
- **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, 2017, 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) (2013)**: Stock Assessment of Swordfish (*Xiphias gladius*) in the Southwest Pacific Ocean. Davies, N., G. Pilling, S. Harley, and J. Hampton Secretariat of the Pacific Community (SPC), Ocean Fisheries Programme (OFP), Noumea, New Caledonia (July 17, 2013).

Sharks

- **Blue shark (NPO) (2017):** Stock Assessment and Future Projections of Blue Shark in the North Pacific Ocean Through 2015. Report of the Shark Working Group. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. 12-17 July 2017, Vancouver, Canada.
- **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.

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.

9. HMS Research and Management Organizations

- Research
  - HMS research and data needs (Chapter 7 in the 2018 edition of the Council research and data needs document)
  - American Fishermen's Research Foundation
  - California State University, Long Beach
  - Centro de Investigacion Cientofica y Educacion Superior de Ensenada
  - Monterey Bay Aquarium and Monterey Bay Aquarium Tuna Research and Conservation Center
  - Moss Landing Marine Lab
  - NOAA Pacific Islands Fisheries Science Center
  - NOAA Southwest Fisheries Science Center. also see SWFSC Report on HMS Research
  - Pfleger Institute of Environmental Research
  - Scripps Institute of Oceanography
  - Tagging of Pacific Pelagics
- Regional fishery management
  - Inter-American Tropical Tuna Commission (conducts HMS stock assessments)
  - Western and Central Pacific Fisheries Commission
  - International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (conducts HMS stock assessments)
  - SPC Oceanic Fisheries Programme (conducts stock assessments)
  - Western Pacific Fishery Management Council
- State and interstate fisheries commissions
  - California Department of Fish and Wildlife
  - Oregon Department of Fish and Wildlife
  - Pacific States Marine Fisheries Commission
  - Washington Department of Fish and Wildlife
  - NOAA West Coast Regional Office (HMS management)
- Sport and commercial fishing industry related associations
  - American Albacore Fishing Association
  - Oregon Albacore Commission
  - Sportfishing Association of California
  - United Anglers of Southern California (Facebook)
  - Western Fishboat Owner's Association

Appendix A: PacFIN Landing and Revenue Tables

Table 1. West Coast commercial HMS landings (round mt), nominal revenue ($1,000s), and average prices ($/lb) by species and year.
Time run: 4/18/2019 10:26:44 AM

		2017			2018		
		Landings (mt)	Revenue ($1,000)	Average Price ($/lb)	Landings (mt)	Revenue ($1,000)	Average Price ($/lb)
Tunas	Albacore Tuna	7,467	34,834	$2.12	6,951	24,931	$1.63
	Bigeye Tuna	519	3,466	$3.03	615	4,006	$2.96
	Bluefin Tuna	486	701	$0.65	64	399	$2.81
	Skipjack Tuna	42	42	$0.46	1,125	955	$0.39
	Unspecified Tuna						
	Yellowfin Tuna	1,748	2,418	$0.63	1,417	1,714	$0.55
Swordfish	Swordfish	642	3,509	$2.48	549	2,673	$2.21
Sharks	Blue Shark	1	0.8		3	1	
	Common Thresher Shark	66	106	$0.73	44	72	$0.74
	Shortfin Mako Shark	38	71	$0.84	29	53	$0.82
Dorado	Dorado/Dolphinfish	11	53	$2.15	12	51	$1.98
Total HMS		**11,020**	**45,201**		**10,808**	**34,854**	

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 2. West Coast commercial HMS landings (round mt), nominal revenue ($1,000s), and average prices by fishery, 2017-2018.

Time run: 4/18/2019 10:28:04 AM

	2017			2018		
Fishery	Landings (mt)	Revenue ($1,000)	Average Price ($/lb)	Landings (mt)	Revenue ($1,000)	Average Price ($/lb)
Drift Gillnet	230	985	$1.94	201	834	$1.88
Harpoon	28	313	$5.03	10	132	$5.72
Longline	1,023	6,052	$2.68	1,069	6,109	$2.59
Other Fisheries	111	597	$2.43	77	423	$2.48
Purse Seine	2,206	2,678	$0.55	2,500	2,426	$0.44
Surface Hook and Line	7,421	34,578	$2.11	6,950	24,930	$1.63
Grand Total	**11,021**	**45,202**		**10,808**	**34,854**	

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

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

Table 3. West Coast commercial landings (round mt) of HMS by all HMS and non-HMS gears, 1981-2018.

Time run: 4/18/2019 10:25:58 AM

	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	1,167	867	57,868	39	76,090	749	92	1,521	182	3	**152,295**
1982	5,409	967	2,404	41,903	50	61,768	1,112	26	1,848	351	1	**115,844**
1983	9,578	21	763	44,994	55	55,739	1,762	7	1,331	217	0.0	**114,472**
1984	12,654	125	635	31,251	1,014	35,062	2,889	1	1,279	159	3	**85,077**
1985	7,301	6	3,253	2,976	468	15,024	3,417	1	1,190	149	0.0	**33,789**
1986	5,242	28	4,731	1,360	143	21,516	2,529	1	974	311		**36,840**
1987	3,159	49	822	5,723	128	23,200	1,802	1	562	402		**35,854**
1988	4,912	6	803	8,862	10	19,519	1,635	3	500	321	0.0	**36,577**
1989	2,214	0.0	1,018	4,505	76	17,614	1,358	6	503	255	0.0	**27,554**
1990	3,027	2	925	2,255	46	8,509	1,235	19	356	373	0.0	**16,751**
1991	1,676	7	103	3,407	11	4,177	1,029	0.0	583	218	0.0	**11,216**
1992	4,901	6	1,087	2,585	10	3,349	1,545	1	292	142	3	**13,925**
1993	6,165	25	558	4,538	15	3,794	1,766	0.0	275	122	16	**17,281**
1994	10,751	46	915	2,111	32	5,055	1,699	12	329	127	41	**21,124**
1995	6,529	48	713	7,036	1	3,038	1,162	5	269	95	5	**18,906**
1996	14,173	62	4,687	5,454	3	3,346	1,198	0.0	319	96	9	**29,352**
1997	11,291	82	2,250	6,069	10	4,774	1,459	0.0	319	132	4	**26,397**
1998	13,914	52	1,949	5,845	11	5,799	1,408	2	360	100	3	**29,448**
1999	9,781	108	186	3,758	12	1,353	2,033	0.0	320	62	17	**17,634**
2000	9,071	84	312	779	0.0	1,158	2,656	0.0	296	80	42	**14,484**
2001	11,194	52	195	57	0.0	654	2,205	2	372	46	15	**14,798**
2002	10,031	10	11	236	1	543	1,726	41	300	81	0.0	**12,984**
2003	16,668	35	36	348		465	2,135	0.0	300	69	5	**20,066**
2004	14,539	22	10	306	9	487	1,184	0.0	115	54	1	**16,732**
2005	9,054		206	522		285	296	0.0	178	33	0.0	**10,580**
2006	12,785		0.0	47		76	541	0.0	159	45	2	**13,661**
2007	11,593		44	5		104	549	9	203	44	2	**12,558**
2008	11,130	27	0.0	2	0.0	65	531	0.0	147	35	1	**11,943**
2009	12,331		414	5		45	408	1	106	29	0.0	**13,344**
2010	11,855		1			0.0	369	0.0	96	21	3	**12,349**
2011	11,049	45	118	1		0.0	609	0.0	76	19	3	**11,924**
2012	13,935	49	43	0.0		1	402	0.0	70	27	10	**14,540**
2013	12,937		10	0.0		5	532	0.0	71	30	0.0	**13,591**
2014	12,466	185	407	19	1	1,008	573	0.0	40	24	17	**14,744**
2015	11,312	440	98	109	0.0	595	624	0.0	57	20	26	**13,287**
2016	10,457	523	355	35	1	379	629	0.0	49	29	20	**12,481**
2017	7,467	519	485	41		1,747	685	1	65	38	11	**11,064**
2018	6,950	614	64	1,124		1,416	615	3	44	29	11	**10,875**

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 4. West Coast real commercial ex-vessel revenues (inflation adjusted, 2018, $1,000s) from HMS landings by all HMS and non-HMS gears, 1981-2018.

Time run: 4/18/2019 10:29:36 AM

	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	63,287	3,745	2,956	158,266	173	235,551	8,005	141	3,521	387	7	**476,040**
1982	18,050	2,715	6,045	91,020	222	167,330	11,496	42	4,450	762	2	**302,135**
1983	26,468	99	2,298	79,242	206	128,587	14,702	10	3,187	497	2	**255,298**
1984	35,914	364	1,889	51,738	5,406	77,299	24,254	5	3,427	396	9	**200,701**
1985	16,776	36	5,703	4,285	2,081	29,718	27,139	4	3,676	390	0.8	**89,810**
1986	12,251	179	9,195	1,794	393	35,852	25,237	3	3,353	849		**89,104**
1987	9,922	342	3,981	8,566	867	53,945	21,509	4	2,291	1,384		**102,811**
1988	17,041	49	3,870	17,288	151	50,519	18,166	4	1,831	1,214	1.0	**110,134**
1989	6,810	4	2,288	7,097	229	37,463	14,858	6	1,699	994	0.9	**71,449**
1990	9,747	15	1,993	3,293	98	16,271	12,393	18	1,107	1,282	3	**46,220**
1991	4,736	72	195	4,515	35	6,703	10,636	1	1,625	696	2	**29,217**
1992	18,833	73	1,853	2,313	35	6,031	12,409	3	761	379	10	**42,700**
1993	18,739	339	1,205	5,259	116	7,724	14,344	1.0	735	355	68	**48,886**
1994	31,656	482	2,625	2,746	87	7,091	15,047	25	916	387	117	**61,179**
1995	17,776	397	1,625	7,300	8	4,677	10,091	4	734	254	8	**42,874**
1996	41,051	393	6,085	6,011	43	4,872	9,144	0.9	909	252	15	**68,776**
1997	29,547	534	4,113	8,163	32	7,402	9,117	0.5	877	337	16	**60,140**
1998	27,700	399	4,347	7,642	90	8,594	8,769	9	917	258	15	**58,742**
1999	25,559	950	1,282	3,971	88	2,067	12,203	0.1	892	160	69	**47,240**
2000	24,294	801	765	683	3	1,750	16,672	1	808	187	89	**46,053**
2001	28,558	443	646	47	3	644	12,091	2	822	104	28	**43,387**
2002	19,405	117	57	175	9	802	8,725	25	685	169	1.0	**30,169**
2003	32,594	351	99	214		599	10,498	0.5	649	154	14	**45,173**
2004	35,684	192	49	142	71	581	6,287	0.6	257	128	7	**43,401**
2005	26,300		173	369		399	2,399	0.5	343	73	2	**30,057**
2006	29,150		5	49		214	3,370	0.4	370	98	22	**33,278**
2007	25,851		69	5		179	3,739	2	403	94	12	**30,354**
2008	33,787	241	4	4	4	147	2,779	0.2	329	79	11	**37,384**
2009	32,126		515	6		194	2,251	3	231	64	5	**35,394**
2010	33,981		7			8	2,535	0.2	180	42	18	**36,771**
2011	48,770	367	270	2		1	3,734	0.1	115	43	13	**53,316**
2012	50,620	405	106	2		15	2,307	0.0	126	58	39	**53,678**
2013	45,518		75	4		44	2,930	0.0	135	66	6	**48,778**
2014	35,181	1,617	668	16	4	1,091	3,266	0.0	74	52	63	**42,031**
2015	30,988	3,294	140	79	7	702	3,834	0.5	99	44	94	**39,278**
2016	39,318	3,707	712	35	2	626	3,921	0.0	91	58	76	**48,547**
2017	35,636	3,546	718	43		2,473	4,039	0.8	109	73	54	**46,691**
2018	24,931	4,006	399	955		1,714	3,280	1	72	53	51	**35,461**

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.

Table 5. Number of vessels and commercial landings (round mt) in the West Coast albacore surface hook-and-line (troll and baitboat) fishery, 1990-2018, Canadian vessels included.

Time run: 4/18/2019 10:30:57 AM

	# Vessels	Albacore	Other HMS	**Total**
1990	369	2,976		**2,976**
1991	179	1,654		**1,654**
1992	606	4,780	0.3	**4,781**
1993	613	5,974	0.2	**5,974**
1994	716	10,671		**10,671**
1995	476	6,474	0.6	**6,475**
1996	724	14,077	0.2	**14,077**
1997	1192	11,229	1	**11,231**
1998	866	13,588	0.4	**13,589**
1999	813	9,481	0.9	**9,482**
2000	761	8,969	0.8	**8,970**
2001	979	11,068	2	**11,070**
2002	734	10,002	0.7	**10,003**
2003	888	16,606	0.2	**16,607**
2004	779	14,497	0.3	**14,498**
2005	597	9,028	0.1	**9,028**
2006	634	12,772		**12,772**
2007	674	11,508	0.0	**11,508**
2008	522	11,127	0.2	**11,128**
2009	684	12,296	0.2	**12,296**
2010	650	11,842		**11,842**
2011	680	11,019	0.4	**11,019**
2012	811	13,885	0.1	**13,885**
2013	700	12,675	0.4	**12,676**
2014	602	12,459	0.1	**12,459**
2015	567	11,267		**11,267**
2016	566	10,455	0.2	**10,455**
2017	506	7,421	0.1	**7,421**
2018	442	6,950	0.2	**6,950**

Blank cells indicate null value (no data exist for that stratum).

Landed Weight rounded to nearest mt. If landed weight is less than 1 mt weight is rounded to nearest 0.1 mt.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 6. Real commercial ex-vessel revenues (inflation adjusted, 2018, $1,000s) for the West Coast albacore surface hook-and-line (troll and baitboat) fishery, 1990–2018, Canadian vessels included.

Time run: 4/18/2019 10:32:34 AM

Year	Albacore	Other HMS	**Total**
1990	9,561		**9,561**
1991	4,668		**4,668**
1992	18,251	0.6	**18,252**
1993	18,238	0.3	**18,238**
1994	31,438		**31,438**
1995	17,635	0.9	**17,636**
1996	40,843	0.7	**40,843**
1997	29,394	3	**29,397**
1998	26,793	1	**26,794**
1999	24,923	3	**24,926**
2000	24,066	2	**24,068**
2001	28,318	6	**28,324**
2002	19,352	2	**19,355**
2003	32,533	0.9	**32,534**
2004	35,585	0.9	**35,585**
2005	26,223	0.2	**26,223**
2006	29,094		**29,094**
2007	25,685	0.2	**25,685**
2008	33,780	0.6	**33,781**
2009	32,084	0.4	**32,084**
2010	33,938		**33,938**
2011	48,658	2	**48,660**
2012	50,386	0.7	**50,386**
2013	44,315	1.0	**44,316**
2014	35,158	0.3	**35,158**
2015	30,862		**30,862**
2016	39,311	0.9	**39,312**
2017	35,372	0.8	**35,373**
2018	24,929	0.6	**24,930**

Blank cells indicate null value (no data exist for that stratum).

Revenue rounded to nearest $1,000. If revenue is less than $1,000 revenue rounded to nearest 0.1.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 7. Monthly commercial landings (number, weight in round mt) and real commercial ex-vessel revenue (inflation adjusted, 2018, $1,000s) of albacore by the surface hook-and-line (troll and baitboat) fishery, by state, 2016-2018, Canadian vessels included.

Time run: 4/18/2019 10:33:23 AM

2016

	California			Oregon			Washington			Coastwide		
Month	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Jan-May												
Jun				169	387	1,404	56	252	916	225	639	2,320
Jul	8	2	6	474	1,161	4,356	360	2,012	7,331	842	3,175	11,692
Aug	12	5	12	300	718	2,788	198	1,354	4,973	510	2,077	7,774
Sep	93	86	379	365	831	3,681	315	2,801	10,195	773	3,718	14,255
Oct	4	18	61	60	191	798	87	623	2,348	151	833	3,207
Grand Total	**117**	**109**	**458**	**1368**	**3,288**	**13,026**	**1016**	**7,042**	**25,763**	**2501**	**10,439**	**39,247**

2017

	California			Oregon			Washington			Coastwide		
Month	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Jun				20	14	56				20	14	56
Jul				352	583	2,751	203	680	3,211	555	1,263	5,962
Aug	63	43	184	306	851	4,532	223	1,233	6,000	592	2,128	10,716
Sep	63	40	201	291	477	2,618	256	2,136	8,992	610	2,654	11,811
Oct	27	19	88	93	226	1,089	125	1,109	5,613	245	1,354	6,790
Nov												
Grand Total	**153**	**103**	**473**	**1062**	**2,151**	**11,046**	**807**	**5,158**	**23,816**	**2022**	**7,412**	**35,335**

2018

	California			Oregon			Washington			Coastwide		
Month	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Jan-May												
Jun				28	27	117				28	27	117
Jul	5	4	18	295	1,201	4,608	128	853	3,186	428	2,059	7,811
Aug	51	24	106	324	894	3,138	278	1,978	6,823	653	2,896	10,067
Sep	65	109	289	235	444	1,581	199	1,296	4,575	499	1,849	6,446
Oct	18	14	47	30	70	279	11	20	64	59	104	389
Nov												
Dec												
Grand Total	**139**	**151**	**459**	**912**	**2,636**	**9,722**	**616**	**4,147**	**14,647**	**1667**	**6,934**	**24,828**

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.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

The number of landings was calculated as the number of distinct vessels making landings in a state on a landing day.

Table 8. Annual commercial landings (number, weight in round mt) and real ex-vessel revenue (inflation adjusted, 2018, $1,000s) of albacore by the surface hook-and-line (troll and baitboat) fishery, by port group, 2016-2018, Canadian vessels included.

Time run: 4/18/2019 10:34:08 AM

	2016			2017			2018		
	# Landing	Landings (mt)	Adj. Revenue ($1,000)	# Landing	Landings (mt)	Adj. Revenue ($1,000)	# Landing	Landings (mt)	Adj. Revenue ($1,000)
Puget Sound	30	122	642	21	29	170	5	12	46
Washington Coast	988	6,928	25,161	785	5,131	23,647	510	3,956	13,920
Other							111	194	778
Washington Total	**1018**	**7,049**	**25,803**	**806**	**5,159**	**23,816**	**626**	**4,161**	**14,744**
Astoria-Tillamook	280	918	4,028	160	350	1,859	148	481	1,786
Newport	543	1,283	4,952	417	927	4,944	391	1,249	4,654
Coos Bay	523	1,050	3,872	402	793	3,814	331	850	3,071
Brookings	24	37	175	85	82	434	45	56	212
Oregon Total	**1370**	**3,288**	**13,027**	**1064**	**2,152**	**11,051**	**915**	**2,636**	**9,722**
Crescent City	28	14	60	37	32	143	26	47	140
Eureka	40	55	217	70	52	238	68	55	198
Fort Brag	21	12	58	21	8	36	20	10	47
Bodega Bay				6	2	13	7	5	21
San Francisco				6	3	23	5	21	10
Monterey									
Morro Bay	6	7	31	13	4	24			
Santa Barbara	3	3	9						
Los Angeles									
San Diego									
California Total	**98**	**90**	**375**	**153**	**101**	**477**	**126**	**137**	**415**
Grand Total	**2486**	**10,428**	**39,205**	**2023**	**7,413**	**35,346**	**1667**	**6,935**	**24,882**

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.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

The number of landings was calculated as the number of distinct vessels making landings in a state on a landing day.

Table 9. Number of vessels, commercial landings (round mt), and ex-vessel revenue inflation adjusted, 2018, $1,000s) of albacore and in the West Coast albacore surface hook-and-line (troll and baitboat) fishery (in U.S. west coast ports), 1990-2018, Canadian and US vessels compared.

Time run: 4/18/2019 10:34:53 AM

	Canadian Vessels			U.S. Vessels		
Year	# Vessels	Landings (mt)	Adj. Revenue ($1,000)	# Vessels	Landings (mt)	Adj. Revenue ($1,000)
1990				369	2,976	9,561
1991				179	1,654	4,668
1992	9	77	294	598	4,704	17,957
1993				612	5,952	18,171
1994				714	10,648	31,373
1995				472	6,407	17,449
1996	66	868	2,401	658	13,209	38,441
1997	32	399	1,064	1160	10,831	28,330
1998	29	961	1,613	837	12,628	25,180
1999	52	713	1,826	761	8,769	23,097
2000	57	889	2,399	704	8,081	21,667
2001	52	806	2,332	927	10,262	25,986
2002	38	702	1,419	696	9,300	17,933
2003	105	3,118	6,363	783	13,488	26,170
2004	52	1,130	3,973	727	13,367	31,612
2005	45	811	2,849	552	8,217	23,374
2006	19	397	1,102	615	12,374	27,992
2007	22	357	985	652	11,151	24,700
2008	47	1,336	4,604	476	9,792	29,177
2009	26	650	1,874	658	11,646	30,210
2010	41	938	3,487	609	10,904	30,451
2011	47	1,187	6,733	633	9,832	41,925
2012				811	13,885	50,386
2013	22	650	2,968	679	12,025	41,347
2014	12	415	1,297	590	12,044	33,861
2015	11	245	655	557	11,022	30,207
2016	9	189	911	557	10,266	38,401
2017	11	236	1,421	495	7,185	33,951
2018	8	221	829	434	6,729	24,100

Blank cells indicate null value (no data exist for that stratum).

Revenue and weight rounded to nearest whole unit.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 10. Number of vessels, commercial landings (round mt), and ex-vessel revenue (inflation adjusted, 2018, $1,000s) of albacore in the West Coast albacore surface hook-and-line (troll and baitboat) fishery by state, 1990-2018, Canadian vessels included.

Time run: 4/18/2019 10:35:34 AM

	California			Oregon			Washington		
Year	# Vessels	Landings (mt)	Adj. Revenue ($1,000)	# Vessels	Landings (mt)	Adj. Revenue ($1,000)	# Vessels	Landings (mt)	Adj. Revenue ($1,000)
1990	108	808	2,699	211	943	3,058	102	1,225	3,804
1991	83	656	1,864	71	571	1,642	42	428	1,161
1992	138	1,149	4,592	352	1,767	6,509	225	1,864	7,151
1993	211	1,634	5,389	367	2,157	6,220	205	2,183	6,629
1994	274	3,097	10,172	328	2,131	5,880	261	5,443	15,386
1995	138	777	2,179	230	2,283	6,221	206	3,414	9,236
1996	290	5,049	15,972	385	4,059	11,204	213	4,968	13,667
1997	611	3,296	8,434	498	4,158	10,888	240	3,775	10,072
1998	385	2,338	4,720	371	4,718	9,256	218	6,532	12,817
1999	431	5,398	14,337	309	2,045	5,415	186	2,039	5,171
2000	350	1,800	5,212	375	3,972	10,589	177	3,197	8,265
2001	473	2,849	6,897	473	4,064	10,454	205	4,156	10,967
2002	320	2,666	5,257	269	1,978	4,020	239	5,357	10,075
2003	327	1,695	3,366	385	4,118	8,234	323	10,793	20,933
2004	191	1,339	3,138	450	4,878	11,906	300	8,280	20,540
2005	97	455	1,338	383	3,668	11,134	223	4,904	13,751
2006	80	201	618	368	3,864	9,867	312	8,707	18,609
2007	156	772	1,882	413	4,748	11,305	215	5,988	12,499
2008	67	376	1,120	336	4,026	12,489	224	6,725	20,171
2009	131	358	1,082	420	4,599	11,915	271	7,339	19,087
2010	136	729	2,016	423	4,854	14,275	241	6,259	17,647
2011	141	612	2,507	442	4,392	21,112	226	6,015	25,039
2012	189	603	2,228	446	4,508	16,745	329	8,774	31,413
2013	137	315	1,168	396	4,574	17,283	280	7,786	25,865
2014	50	200	608	380	3,978	11,739	295	8,281	22,811
2015	26	42	175	353	3,409	9,613	299	7,817	21,074
2016	34	115	476	373	3,288	13,027	267	7,051	25,808
2017	66	106	492	311	2,152	11,052	224	5,163	23,829
2018	64	153	462	276	2,636	9,723	195	4,161	14,745

Blank cells indicate null value (no data exist for that stratum).

Revenue and weight rounded to nearest whole unit.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 11. Average nominal price-per-pound ($/lb) for albacore by month and by state, 2016-2018, Canadian vessels included.

Time run: 4/18/2019 10:36:21 AM

	2016			2017			2018		
Month	California	Oregon	Washington	California	Oregon	Washington	California	Oregon	Washington
Jan - May									
Jun		$1.58	$1.58		$1.74			$1.96	
Jul	$1.72	$1.63	$1.59		$2.09	$2.09	$1.90	$1.74	$1.69
Aug	$1.06	$1.69	$1.60	$1.89	$2.36	$2.16	$2.01	$1.59	$1.56
Sep	$1.93	$1.93	$1.58	$2.20	$2.44	$1.87	$1.20	$1.62	$1.60
Oct	$1.49	$1.81	$1.64	$2.01	$2.14	$2.24	$1.51	$1.82	$1.43
Nov									
Dec									

Blank cells indicate null value (no data exist for that stratum).

If a record is confidential (fewer than 3 vessels or dealers) data is suppressed and highlighted yellow.

Table 12. Number of vessels and commercial landings (round mt) in the West Coast drift gillnet fishery, 1990-2018.

Time run: 4/18/2019 10:40:29 AM

Year	# Vessels	Blue Shark	Common Thresher Shark	Non-HMS FMP Sharks	Shortfin Mako Shark	Swordfish	Tunas	**Landings (mt)**
1990	141		163	2	197	1,133	29	**1,523**
1991	121		379	2	107	945	31	**1,463**
1992	120		92	2	102	1,407	69	**1,671**
1993	124		210	9	80	1,413	233	**1,944**
1994	129		203	1	61	762	89	**1,115**
1995	118		144	11	74	773	88	**1,091**
1996	112	0	168	1	78	764	123	**1,134**
1997	109		218	1	109	704	115	**1,147**
1998	99		238	4	76	877	124	**1,320**
1999	85		88	1	41	589	126	**844**
2000	69		82	1	46	532	69	**729**
2001	60		200	0	23	265	98	**586**
2002	51		108	1	48	299	25	**481**
2003	43		166	1	47	200	29	**444**
2004	35		51		19	181	20	**271**
2005	38		125	1	15	220	27	**388**
2006	39		93	1	32	444	7	**577**
2007	40		144	0	29	490	7	**670**
2008	39		98		19	406	2	**525**
2009	35		38		21	253	7	**319**
2010	26		41	2	10	62	6	**120**
2011	21		55		8	119	24	**206**
2012	17		37	2	9	118	13	**180**
2013	18		48		16	102	12	**179**
2014	21		26		7	127	5	**164**
2015	19		31		7	99	6	**143**
2016	21		28		12	173	10	**224**
2017	18		39	0	12	177	2	**231**
2018	21		26		11	145	19	**201**

Number of drift gillnet vessels (see Table 27) landing swordfish, common thresher shark, mako shark, or blue shark.

Values not reported for cells highlighted in yellow due to confidentiality requirements (less than three vessels or dealers).

Blank cells indicate null value (no data exist for that stratum).

Table 13. Real commercial ex-vessel revenues (inflation adjusted, 2018, $1,000s) for the West Coast drift gillnet fishery, 1990-2018.

Time run: 4/18/2019 10:41:17 AM

Year	# Vessels	Blue Shark	Common Thresher Shark	Non-HMS FMP Sharks	Shortfin Mako Shark	Swordfish	Tunas	**Adj. Revenue ($1,000)**
1990	141		538	6	637	11,054	126	**12,360**
1991	121		1,072	5	324	9,720	132	**11,253**
1992	120		271	4	267	10,837	274	**11,653**
1993	124		533	18	233	10,997	747	**12,529**
1994	129		555	3	183	7,116	409	**8,266**
1995	118		346	25	201	7,085	286	**7,943**
1996	112	0	473	2	204	6,158	419	**7,256**
1997	109		568	5	271	4,913	508	**6,266**
1998	99		592	8	192	5,656	466	**6,915**
1999	85		218	2	103	3,983	310	**4,616**
2000	69		213	0	108	3,325	230	**3,877**
2001	60		476	0	52	1,743	227	**2,498**
2002	51		273	1	97	2,048	72	**2,492**
2003	43		378	1	103	1,380	78	**1,940**
2004	35		113		45	1,221	73	**1,451**
2005	38		229	2	30	1,500	84	**1,846**
2006	39		217	2	63	2,453	15	**2,749**
2007	40		261	0	55	3,019	28	**3,363**
2008	39		207		39	2,007	7	**2,260**
2009	35		80		41	1,259	25	**1,405**
2010	26		62	4	19	468	23	**576**
2011	21		71		17	864	107	**1,059**
2012	17		71	4	19	889	59	**1,042**
2013	18		88		29	739	65	**920**
2014	21		43		13	881	28	**965**
2015	19		43		13	621	20	**697**
2016	21		47		22	1,132	62	**1,264**
2017	18		51	0	23	920	14	**1,007**
2018	21		34		18	692	90	**834**

Values not reported for cells highlighted in yellow due to confidentiality requirements (less than three vessels or dealers).

Blank cells indicate null value (no data exist for that stratum).

Tables 14 a & b. Monthly commercial landings (number, weight in round mt) and real ex-vessel revenue (inflation adjusted, 2018, $1,000s) of common thresher shark and swordfish in the drift gillnet fishery, 2012-2018.

Time run: 4/18/2019 10:42:10 AM

a. Common Thresher Shark

	2016			2017			2018		
Month Name	# Landings	Landings (mt)	Revenue ($1,000)	# Landings	Landings (mt)	Revenue ($1,000)	# Landings	Landings (mt)	Revenue ($1,000)
JAN-AUG	28	12	20	26	21	23	24	19	25
SEP	4	0.4	1	2					
OCT	10	2	4	4	2	5	4	0.4	1
NOV	9	3	5	15	7	10	15	3	5
DEC	42	11	18	23	9	12	9	3	3

b. Swordfish

	2016			2017			2018		
Month Name	# Landings	Landings (mt)	Revenue ($1,000)	# Landings	Landings (mt)	Revenue ($1,000)	# Landings	Landings (mt)	Revenue ($1,000)
JAN-AUG	42	44	304	33	33	222	34	36	197
SEP	9	4	30	2			2		
OCT	24	22	143	6	6	41	22	14	72
NOV	33	33	233	36	64	326	37	56	271
DEC	53	70	423	36	72	328	24	38	147

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Revenue and weight rounded to nearest whole unit. If revenue or weight was < 1 it was rounded to nearest 0.1 of a unit.

Blank cells indicate null value (no data exist for that stratum).

The number of landings was calculated as the number of distinct vessels making landings in a state on a landing day.

Tables 15 a & b. Annual commercial landings (number, weight in round mt) and ex-vessel revenue (inflation adjusted, 2018, $1,000s) for common thresher shark and swordfish

Time run: 4/18/2019 10:42:44 AM

a. Common Thresher Shark

	2016			2017			2018		
Port	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Morro North	8	2	3	10	6	9	7	15	19
Santa Barbara-Los Angeles Areas	39	12	22	27	13	19	15	2	4
San Diego Areas	45	13	21	32	19	20	30	9	12
CCA				1					
ERA	1								

b. Swordfish

	2016			2017			2018		
Port	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Morro North	14	18	132	12	30	118	10	24	90
Santa Barbara-Los Angeles-San Diego Areas	146	154	991	102	145	789	109	121	602
CCA				1					
ERA	1								

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Port areas are grouped together to maintain data confidentiality requirements.

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.

The number of landings was calculated as the number of distinct vessels making landings in a state on a landing day.

Table 16. Number of vessels and commercial landings (round mt) in the West Coast harpoon fishery, 1990-2018.

Time run: 4/18/2019 10:43:24 AM

Year	# Vessels	Swordfish	Other HMS	**Total**
1990	52	65	3	**67**
1991	33	20	1.0	**21**
1992	48	75	3	**78**
1993	42	169	0.8	**170**
1994	48	157	0.7	**158**
1995	39	97	2	**99**
1996	31	81	1	**82**
1997	32	84	3	**87**
1998	27	48	0.8	**49**
1999	30	82	0.4	**82**
2000	26	90	0.4	**90**
2001	23	52	0.6	**53**
2002	29	90	0.7	**90**
2003	35	107	0.3	**107**
2004	29	69	0.9	**70**
2005	24	76	0.6	**77**
2006	24	72	3	**75**
2007	28	59	0.5	**59**
2008	32	48	0.5	**49**
2009	28	50	0.8	**51**
2010	26	37	0.5	**38**
2011	17	24	0.7	**25**
2012	10	5		**5**
2013	13	6		**6**
2014	11	6		**6**
2015	12	5		**5**
2016	19	25		**25**
2017	21	28		**28**
2018	14	10		**10**

Count of vessels landing HMS (excluding striped marlin, pelagic thresher shark, and bigeye thresher shark) with harpoon gear.

Blank cells indicate null value (no data exist for that stratum).

Landed Weight rounded to nearest mt. If landed weight is less than 1 mt weight is rounded to nearest 0.1 mt.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 17. Real commercial ex-vessel revenues (inflation adjusted, 2018, $1,000s) for the West Coast harpoon fishery, 1990-2018.

Time run: 4/18/2019 10:45:11 AM

Year	# Vessels	Swordfish	Other HMS	**Total**
1990	52	935	10	**945**
1991	33	302	3	**305**
1992	48	962	10	**972**
1993	42	1,815	3	**1,818**
1994	48	1,996	3	**1,999**
1995	39	1,168	6	**1,174**
1996	31	955	5	**959**
1997	32	1,013	8	**1,021**
1998	27	591	2	**593**
1999	30	888	1	**889**
2000	26	1,061	1	**1,062**
2001	23	648	2	**649**
2002	29	920	2	**922**
2003	35	1,123	0.8	**1,124**
2004	29	873	3	**876**
2005	24	896	2	**898**
2006	24	834	6	**840**
2007	28	714	2	**715**
2008	32	537	2	**539**
2009	28	542	2	**544**
2010	26	421	2	**423**
2011	17	284	1	**285**
2012	10	70		**70**
2013	13	92		**92**
2014	11	85		**85**
2015	12	77		**77**
2016	19	303		**303**
2017	21	320		**320**
2018	14	132		**132**

Count of vessels landing HMS (excluding striped marlin, pelagic thresher shark, and bigeye thresher shark) with harpoon gear.

Blank cells indicate null value (no data exist for that stratum).

Revenue rounded to nearest $1,000. If revenue is less than $1,000 it is rounded to nearest 0.1.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 18. Monthly commercial landings (number, weight in round mt) and real commercial ex-vessel revenue (inflation adjusted, 2018, $1,000s) of swordfish by the harpoon fishery, 2016-2018. (All landings occurred in California.)

Time run: 4/18/2019 10:46:03 AM

2016

	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Jan-May	7	1	17
Jun	17	5	71
Jul	35	17	197
Aug	7	1	11
Oct			
Nov			
Total	**66**	**25**	**297**

2017

	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Jan-May			
Jun	12	2	34
Jul	26	7	90
Aug	21	3	51
Sep	13	2	33
Oct	18	6	70
Nov	9	4	26
Dec	5	1	8
Total	**104**	**27**	**315**

2018

	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Jan-May			
Jun	7	1	17
Jul	8	1	24
Aug	6	0.0	11
Sep	11	4	50
Oct			
Nov	7	1	16
Dec			
Total	**39**	**9**	**121**

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.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

The number of landings was calculated as the number of distinct vessels making landings in a state on a landing day.

Table 19. Annual commercial landings (number and weight in round mt) and ex-vessel revenue (inflation adjusted, 2018, $1,000s) of swordfish by port group in the harpoon fishery, 2016-2018.

Time run: 4/18/2019 10:46:42 AM

	2016			2017			2018		
	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)	# Landings	Landings (mt)	Adj. Revenue ($1,000)
Santa Barbara				15	4	50	13	3	32
Los Angeles	43	14	163	60	17	188	21	5	76
San Diego	25	11	135	32	7	82	9	2	24
Grand Total	**68**	**25**	**298**	**107**	**28**	**319**	**43**	**10**	**131**

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.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

The number of landings was calculated as the number of distinct vessels making landings in a state on a landing day.

Table 20. Number of vessels and commercial HMS landings (round mt) by Hawaii permitted longline vessels in West Coast ports, 1990-2018.

Time run: 4/18/2019 10:47:20 AM

Year	# Vessels	Landings (mt)
1990	1	
1991	2	
1992	3	54
1993	6	203
1994	26	902
1995	23	355
1996	16	438
1997	21	760
1998	27	591
1999	32	1,351
2000	40	2,031
2001	37	1,963
2002	19	
2003	21	1,804
2004	17	939
2006	1	
2008	3	67
2009	2	
2010	6	277
2011	9	
2012	7	
2013	7	
2014	14	622
2015	17	907
2016	18	931
2017	13	988
2018	22	996

Count of Hawaii permited vessels landing HMS (excluding striped marlin, pelagic thresher shark, and bigeye thresher shark) with longline gear in West Coast ports (see Table 27).

Blank cells indicate null value (no data exist for that stratum).

Landed Weight rounded to nearest mt. If landed weight is less than 1 mt weight is rounded to nearest 0.1 mt.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 21. Real commercial ex-vessel revenues from HMS landings (inflation adjusted, 2018, $1,000s) by Hawaii permitted longline vessels in West Coast ports, 1990-2018.

Time run: 4/18/2019 10:47:20 AM

Year	# Vessels	Adj. Revenue ($1,000)
1990	1	
1991	2	
1992	3	504
1993	6	1,742
1994	26	6,453
1995	23	2,222
1996	16	2,515
1997	21	3,742
1998	27	3,420
1999	32	7,873
2000	40	12,185
2001	37	9,917
2002	19	
2003	21	7,794
2004	17	4,211
2006	1	
2008	3	221
2009	2	
2010	6	1,668
2011	9	
2012	7	
2013	7	
2014	14	3,677
2015	17	5,783
2016	18	5,656
2017	13	5,915
2018	22	5,624

Count of Hawaii permited vessels landing HMS (excluding striped marlin, pelagic thresher shark, and bigeye thresher shark) with longline gear in West Coast ports (see Table 27).

Blank cells indicate null value (no data exist for that stratum).

Revenue rounded to nearest $1,000. If revenue is less than $1,000 it is rounded to nearest 0.1.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 22. Number of vessels and commercial landings (round mt) for HMS tunas in the West Coast purse seine fishery, 1990-2018.

Time run: 4/18/2019 10:48:21 AM

Year	# Vessels	Landings (mt)
1990	23	6,517
1991	15	6,671
1992	23	5,762
1993	17	5,577
1994	19	5,369
1995	18	8,840
1996	21	12,238
1997	24	11,539
1998	25	10,519
1999	12	4,026
2000	15	2,173
2001	12	805
2002	2	
2003	3	862
2004	9	770
2005	8	1,006
2006	1	
2007	4	223
2008	2	
2009	7	460
2011	2	
2012	1	
2014	8	1,413
2015	11	758
2016	9	686
2017	9	2,206
2018	14	2,500

Count of vessels landing HMS (excluding striped marlin, pelagic thresher shark, and bigeye thresher shark) with purse seine gear.

Blank cells indicate null value (no data exist for that stratum).

Landed Weight rounded to nearest mt. If landed weight is less than 1 mt weight is rounded to nearest 0.1 mt.
Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 23. Real commercial ex-vessel revenues (inflation adjusted, 2018, $1,000s) from HMS tunas in the West Coast purse seine fishery, 1990-2018.

Time run: 4/18/2019 10:49:14 AM

Year	# Vessels	Adj. Revenue ($1,000)
1990	23	11,663
1991	15	9,897
1992	23	7,434
1993	17	7,485
1994	19	8,384
1995	18	11,313
1996	21	15,177
1997	24	16,933
1998	25	15,502
1999	12	4,934
2000	15	2,810
2001	12	966
2002	2	
2003	3	833
2004	9	697
2005	8	902
2006	1	
2007	4	344
2008	2	
2009	7	544
2011	2	
2012	1	
2014	8	1,634
2015	11	658
2016	9	772
2017	9	2,739
2018	14	2,426

Count of vessels landing HMS (excluding striped marlin, pelagic thresher shark, and bigeye thresher shark) with purse seine gear.

Blank cells indicate null value (no data exist for that stratum).

Revenue rounded to nearest $1,000. If revenue is less than $1,000 it is rounded to nearest 0.1.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 24. Number of vessels in HMS fisheries other than the West Coast albacore surface hook-and-line (troll and baitboat) fishery by state, 1990-2018.

Time run: 4/18/2019 11:28:08 AM

	California						Oregon				Washington	Coastwide						California Total	Oregon Total	Washington Total	Coastwide Total
Year	DGNLM	HAR	LL	LL-FMP	LX	PS-HMS-EPO	DGNLM	LL	LX	PS-HMS-EPO	LX	DGNLM	HAR	LL	LL-FMP	LX	PS-HMS-EPO				
1990	141	52	1		192	23			1			141	52	1		193	23	**409**	**1**		**410**
1991	121	33	2		115	15						121	33	2		115	15	**286**			**286**
1992	120	48	3		187	23			1			120	48	3		188	23	**381**	**1**		**382**
1993	124	42	6		161	17			2		2	124	42	6		165	17	**350**	**2**	**2**	**354**
1994	129	48	26		123	19						129	48	26		123	19	**345**			**345**
1995	117	39	23		130	18	2		3		1	119	39	23		134	18	**327**	**5**	**1**	**333**
1996	112	31	16		95	21	3		3			115	31	16		98	21	**275**	**6**		**281**
1997	109	32	21		129	24	4		1			113	32	21		130	24	**315**	**5**		**320**
1998	98	27	27		134	25	6		3			104	27	27		137	25	**311**	**9**		**320**
1999	81	30	32	1	83	12	4		5		4	85	30	32	1	92	12	**239**	**9**	**4**	**252**
2000	69	26	40	1	103	15	1		4			70	26	40	1	107	15	**254**	**5**		**259**
2001	60	23	36	1	83	12		1	3			60	23	37	1	86	12	**215**	**4**		**219**
2002	51	29	19	1	75	2	1		1			52	29	19	1	76	2	**177**	**2**		**179**
2003	43	35	21	1	68	3	1		1	1		44	35	21	1	69	4	**171**	**3**		**174**
2004	35	29	17	1	61	9	1		5			36	29	17	1	66	9	**152**	**6**		**158**
2005	38	24		1	34	8			7			38	24		1	41	8	**105**	**7**		**112**
2006	39	24	1	1	51	1			1			39	24	1	1	52	1	**117**	**1**		**118**
2007	40	28		1	45	4			1			40	28		1	46	4	**118**	**1**		**119**
2008	39	32	2	1	57	2		1	2			39	32	3	1	59	2	**133**	**3**		**136**
2009	35	28	2	1	59	7						35	28	2	1	59	7	**132**			**132**
2010	26	26	6	1	33							26	26	6	1	33		**92**			**92**
2011	21	17	9	1	30	2			1			21	17	9	1	31	2	**80**	**1**		**81**
2012	17	10	7	1	39	1			2			17	10	7	1	41	1	**75**	**2**		**77**
2013	18	13	7	1	38				1			18	13	7	1	39		**77**	**1**		**78**
2014	21	11	14	1	81	8			1			21	11	14	1	82	8	**136**	**1**		**137**
2015	19	12	17	2	123	11						19	12	17	2	123	11	**184**			**184**
2016	21	19	18	1	88	9			2			21	19	18	1	90	9	**156**	**2**		**158**
2017	18	21	13	1	80	9			3			18	21	13	1	83	9	**142**	**3**		**145**
2018	21	14	22	1	97	14			2			21	14	22	1	99	14	**169**	**2**		**171**

Blank cells indicate null value (no data exist for that stratum).

State values may not sum to coastwide total because of vessels making landings in more than one state.

Vessel may make landings in more than one fishery, so the number of vessels participating in individual fisheries may not total the number of vessels fishing in the state.

Table 25. Landings (number and weight) and revenue (nominal dollars) of HMS with non-HMS gears by a) state and b) gear type, 2016-2018 (data grouped for 3 years).

Time run: 4/18/2019 10:50:29 AM

a. State

	California			Oregon			Washington		
Species Group	# Landings	Landings (mt)	Revenue ($1,000)	# Landings	Landings (mt)	Revenue ($1,000)	# Landings	Landings (mt)	Revenue ($1,000)
Other HMS	58	37	157	1			2		
Sharks	1030	69	138	134	3	0.3	44	2	3
Grand Total	**1088**	**106**	**294**	**135**	**3**	**0**	**46**	**2**	**3**

b. Gear Type

	Non-HMS Net Gear			Other Non-HMS Gear		
	# Landings	Landings (mt)	Revenue ($1,000)	# Landings	Landings (mt)	Revenue ($1,000)
Other HMS	31	12	49	31	25	108
Sharks	992	68	136	216	6	5
Total	**1023**	**80**	**185**	**247**	**31**	**113**

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.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow

The number of landings was calculated as the number of distinct vessels making landings in a state on a landing day.

Table 26. Shoreside commercial and tribal a) landings (mt) and b) ex-vessel revenue (inflation adjusted, 2017, $1,000), by species management group, 1981-2018.

Time run: 4/18/2019 10:55:22 AM

a) Landings (mt)

Year	CPS	CRAB	Groundfish	**HMS**	Other	Salmon	Shellfish	Shrimp	Total	% of Annual Average
1981	139,768	9,652	103,343	26,883	14,787	7,972	10,813	19,186	332,403	170%
1982	126,969	8,235	119,354	17,244	12,201	8,823	3,623	13,433	309,881	109%
1983	69,346	7,861	98,977	54,957	11,116	2,935	3,288	6,879	255,358	347%
1984	63,821	7,176	89,803	43,926	10,719	2,178	3,661	5,618	226,902	277%
1985	68,174	8,558	90,922	14,153	13,699	5,046	2,447	13,609	216,608	89%
1986	84,041	8,390	82,479	12,963	19,801	7,377	508	26,892	242,451	82%
1987	90,440	9,373	91,981	12,859	24,574	9,410	457	31,514	270,608	81%
1988	108,363	17,509	92,247	14,995	27,929	12,515	344	32,832	306,734	95%
1989	113,411	16,813	99,371	7,694	31,002	6,868	425	36,398	311,982	49%
1990	88,509	14,507	94,539	9,854	29,771	4,685	320	25,631	267,815	62%
1991	90,591	7,027	105,546	10,975	25,075	3,734	262	20,156	263,365	69%
1992	60,595	15,882	132,554	13,586	19,248	2,048	328	36,422	280,664	86%
1993	79,172	18,075	116,393	16,914	16,199	2,213	537	23,496	272,999	107%
1994	85,673	18,167	135,676	16,031	14,632	1,801	336	15,752	288,068	101%
1995	128,068	17,467	134,491	14,011	13,741	4,755	300	12,312	325,146	89%
1996	135,919	25,139	146,451	25,935	12,800	3,306	158	14,919	364,625	164%
1997	151,056	13,013	143,569	23,137	11,742	3,697	98	18,881	365,192	146%
1998	74,371	12,388	131,009	16,310	7,695	1,850	57	5,662	249,341	103%
1999	170,508	16,192	125,907	11,866	9,226	2,716	45	14,121	350,581	75%
2000	225,741	13,565	123,033	10,937	9,832	3,751	114	16,283	403,257	69%
2001	195,825	11,851	103,554	12,717	8,981	3,369	93	18,602	354,992	80%
2002	182,834	16,123	75,056	10,834	9,665	5,163	168	26,246	326,090	68%
2003	125,358	34,070	82,888	17,635	7,953	6,104	108	14,594	288,711	111%
2004	144,317	28,557	122,302	15,182	8,288	5,719	191	9,688	334,244	96%
2005	157,884	25,098	135,453	10,040	8,218	4,296	113	11,404	352,506	63%
2006	159,782	35,707	151,259	13,498	7,721	1,190	137	8,913	378,207	85%
2007	195,044	20,722	117,498	12,519	8,597	1,451	148	11,604	367,583	79%
2008	145,496	17,429	97,767	11,603	10,174	264	177	15,835	298,744	73%
2009	171,618	23,443	82,196	13,263	9,625	476	240	14,952	315,812	84%
2010	201,483	25,054	94,140	11,924	8,928	1,031	258	20,763	363,582	75%
2011	174,183	26,840	128,709	11,766	9,370	1,196	200	30,052	382,316	74%
2012	209,726	21,001	90,918	14,189	10,078	2,350		29,841	378,103	90%
2013	186,319	36,474	127,880	13,098	11,101	3,236		32,159	410,267	83%
2014	150,019	20,185	121,728	14,369	9,756	3,365		42,005	361,426	91%
2015	65,932	6,242	83,100	12,374	7,967	1,927	307	47,323	225,172	78%
2016	55,566	26,633	113,895	11,552	6,419	816	371	24,742	239,993	73%
2017	72,144	23,977	183,373	10,000	5,911	733	331	15,894	312,364	63%
2018	58,326	25,849	170,484	9,784	4,930	902	471	23,219	293,965	62%
Pct of Total	40.4%	5.8%	36.5%	5.1%	4.1%	1.2%	0.3%	6.6%	100.0%	
Total	4,806,390	690,243	4,339,843	601,581	489,470	141,267	31,432	787,829	11,888,056	
Annual Average	126,484	18,164	114,206	15,831	12,881	3,718	898	20,732	312,844	

b) Ex-vessel revenue (inflation adjusted, 2018, $1,000)

Year	CPS	CRAB	Groundfish	**HMS**	Other	Salmon	Shellfish	Shrimp	Total	% of Annual Average
1981	$64,506	$46,746	$107,393	$104,504	$25,674	$75,788	$29,296	$55,621	$509,528	224%
1982	$63,121	$44,463	$134,110	$54,707	$21,697	$84,010	$15,750	$39,875	$457,733	117%
1983	$54,232	$53,416	$113,137	$127,529	$21,920	$19,642	$10,658	$27,833	$428,368	274%
1984	$27,746	$48,743	$101,043	$115,501	$22,305	$22,412	$12,632	$20,704	$371,086	248%
1985	$39,412	$52,886	$113,202	$53,091	$27,543	$42,170	$12,319	$26,797	$367,418	114%
1986	$38,082	$48,749	$111,926	$50,229	$38,794	$49,905	$4,301	$66,362	$408,348	108%
1987	$40,219	$52,849	$138,741	$57,922	$42,041	$89,102	$5,116	$94,126	$520,117	124%
1988	$45,949	$83,700	$127,809	$58,932	$54,877	$127,117	$4,068	$58,322	$560,774	126%
1989	$40,650	$74,267	$123,680	$32,077	$62,653	$48,087	$6,021	$54,746	$442,180	69%
1990	$38,527	$82,383	$111,388	$32,159	$70,597	$38,050	$4,712	$50,558	$428,373	69%
1991	$38,597	$38,928	$121,901	$28,537	$80,462	$23,815	$3,421	$44,014	$379,675	61%
1992	$30,689	$66,440	$116,793	$41,451	$67,828	$15,199	$5,602	$48,510	$392,513	89%
1993	$26,905	$70,737	$102,262	$47,240	$60,314	$14,304	$7,246	$31,562	$360,569	101%
1994	$33,921	$84,192	$106,454	$47,235	$57,406	$11,382	$4,574	$36,603	$381,765	101%
1995	$57,703	$99,530	$133,171	$33,681	$53,113	$23,717	$4,923	$34,364	$440,200	72%
1996	$64,772	$114,285	$123,884	$62,104	$46,348	$14,079	$3,462	$36,050	$464,985	133%
1997	$65,922	$79,181	$119,900	$52,343	$43,589	$14,984	$1,667	$34,043	$411,629	112%
1998	$14,416	$70,188	$78,155	$37,649	$28,305	$8,373	$103	$20,192	$257,380	81%
1999	$60,803	$98,608	$82,686	$33,845	$34,608	$14,035	$71	$28,811	$353,467	73%
2000	$58,410	$89,235	$86,539	$32,166	$37,927	$19,971	$227	$28,955	$353,430	69%
2001	$44,092	$73,170	$69,370	$33,512	$32,692	$14,653	$246	$23,144	$290,879	72%
2002	$43,931	$81,052	$57,554	$23,433	$31,728	$19,709	$497	$29,104	$287,009	50%
2003	$46,701	$157,599	$63,882	$37,585	$28,177	$28,507	$180	$15,279	$377,911	81%
2004	$42,601	$133,804	$60,669	$38,401	$28,491	$40,177	$609	$14,272	$359,023	82%
2005	$54,499	$106,153	$69,217	$29,020	$26,052	$30,438	$354	$17,779	$333,511	62%
2006	$49,807	$160,206	$74,292	$32,876	$26,975	$12,449	$439	$13,377	$370,421	71%
2007	$53,466	$125,151	$70,363	$30,247	$25,997	$15,208	$430	$18,263	$339,125	65%
2008	$52,338	$105,685	$81,678	$36,388	$31,983	$2,369	$574	$27,174	$338,189	78%
2009	$85,051	$121,097	$76,581	$35,089	$30,116	$2,903	$784	$17,487	$369,108	75%
2010	$97,046	$130,123	$77,689	$35,496	$33,769	$10,304	$783	$23,178	$408,388	76%
2011	$88,263	$176,654	$104,201	$52,375	$39,690	$12,381	$576	$43,254	$517,393	112%
2012	$96,350	$168,587	$81,871	$51,881	$40,133	$24,359		$41,755	$504,935	111%
2013	$100,863	$242,251	$82,613	$46,424	$41,542	$38,901		$43,067	$595,660	100%
2014	$92,099	$179,350	$80,172	$39,929	$43,172	$35,333		$61,603	$531,657	86%
2015	$30,935	$66,364	$71,857	$33,437	$38,226	$22,472	$698	$88,853	$352,842	72%
2016	$45,389	$202,705	$77,677	$42,960	$35,425	$12,932	$1,047	$46,710	$464,845	92%
2017	$72,392	$176,770	$95,461	$40,260	$34,780	$11,325	$710	$26,258	$457,956	86%
2018	$42,945	$190,588	$81,215	$29,235	$30,742	$13,666	$1,438	$44,951	$434,779	63%
Pct of Total	13.6%	28.0%	22.3%	$0	9.4%	6.3%	0.7%	9.0%	100.0%	
Total	$2,043,349	$3,996,834	$3,630,534	$1,771,452	$1,497,691	$1,104,226	$145,533	$1,433,552	$15,623,171	
Annual Average	$53,772	$105,180	$95,540	$46,617	$39,413	$29,059	$4,158	$37,725	$411,136	

Confidential data (less than 3 vessels or dealers) are suppressed and highlighted yellow.

Revenue and weight rounded to nearest whole unit. If revenue or weight was 1 it was rounded to nearest 0.01 of a unit.

Blank cells indicate a null value (no data exist for that stratum).

Table 27. Number of vessels and commercial landings (round mt) in the West Coast South Pacific albacore surface hook-and-line (troll and baitboat) fishery, 1990-2018.

Time run: 4/18/2019 10:51:36 AM

Year	No. Vessels	Landings (mt)
1990		
1991		
1992	3	
1993		
1994		
1995		
1996		
1997		
1998	6	203
1999	4	63
2000	2	
2001		
2002		
2003		
2004	1	
2005		
2006		
2007		
2008		
2009		
2011		
2012	1	
2013	4	254
2014		
2015	1	
2016		
2017	5	
2018		

Blank cells indicate null value (no data exist for that stratum).

Landed Weight rounded to nearest mt. If landed weight is less than 1 mt weight is rounded to nearest 0.1 mt.
Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 28. Real commercial ex-vessel revenues (inflation adjusted, 2018, $1,000s) for the West Coast South Pacific albacore surface hook-and-line (troll and baitboat) fishery, 1990–2018.

Time run: 4/18/2019 10:52:47 AM

Year	Adj. Revenue ($1,000)
1990	
1991	
1992	
1993	
1994	
1995	
1996	
1997	
1998	660
1999	157
2000	
2001	
2002	
2003	
2004	
2005	
2006	
2007	
2008	
2009	
2011	
2012	
2013	1,177
2014	
2015	
2016	
2017	
2018	

Blank cells indicate null value (no data exist for that stratum).

Revenue rounded to nearest $1,000. If revenue is less than $1,000 revenue rounded to nearest 0.1.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 29. The number of vessels, commercial landings (round mt), and ex-vessel revenue (inflation adjusted, 2018, $1,000) for HMS Ecosystem component species, 1990-2018.

Time run: 4/18/2019 10:53:28 AM

		Pelagic Thresher Shark		Bigeye Thresher Shark	
Year	# Vessels	Landings (mt)	Adj. Revenue ($1,000)	Landings (mt)	Adj. Revenue ($1,000)
1990	73	1	3	31	60
1991	58			32	42
1992	54	0.5	1.0	22	24
1993	74	0.5	0.7	44	45
1994	81			37	52
1995	71	5	13	31	38
1996	43	1	2	20	27
1997	67	35	93	32	52
1998	38	2	4	11	14
1999	31	10	27	7	10
2000	36	3	4	5	7
2001	17	2	4	2	12
2002	9				
2003	19	4	4	6	5
2004	19	2	3	5	5
2005	21	0.5	0.7	10	8
2006	16	0.2	0.3	4	6
2007	19	2	3	5	5
2008	19			6	6
2009	18			7	6
2010	8				
2011	6				
2012	2				
2013	5			0.6	0.7
2014	5	6	10		
2015	13	3	4	1	2
2016	5	0.3	0.4	1	3
2017	7			2	4
2018	6	0.2	0.3		

Count of vessels landing HMS ecosystem component species (pelagic thresher shark and bigeye thresher shark) with any gear.

Blank cells indicate null value (no data exist for that stratum).

Landed Weight rounded to nearest mt. If landed weight is less than 1 mt weight is rounded to nearest 0.1 mt.

Revenue rounded to nearest $1,000. If revenue is less than $1,000 it is rounded to nearest 0.1.

Confidential data (less than 3 vessels or dealers) is suppressed and highlighted yellow.

Table 30. Inflation adjustment derived from Bureau of Economic Analysis Table 1.1.9 (Implicit Price Deflators for Gross Domestic Product).

Time run: 4/18/2019 10:54:25 AM

Year	Inflation Adjuster	Price Deflator
1981	2.386	46.273
1982	2.247	49.132
1983	2.162	51.056
1984	2.087	52.898
1985	2.023	54.571
1986	1.983	55.670
1987	1.935	57.046
1988	1.869	59.059
1989	1.799	61.374
1990	1.734	63.671
1991	1.677	65.825
1992	1.640	67.325
1993	1.602	68.920
1994	1.568	70.392
1995	1.536	71.868
1996	1.508	73.183
1997	1.483	74.445
1998	1.466	75.283
1999	1.445	76.370
2000	1.414	78.078
2001	1.383	79.790
2002	1.362	81.052
2003	1.337	82.557
2004	1.302	84.780
2005	1.263	87.421
2006	1.226	90.066
2007	1.194	92.486
2008	1.171	94.285
2009	1.162	95.004
2010	1.149	96.111
2011	1.125	98.118
2012	1.104	100.000
2013	1.085	101.755
2014	1.065	103.680
2015	1.053	104.789
2016	1.042	105.935
2017	1.023	107.948
2018	1.000	110.389
2019	1.000	110.389

Data downloaded from Bureau of Economic Analysis Table 1.1.9

Appendix B: Recreational Tables

Table R1. Recreational albacore catch (number of kept fish) for charter and private boats by year and port, 2016-2018.

Port Area**	2016			2017			2018		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
North Coast	75	137	212	0	51	51	0	24	24
Westport	16,256	16,296	32,551	14,050	9,998	24,048	10,989	9,878	20,867
Ilwaco	3,755	10,961	14,716	1,399	4,929	6,329	880	3,513	4,393
Washington Subtotal	**20,086**	**27,394**	**47,479**	**15,449**	**14,978**	**30,428**	**11,869**	**13,415**	**25,284**
Astoria	81	684	765	6	223	229	0	9	9
Garibaldi	148	3,774	3,922	34	1,600	1,634	27	1,716	1,743
Pacific City	0	1,026	1,026	0	222	222	0	48	48
Depoe Bay	695	2,038	2,733	220	208	428	159	1,403	1,562
Newport	1,193	5,757	6,950	97	1,096	1,193	125	4,124	4,249
Florence	0	64	64	0	0	0	0	13	13
Winchester Bay	0	1,884	1,884	0	1,538	1,538	0	5,519	5,519
Charleston	591	18,725	19,316	135	7,861	7,996	301	10,086	10,387
Coos Bay	0	0	0	0	0	0	0	0	0
Bandon	199	220	419	70	82	152	89	572	661
Gold Beach	0	0	0	0	76	76	0	27	27
Brookings	0	50	50	37	2,491	2,528	0	1,288	1,288
Oregon Subtotal	**2,907**	**34,222**	**37,129**	**599**	**15,397**	**15,996**	**701**	**24,805**	**25,506**
Redwood District	15	0	15	656	3,522	4,178	529	6,171	6,700
Wine District	25	452	477	421	6,068	6,489	750	5,731	6,481
San Francisco District	14	0	14	19	182	201	9	191	200
Central District	0	0	0	0	0	0	0	11	11
Channel District	0	0	0	0	0	0	0	0	0
South District	0	0	0	0	0	0	0	0	0
California Subtotal	**54**	**452**	**506**	**1,096**	**9,772**	**10,868**	**1,288**	**12,104**	**13,392**
Mexican Waters	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Oregon-Washington Total	**22,993**	**61,616**	**84,608**	**16,048**	**30,375**	**46,424**	**12,570**	**38,220**	**50,790**
U.S. Total	**23,047**	**62,068**	**85,114**	**17,144**	**40,147**	**57,292**	**13,858**	**50,324**	**64,182**
Coastwide Total	**23,048**	**62,068**	**85,115**	**17,144**	**40,147**	**57,292**	**13,858**	**50,324**	**64,182**

** California catch is summarized by CRFS Sampling District. For a description, see: California Recreational Fisheries Survey Districts

California Data Sources: Charter data comes from California Commercial Passenger Fishing Vessel (CPFV) logbooks extracted from CDFW Marine Logs System (MLS) data portal on May 21, 2019; California Recreational Fisheries Survey (CRFS) Total Private and Rental Boat (PR) data, including private access and night fishing (PR-PAN) extracted from the CFRS Data Portal May 21, 2019.

Table R2. Recreational albacore effort (angler **days***) for charter and private boats by year and port, 2016-2018.

Port Area**	2016			2017			2018		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
North Coast	11	119	130	0	62	62	0	46	46
Westport	1,796	5,067	6,863	1,636	3,926	5,562	1,312	4,074	5,386
Ilwaco	1,284	2,715	4,000	804	1,989	2,794	670	1,740	2,410
Washington Subtotal	**3,091**	**7,901**	**10,993**	**2,440**	**5,977**	**8,418**	**1,982**	**5,860**	**7,842**
Astoria	57	107	164	28	141	169	0	34	34
Garibaldi	131	1,455	1,586	49	784	833	37	904	941
Pacific City	0	239	239	0	140	140	0	72	72
Depoe Bay	228	708	936	176	226	402	74	378	452
Newport	552	2,206	2,758	148	616	764	93	990	1,083
Florence	0	7	7	0	0	0	0	26	26
Winchester Bay	0	520	520	0	444	444	0	906	906
Charleston	170	3,300	3,470	75	2,312	2,387	118	1,886	2,004
Coos Bay	0	0	0	0	0	0	0	0	0
Bandon	39	69	108	29	86	115	30	115	145
Gold Beach	0	4	4	0	12	12	0	18	18
Brookings	0	36	36	6	412	418	0	226	226
Oregon Subtotal	**1,177**	**8,651**	**9,828**	**511**	**5,173**	**5,684**	**352**	**5,555**	**5,907**
Redwood District	13	NA	NA	128	NA	NA	70	NA	NA
Wine District	12	NA	NA	91	NA	NA	148	NA	NA
San Francisco District	14	NA	NA	29	NA	NA	6	NA	NA
Central District	0	NA	NA	0	NA	NA	0	NA	NA
Channel District	0	NA	NA	0	NA	NA	0	NA	NA
South District	0	NA	NA	0	NA	NA	0	NA	NA
California Subtotal	**39**	**NA**	**NA**	**248**	**NA**	**NA**	**224**	**NA**	**NA**
Mexican Waters	**19**	**NA**	**NA**	**0**	**NA**	**NA**	**0**	**NA**	**NA**
Oregon-Washington Total	**4,268**	**16,552**	**20,821**	**2,951**	**11,150**	**14,102**	**2,334**	**11,415**	**13,749**
U.S. Total	**4,307**	**NA**	**NA**	**3,199**	**NA**	**NA**	**2,558**	**NA**	**NA**
Coastwide Total	**4,326**	**NA**	**NA**	**3,199**	**NA**	**NA**	**2,558**	**NA**	**NA**

* 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.

** California catch is summarized by CRFS Sampling District. For a description, see: California Recreational Fisheries Survey Districts

Private boat estimates for effort are not available by species for California.

California Data Source: California Commercial Passenger Fishing Vessel (CPFV) logbooks extracted from CDFW Marine Logs System (MLS) data portal on May 21, 2019.

Table R3. Recreational albacore catch per unit of effort (number of kept fish/angler **day***) for charter and private boats by year and port, 2016-2018.

Port Area**	2016			2017			2018		
	Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined
North Coast	6.8	1.2	1.6	0.0	0.8	0.8	0.0	0.5	0.5
Westport	9.1	3.2	4.7	8.6	2.5	4.3	8.4	2.4	3.9
Ilwaco	2.9	4	3.7	1.7	2.5	2.3	1.3	2	1.8
Washington Subtotal	**6.5**	**3.5**	**4.3**	**6.3**	**2.5**	**3.6**	**6.0**	**2.3**	**3.2**
Astoria	1.4	6.4	4.7	0.2	1.6	1.4	0.0	0.3	0.3
Garibaldi	1.1	2.6	2.5	0.7	2	2	0.7	1.9	1.9
Pacific City	0.0	4.3	4.3	0.0	1.6	1.6	0.0	0.7	0.7
Depoe Bay	3.0	2.9	2.9	1.2	0.9	1.1	2.1	3.7	3.5
Newport	2.2	2.6	2.5	0.7	1.8	1.6	1.3	4.2	3.9
Florence	0.0	9.1	9.1	0.0	0	0	0.0	0.5	0.5
Winchester Bay	0.0	3.6	3.6	0.0	3.5	3.5	0.0	6.1	6.1
Charleston	3.5	5.7	5.6	1.8	3.4	3.3	2.6	5.3	5.2
Coos Bay	0.0	0	0	0.0	0	0	0.0	0	0
Bandon	5.1	3.2	3.9	2.4	1	1.3	3.0	5	4.6
Gold Beach	0.0	0	0	0.0	6.3	6.3	0.0	1.5	1.5
Brookings	0.0	1.4	1.4	6.2	6	6	0.0	5.7	5.7
Oregon Subtotal	**2.5**	**4**	**3.8**	**1.2**	**3**	**2.8**	**2.0**	**4.5**	**4.3**
Redwood District	1.2	NA	NA	5.1	NA	NA	7.6	NA	NA
Wine District	2.1	NA	NA	4.6	NA	NA	5.1	NA	NA
San Francisco District	1.0	NA	NA	0.7	NA	NA	1.5	NA	NA
Central District	0.0	NA	NA	0.0	NA	NA	0.0	NA	NA
Channel District	0.0	NA	NA	0.0	NA	NA	0.0	NA	NA
South District	0.0	NA	NA	0.0	NA	NA	0.0	NA	NA
California Subtotal	**1.4**	**NA**	**NA**	**4.4**	**NA**	**NA**	**5.8**	**NA**	**NA**
Mexican Waters	**0.1**	**NA**	**NA**	**0.0**	**NA**	**NA**	**0.0**	**NA**	**NA**
Oregon-Washington Total	**5.4**	**3.7**	**4.1**	**5.4**	**2.7**	**3.3**	**5.4**	**3.3**	**3.7**
U.S. Total	**5.4**	**NA**	**NA**	**5.4**	**NA**	**NA**	**5.4**	**NA**	**NA**
Coastwide Total	**5.3**	**NA**	**NA**	**5.4**	**NA**	**NA**	**5.4**	**NA**	**NA**

* 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.

** California catch is summarized by CRFS Sampling District. For a description, see: California Recreational Fisheries Survey Districts

Private boat estimates for CPUE are not available by species for California.

California Data Source: California Commercial Passenger Fishing Vessel (CPFV) logbooks extracted from CDFW Marine Logs System (MLS) data portal on May 21, 2019.

Table R-4. Estimated number of highly migratory MUS kept or released by recreational anglers fishing from California private vessels in U.S. EEZ waters, 2016-2018.

	2016			2017			2018		
	No. Fish			No. Fish			No. Fish		
Species	**Kept[1]**	**Released alive[2]**	**Released dead[2]**	**Kept[1]**	**Released alive[2]**	**Released dead[2]**	**Kept[1]**	**Released alive[2]**	**Released dead[2]**
Tuna									
Albacore	452	7	0	9,772	98	5	12,104	29	0
Bigeye	0	0	0	0	0	0	0	0	0
Pacific Bluefin	1,427	73	0	664	27	0	723	8	0
Skipjack	49	9	0	168	91	0	1,547	2,400	0
Yellowfin	4,645	471	0	1,896	111	0	2,197	61	0
Billfishes									
Striped Marlin	11	12	0	10	10	0	20	0	0
Swordfish	12	0	0	0	0	0	0	0	0
Sharks									
Blue	0	113	0	13	241	0	7	85	0
Common Thresher	418	485	0	236	694	0	254	407	0
Shortfin Mako	134	262	8	198	346	0	199	458	0
Other Fish									
Dorado	592	0	12	4,801	1,272	29	3,149	126	0
Total	**7,740**	**1,432**	**20**	**17,758**	**2,890**	**34**	**20,200**	**3,574**	**0**

Additional Processing Information: [1]Sampler examined fish plus angler reported kept fish; [2]The angler reported the fish released alive or dead.
Source: California Recreational Fisheries Survey (CRFS) Total Private and Rental Boat (PR) data, including private access and night fishing (PR-PAN) extracted from the CFRS Data Portal May 21, 2019.

Table R-5. Estimated number of highly migratory MUS kept or released by recreational anglers fishing from California private vessels in Mexico EEZ waters, 2016-2018.

	2016			2017			2018		
	No. Fish			No. Fish			No. Fish		
Species	**Kept[1]**	**Released alive[2]**	**Released dead[2]**	**Kept[1]**	**Released alive[2]**	**Released dead[2]**	**Kept[1]**	**Released alive[2]**	**Released dead[2]**
Tuna									
Albacore	0	0	0	0	0	0	0	0	0
Bigeye	0	0	0	0	0	0	0	0	0
Pacific Bluefin	618	12	0	570	31	0	164	0	0
Skipjack	0	0	0	546	271	0	3,040	2,523	0
Yellowfin	878	12	0	1,312	86	0	1,760	10	0
Billfishes									
Striped Marlin	13	0	0	0	0	0	0	0	0
Swordfish	0	0	0	0	0	0	0	0	0
Sharks									
Blue	0	0	0	0	21	0	0	10	0
Common Thresher	0	0	0	0	0	0	0	0	0
Shortfin Mako	0	0	0	10	23	0	0	68	0
Other Fish									
Dorado	0	0	0	3,473	1,143	0	888	178	0
Total	**1,509**	**24**	**0**	**5,911**	**1,575**	**0**	**5,852**	**2,789**	**0**

Additional Processing Information: [1]Sampler examined fish plus angler reported kept fish; [2]The angler reported the fish released alive or dead.
Source: California Recreational Fisheries Survey (CRFS) Total Private and Rental Boat (PR) data, including private access and night fishing (PR-PAN) extracted from the CFRS Data Portal May 21, 2019.

Table R-6. Number of highly migratory MUS kept or released by recreational anglers fishing from California charter vessels in U.S. EEZ waters*, 2016-2018.

Species	2016		2017		2018	
	No. Fish		No. Fish		No. Fish	
	Kept	Released[1]	Kept	Released[1]	Kept	Released[1]
Tuna						
Albacore	54	0	1,096	8	1,288	0
Bigeye	42	0	0	0	68	0
Pacific Bluefin	9,257	43	11,424	36	8,896	22
Skipjack	124	6	1,953	209	15,700	2,350
Yellowfin	23,621	112	13,566	329	15,399	180
Billfishes						
Striped Marlin	3	2	7	1	0	4
Swordfish	2	0	0	0	2	0
Sharks						
Blue	1	14	91	90	1	52
Common Thresher	30	8	42	17	39	25
Shortfin Mako	74	116	103	152	129	106
Other Fish						
Dorado	756	66	2,805	133	3,047	68
Total	**33,964**	**367**	**31,087**	**975**	**44,569**	**2,807**

* U.S. EEZ waters include catch from CDFG blocks 877-882 which straddle the U.S.-Mexico border

[1]Released includes both fish released alive or dead

Source: California Commercial Passenger Fishing Vessel (CPFV) logbooks extracted from CDFW Marine Logbook System (MLS) data portal on May 21, 2019.

Table R-7. Number of highly migratory MUS kept or released by recreational anglers fishing from California charter vessels in Mexico EEZ waters, 2016-2018.

Species	2016		2017		2018	
	No. Fish		No. Fish		No. Fish	
	Kept	Released[1]	Kept	Released[1]	Kept	Released[1]
Tuna						
Albacore	1	0	0	0	0	0
Bigeye	105	33	250	10	7	0
Pacific Bluefin	1,159	12	3,845	27	2,805	6
Skipjack	289	90	3,097	667	33,199	9,237
Yellowfin	53,838	4,025	65,867	5,891	85,818	6,814
Billfishes						
Striped Marlin	4	11	3	20	3	37
Swordfish	0	0	0	0	0	0
Sharks						
Blue	16	0	0	1	0	0
Common Thresher	0	0	0	1	0	0
Shortfin Mako	4	2	6	1	7	4
Other Fish						
Dorado	3,982	297	13,147	1,191	8,658	349
Total	**59,398**	**4,470**	**86,215**	**7,809**	**130,497**	**16,447**

[1]Released includes both fish released alive or dead

Source: California Commercial Passenger Fishing Vessel (CPFV) logbooks extracted from CDFW Marine Logbook System (MLS) data portal on May 21, 2019.

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

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

	Canadian Fleet [2, 3]					U.S. Fleet [5, 9]				
Year	*Canadian EEZ (%)*	*U.S. EEZ (%)*	*High Seas (%)*	*Total catch (metric tons)*	*Logbook coverage (%) [4]*	*U.S. EEZ (%)*	*Canadian EEZ (%)*	*High Seas (%)*	*Total catch (metric tons) [6]*	*Logbook coverage (%) [7]*
1995	88	2.2	9.8	1,761	18	5.4	5.7	88.9	8,125	*63*
1996	16.9	45.8	37.3	3,321	24	13.5	0.1	86.4	16,962	*42*
1997	7.2	30.5	62.3	2,166	30	16.5	3.5	80.0	14,325	38
1998	7.3	43.6	49.1	4,177	50	14.8	0.1	85.1	14,489	35
1999	16.6	66.8	16.6	2,734	71	65.3	0.8	33.9	10,120	35
2000	9.6	73.1	17.4	4,531	68	69.6	0.2	30.2	9,714	41
2001	13.5	72.7	13.9	5,248	81	57.0	0.3	42.7	11,349	49
2002	7.8	86.2	5.9	5,379	74	63.9	2.0	34.0	10,768	38
2003	8.0	85.3	6.6	6,847	96	86.0	0.6	13.3	14,161	36
2004	16.9	80.7	2.4	7,857	92	92.9	1.2	5.9	13,473	47
2005	33.1	62.6	4.3	4,829	94	92.0	2.3	5.8	8,479	73
2006	18.5	70.1	11.3	5,833	95	82.5	1.0	16.5	12,547	93
2007	21.5	78.5	0.1	6,041	92	98.8	0.7	0.5	11,908	86
2008	4.5	86.4	9.1	5,464	93	78.5	6.0	15.5	11,761	79
2009	7.1	91.3	1.5	5,693	97	93.1	2.5	4.4	12,340	86
2010	35.9	51.2	12.9	6,526	96	72.1	2.1	25.9	11,689	76
2011	12.4	85.7	2.0	5,415	98	94.9	0.4	4.7	10,143	84
2012	83.0	0.0	17.0	2,484	100	99.2	0.0	0.8	14,149	81
2013	59.6	37.9	2.5	5,088	99	96.4	1.5	2.1	12,310	76
2014	55.3	44.6	0.1	4,780	100	94.6	5.2	0.2	13,398	84
2015	66.5	33.4	0.1	4,391	100	96.5	3.3	0.2	11,595	86
2016	54.8	44.4	0.8	2,842	100	97.9	1.4	0.7	10,777	79
2017	11.2	75.0	13.8	1,830	100	91.2	0.2	8.7	7,430	81
2018 [8]	30.8	68.9	0.3	2,717	100	95.4	3.8	0.8	7,708	65

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 19.03.31

[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 [12]	2,483	234	221	0	2,717	275	20	19	121	9	8	680	823	6,885		7,708	28	26	1,656	13	19	435

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 from fish slip data and a survey of Canadian buyers/processors and are not expanded.

[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 , 11/01/2018, using the 'Boston method' . 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 19.03.31

[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]

	Canadian Fleet [1]							U.S. Fleet[11]					
Year	*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	0	14,636	11	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 [9]	45 vessels	45	118	N/A	2,228	1,924	44	Historical level	451	25	10,117	508	379

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 19.03.31

[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.