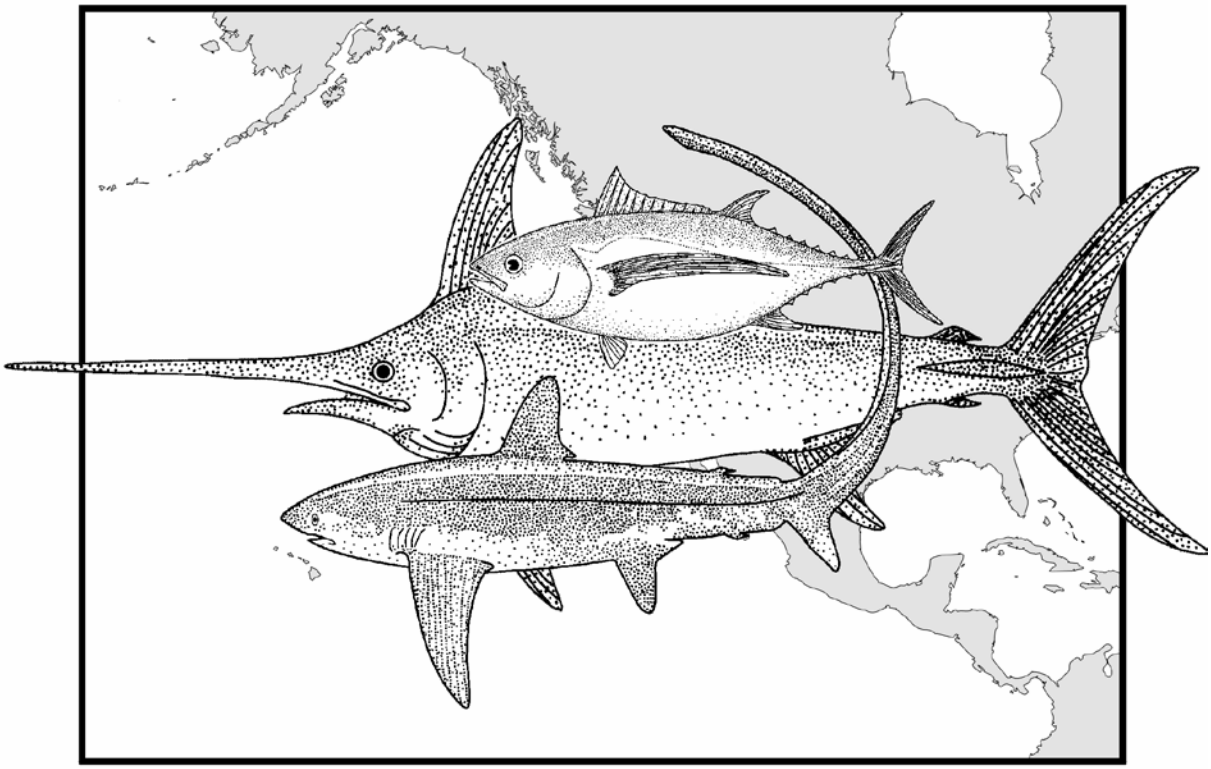
# STATUS OF THE U.S. WEST COAST FISHERIES FOR HIGHLY MIGRATORY SPECIES THROUGH 2010



## STOCK ASSESSMENT AND FISHERY EVALUATION

## SEPTEMBER 2011

PACIFIC FISHERY MANAGEMENT COUNCIL
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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 |
| 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 |

# 1.0 INTRODUCTION

## 1.1 The Fishery Management Plan

The Fishery Management Plan (FMP) for U.S. West Coast Fisheries for Highly Migratory Species (HMS) was developed by the Pacific Fishery Management Council (Council) in response to the need to coordinate state, federal, and international management of the stocks listed in Table 1–1.[1] 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. A list of current HMS FMP regulations is provided in Table 3-1 on page 39.

On June 7, 2007, NMFS approved Amendment 1 to the HMS FMP. The FMP was amended to incorporate recommended international measures to end overfishing of the Pacific stock of bigeye tuna (*Thunnus obesus*) in response to formal notification from NMFS that overfishing was occurring on this stock. Amendment 1 also served as a means to substantially reorganize the original combined FMP and Final Environmental Impact Statement, published in August 2003. Much of the descriptive material in the combined document was moved to a series of appendices, substantially shortening the body of the FMP. An electronic copy of the current FMP and the aforementioned appendices are available on the Council's website at http://www.pcouncil.org/highly-migratory-species/fishery-management-plan-and-amendments/.

**Table 1-1. HMS FMP management unit species.**

| Common Name | Scientific Name |
|---|---|
| striped marlin | *Kajikia audax*[2] |
| swordfish | *Xiphias gladius* |
| common thresher shark | *Alopias vulpinus* |
| pelagic thresher shark | *Alopias pelagicus* |
| bigeye thresher shark | *Alopias superciliosus* |
| 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, dolphinfish) | *Coryphaena hippurus* |

## 1.2 Purpose of the SAFE Report

Federal regulations (40 CFR 600.315(e)) pursuant to National Standard 2 in the Magnuson-Stevens Fishery Conservation and Management Act (MSA), state that "Conservation and management measures shall be based upon the best scientific information available…," which the Council addresses in part by

[1] Throughout this document "West Coast" is used to denote the geographic region comprising the coastal areas of Washington, Oregon, and California.

[2] This scientific name for this species was previously *Tetrapturus audax.*

the annual requirement to prepare a Stock Assessment and Fishery Evaluation (SAFE) report for each FMP. Section 4.3 in the HMS FMP describes the requirements for a SAFE report. The SAFE report is produced annually and summarizes biological and socioeconomic conditions related to HMS stocks and fisheries. The Council may use this information in making decisions about needed management measures.

## 1.3 The Management Cycle

The HMS FMP also establishes an annual process for the delivery of the SAFE report to the Council, intended to coincide with the management cycle: a draft report is provided in June for initial decision-making on the need for new harvest specifications and management measures. The final report is delivered in September to provide the recommendations and information necessary to develop and implement any harvest specifications and management measures. NMFS implements the Council's recommended management measures through the federal regulatory process, if they are found to be consistent with the MSA and other applicable law. Any such measures become effective at the start of the next fishing year, April 1 of the following year, or when the rulemaking process is complete, and stay in 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 2010the Council considered management changes for the third biennial period, April 1, 2011–March 31, 2013.

## 1.4 Highly Migratory Species Management Team

This SAFE report was prepared by the members of the Highly Migratory Species Management Team (HMSMT). The HMSMT members as of August 1, 2011, and their primary responsibilities in preparing the report, are listed below.

Mr. Ricardo Belmontes
Fishery Management and Policy, Inter-American Tropical Tuna Commission

Mr. Craig Heberer, (chapter 3, description of FMP management, compliance, and regulatory measures)
Fisheries Biologist, NMFS Southwest Region

Ms. Heidi Hermsmeyer (chapter 3, description of international regulatory aspects of the HMS FMP)
Fishery Policy Analyst, NMFS Southwest Region

Mr. Kirt Hughes (chapter 2, description of Washington fisheries)
Regional Fish Program Manager, Washington Department of Fish and Wildlife

Dr. Suzy Kohin (chapter 5 and chapter 6)
Research Fishery Biologist, NMFS Southwest Fisheries Science Center

Ms. Leeanne M. Laughlin (chapter 2, description of California fisheries)
Associate Marine Biologist, California Department of Fish and Game

Ms. Cyreis Schmitt (chapter 2, description of Oregon fisheries)
Oregon Department of Fish and Wildlife representative

Dr. Stephen Stohs, Team Chair (chapter 4, summaries of catch, revenue and effort, chapter 6, research and data needs, chapter 7, commonly used web links in HMS management and research)

Industry Economist, NMFS Southwest Fisheries Science Center

Changes in HMSMT membership in2011(not noted in the 2010 SAFE): Mr. Kirt Hughesreplaced Ms. Carol Henry as the Washington Department of Fish and Wildlife member of the HMSMT.

In addition to HMSMT members, the following people contributed to this SAFE report:

Mr. John Childers (section 3.1.7 and chapter 6)
Supervisory IT Specialist, NMFS Southwest Fisheries Science Center

Dr. Kit Dahl (chapter 1)
Staff Officer, Pacific Fishery Management Council

Mr. Craig D'Angelo (section 3.1.6)
Business and Industry Specialist, NMFS Southwest Region

Ms. Donna Dealy (chapter 4, commercial fisheries data)
Computer Specialist, NMFS Southwest Fisheries Science Center

Ms. Elizabeth Petras (section 3.2)
Natural Resources Specialist, NMFS Southwest Region Protected Resources Division

Mr. Jordan Schafer (chapter 4)
Statistical Assistant, NMFS Southwest Fisheries Science Center

Ms. Jennifer Stanford (compilation of the report)
Fishery Policy Analyst, NMFS Southwest Region

## 1.5 Council Highly Migratory Species Activities in 2010

Beginning with this SAFE, Council activities are reported on a calendar year basis. The 2009 SAFE reported activities from September 2009 to June 2010. Where there is an overlap, activities reported in the 2009 SAFE are only noted. Written materials distributed at Council meetings are available at http://www.pcouncil.org/bb/bbarchives.html and summaries of decisions taken at these meetings are available at http://www.pcouncil.org/resources/archives/council-meeting-decisions/.

***Biennial Harvest Specifications***

In June 2010 the Council initiated the third cycle for adopting biennial harvest specifications and management measures since the HMS FMP was implemented. The Council considered two proposals, one proposed by the Washington Department of Fish and Wildlife (WDFW) to place a per-trip limit on the Washington recreational albacore tuna fishery and a second to change the current federal regulations placing a 10 swordfish retention limit on vessels fishing with deep-set (tuna-targeting) pelagic longline gear, consistent with a proposal made by the Western Pacific Regional Fishery Management Council for the pelagic longline fishery managed under their Fishery Ecosystem Plan. WDFW subsequently withdrew the bag limit proposal. In November the Council recommended the change in the swordfish incidental catch retention limit regulations. If approved by NMFS, the regulations would lift the incidental catch retention limit for vessels carrying an observer. For vessels not carrying an observer but using circle hooks, the limit would increase to 25 swordfish.

***Recommendations to Regional Fishery Management Organizations***

At the June 2010 meeting the Council made recommendations to the U.S. delegations to theInter-American Tropical Tuna Commission (IATTC) and Western and Central Pacific Fisheries Commission (WCPFC) forums. A summary of the recommendations can be found in the decision document: http://www.pcouncil.org/wp-content/uploads/0610decisions.pdf.

At the September 2010 meeting the Council made recommendations to the U.S. delegation to the 81st IATTC meeting held September 27-October 1, 2010. A summary of the recommendations can be found in the decision document: http://www.pcouncil.org/wp-content/uploads/0910decisions.pdf.

At the November 2010 meeting the Council made recommendations to the U.S. delegation to the WCPFC Seventh Regular Session held December 6-10, 2010. A summary of the recommendations can be found in the decision document: http://www.pcouncil.org/wp-content/uploads/1110decisions.pdf.

***Amendment 2 to the HMS FMP***

In June 2010 the Council took final action on Amendment 2, which addresses new provisions relative to National Standard 1 in the MSA ("Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.") The amendment was submitted to NMFS in early 2011 with implementation expected by mid-2011.

***Limited Entry for the West Coast North Pacific Albacore Fishery***

In April 2010 the Council considered the need for a limited entry program for the albacore fishery but decided it was not necessary at this time. It directed the HMSMT, with assistance from the HMSAS and support from NMFS, to gather additional information about characteristics of domestic and international albacore fishing fleets and report back in the first half of 2011. Related to the limited entry question, the Council considered whether to take action to change the current March 9, 2000, control date for HMS fisheries but concluded that no action was necessary, since a limited entry program will not be developed in the foreseeable future.

***Critical Habitat Designation for Pacific Leatherback Sea Turtles***

At the April 2010 meeting the Council commented on a proposed rule to designate critical habitat for the endangered leatherback sea turtle (*Dermochelys coriacea*), in selected areas of the U.S. West Coast Exclusive Economic Zone (EEZ). A summary of the comments can be found in the decision document: http://www.pcouncil.org/wp-content/uploads/0410decisions.pdf.

# 2.0 DESCRIPTION OF THE FISHERIES

## 2.1 California

### *2.1.1 Commercial Fisheries*

#### 2.1.1.1 Surface Hook-and-Line Fishery for Albacore

Albacore is an economically valuable fishery in California 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 California-based fleet, and economics. A typical season runs July through October, with landings peaking in the fall. A general resident or non-resident commercial fishing license and a current California Department of Fish and Game (CDFG) vessel registration are required to catch and land albacore in the state of California. Additionally, 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, 3–200 nautical miles) 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. This may partly explain the decline in participation since the 1980s, when the number of surface hook-and-line vessels landing albacore in California ports average annually slightly over 700, compared to an average of 231 in the period from 2001 to 2010.As with participation, landings and revenues from albacore have declined since the 1980s. For the period 1981-90 California landings averaged 4,135 mt annually and inflation adjusted revenue averaged $11.6 million annually. Comparable figures for the 2001-10 period are 1,135 mt and $2.3 million.

The recent decline in landings and revenues does not necessarily reflect a decline in the albacore population but more likely reflects a shift in fishing effort by California-based vessels into waters off Oregon and Washington where albacore have been more available due to favorable oceanographic conditions. Additionally, industry representatives have indicated that in recent years lower operating costs and better landing facilities outside of California have resulted in a decrease in California landings.

Albacore landings more than doubled in 2010, with 141 commercial surface hook-and-line vessels landing 710.7 mt of albacore, compared to 132 vessels that landed 349.4 mt in 2009 (Table 2–22). The volume and number of landings varied throughout ports in California. Forty-two percent of the 2010 landings were delivered to the Eureka area, with an additional thirty-eight percent split between Crescent City and the Los Angeles/Santa Barbara area. Nominal landings occurred January through June, peaked in September, then declined the rest of the year (Table 2–21). The ex-vessel revenue was $1.7 million in 2010, an increase of around ninety percent compared to about $0.91 million in 2009 (Table 2-21).

#### 2.1.1.2 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 EPO tuna catch. More than 90 percent of the catch for these species in the U.S. EEZ portion of the eastern Pacific Ocean (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 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 have landed tuna in California averaged 197 annually 1981-90 but has subsequently declined substantially to an annual average of 11 in the 2001-2010 period.

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

A general resident or non-resident commercial fishing license and a current CDFG vessel registration are required to catch and land tuna caught in purse seine gear. Additionally, the HMS FMP requires a logbook and federal permit with a purse seine 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.

In 2009 six purse seine vessels made HMS landings in California. They landed 410.2 mt of bluefin tuna worth $426,989 and 4.2 mt of skipjack tuna worth $3,655. They also landed albacore tuna and yellowfin tuna (the amounts cannot be reported due to data confidentiality). These landings occurred May through October. All landings but one occurred in the Los Angeles area. On many trips these HMS were landed with Pacific bonito and/or chub mackerel. Landings in 2010 cannot be reported due to data confidentiality because less than three vessels made HMS landings.

#### 2.1.1.3 Harpoon Fishery for Swordfish

California's 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, and the number of harpoon permits decreased from a high of 1,223 in 1979 to a low of 25 in 2001.Fishing effort typically occurs in the SCB 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.

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

**Table 2-1. Monthly landings and ex-vessel revenue for swordfish landed in California by the harpoon fleet, 2009-10**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Landings | | | Landings | | |
| Month | No. | mt | Revenue | No. | mt | Revenue |
| July | 46 | 9.3 | $101,152 | 6 | 0.8 | $10,180 |
| August | 43 | 9.9 | $107,246 | 38 | 5.7 | $68,898 |
| September | 75 | 16.9 | $143,415 | 27 | 5.2 | $57,951 |
| October | 39 | 9.8 | $82,531 | 25 | 5.6 | $55,515 |
| Allothermonths | 16 | 3.9 | $32,303 | 62 | 18.4 | $159,981 |
| Total | 219 | 49.8 | $466,647 | 158 | 35.7 | $352,525 |

**Table 2-2. Annual commercial landings and ex-vessel revenue for swordfish landed in California port groups by the harpoon fleet, 2009-10.**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Landings | | | Landings | | |
| Port Group | No. | mt | Revenue | No. | Mt | Revenue |
| Los Angeles and ports north | 125 | 28.5 | $267,407 | 107 | 24.6 | $246,236 |
| San Diego | 94 | 21.2 | $199,239 | 51 | 11.1 | $106,289 |
| Total | 219 | 49.7 | $466,646 | 158 | 35.7 | $352,525 |

In 2010, 26 harpoon vessels landed 35.7mt of swordfish, declining from 49.7 mt in 2009, landed by28vessels (Tables 2-1 and 2–2). Fishing effort was concentrated in coastal waters off San Diego and Orange Counties in the SCB, especially from fishing blocks between the coast and Santa Catalina and San Clemente Islands.

The ex-vessel revenue for 2010 was $352,525,about $114 thousand less than in 2009(Tables 2-1 and 2–2). Because harpoon vessels spend less time on the water and are a low-volume fishery, their catch is often fresher than drift-gillnet-caught fish, so markets tend to pay more for harpooned fish. The average ex-vessel price-per-pound of landed weight for harpooned fish was $6.99compared to $4.25 for drift gillnet caught fish in 2010.

#### 2.1.1.4 Drift Gillnet Fishery for Swordfish and Shark

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, with228 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 and it commanded a higher price-per-pound. 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.

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. The drift gillnet fishery is managed by a limited entry permit system, with mandatory gear standards and seasonal area closures used to address various conservation concerns. The permit is linked to an individual fisherman, not a vessel, and is only transferable under very restrictive conditions; thus the value of the vessel does not become

artificially inflated. To keep a permit active, current permittees are required to purchase a permit from one consecutive year to the next; however, they are not required to make landings using drift gillnet gear. In addition, a general resident or non-resident commercial fishing license and a current vessel registration are required to catch and land fish caught in drift gillnet gear. A logbook is also required. The HMS FMP requires a federal permit with a drift gillnet 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. About 150 permits were initially issued when the limited entry program was established in 1980 and peaked at 251 permits in 1986 (Table 2-3).

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. (However, Oregon no longer issues the necessary permit to land drift gillnet catch in the state.) 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 percent of the fishing effort occurs from August 15 through January 31.

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 leatherbacks sea turtles. A smaller closure was implemented to protect Pacific loggerhead turtles from drift gillnet gear during a forecasted or occurring 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). Since the closure was enacted the number of active participants in the drift gillnet fishery declined by nearly half, from 78 vessels in 2000 to 40 in 2004, and has remained under 50 vessels since then.

The number of permits has declined from more than 200 in the 1980s to less than 50 active vessels since 2003 (see Table 2-3). Annual fishing effort has also decreased from a high of 11,243 sets in the 1986 fishing season to 1,043 sets in 2005. Industry representatives attribute the decline in vessel participation and annual effort to regulations implemented to protect threatened and endangered marine mammals, sea turtles, and seabirds.

**Table 2-3. Annual drift gillnet permits issued and number of active vessels, 1981–2010.**

| Year | Active[1] Vessels | Permits Issued | Year | Active[1] Vessels | Permits Issued |
|---|---|---|---|---|---|
| 1980 | 100 | * | 1996 | 111 | 167 |
| 1981 | 118 | * | 1997 | 108 | 120 |
| 1982 | 166 | * | 1998 | 98 | 148 |
| 1983 | 193 | * | 1999 | 84 | 136 |
| 1984 | 214 | 226 | 2000 | 78 | 127 |
| 1985 | 228 | 229 | 2001 | 69 | 114 |
| 1986 | 204 | 251 | 2002 | 50 | 106 |
| 1987 | 185 | 218 | 2003 | 43 | 100 |
| 1988 | 154 | 207 | 2004 | 40 | 96 |
| 1989 | 144 | 189 | 2005 | 42 | 90 |
| 1990 | 134 | 183 | 2006 | 45 | 88 |
| 1991 | 114 | 165 | 2007 | 46 | 86 |
| 1992 | 119 | 149 | 2008 | 46 | 85 |
| 1993 | 123 | 117 | 2009 | 35 | 84 |
| 1994 | 138 | 162 | 2010 | 27 | 73 |
| 1995 | 117 | 185 | | | |

Source: CDFG License and Revenue Branch (LRB), extracted July 14, 2011.

Additional processing information:

[1]-some vessels only land thresher and/or swordfish from year to year, so the highest numbers of active vessels for both components of the fishery were reported for this gear.

*-actual number of permits issued by LRB not available but the California State Legislature set a cap of 150 in 1982.

**Table 2-4. Monthly commercial landings and ex-vessel revenue for swordfish landed in California by the large mesh drift gillnet fleet, 2009-10.**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Landings | | | Landings | | |
| Month | No. | mt | Revenue | No. | mt | Revenue |
| January-August | 22 | 16.7 | $69,969 | 28 | 20.6 | $126,325 |
| September | 20 | 19.8 | $86,393 | 11 | 4 | $27,884 |
| October | 32 | 29.6 | $129,673 | 19 | 4.5 | $34,096 |
| November | 74 | 63.6 | $295,148 | 48 | 24.8 | $169,957 |
| December | 81 | 121.2 | $495,354 | 9 | 5.2 | $34,617 |
| Total | 229 | 250.9 | $1,076,537 | 115 | 59.1 | $392,879 |

**Table 2-5. Annual commercial landings and ex-vessel revenue for swordfish landed in California port groups by the large mesh drift gillnet fleet, 2009-10.**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Landings | | | Landings | | |
| Port Group | No. | mt | Revenue | No. | mt | Revenue |
| Monterey | 7 | 8.7 | $37,070 | 5 | 8.4 | $57,854 |
| Morro Bay | 32 | 44.3 | $198,288 | 14 | 19 | $123,243 |
| Santa Barbara | 10 | 8.4 | $38,049 | 11 | 4.6 | $34,619 |
| Los Angeles | 26 | 17.7 | $83,094 | 7 | 2.2 | $14,479 |
| San Diego | 154 | 172 | $720,035 | 78 | 25 | $162,684 |
| Total | 229 | 251 | $1,076,536 | 115 | 59.2 | $392,879 |

In 2010, 24 drift gillnet vessels landed 59 mt of swordfish compared to 32 vessels that landed 251 mt in 2009. Landings in 2010 were only a quarter of those in 2009. They were concentrated in San Diego, but occurred at ports from San Diego to Monterey (Table 2–4). The majority of 2010 landings occurred in November (Table 2-5).

**Table 2-6. Monthly commercial landings and ex-vessel revenue for common thresher shark landed in California by the large mesh drift gillnet fleet, 2009-10.**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Landings | | | Landings | | |
| Month | No. | mt | Revenue | No. | mt | Revenue |
| January-April | 69 | 17.7 | $37,726 | 75 | 10.6 | $19,635 |
| May | 13 | 1.5 | $3,825 | 18 | 2.9 | $5,930 |
| June | 75 | 10.4 | $15,598 | 78 | 9.4 | $14,399 |
| July | 68 | 9.7 | $16,029 | 58 | 5.1 | $8,845 |
| August | 65 | 9.4 | $17,748 | 37 | 4.1 | $5,958 |
| September | 34 | 2.5 | $4,207 | 37 | 5.5 | $11,326 |
| October | 19 | 1.9 | $3,238 | 22 | 3.3 | $6,398 |
| November | 47 | 14 | $21,620 | 26 | 14.6 | $18,677 |
| December | 56 | 13.5 | $21,608 | 17 | 12.4 | $9,588 |
| Total | 446 | 80.6 | $141,599 | 368 | 67.9 | $100,756 |

Thresher shark landings declined fifteen percent from 2009 landings to 67.9 mt. Like swordfish, the highest landings were in November (Table 2-6), but were concentrated in Santa Barbara (Table 2-7).

**Table 2-7. Annual commercial landings and ex-vessel revenue for common thresher shark landed in California port groups by the large mesh drift gillnet fleet, 2009-10.**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Landings | | | Landings | | |
| | No. | mt | Revenue | No. | mt | Revenue |
| Monterey & Morro Bay | 13 | 5.3 | $8,145 | 22 | 12.9 | $14,578 |
| Santa Barbara | 251 | 35.2 | $57,917 | 203 | 22.8 | $34,726 |
| Los Angeles | 37 | 9.9 | $13,989 | 42 | 9.3 | $11,544 |
| San Diego | 145 | 30.1 | $61,547 | 101 | 22.9 | $39,908 |
| Total | 446 | 80.5 | $141,598 | 368 | 67.9 | $100,756 |

#### 2.1.1.5 High Seas Longline Fishery for Swordfish

California prohibits pelagic longline fishing within the EEZ and the retention of striped marlin. Vessels operating outside of the EEZ can land fish in California ports if the operator has a general resident or non-resident commercial fishing license and a current CDFG vessel registration. 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 shallow-set longline fishing to target swordfish. As result, 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. Targeting tunas with deep-set longline gear is permitted outside the EEZ under the HMS FMP. These measures have impacted the number of landings of swordfish in California ports in the 2000s.

### *2.1.2 Recreational Fisheries*

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; a nominal amount of fish, primarily tunas and dorado, are taken by free divers using spear guns. Fishing occurs in the EEZ waters of the U.S. as well as Mexico aboard commercial passenger fishing vessels (CPFVs) and private boats. A fishing season is dependent on oceanographic conditions, which strongly influence the availability of fish within range of the California-based fleet; a typical season begins in late spring and runs through fall. Anglers 16 years and older must have a resident or non-resident annual or short-term recreational fishing license to catch and land any ocean fish in California, and an Ocean Enhancement Stamp is required if fishing within ocean waters south of Point Arguello, Southern California. California does not have size or slot limit restrictions but it does have daily possession limits for some of the MUS (Table 2–8).

**Table 2-8. California's recreational daily possession limits for highly migratory MUS included within the fishery management plan.**

| Species | 1-Fish | 2-fish | 10-fish[2] | 25-fish | No limit[1] |
|---|---|---|---|---|---|
| **Tunas** | | | | | |
| Albacore[3] | | | X | X | |
| Bigeye | | | X | | |
| Bluefin[3] | | | X | | |
| Skipjack | | | | | X |
| Yellowfin | | | X | | |
| **Billfishes** | | | | | |
| Striped Marlin | X | | | | |
| Swordfish | | X | | | |
| **Sharks** | | | | | |
| Blue | | X | | | |
| Common Thresher | | X | | | |
| Mako | | X | | | |
| **Other Fish** | | | | | |
| Dorado | | | X | | |

[1]-In general, no more than 20 finfish in combination of all species, with not more than 10 of any one species, may be taken or possessed by any one person, unless otherwise authorized, e.g. skipjack tunas (CCR, Title 14, 27.60).
[2]-California authorizes boat limits for two or more persons that are licensed to fish in ocean waters off California (CCR, Title 14,Section 27.60). This authorization does not apply to fishing trips originating in California where fish are taken in other jurisdictions.
[3]- Prior to November 2008, these species had no limit; however, since then new regulations have become effective: albacore south of Point Conception – 10 fish, albacore north of Point Conception – 25 fish; bluefin tuna - 10 fish statewide. These limits are in addition to the general 20 fish bag limit.

Vessel operators that charge a fee to passengers to sport fish from any vessel must have a CPFV license and a current CDFG vessel registration, and the operator must submit a monthly log of their fishing activity. Additionally, the HMS FMP requires a federal permit with a recreational gear endorsement for all U.S. CPFVs that fish for HMS within the West Coast EEZ and that pursue HMS on the high seas and land their catch in California, Oregon, and Washington.

Fishery statistics are available from both PSMFC, through their Recreational Fisheries Information Network (RecFIN) website,[3] and the CDFG CPFV logbook program. The RecFIN provides estimates based on field sampling of catch and a telephone survey for effort—California data is 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 catches of highly migratory MUS constitute a relatively rare event 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.

With the exception of sharks, most HMS MUS are caught by anglers fishing from CPFVs in the Mexican EEZ (Table 4–63). However, for some species the entire reported catch for the fleet comes from California (U.S. waters).

[3]www.psmfc.org/recfin

**Table 2-9. Annual number of highly migratory MUS kept and thrown back by recreational anglers fishing from California commercial passenger fishing vessels (CPFV) in U.S. EEZ waters , 2009–2010.**

| Species | 2009 Number of Fish (kept) | 2009 Number of Fish (thrown back[1]) | 2010 Number of Fish (kept) | 2010 Number of Fish (thrown back[1]) |
|---|---|---|---|---|
| **Tunas** | | | | |
| Albacore | 4,783 | 236 | 5,865 | 12 |
| Bigeye | 0 | 0 | 0 | 0 |
| Bluefin | 2,819 | 6 | 439 | 21 |
| Skipjack | 1,899 | 374 | 7 | 1 |
| Yellowfin | 9,499 | 1,525 | 3,072 | 1,688 |
| **Billfishes** | | | | |
| Striped Marlin | 4 | 4 | 0 | 0 |
| Swordfish | 0 | 0 | 0 | 0 |
| **Sharks** | | | | |
| Blue | 0 | 0 | 0 | 0 |
| Common Thresher | 39 | 17 | 68 | 42 |
| Shortfin Mako | 43 | 304 | 32 | 225 |
| **Other Fish** | | | | |
| Dorado | 1,942 | 240 | 178 | 206 |
| Total | 21,028 | 2,706 | 9,661 | 2,195 |

Source: California's Commercial Fisheries Information System (CFIS), CPFV logbook data, extracted July1**,** 2011.
Additional Processing Information:
[1]-The condition (live or dead) of fish thrown back fish is not available; includes "lost to seals."

**Table 2-10. Estimated number of highly migratory MUS kept and thrown back alive by recreational anglers fishing from California private vessels in U.S. EEZ waters, 2009–2010.**

| Species | 2009 Number of Fish (kept[1]) | 2009 Number of Fish (reported dead[2]) | 2009 Number of Fish (released alive[2]) | 2010 Number of Fish (kept[1]) | 2010 Number of Fish (reported dead[2]) | 2010 Number of Fish (released alive[2]) |
|---|---|---|---|---|---|---|
| **Tunas** | | | | | | |
| Albacore | 7,970 | 6,272 | 33 | 8,636 | 1,022 | 32 |
| Bigeye | 0 | 0 | 0 | 0 | 0 | 0 |
| Bluefin | 142 | 68 | 7 | 20 | 0 | 0 |
| Skipjack | 244 | 236 | 1639 | 0 | 0 | 0 |
| Yellowfin | 1,346 | 5,259 | 242 | 27 | 170 | 0 |
| **Billfishes** | | | | | | |
| Striped Marlin | 7 | 0 | 51 | 9 | 0 | 125 |
| Swordfish | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sharks** | | | | | | |
| Blue | 17 | 51 | 1431 | 0 | 8 | 900 |
| Common Thresher | 800 | 284 | 700 | 430 | 278 | 982 |
| Shortfin Mako | 332 | 246 | 924 | 27 | 263 | 436 |
| **Other Fish** | | | | | | |
| Dorado | 630 | 1,795 | 319 | 46 | 0 | 0 |
| Total | 11,488 | 14,211 | 5,346 | 9,195 | 1,741 | 2,475 |

Source: Pacific States Marine Fisheries Commission, Recreational Fisheries Information System, California Recreational Fisheries Survey data, extracted July 15, 2011.
Additional Processing Information:

[1]-Examined by sampler.[2]-The angler reported the fish as dead or thrown back alive after capture.

Except for CRFS-sampled albacore (but not angler-reported-only) and CPFV reported albacore and thresher shark, catches of HMS MUS in the US EEZ declined in 2010 from 2009 levels, markedly so for CPFV vessels. In 2010, approximately 115 CPFVs logged 524days at-sea within the U.S. EEZ compared to 145 CPFVs that logged 775 days at-sea in 2009. The total number of MUS kept by CPFV anglers decreased from 21,086 fish in 2009 to 9,661 fish in 2010 (Table 2–17); the number of most MUS caught declined except for albacore and common thresher shark. Tunas made up about 94 percent of CPFV vessel catch and 73 percent of the numbers of MUS caught by private/rental boats. Total numbers of sharks released were greater than those kept for both CPFV and private/rental boats.

### *2.1.3 Highly Migratory Species Taken in Non-HMS Fisheries in California*

In California, HMS MUS are occasionally taken by fisheries targeting other species (Table 2-11).
In 2009, about 100 kg of albacore were taken incidentally with groundfish trolling for sablefish and rockfish, and about 400 kg were taken incidentally with coastal pelagic species. An unreportable amount of thresher shark was taken incidentally to trawling in trawl and seine gear. However, 17.2 mt was taken in set gillnet, as were 1.4 mt of mako shark, and small amounts of bluefin tuna and swordfish, unreportable due to data confidentiality. Although the amount of thresher shark taken in set gill net gear is significant, they are caught incidentally to fisheries for California halibut and white seabass, which command a much higher ex-vessel price; set gill net is not subject to the restrictions on HMS that small mesh drift gill net is. Both thresher shark and albacore were also taken in coastal pelagic species (CPS) purse seines; however, less than three vessels landed both species, and landings could not be reported because of federal data confidentiality rules.

**Table 2-11. Landings (mt) of HMS Species in non-HMS gears in California, 2010.**

| | Seine | Trawl | Set Gillnet |
|---|---|---|---|
| Blue Shark | | | * |
| Thresher Shark | * | * | 17.2 |
| Mako Shark | | | 1.4 |
| Bluefin Tuna | | | * |
| Swordfish | | | * |

*-Withheld for data confidentiality reasons.
Source: Pacific Fisheries Information Network (PacFIN), extracted

### *Highly Migratory Species Fisheries in California, 2009-10*

Landings for nearly all commercial and recreationally caught HMS species except for albacore were characterized by declines in landings. While much of 2009 was an El Niño year, cooler La Niña conditions prevailed in the latter part of 2010, possibly affecting availability of HMS species.

## 2.2 Oregon

### *2.2.1 Commercial Fisheries*

#### 2.2.1.1 Surface Hook-and-Line Fishery for Albacore

Albacore has been fished commercially off of Oregon since the mid-1930s when the fishery expanded north from the traditional grounds off southern California. For many years, both bait boats and jig boats fished for albacore off Oregon, but in recent years, predominantly jig-caught (troll-caught) fish have been

landed. The current fleet consists primarily of small to medium (20 ft to 60 ft) "combination" boats, which may fish crab, salmon, or bottom fish at other times of the year, and large freezer boats (most longer than 60 ft) that travel the north and south Pacific, principally fishing albacore.

Oregon albacore landings have been highly variable through the years, ranging from a low of 12.3 mt in 1936 to a high of over 17,000 mt in 1968. Since 1981, when PacFIN records begin, albacore landings in Oregon have generally increased. Average annual landings and inflation adjusted revenue were 1,272 mt and slightly less than $3.8 million during 1981-1990, compared to 4,077 mt and $9.2 million during 2001-2010. The average number of surface hook-and-line vessels making albacore landings in albacore increased from 241 vessels per year during 1981-1990, to 388 vessels during 2001-2010.

Sampling of Oregon's commercial albacore fishery is a cooperative effort between the ODFW, NMFS, and the PSMFC.

#### 2.2.1.2 Drift Gillnet Fishery for Swordfish and Shark

The Oregon commercial DGN fishery historically existed as an extension of the California 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.

### *2.2.2 Recreational Fisheries*

Recreational anglers fishing from private vessels and from CPFVs) target albacore and only occasionally take other HMS species, such as blue sharks. They fish 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. Albacore typically begin to show up within range of the Oregon recreational fishery in mid to late June, and are available through late September or early October in most years. Albacore fishing tournaments, usually to benefit a charity, began in 2005 but have been limited due to poor weather or ocean conditions.

Anglers 14 and older must have a recreational license to catch and land fish in Oregon. Albacore and other HMS MUS are included in a daily catch limit of 25 fish in the aggregate for offshore pelagic species, which includes all tunas, mackerels, swordfish, billfish, jacks, opah, dorado, Pacific pomfret and all sharks, except leopard shark, spiny dogfish, white shark, soupfin shark and basking shark. The possession limit is two daily catch limits (50 fish, with 25 fish caught on each of 2 days).

Vessel operators that charge a fee to passengers to sport fish from any vessel must have a license issued by the Oregon Marine Board. Additionally, the HMS FMP requires a federal permit with a recreational gear endorsement for all U.S. CPFVs that fish for HMS within the West Coast EEZ and that pursue HMS on the high seas and land their catch in California, Oregon, and Washington.

Statistics for the recreational fisheries, including private, CPFV, and tournament fisheries, are available from the ODFW Ocean Recreational Boat Survey Program. RecFIN estimates of recreational fishery statistics are also available from PSMFC. Statistics for the CPFV fishery are also available from the federal charter logbook program.

### *2.2.3 Highly Migratory Species Taken in Non-HMS Fisheries in Oregon*

In Oregon, most Highly Migratory Species (MUS) are rarely landed by gears targeting other species. During 2010, less than 1 mt of these HMS species, consisting of small amounts of blue shark and thresher shark species, were landed by non-HMS fisheries (Table 2-12). In total, six vessels, using either setline or midwater trawl gear, landed 0.08 mt of blue shark and 0.49 mt of thresher sharks.

**Table 2-12. Landings (mt) of HMS Species with non-HMS gear in Oregon, 2010.**

| Species | Bottom Longline and Midwater Trawl Gears |
|---|---|
| Blue Shark | 0.08 |
| Thresher Shark | 0.49 |
| Total | 0.57 |

Data source: PacFIN fish ticket landings data, extracted August 2011.

### *2.2.4 Highly Migratory Species Fisheries in Oregon, 2008-10*

#### 2.2.4.1 Surface Hook and Line Fishery for Albacore, 2008-2010

Participation in the 2010 fishery was the same as in 2009. A total of 419 vessels made at least one landing of albacore into Oregon ports during the 2010 season. The number of landings was similar, slightly more than 1,300 each year, although the amount of albacore landed was approximately 6 percent higher in 2010 than 2009.

The 2010 Oregon albacore season began with a small landing in late June. The main fishery began in early July and continued through early October. Landings peaked during the third week of August. Rough ocean conditions throughout most of July and early September caused two brief declines in landings. Sea surface temperatures were much cooler in 2010 than previous years, as illustrated at http://coastwatch.pfel.noaa.gov/cgi-bin/elnino.cgi. Despite these poor weather and fishing conditions, strong markets and good prices for brine and blast frozen fish spurred fishing later into the year. Ten percent of the 2010 total was landed during October through December, about twice as high as in 2009 (Table 2-22).

Astoria was the top Oregon port in 2010, with 41 percent of the total albacore catch in 2010 followed by Newport with 39 percent, and Charleston with 17 percent. Nine other ports also received deliveries in 2010, accounting for about3 percent of the total catch (Table 2-23).

**Table 2-13. Oregon commercial albacore landings (mt) by port, 2008-2010.**

| Port | 2008 | 2009 | 2010 |
|---|---|---|---|
| Astoria | 1213.8 | 1184.4 | 1994.7 |
| Garibaldi | 103.7 | 97.5 | 98.9 |
| Pacific City | 3.5 | 4.5 | 2.6 |
| Depoe Bay | 1.6 | 2.9 | 6.6 |
| Newport | 1469.0 | 2297.7 | 1875.6 |
| Florence | 11.5 | 9.1 | 11.2 |
| Winchester Bay | 61.0 | 40.1 | 27.5 |
| Charleston | 1140.0 | 922.1 | 812.0 |
| Bandon | 1.4 | 1.3 | - |
| Port Orford | 3.4 | 12.1 | 6.6 |
| Gold Beach | 0.8 | 5.8 | 2.0 |
| Brookings | 16.4 | 20.3 | 14.7 |
| Smaller Ports | 0.0 | 1.0 | 1.2 |
| **Total** | **4026.2** | **4598.8** | **4853.6** |

Data source: ODFW fish ticket landings data.

The ex-vessel value of the 2010 fishery was the highest on record (Tables 4-40 and 4-41), nearly $12.4 million, and 22 percent more than 2009 (Table 2-22). The average price per pound for albacore was $1.16 per pound, the second highest price on record. This is up $.15 per pound from 2009. Markets for blast frozen albacore started off extremely strong, with buyers paying up to $1.55 per pound for top quality, super-cold fish. Prices dipped slightly in late July and early August, but recovered by September and finished the season with many dealers paying a record $1.60 per pound. Brine markets started off strong with prices in July ranging from $.90 to $1.00 per pound. Continued foreign demand pushed prices up throughout the season to finish between $1.15 and $1.25 per pound. Similarly, fresh, iced prices at the beginning of the season ranged from $.85 to $1.00 per pound, and increased to finish at $1.25 per pound. Demand and prices for fresh fish at alternative, smaller markets were strong throughout the 2010 season in all Oregon ports, with prices ranging from $1.00 to $1.75 per pound. In recent years, more fishers are marketing their catches directly from their vessels to the public to improve the value of their albacore. Their prices ranged from $1.50 to $2.50 per pound.

#### 2.2.4.2 Recreational Fisheries for Albacore, 2008-2010

The2010 recreational albacore fishery landed an estimated 37,721 albacore (343 mt) in Oregon, the third highest in history, but 10 percent less than in 2009. The fishery began in late June and continued into the first week of October. Most of the recreational albacore effort and catch (charter and private vessels combined) came from the ports of Newport, Garibaldi, Charleston and Depoe Bay. Ports on the north coast (Astoria, Garibaldi and Pacific City) saw a surge in private and charter catch and effort for albacore, whereas catch and effort decreased in southern ports (Tables 2-14, 2-15, and 2-16).

Recreational fishing opportunity and success are highly influenced by distances to the fish, as well as weather and ocean conditions. In 2010, typical northeast Pacific weather conditions with strong northerly winds kept a large mass of cool water off Oregon for much of the season and access to albacore was mainly limited to areas outside of 30-50 miles offshore. Weather through most of July was extremely rough and limited sport fishing opportunities to only several days before calmer weather in August and September.

Recreational fishing effort for albacore was less in 2010 than in 2009. Directed charter fishing effort for albacore totaled 2,475 angler trips in 2010, 8 percent less than in 2009, although Astoria and Garibaldi set records for the number of charter angler trips for albacore in 2010. Directed private albacore trips totaled 8,902angler trips, 16 percent less than in 2009. Garibaldi, Pacific City and Newport set records for the number of private angler trips for albacore in 2010 (Table 2-14).

Trends in recreational catch were similar to effort. Directed charter catch for albacore totaled 6,801 fish in 2010, 20 percent less than in 2009. The Astoria and Garibaldi charter fleets set records for the number of albacore landed in 2010 with 1,294 and 651 fish, respectively. Directed private albacore catch totaled 30,920 fish in 2010, 8 percent less than in 2009. The Garibaldi sport fleet set a record for the number of albacore landed in 2010 with 10,309 fish (Tables 2-15).

Private vessel catch-per-unit of effort CPUE in 2010 (3.5 albacore per angler) was more than 20 percent less than in 2009 (4.4 albacore per angler). Charter vessel CPUE in 2010 was identical to 2009 (3.2 albacore per angler) (Table2-16).

**Table 2-14. Oregon albacore fishing effort (angler trips) for charter and private boats by year and port, 2008-2010.**

| Port | Charter | | | Private | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** |
| Astoria | 390 | 330 | 399 | 422 | 59 | 242 | 812 | 389 | 641 |
| Garibaldi | 164 | 117 | 212 | 960 | 1,059 | 2,535 | 1,124 | 1,176 | 2,747 |
| Pacific City | 5 | 1 | 8 | 35 | 92 | 246 | 40 | 93 | 254 |
| Depoe Bay | 245 | 432 | 595 | 743 | 694 | 1,067 | 988 | 1,126 | 1,662 |
| Newport | 1,089 | 1,260 | 970 | 1,475 | 1,991 | 2,959 | 2,564 | 3,251 | 3,929 |
| Florence | 0 | 0 | NS | 67 | 15 | 16 | 67 | 15 | 16 |
| Winchester Bay | 0 | 12 | 0 | 231 | 370 | 177 | 231 | 382 | 177 |
| Coos Bay | 109 | 240 | 142 | 960 | 2,962 | 1,526 | 1,069 | 3,202 | 1,668 |
| Bandon | 107 | 222 | 149 | 0 | 239 | 19 | 107 | 461 | 168 |
| Gold Beach | 0 | 48 | 0 | 0 | 28 | 0 | 0 | 76 | 0 |
| Brookings | 14 | 20 | 0 | 85 | 166 | 115 | 99 | 186 | 115 |
| **Total** | **2,123** | **2,682** | **2,475** | **4,978** | **7,675** | **8,902** | **7,101** | **10,357** | **11,377** |
| **Private boat (%)** | | | | | | | 70% | 74% | 78% |

Data Source: ODFW Ocean Recreational Boat Survey. NS = no sampling in port.

**Table 2-15. Oregon albacore catch (number of fish) for charter and private boats by year and port, 2008-2010.**

| Port | Charter | | | Private | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 |
| Astoria | 1,167 | 1,016 | 1,294 | 1,809 | 247 | 344 | 2,976 | 1,263 | 1,638 |
| Garibaldi | 440 | 322 | 651 | 3,993 | 4,119 | 10,309 | 4,433 | 4,441 | 10,960 |
| Pacific City | 98 | 4 | 20 | 314 | 767 | 1,468 | 412 | 771 | 1,488 |
| Depoe Bay | 670 | 942 | 1,552 | 2,666 | 3,458 | 3,477 | 3,336 | 4,400 | 5,029 |
| Newport | 3,126 | 3,419 | 2,364 | 6,267 | 10,887 | 9,911 | 9,393 | 14,306 | 12,275 |
| Florence | 0 | 0 | 0 | 287 | 41 | 32 | 287 | 41 | 32 |
| Winchester Bay | 0 | 31 | 0 | 460 | 969 | 547 | 460 | 1,000 | 547 |
| Coos Bay | 269 | 850 | 410 | 2,153 | 12,036 | 4,617 | 2,422 | 12,886 | 5,027 |
| Bandon | 333 | 1,727 | 510 | 0 | 813 | 28 | 333 | 2,540 | 538 |
| Gold Beach | 0 | 161 | 0 | 0 | 21 | 0 | 0 | 182 | 0 |
| Brookings | 81 | 41 | 0 | 136 | 184 | 187 | 217 | 225 | 187 |
| **Total** | 6,184 | 8,513 | 6,801 | 18,085 | 33,542 | 30,920 | 24,269 | 42,055 | 37,721 |
| **Private boat (%)** | | | | | | | 75% | 80% | 82% |

Data Source: ODFW Ocean Recreational Boat Survey.

**Table 2-16. Oregon albacore catch per unit of effort (number of fish/angler trip), for charter and private boats by year, by port, 2008-2010.**

| Port | Charter | | | Private | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 |
| Astoria | 3.0 | 3.1 | 3.2 | 4.3 | 4.2 | 1.4 | 3.7 | 3.2 | 2.6 |
| Garibaldi | 2.7 | 2.8 | 3.1 | 4.2 | 3.9 | 4.1 | 3.9 | 3.8 | 4.0 |
| Pacific City | 19.6 | 4.0 | 2.5 | 9.0 | 8.3 | 6.0 | 10.3 | 8.3 | 5.9 |
| Depoe Bay | 2.7 | 2.2 | 2.6 | 3.6 | 5.0 | 3.3 | 3.4 | 3.9 | 3.0 |
| Newport | 2.9 | 2.7 | 2.4 | 4.2 | 5.5 | 3.3 | 3.7 | 4.4 | 3.1 |
| Florence | - | - | - | 4.3 | 2.7 | 2.0 | 4.3 | 2.7 | 2.0 |
| Winchester Bay | - | 2.6 | - | 2.0 | 2.6 | 3.1 | 2.0 | 2.6 | 3.1 |
| Coos Bay | 2.5 | 3.5 | 2.9 | 2.2 | 4.1 | 3.0 | 2.3 | 4.0 | 3.0 |
| Bandon | 3.1 | 7.8 | 3.4 | - | 3.4 | 1.5 | 3.1 | 5.5 | 3.2 |
| Gold Beach | - | 3.4 | - | - | 0.8 | - | - | 2.4 | - |
| Brookings | 5.8 | 2.1 | - | 1.6 | 1.1 | 1.6 | 2.2 | 1.2 | 1.6 |
| **Overall** | **2.9** | **3.2** | **3.2** | **3.6** | **4.4** | **3.5** | **3.4** | **4.1** | **3.3** |

Data Source: ODFW Ocean Recreational Boat Survey.

## 2.3 Washington

### *2.3.1 Commercial Fisheries*

The commercial and recreational highly migratory species fisheries off the Washington coast are primarily for albacore tuna, although there are occasional smaller landings of thresher shark and blue shark. While there is not a fixed season, albacore fisheries generally begin in early to mid-July and continue until the tuna are no longer accessible off the Washington coast, usually around late September.

The albacore fisheries off Washington include commercial troll, bait boats, charter boats, and recreational fishing boats. There is no state commercial fishing license requirement for albacore tuna in Washington; however, a delivery permit is required to land commercially caught albacore into Washington. If fishers do not already have a fishing permit, which includes a delivery permit, fishers will need to purchase a

delivery permit from the state.

Ilwaco and Westport are the two Washington ports with the highest HMS landings of albacore from the commercial surface hook-and-line fishery and account for more than 90 percent of the annual landings into the state. Several other ports along the coast and in Puget Sound receive albacore landings as well.[4] Landings at these ports vary and are a direct reflection of market conditions. Many vessels, particularly in Westport, sell their product directly to the public off the dock rather than to fish buyers for processing.

In recent years, large amounts of albacore tuna have been landed into Washington, and in general, the tuna fishery has remained stable since the early 1990s. Variability in tuna landings has likely been an indication of changes in availability of tuna, rather than effort, as the number of participating vessels and the effort expended has been fairly consistent.

As provided for under the U.S.–Canada albacore treaty, some Washington ports also receive albacore landings from Canadian vessels (Table 2-17). Canadian landings into the state rebounded slightly in 2008 and 2009, but were still less than 2004 levels. Anecdotal evidence suggests this drop was attributable to new rules implemented by U.S. Customs and Border Protection under the U.S. Trade Act of 2002, rather than to any shift in Canadian catch or effort.

**Table 2-17. U.S. and Canadian albacore landings into Washington, 1995–2010.**

| | U.S. Vessels | | Canadian Vessels | | Total | |
|---|---|---|---|---|---|---|
| | Mt | $ | mt | $ | Mt | $ |
| 1995 | 3,337.12 | 5,868,111 | 16.27 | 32,047 | 3,353.40 | 5,900,159 |
| 1996 | 4,936.37 | 8,962,593 | 6.20 | 10,833 | 4,942.57 | 8,973,426 |
| 1997 | 3,662.89 | 6,570,385 | 77.74 | 137,757 | 3,740.62 | 6,708,141 |
| 1998 | 6,473.15 | 8,441,892 | 138.18 | 137,965 | 6,611.33 | 8,579,856 |
| 1999 | 1,894.54 | 3,312,925 | 180.14 | 316,084 | 2,074.68 | 3,629,009 |
| 2000 | 3,080.74 | 5,604,227 | 134.98 | 262,902 | 3,215.73 | 5,867,130 |
| 2001 | 3,828.67 | 7,270,632 | 320.03 | 647,970 | 4,148.70 | 7,918,602 |
| 2002 | 4,721.31 | 6,444,736 | 626.34 | 930,085 | 5,347.66 | 7,374,821 |
| 2003 | 7,988.26 | 11,352,266 | 2,779.20 | 4,255,436 | 10,767.47 | 15,607,702 |
| 2004 | 7,426.79 | 13,437,940 | 875.84 | 2,367,778 | 8,302.63 | 15,805,718 |
| 2005 | 4,514.74 | 9,784,195 | 365.31 | 1,006,528 | 4,880.04 | 10,790,723 |
| 2006 | 8,568.03 | 14,804,508 | 164.46 | 355,611 | 8,732.49 | 15,160,119 |
| 2007 | 5,879.77 | 10,244,909 | 75.00 | 168,055 | 5,954.77 | 10,412,964 |
| 2008 | 6,340.71 | 16,065,465 | 384.33 | 1,159,756 | 6,725.04 | 17,225,221 |
| 2009 | 6,904.37 | 15,346,582 | 435.10 | 1,078,547 | 7,339.46 | 16,425,128 |
| 2010 | 5,838.86 | 14,077,026 | 420.00 | 1,281,206 | 6,258.85 | 15,358,232 |

Data source: WDFW fish ticket landings data, extracted August 2011
Note: U.S. landings include landings by tribal fishers and landings of albacore caught by U.S. vessels in Canadian waters.

[4] In Washington, port of landing is not directly recorded on the marine fish receiving ticket and so must be indirectly assigned based on the address of the fish dealer or buyer. Therefore some landings may be wrongly attributed.

### *2.3.2 Recreational Fisheries*

The recreational albacore fishery in Washington experienced a substantial increase in effort and catch in 2010 over levels that occurred in 2008 and 2009 (Table 2-18and 2-19). The coast-wide increases in effort in 2010 were42 percent and 43 percent, compared with 2008 and 2009 levels, respectively. Meanwhile, catch increased by 46 percent and 27 percent, compared with 2008 and 2009 levels, respectively. The most notable changes occurred in the Westport fishery private boat effort and catch, which were more than two times the 2009 levels. Total catch per unit of effort was relatively stable for private boats between2008and 2009 when compared to 2010 and increased by 10 percent in the aggregate, from 4.0 to 4.4 fish per trip (Table 2-20). Conversely, CPUE in the charter fleet in 2010 was more similar to 2008 (9.0 in 2010 versus 9.2 in 2008) and was only 85 percent of the CPUE in 2009 (10.6).

**Table 2-18. Washington albacore fishing effort (angler trips) for charter and private boats by year and port area, 2008–2010.**

| | Charter | | | Private | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** |
| North Coast | 63 | 48 | 92 | 165 | 194 | 285 | 228 | 242 | 377 |
| Westport | 919 | 1,013 | 1,337 | 635 | 550 | 1,118 | 1,554 | 1,563 | 2,455 |
| Ilwaco | 516 | 568 | 696 | 1,130 | 1,082 | 1,386 | 1,646 | 1,650 | 2,082 |
| Total | 1,498 | 1,629 | 2,125 | 1,930 | 1,826 | 2,789 | 3,428 | 3,455 | 4,914 |
| **Private boat (%)** | — | — | — | — | — | — | **56.30%** | **52.85%** | **56.76%** |

Data source: WDFW Ocean Sampling Program, extracted May 2011.

**Table 2-19. Washington albacore catch (number of fish) for charter and private boats by year and port area, 2008–2010.**

| | Charter | | | Private | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** |
| North Coast | 240 | 406 | 505 | 474 | 1,158 | 1,922 | 714 | 1,564 | 2,427 |
| Westport | 10,981 | 12,978 | 15,160 | 2,439 | 2,134 | 4,983 | 13,420 | 15,112 | 20,143 |
| Ilwaco | 2,575 | 3,887 | 3,480 | 4,818 | 4,044 | 5,445 | 7,393 | 7,931 | 8,925 |
| Total | 13,796 | 17,271 | 19,145 | 7,731 | 7,336 | 12,350 | 21,527 | 24,607 | 31,495 |
| **Private boat (%)** | — | — | — | — | — | — | **35.91%** | **29.81%** | **39.21%** |

Data source: WDFW Ocean Sampling Program, extracted May 2011.

**Table 2-20. Washington albacore catch per unit of effort (number of fish/angler trip) for charter and private boats by year and port, 2008–2010.**

| | Charter | | | Private | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|
| **Port Area** | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** | **2008** | **2009** | **2010** |
| North Coast | 3.8 | 8.5 | 5.5 | 2.9 | 6.0 | 6.7 | 3.1 | 6.5 | 6.4 |
| Westport | 11.9 | 12.8 | 11.3 | 3.8 | 3.9 | 4.5 | 8.6 | 9.7 | 8.2 |
| Ilwaco | 5.0 | 6.8 | 5.0 | 4.3 | 3.7 | 3.9 | 4.5 | 4.8 | 4.3 |
| **Total** | 9.2 | 10.6 | 9.0 | 4.0 | 4.0 | 4.4 | 6.3 | 7.1 | 6.4 |

Data source: WDFW Ocean Sampling Program, extracted May 2010.

Beginning in 2005, a mandatory charter boat tuna logbook program was implemented to provide additional information on location and effort in the charter albacore fishery. Average catch per angler as reported in logbooks was 12.0 in 2005, then increased to 12.8 in 2006 and 2007 and declined in both 2009 and 2010 to 11.6 and 11.2, respectively (Table 2-21). The average weight (pounds) per tuna caught and reported in the logbooks was 19.1 in 2005, and subsequently decreased to 16.1 in 2006, increased to 19.8 in 2007 and decreased to 18.2 in both 2008 and 2009 and increased to 19.6 in 2010.

**Table 2-21. Washington albacore catch per unit of effort (number of fish/angler trip) and average weight (pounds) per tuna caught by year as reported in charter logbook program, 2005–2010.**

| Year | Average CPUE | Average Weight per Albacore (pounds) |
|---|---|---|
| 2005 | 12.0 | 19.1 |
| 2006 | 12.8 | 16.1 |
| 2007 | 12.8 | 19.8 |
| 2008 | 12.1 | 18.2 |
| 2009 | 11.6 | 18.2 |
| 2010 | 11.2 | 19.6 |

## 2.4 State-level Summaries for the Albacore Surface Hook-and-line Fishery

Section 2.4 includes state-level tables of commercial landings and ex-vessel revenues for the albacore surface hook-and-line (troll and baitboat) fleet for 2009-2010, broken out by months when landings occurred (Table 2-22) and by port (Table 2-23). Additionally, Table2-24summarizes average price per pound by months when landings occurred.

**Table 2-22. Monthly commercial landings and ex-vessel revenue for albacore by the surface hook-and-line fleet, by state, 2009-10.**

| | 2009 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | California | | | Oregon | | | Washington | | |
| Month | No. | mt | Revenue | No. | mt | Revenue | No. | mt | Revenue |
| Jan-Jul | 73 | 56.6 | $139,479 | 488 | 1621.1 | $3,582,994 | 220 | 1686.9 | $3,615,546 |
| August | 159 | 133.6 | $324,038 | 677 | 1917.9 | $4,053,189 | 407 | 2,762.2 | $5,918,893 |
| September | 135 | 76 | $238,675 | 297 | 819.8 | $2,007,621 | 317 | 2,371.5 | $5,622,979 |
| Oct-Dec | 57 | 83.2 | $209,947 | 39 | 214.9 | $546,858 | 50 | 519 | $1,268,575 |
| Total | 424 | 349.4 | $912,139 | 1501 | 4,573.7 | $10,190,662 | 994 | 7,339.6 | $16,425,993 |
| | 2010 | | | | | | | | |
| | California | | | Oregon | | | Washington | | |
| Month | No. | mt | Revenue | No. | mt | Revenue | No. | mt | Revenue |
| Jan-Jul | 19 | 6.5 | $19,606 | 350 | 1482.3 | $3,809,220 | 201 | 1507.4 | $3,791,638 |
| August | 82 | 27.4 | $78,039 | 654 | 1,836.7 | $4,603,478 | 312 | 1,927.5 | $4,573,585 |
| September | 174 | 190.3 | $499,648 | 350 | 1048 | $2,761,919 | 272 | 2,511.9 | $6,151,725 |
| Oct-Dec | 119 | 486.7 | $1,117,707 | 103 | 486.6 | $1,247,792 | 46 | 311.3 | $839,021 |
| Total | 394 | 710.9 | $1,715,000 | 1457 | 4,853.6 | $12,422,409 | 831 | 6,258.1 | $15,355,969 |

**Table 2-23. Annual commercial landings and ex-vessel revenue for albacore tuna landed in port groups by the surface hook-and-line fleet, by state, 2009-10.**

| Port Group | 2009 Landings | | | 2010 Landings | | |
|---|---|---|---|---|---|---|
| **Washington** | No. | mt | Revenue | No. | mt | Revenue |
| North Puget Sound Ports | 22 | 175.8 | $440,813 | 24 | 238.8 | $708,009 |
| South Puget Sound Ports | 10 | 11.5 | $27,650 | 8 | 32.7 | $73,158 |
| Washington Coastal Ports | 583 | 4,189.9 | $9,165,697 | 434 | 3,347.3 | $7,491,438 |
| Columbia River And Other Ports | 379 | 2,962.3 | $6,791,834 | 365 | 2,639.3 | $7,083,365 |
| **Washington Subtotal** | **994** | **7,339.5** | **$16,425,994** | **831** | **6,258.1** | **$15,355,970** |
| **Oregon** | | | | | | |
| Columbia River Ports (Oregon) | 210 | 1,210.6 | $2,740,685 | 237 | 1,994.7 | $5,420,715 |
| Tillamook Area Ports | 125 | 102.0 | $216,000 | 175 | 101.5 | $233,373 |
| Newport Area Ports | 636 | 2,275.5 | $5,071,943 | 685 | 1,882.9 | $4,566,760 |
| Coos Bay Area Ports | 483 | 947.5 | $2,067,566 | 334 | 839.0 | $2,114,167 |
| Brookings Area Ports | 47 | 38.2 | $94,467 | 26 | 35.5 | $87,393 |
| **Oregon Subtotal** | **1501** | **4,573.8** | **$10,190,661** | **1457** | **4,853.6** | **$12,422,408** |
| **California** | | | | | | |
| Crescent City Area Ports | 77 | 99.7 | $212,326 | 55 | 135.1 | $300,545 |
| Eureka Area Ports | 125 | 109.0 | $307,361 | 140 | 301.7 | $735,687 |
| Fort Bragg Area Ports | 35 | 11.9 | $51,527 | 45 | 72.6 | $196,441 |
| Bodega Bay Area Ports | 10 | 8.2 | $18,489 | 8 | 8.6 | $21,250 |
| San Francisco Area Ports | 53 | 20.0 | $72,944 | 23 | 13.1 | $44,428 |
| Monterey Area Ports | 55 | 37.1 | $93,353 | 37 | 26.1 | $68,142 |
| Morro Bay Area Ports | 31 | 7.0 | $19,151 | 60 | 15.9 | $38,474 |
| Santa Barbara And Los Angeles Area Ports | 17 | 50.8 | $121,119 | 17 | 133.3 | $295,188 |
| San Diego Area Ports | 21 | 5.7 | $15,868 | 9 | 4.3 | $14,847 |
| **California Subtotal** | **424** | **349.4** | **$912,138** | **394** | **710.7** | **$1,715,002** |
| **Coastwide Total** | **2,919** | **12,262.7** | **$27,528,793** | **2,682** | **11,822.4** | **$29,493,380** |

**Table 2-24. Average price per pound for albacore landed in California, Oregon, and Washington, by month, 2009-10. (Some months with landings are excluded for data confidentiality.)**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| Month | **California** | **Oregon** | **Washington** | **California** | **Oregon** | **Washington** |
| July | $1.14 | $1.00 | $0.97 | $1.38 | $1.17 | $1.14 |
| August | $1.10 | $0.96 | $0.97 | $1.29 | $1.14 | $1.08 |
| September | $1.42 | $1.11 | $1.08 | $1.19 | $1.20 | $1.11 |
| October | $1.12 | $1.16 | $1.13 | $1.04 | $1.16 | $1.22 |

# 3.0 REGULATIONS CURRENTLY IN PLACE

## 3.1 Summary of the HMS FMP Management Measures and Regulations

On April 7, 2004, NMFS published a final rule to implement the approved provisions of the HMS FMP (69 FR 18444), with the exception of the Reports and Record Keeping requirements, which were granted a delayed effectiveness pending collection-of-information clearance by the Office of Management and Budget (OMB). Clearance of these delayed requirements, which covers logbooks, permits, vessel monitoring systems, and pre-trip notifications, was received by OMB and became effective on February 10, 2005 (70 FR 7022). In addition, five HMS FMP regulatory amendments have been prepared and finalized since the original final rule was put in place along with the recent implementation of regulatory measures in support of the HMS FMP Amendment 2 (Table 3-1).

**Table 3-1.History of HMS FMP domestic regulatory amendments.**

| Title of Regulation | Federal Register Number | Date Published | Date Effective |
|---|---|---|---|
| Revised Method for Renewing and Replacing Permits Issued under the HMS FMP. | 72 FR 10935 | 6/12/07 | 4/11/07 |
| Amended Regulatory Text Governing Closures of the Swordfish Drift Gillnet Fishery in the Pacific Loggerhead Sea Turtle Conservation Area during an El NiZo Event | 72 FR 31756 | 6/8/07 | 7/9/07 |
| Amended Vessel Identification Regulations for HMS Recreational Charter Vessels | 72 FR 43563 | 8/6/07 | 9/5/07 |
| Daily Bag Limits for Sport Caught Albacore and Bluefin Tuna in the EEZ off California | 72 FR 58258 | 10/15/07 | 11/14/07 |
| Establishment of an HMS Permit Fee | 74 FR 37177 | 7/28/09 | 08/27/09 |
| Amendment 2 to the HMS FMP, Annual Catch Limits and Accountability Measures | 76 FR 56327 | 9/13/11 | 10/13/11 |

The final rule for Amendment 2 revises the HMS FMP to make it consistent with guidelines to meet the objectives of National Standard 1 (NS1) in the MSA. Amendment 2 sets a process through which the Council will strive to meet the objectives of NS1 in order to more effectively prevent overfishing and rebuild overfished stocks, or stocks that may become overfished.

The HMS FMP identifies 13 highly migratory species as management unit species (listed in Table 1–1) and defines the legal gear types and management measures used to harvest them. The final rule modifies the suite of management unit species (MUS) from 13 species to 11 species. The final rule also modifies the process for revising and seeking NMFS approval for numerical estimates of maximum sustainable yield and optimal yield, and specifies status determination criteria so that overfishing and overfished determinations can be made for stocks and stock complexes that are part of a fishery. The 11 MUS will fall under the international exception for setting Annual Catch Limits (ACLs), as described at §660.310(h)(2)(ii).

A summary of the other HMS regulations contained in Table 3-1 can be found in the 2009 HMS SAFE report, which is available on-line (http://www.pcouncil.org/highly-migratory-species/stock-assessment-and-fishery-evaluation-safe-documents/). Copies of the current suite of HMS FMP regulations along with an HMS FMP Compliance Guide can be found on the NMFS Southwest Region website at http://swr.nmfs.noaa.gov. Since fishery rules frequently change, fishermen must familiarize themselves with the latest regulations and are responsible for complying with the current official regulations set forth

in the Code of Federal Regulations at 50 CFR Part 660.[1]

The HMS FMP regulations are necessary for federal management of U.S. fishing vessels targeting HMS within the West Coast EEZ of California, Oregon, and Washington and the adjacent high seas waters. This HMS FMP applies to all U.S. vessels that fish for HMS within the EEZ off California, Oregon, or Washington and to U.S. vessels that pursue HMS on the high seas (seaward of the EEZ) and land their fish in California, Oregon, or Washington. The HMS FMP does not apply to U.S. vessels that fish for HMS on high seas and land into a non-U.S. port. Additional restrictions apply under the High Seas Fishing Compliance Act[2]and for Western Pacific longline permitted vessels landing into West Coast ports.[3]

Regulations for HMS in Washington, Oregon, and California vary from state to state. The HMS FMP contains federal measures for HMS fisheries, which provide a region-wide management regime applicable to all vessels landing in West Coast ports. State regulations not superseded by the initial federal regulations will continue to remain in effect until such time as the Council determines they should be supplanted by federal regulations. Some of the state regulations are inconsistent from state to state, but these inconsistencies do not pose management problems that require immediate federal action.

The HMS FMP, under the management auspices of the Pacific Council, serves as a mechanism to cooperate with other regional and international management bodies to work towards consistent management of U.S. fisheries in the Pacific Ocean. Federal measures impacting these fisheries, which arise from several different federal laws, may be more efficiently addressed within the Council framework, and related regulations can be viewed together. An important goal of the HMS FMP is to assure that issues of national and international concern are addressed, and to determine how recommendations of international bodies should be applied to domestic fisheries of the West Coast.

The fishing gears described below are authorized for the commercial and recreational harvest of HMS in the EEZ by all permitted vessels, and beyond the EEZ by vessels landing into West Coast ports. Gear that is not defined as legal gear is prohibited from harvesting HMS under the HMS FMP. Specific management measures regulating the use of legal gear types will be developed if necessary, using the framework procedures of the HMS FMP.

### *3.1.2 HMS Commercial Gear*

**Harpoon**: Fishing gear consisting of a pointed dart or iron attached to the end of a line several hundred feet in length, the other end of which is attached to a flotation device. Harpoon gear is attached to a pole or stick that is propelled only by hand, and not by mechanical means.

**Surface Hook-and-Line**: One or more hooks attached to one or more lines (includes troll, rod and reel, handline, albacore jig, live bait, and bait boat; excludes pelagic longline and mousetrap gear[4]). Surface hook-and-line is always attached to the vessel.

**Drift Gillnet**: A panel of netting, suspended vertically in the water by floats along the top and weights along the bottom, which is neither stationary nor anchored to the bottom. The HMS FMP final rule defines drift gillnet gear as 14 inch (35.56 cm) stretched mesh or greater.

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1 50 CFR part 660 is available online at http://www.access.gpo.gov/nara/cfr/waisidx_03/50cfr660_03.html
2 http://www.nmfs.noaa.gov/ia/services/highseas.htm
3 http://www.wpcouncil.org/pelagic.htm

**Purse Seine**: A floated and weighted encircling net that is closed by means of a purse line threaded through rings attached to the bottom of the net (includes encircling net, purse seine, ring net, drum purse seine, lampara net).

**Pelagic Longline**: A main line that is suspended horizontally in the water column, which is neither stationary nor anchored, and from which dropper lines with hooks (gangions) are attached.

### *3.1.3 HMS Recreational Gear*

**Rod-and-Reel (pole-and-line)**: A hand-held (including rod holder) fishing rod with a manually or electrically operated reel attached.

**Spear**: A sharp, pointed, or barbed instrument on a shaft. Spears can be operated manually or shot from a gun or sling.

**Hook-and-Line**: One or more hooks attached to one or more lines (excludes mousetrap gear).[4]

### *3.1.4 Landings and Gear Use Regulations*

At this time there are no quotas for HMS species, although there are harvest guidelines. A quota is a specified numerical harvest objective, the attainment of which triggers the closure of the fishery or fisheries for that species. A harvest guideline is a numerical harvest level that is a general objective and is not a quota. If a harvest guideline has been reached, NMFS will initiate a review of the species in question according to provisions in the HMS FMP and in consideration of Council guidance. The HMS FMP establishes annual harvest guidelines of 340 mt for common thresher sharks and 150 mt for shortfin mako sharks. Because total catches and basic population dynamic parameters for these shark species are poorly known, they are being managed using precautionary harvest guidelines.

The HMS FMP final rule prohibits the retention of the species listed below in Table 3-2. In general, prohibited species must be released immediately if caught while targeting HMS, unless other provisions for their disposition are established in accordance with HMS FMP guidelines.

**Table 3-2. Prohibited Species covered under the HMS FMP final rule.**

| Common Name | Scientific Name |
|---|---|
| great white shark | *Carcharodon carcharias* |
| basking shark | *Cetorhinus maximus* |
| megamouth shark | *Megachasma pelagio* |
| Pacific halibut | *Hippoglossus stenolepis* |
| pink salmon | *Onchorhynchus gorbuscha* |
| Chinook salmon | *O. tshawytscha* |
| chum salmon | *O. keta* |
| sockeye salmon | *O. nerka* |
| coho salmon | *O. kisutch* |

U.S. citizens fishing in waters covered under the HMS FMP are bound by the rules and regulations set

[4] Mousetrap gear means a free-floating set of gear thrown from a vessel, composed of a length of line with a float on one end and one or more hooks or lures on the opposite end.

forth in the Shark Finning Prohibition Act of 2000.[5]The Act prohibits, among other things, any person subject to U.S. jurisdiction from: 1) engaging in shark finning, 2) possessing shark fins aboard a U.S. fishing vessel without the corresponding carcass, or 3) landing shark fins without a corresponding carcass. The Act requires an annual report to Congress detailing progress made in addressing the elements of the Act. The report highlights work being conducted by NMFS to monitor and conserve HMS shark populations under Pacific Council management. A copy of the Shark Finning Report to Congress for 2010 can be viewed at: http://www.nmfs.noaa.gov/sfa/domes_fish/ReportsToCongress/SharkFinningReport10.pdf

The HMS FMP prohibits the sale of striped marlin by all vessels as a means to provide for and maximize recreational fishing opportunities for this species. Striped marlin is considered to have far greater value as a recreational target species than as a commercial target species. Prohibiting sale removes the incentive for commercial fishermen to take striped marlin.

### *3.1.5 Incidental Landings*

The HMS FMP authorizes incidental commercial landings of HMS, within limits, for non-HMS gear such as bottom longline, trawl, pot gear, small mesh drift gillnet, set/trammel gillnets, and others. Incidental catch refers to harvest of HMS that are unavoidably caught while fishing for other species or fishing with gear that is not legal for the harvest of HMS.

Small-mesh drift gillnetters and bottom set net gillnetters are not permitted to land swordfish but would be permitted to land other HMS, with the restriction of 10 fish per landing of each non-swordfish HMS.

Bottom longline (set line) fishery landings are restricted to three HMS sharks, or 20 percent of total landings by weight of HMS sharks, whichever is greater.

For trawl, pot gear, and other non-HMS gear, a maximum of 1 percent of total weight per landing for all HMS shark species combined is allowed (i.e., blue shark, shortfin mako shark, and bigeye, pelagic, and common thresher sharks) or two HMS sharks, whichever is greater.

A drift gillnet vessel with a stretched mesh size less than 14 inches may not target HMS, although an incidental landing of 10 HMS per trip, other than swordfish, will be allowed to minimize bycatch while fishing for state managed species.

Albacore surface hook-and-line vessels may not deploy small-mesh drift gillnets to target albacore as was customarily practiced by selected vessels prior to passage of the HMS FMP final rule.

In Washington, it is unlawful to land thresher shark taken by any means from state and offshore waters of the Pacific Ocean north of the Washington-Oregon boundary and south of the U.S.-Canada boundary. It is unlawful to land any thresher shark in Washington taken south of the Washington-Oregon boundary unless each thresher shark landed is accompanied by a minimum of two swordfish.

In Oregon, it is unlawful to take thresher shark, swordfish or other HMS species for commercial purposes with gillnets in State waters. It is also unlawful, based on a 2009 Oregon State regulation change, to land any of these species in Oregon if taken with gillnets, including fish taken outside State waters. However,

[5] Copies of the Act can be downloaded at: http://www.govtrack.us/congress/billtext.xpd?bill=h106-5461. Copies of the Small Entity Compliance Guide Outlining the Regulations to Implement Shark Finning Prohibition Act can be viewed at: http://www.nmfs.noaa.gov/sfa/hms/shark_finning/complianceguid.PDF.

thresher shark, swordfish, or other HMS species taken with authorized commercial gear (i.e., approved gear other than gillnet) may be landed in Oregon provided that the gear and catch are in compliance with all other applicable regulatory measures.

### *3.1.6 Status of HMS Permits*

The reporting and recordkeeping requirements of the HMS FMP became effective February 10, 2005(70 FR 7022), 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 and/or landing HMS 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.

Table 3-3 shows the number of HMS permits active by year. The permit data presented reflect valid permits and do not necessarily reflect total number of active vessels (i.e., vessels with catch and effort history in a given fishery year).

**Table 3-3. HMS permits recorded in the permit database for each year since the regulation became effective on February 10, 2005.**

| 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** |

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

### *3.1.7 HMS Fisheries Logbook Data Collection*

Catch, effort, and catch disposition data are critical for monitoring HMS fisheries, assessing the status of the stocks, and evaluating the effectiveness of management. All commercial fishing operations conducted with HMS FMP approved gear, 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 day of the fishing trip must be submitted to NMFS or the appropriate state management agency within 30 days of each landing or transshipment of HMS. Each form must be signed and dated by the fishing vessel operator.

Logbooks from a total of 1,490 North Pacific albacore trips (including both albacore troll and pole-and-line gears) from 409 vessels were submitted to the NMFS Southwest Fisheries Science Center (SWFSC) in La Jolla, California in 2010, compared to 1,840 logbooks from 500 vessels in 2009. A total of 12,004 mt of albacore was landed by albacore troll and pole-and-line vessels in 2010, compared to 12,793 mt in 2009. A total of 8,144 mt of albacore were recorded as catch in mandatory logbook submissions for 2010, compared to 9,967 mt in 2009. This equates to a 68 percent logbook compliance rate estimate for 2010 using the landed catch versus logbook reported catch methodology.

CDFG implemented a harpoon logbook and permit program in 1974. The logbook has been modified over time, but the primary focus has been to document catch, effort, and oceanographic conditions on the fishing grounds. According to landings data, 25 vessels landed a total of 22 mt of swordfish in 2010. No logbook data are available from the 2010 harpoon fishery at this time. In 2009, 28 vessels landed 34 mt of swordfish. Twenty-five vessels submitted logbooks from the 2009 harpoon fishery, recording 513 vessel-days of effort. CDFG will be looking into logbook compliance in the near future.

The gillnet logbook program was implemented in 1980 to study the development of the drift gillnet shark fishery to determine the effects of the fishery on swordfish and striped marlin. In 2010, 38 drift gillnet vessels landed a total of 48 mt of swordfish and 36 mt of common thresher shark. Logbook data from the 2010 drift gillnet fishery are not yet available. In 2009, 54 drift gillnet vessels landed a total of 249 mt of swordfish and 48 mt of common thresher shark. Thirty vessels submitted logbooks from the 2009 drift gillnet fishery, resulting in 575 vessel-days of effort.

Purse seine vessels primarily target CPS along the West Coast, but occasionally target HMS when fish are available and market conditions are favorable. In 2010 only one vessel targeted HMS with purse seine gear. In accordance with agency confidentiality policies, this catch is combined with the "Other" gear category for reporting. In 2009 eight vessels caught a total of 39 mt of albacore, 410 mt of bluefin tuna, 4 mt of skipjack tuna, and 15 mt of yellowfin tuna.

### *3.1.8 Observer Requirements*

All U.S. fishing vessels operating in HMS fisheries (including catcher/processors, at-sea processors, and vessels that embark from a port in Washington, Oregon, or California and land catch in another area), may be required to carry a NMFS-certified observer on board to collect scientific data when directed to do so by the NMFS Regional Administrator. NMFS shall advise the permit holder or the designated agent of any observer requirement at least 24 hours (not including weekends and federal holidays) before any trip. Pre-season informational letters were sent out to the various HMS fleets explaining the requirements for carrying an observer, which includes, among other things, providing bunk space and food equivalent to that given to crew members.

During 2010, the NMFS Southwest Region Observer Program observed the following HMS fisheries:

- Drift gillnet: 12 trips and 59 sets for a coverage rate of approximately 12 percent.
- Albacore troll: Albacore trips did not carry federal observers in 2010.
- Tuna Purse Seine: The West Coast-based coastal purse seine fleet did not carry federal observers in 2010.
- Pelagic tuna longline: 5 trips and 77 sets, 100 percent coverage.
- HMS CPFV: CPFV trips did not carry federal observers in 2010.

### *3.1.9 HMS Regulatory Enforcement and Permits Compliance Check for 2010*

#### 3.1.9.1 Enforcement of Regulations

Penalties for violating the regulations and prohibitions outlined in the HMS FMP final rule are determined on a case-by-case basis; they can include significant civil penalties and permit sanctions. NOAA has implemented a summary settlement penalty program to increase compliance with logbook reporting requirements, and is developing a civil administrative penalty schedule for the HMS FMP Final Rule. The NOAA Summary Penalty Program for the West Coast HMS fishery can be found at 50 CFR 660, Subpart K. The Program focuses on the reporting compliance for logbooks and sets the penalty schedule for failure to timely complete, or timely submit, a logbook as required by regulation as follows:

1–5 days late, $500; 6 or more days late, $100/day.

#### 3.1.9.2 Compliance Check

HMS permit compliance improved this year to more than 95 percent. During the fishing season, 712 U.S. vessels made HMS landings with HMS gear. Of these vessels, 24 were identified as not having had a valid HMS permit. In 2009, 83 of the 780 vessels made landings that were found to be fishing without a permit. The CPFV portion of the 2010 compliance checks found 21 vessels targeting HMS without a permit. This is approximately the same as 2009 when 20 vessels fished without a valid permit. Vessels which appeared to be in noncompliance with the HMS regulations were either sent a certified warning letter or were referred to the NOAA Fisheries Office for Law Enforcement for investigation.

## 3.2 Protected Resources Regulations

Longline and drift gillnet vessels on rare occasions encounter endangered and threatened species of sea turtles and marine mammals while targeting HMS. Longline vessels also infrequently encounter a number of sea birds, including the endangered short-tailed albatross. 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 the HMS FMP on ESA-listed protected resources (including marine mammals and sea turtles) were analyzed as part of the section 7 consultation and 2004 biological opinion (BO). The BO included an Incidental Take Statement with anticipated mortalities and entanglements of ESA-listed marine mammals and sea turtles that are likely to interact with the drift gillnet vessels targeting HMS fish species (see Table 3-4). Except where noted, the anticipated mortalities are annual estimates. The BO 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.

**Table 3-4. Anticipated incidental takes of ESA-listed marine mammal and sea turtle species in the drift gillnet HMS fishery.**

| Species | Estimated Entanglements (number of animals in 3 years) | Estimated Mortalities (number of animals in 3 years) | Typical Conditions Resulting in Take |
|---|---|---|---|
| Fin whale | 4 in 3 years | 2 in 3 years | |
| Humpback whale | 4 in 3 years | 0 | |
| Sperm whale | 4 in 3 years | 2 in 3 years | |
| Green turtle | 4 | 1 | SSTs in fishing area similar to Nov 99 |
| Leatherback turtle | 3 | 2 | |
| Loggerhead turtle | 5 | 2 | Only in El Niño years |
| Olive ridley turtle | 4 | 1 | SSTs in fishing area similar to Nov 99 |

Note: SST – sea surface temperature.

Takes of green, olive ridley and loggerhead sea turtles are uncommon 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 one leatherback has been observed taken (released alive), in 2009.

Takes of listed marine mammals are rare events and are calculated over a three-year time period, consistent with the MMPA permit required under section 101(a)(5)(E) for incidental take of ESA-listed marine mammals in fisheries. The last 101(a)(5)(E) permit was completed in September 2007 with a Federal Register Notice published on October 26, 2007 (72 FR 60816). The three-year permit expired on October 26, 2010. The Southwest Regional Office's Protected Resources Division is in the process of evaluating the estimated takes of ESA-listed marine mammals (fin whales, blue whales, and humpback whales) in the California drift gillnet fishery. A negligible impact determination should be in place for all or some of the above-referenced whales by the fall of 2011.

In December, 2010, a California drift gillnet vessel was observed to take two sperm whales in one set. One of the whales died, while the other whale was released with trailing gear, which NMFS considers a serious injury leading to mortality. Because the incidental take of sperm whales exceeded the levels authorized by the 2004 BO, the SWR Sustainable Fisheries Division has initiated formal consultation with the SWR Protected Resources Division and is in the process of preparing a biological assessment on the take of all endangered and threatened species adversely affected by this fishery.

In early 2011, NMFS completed a Biological Opinion on the deep-set longline component of the HMS fishery. When the 2004 Biological Opinion was completed, there was no deep-set longline fishing effort, so there was no analysis done. However, since 2005 there has been deep-set longline fishing in the high seas and NMFS was required to complete an Environmental Assessment and Biological Opinion. The take of ESA listed species in the deep-set longline fishery is rare, and the fishery is observed at 100 percent. The anticipated incidental take is shown in Table 3-5. No ESA-listed marine mammals are expected to be taken in the deep-set longline fishery.

**Table 3-5. Anticipated number of turtle entanglements and associated mortality from the deep-set longline HMS fishery during 2011-2013.**

| Species | Estimated entanglements (mortality) in three years |
|---|---|
| Green turtle | 1 |
| Leatherback turtle | 1 |
| Olive Ridley turtle | 3 |
| Loggerhead turtle | 1 |

The MMPA requires that all commercial fisheries in the U.S. be categorized and included on an annual List of Fisheries (http://www.nmfs.noaa.gov/pr/interactions/lof/#lof). The fisheries are placed in one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery:

I. **frequent** incidental mortality or serious injury of marine mammals
II. **occasional** incidental mortality or serious injury of marine mammals
III. **remote likelihood of/no known** incidental mortality or serious injury of marine mammals

The current 2011 LOF was published on November 8, 2010 (75 FR 68468). The drift gillnet HMS fishery, the tuna purse seine fishery, and pelagic longline fishery are all listed as Category III fisheries. In the proposed 2012 LOF, the drift gillnet fishery is proposed to be elevated to a Category II fishery due to a Marine Mammal Authorization Program (MMAP) self-reporting of a humpback whale entanglement during drift gillnet fishing operations in 2009. The animal was cut loose with trailing gear and considered

seriously injured. The final 2012 LOF should be published in November 2011. The Federal Register Notice for the proposed 2012 LOF can be found at: http://swr.nmfs.noaa.gov/pdf/2012_proposed_LOF-76FR37716_062811.pdf.

Any incidental injuries or mortalities of marine mammals occurring during fishing operations must be reported to NMFS. Injury/mortality report forms and instructions for submitting forms to NMFS can be downloaded from http://www.nmfs.noaa.gov/pr/interactions/mmap/. Owners of vessels in Category I or II fisheries are required to register with NMFS and obtain a marine mammal authorization to lawfully incidentally take marine mammals. They may also be required to accommodate an observer aboard the vessel, upon request by NMFS. On January 5, 2010, NMFS published a proposed rule to designate areas off the U.S. west coast as critical habitat for endangered leatherback sea turtles (75 FR 319). NMFS failed to publish the final rule on critical habitat within 12 months of the proposed rule and was sued by environmental groups in early 2011. As part of the settlement agreement, NMFS must publish the final rule on leatherback critical habitat by November 15, 2011. Existing leatherback critical habitat is at Sandy Point Beach and adjacent waters on the western end of St. Croix in the U.S. Virgin Islands. This area is a known nesting beach for leatherback sea turtles in the Atlantic Ocean. NMFS was petitioned in October 2007 to designate the drift gillnet leatherback sea turtle conservation area as critical habitat, an area of roughly 200,000 square miles. The proposed rule is to designate as critical habitat an area of approximately 70,000 square miles from Point Vicente to Point Arena, California and from the Umpqua River in Oregon to Cape Flattery, Washington. The proposed rule can be found at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr75-319.pdf.

## 3.3 International Regulatory Aspects of the HMS FMP

Management of Pacific HMS fisheries is complicated by the wide-ranging behavior of the stocks, the many jurisdictions that are involved, and a lack of reliable data. Many HMS are distributed throughout the Pacific Ocean and vessels from the United States and many other nations harvest them. Effective management of the stocks throughout their ranges requires international cooperation. The HMS FMP and its associated fisheries are affected by the conservation and management measures adopted by regional fishery management organizations (RFMOs); in particular, those adopted by the Inter-American Tropical Tuna Commission (IATTC) and the Western and Central Pacific Fisheries Commission (WCPFC). In addition, the U.S.-Canada Albacore Treaty and the associated bilateral negotiations between the United States and Canada affect the HMS FMP and albacore fisheries based out of the U.S. West Coast.

### *3.3.1 The Inter-American Tropical Tuna Commission*

The IATTC was established in 1949 for the conservation and management of fisheries for tunas, tuna-like species, and other species of fish taken incidentally by tuna fishing vessels in the eastern Pacific Ocean (EPO). Currently, there are 21 members of the IATTC: Belize, Canada, China, Colombia, Costa Rica, Ecuador, El Salvador, the European Union, France, Guatemala, Japan, Kiribati, Korea, Mexico, Nicaragua, Panama, Peru, Chinese Taipei, United States, Vanuatu, and Venezuela. The Cook Islands is a Cooperating Non-Member.

The IATTC is responsible for the conservation and management of fisheries for tunas and other species taken by tuna-fishing vessels in the EPO. The Tuna Conventions Act of 1950 provides the United States with the federal authority to implement the measures adopted by the IATTC. The HMS FMP can at times be used to implement or supplement recommendations of the IATTC or other international fishery management bodies, particularly for U.S. fisheries based out of the U.S. West Coast that primarily operate in domestic waters.

In 2003, the IATTC adopted a resolution that approved the Antigua Convention, a major revision of the

original convention establishing the IATTC. This new text brings the convention current with respect to internationally accepted laws on the conservation and management of oceanic resources, including a mandate to take a more ecosystem-based approach to management. The Antigua Convention entered into force on August 27, 2010. Implementing legislation packages for the Antigua Convention have been sent to the House Committee on Foreign Affairs and the Senate Commerce Science and Transportation Committee; however, Congress has not yet passed such legislation.

IATTC resolutions are domestically implemented in regulations at 50 CFR 300, Subpart C.

The next IATTC meeting is scheduled for the second week of July 2012 at a location yet to be determined.

#### 3.3.1.1 An Update of IATTC Resolutions

Since the 2010 HMS SAFE report, two IATTC plenary meetings have convened. There were meetings held in Antigua, Guatemala in September 2010, and in La Jolla, California in July 2011. The three recommendations (non-binding agreements) that were adopted at the 2010 annual meeting were replaced with resolutions (binding decisions of the IATTC) adopted at the 2011 annual meeting, thus only resolutions adopted at the 2011 meeting are discussed here.

The active IATTC Resolutions may be accessed at the following IATTC website: http://www.iattc.org/ResolutionsActiveENG.htm.

**Recommendations adopted at the July 2011 IATTC meeting**

Resolution C-11-01 - Resolution on a Multiannual Program for the Conservation of Tuna in the Eastern Pacific Ocean in2011-2013
This measure is very similar to IATTC Resolution C-09-01 which was adopted at the 2009 IATTC meeting. The measure is applicable to purse seine vessels class sizes 4-6 (182 metric tons and greater well volume carrying capacity) and longline vessels greater than 24 meters in length that fish for yellowfin, bigeye, and skipjack tunas in the EPO. The resolution consists of, among other things, a purse seine closure period in the IATTC Convention Area for 62 days from 2011-2013, a time/area closure for purse seine vessels on the high seas to the west of the Galapagos Islands, a bigeye tuna quota for longline vessels, and a tuna retention program in the purse seine fishery.

Resolution C-11-02 – Resolution to Mitigate the Impact on Seabirds of Fishing for Species Covered by the IATTC
This measure is very similar to the seabird measure adopted by the WCPFC in 2007 (CMM-2007-04). The IATTC measure is applicable to longline vessels greater than 20 meters in length that use hydraulic, mechanical, or electrical systems and fish for species covered by the IATTC in the EPO north of 23°N (except in Mexican national waters) and south of 30°S, plus the area bounded by the coastline at 2°N, west to 2°N-95°W, south to 15°S-95°W, east to 15°S-85°W, and south to 30°S. Applicable vessels must use at least two mitigation measures listed in the table provided in the measure. The current U.S. requirements for seabird mitigation in the longline fisheries operating in the Pacific Ocean satisfy these provisions. There are also other provisions in the measure pertaining to data collection and reporting.

Recommendation C-11-03 – Resolution Prohibiting Fishing on Data Buoys
This measure is different from the measure adopted by the WCPFC in 2009 (CMM-2009-05). This measure, among other things, prohibits all fishing vessels from interacting with data buoys in the IATTC Convention Area and prohibits longline and purse seine fishing vessels from deploying fishing gear within one nautical mile of an anchored data buoy in the IATTC Convention Area. Interactions include,

but are not limited to, encircling the buoy with fishing gear, tying up to or attaching the vessel, fishing gear, or any part or portion of the vessel, to a data buoy, or cutting its anchor line.

Resolution C-11-07 – Resolution on the Process for Improved Compliance of Resolutions Adopted by the Commission

This measure establishes a process for improved compliance of resolutions adopted by the IATTC. The measure establishes procedures for improving compliance, including requiring each member to fill out an annual questionnaire regarding compliance with each IATTC resolution, and establishing procedures and timelines for submitting information for consideration in compliance cases. The questionnaire and all supplemental materials will then be reviewed by the IATTC Implementation Committee and the IATTC plenary each year.

Resolution C-11-08 – Resolution on Scientific Observers for Longline Vessels

This measure requires that at least five percent of the fishing effort made by longline fishing vessels greater than 20 meters in length operating in the IATTC Convention Area carry a scientific observer. The measure goes into effect on January 1, 2013 and the results of the observer program will be reviewed in subsequent years to determine whether the five percent coverage rate should be increased.

Resolution C-11-10 – Resolution on the Conservation of Oceanic Whitetip Sharks Caught in Association with Fisheries in the Convention Area

This measure prohibits the retention, sale, landing, transshipment, storing, or offering for sale any part or whole carcass of oceanic whitetip sharks in the fisheries covered by the IATTC. The measure also requires vessels to promptly release unharmed, to the extent practicable, whitetip sharks when brought alongside the vessel.

Resolution C-11-11 – Resolution on the Creation of the Special Sustainable Development Fund for Fisheries for Highly Migratory Species to Strengthen the Institutional Capacity of Developing Countries

This measure establishes a development fund for capacity building, such as creating systems for the collection, processing, and analyzing of data and participation in meetings of the IATTC, in developing countries. An initial USD $50,000 contribution will go into the fund from the annual IATTC budget in 2013. The remainder of the resources of the fund will come from contributions obtained from Members of the IATTC or from national and international bodies or entities interested in strengthening the capacities of developing countries. Contributions may be declared for a specific use, consistent with the nature of the fund.

Resolution C-11-12 – Resolution on the Carrying Capacity of Peru

This measure grants Peru 5,000 cubic meters of additional purse seine carrying capacity per the footnote in Resolution C-02-03, to be utilized by vessels flying the Peruvian flag operating in the marine areas under the jurisdiction of Peru. This capacity cannot be transferred to other flags nor used for the chartering of vessels of other flags.

Other Resolutions and Decisions Adopted by the IATTC in 2011

The IATTC also adopted a resolution on the budget for 2012 (Resolution C-11-04), made several amendments to the Regional Vessel Register Resolution (now Resolution C-11-06), the List of Authorized Large-Scale Longline Vessels (now Resolution C-11-05), and the Transshipment Resolution (now Resolution C-11-09), and agreed to a Memorandum of Cooperation with the WCPFC for the cross endorsement of observers.

### *3.3.2 Western and Central Pacific Fisheries Commission*

The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western

and Central Pacific Ocean (WCPO) became effective in June 2004. The objective of the Convention is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stock in the WCPO. The United States signed the Convention in 2000 and ratified it in 2007, thereby becoming a member of the WCPFC. The U.S. domestic procedures for ratification of the Convention were completed in June 2007.

There are 25 Members of the Commission: Australia, China, Canada, Cook Islands, European Union, Federated States of Micronesia, Fiji, France, Japan, Kiribati, Korea, Republic of Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Chinese Taipei, Tonga, Tuvalu, United States, and Vanuatu. American Samoa, Guam, French Polynesia, New Caledonia, Tokelau, Wallis, Futuna, and the Commonwealth of the Northern Mariana Islands are Participating Territories, and Belize, Indonesia, Panama, Senegal, Mexico, El Salvador, Ecuador, Thailand, and Vietnam are Cooperating Non-members.

WCPFC conservation and management measures are accessible on the following WCPFC website: http://www.wcpfc.int/conservation-and-management-measures. The NOAA Fisheries Pacific Islands Regional Office (PIRO) has the lead on implementing the measures adopted by the WCPFC. Documentation and background information on recent rulemakings can be found at http://www.fpir.noaa.gov/IFD/ifd_documents_data.html.

WCPFC conservation and management measures are domestically implemented in regulations at 50 CFR 300, Subpart O.

The next meeting of the WCPFC will be in December 2011 in Koror, Palau.

#### 3.3.2.1 An Update of WCPFC Conservation and Management Measures

The last WCPFC annual meeting was held in December 2010 in Honolulu, Hawaii. Several conservation and management measures (CMMs) were adopted and a number of existing measures were revised. Each of these decisions is summarized below.

CMM 2010-01 - North Pacific Striped Marlin
The WCPFC adopted this measure calling for a phased reduction by all members and cooperating non-members in their catch of North Pacific striped marlin, such that their catch on January 1, 2013, is 80 percent of their highest catch from 2000–2003. The measure applies to all gear types and will be amended in 2011 on the basis of the 2011 stock assessment results. All members were also encouraged to implement and test gear modifications that may assist with reduction of North Pacific striped marlin catch and inform amendment of the measure in 2011.

CMM 2010-02 – Eastern High Seas Pocket Special Management Areas
The WCPFC adopted this measure to reduce IUU fishing in the eastern high seas pocket of the Convention Area. The measure includes specific vessel reporting requirements and a provision requiring near real-time VMS information for eastern high seas pockets adjacent to coastal states/territories for monitoring purposes.

CMM 2010-03 - Committee on Compliance with Conservation Measures
The WCPFC adopted a one year pilot program for a compliance monitoring scheme. The Commission requested Australia, which proposed this CMM, to continue to work intersessionally through the Compliance with Conservation and Management Measures Working Group to develop a process that will identify a range of possible responses to non-compliance and report back to the Technical and Compliance Committee Meeting in 2011.

CMM-2010-04 – Pacific Bluefin Tuna

The WCPFC adopted this measure to ensure that the level of Pacific bluefin tuna fishing mortality does not increase above 2002–2004 levels. The measure will be reviewed in 2012 on the basis of the 2012 stock assessment results.

### *3.3.3 The U.S.-Canada Albacore Treaty*

The Treaty entered into force in 1982 and has been renegotiated several times to address limitations on access to North Pacific albacore tuna by fishing vessels of one country operating in the jurisdiction of the other. The Treaty allows fishing in the host country beyond 12 nautical miles during a fishing season that runs from June through October. The Treaty requires that the United States and Canada annually exchange lists of fishing vessels that may fish for albacore tuna in each other's waters. The vessels agree to abide by the provisions of the Treaty, which include vessel marking, recordkeeping, and reporting. The Treaty also allows the fishing vessels of each country to enter designated fishing ports of the other country to conduct several types of business transactions including the landing of albacore without payment of duties; transshipment of catches to any port of the flag state; selling catches for export or locally; and obtaining fuel, supplies, repairs, and equipment on the same basis as albacore tuna vessels of the other country. The Treaty allows Canadian albacore vessels to land their catch in the ports of Bellingham and Westport, Washington; Astoria, Coos Bay, and Newport, Oregon; and Eureka, California.

The current 3-year fishing regime (2009-2011), which allows 110 Canadian vessels to fish in the U.S. EEZ and an unlimited number of U.S. vessels in the Canadian EEZ, ends December 2011. There is no default mechanism for reciprocal fishing to continue in the absence of an extended or new regime. The two countries are currently in the process of renegotiation. Canada and the United States held their annual data consultation to review the 2010 fishing season, to discuss management arrangements, and to exchange updates on the status during a conference call on April 18, 2011. Canada reported that 106 out of the allotted 110 Canadian vessels fished in the U.S. EEZ. The Canadian effort in terms of vessel days was distributed off Washington (1,047 vessel days), Oregon (2,748 vessel days), and California (53 vessel days). Forty-two Canadian vessels landed 958 mt, while making 76 landings to U.S. ports. The amount of albacore landed in the United States was 37 percent more than in 2009. The United States reported that eight vessels made a total of 13 landings in Canadian ports.

Members of both countries renewed their agreement to form a data working group that would be used to reconcile differences in Canadian and U.S. catch reports and other data related issues. The first meeting of the working group is planned for late summer 2011.

U.S-Canada Albacore Treaty measures are domestically implemented in regulations at 50 CFR 300, Subpart L.

Tables 4-9 (Canadian vessels excluded) and 4-10 (all landings) provide data on the commercial landings in the West Coast albacore surface hook-and-line fishery from 1981-2010all landings, and Tables 4-19 and 4-20 provide the real commercial ex-vessel revenues.

## 3.4 Bycatch and Other Monitored Species

NMFS monitors catch and bycatch in HMS fisheries through onboard observers. During the 2009/2010 fishing year, observers were placed on deep-set pelagic longline and drift gillnet fishing vessels. Less than three vessels participated in the deep-set pelagic longline fishery, so data confidentiality rules prevent those observations from being reported here. Observer coverage in this fishery was 100 percent.

The drift gillnet fishery for swordfish and sharks has been observed by NMFS since 1990.

Table 3–6summarizes the total catch and final disposition by species of all fish, marine mammals, sea turtles, and seabirds observed caught in the California/Oregon drift gillnet fishery during the 2009/2010 fishing season. Data were collected at sea by contract observers, and represent a total of 108 sets. Estimated total fishing effort for the season was 832 sets.

**Table 3-6. NMFS California/Oregon Drift Gillnet Observer Program Observed Catch - 2010/2011 Fishing Season May 1, 2010, through January 31, 2011 (Source: NMFS SWR Observer Program).**

| Species | Total Caught | Number Kept | Number Returned | | | Number Damaged | Catch per 100 Sets |
|---|---|---|---|---|---|---|---|
| | | | Alive | Dead | Unknown | | |
| Swordfish | 25 | 25 | 0 | 0 | 0 | 1 | 23.1 |
| Striped Marlin | 1 | 0 | 0 | 1 | 0 | 0 | 0.9 |
| Albacore | 5 | 5 | 0 | 0 | 0 | 2 | 4.6 |
| Bluefin Tuna | 14 | 14 | 0 | 0 | 0 | 1 | 13.0 |
| Common Thresher Shark | 80 | 79 | 1 | 0 | 0 | 0 | 74.1 |
| Bigeye Thresher Shark | 3 | 2 | 0 | 0 | 1 | 0 | 2.8 |
| Shortfin Mako Shark | 30 | 30 | 0 | 0 | 0 | 0 | 27.8 |
| Blue Shark | 27 | 0 | 11 | 16 | 0 | 0 | 25.0 |
| Salmon Shark | 3 | 0 | 0 | 3 | 0 | 0 | 2.8 |
| Pacific Electric Ray | 2 | 0 | 1 | 0 | 1 | 0 | 1.9 |
| Common Mola | 680 | 0 | 668 | 11 | 1 | 4 | 629.6 |
| Louvar | 8 | 7 | 1 | 0 | 0 | 0 | 7.4 |
| Opah | 115 | 115 | 0 | 0 | 0 | 7 | 106.5 |
| Pacific Bonito | 3 | 3 | 0 | 0 | 0 | 1 | 2.8 |
| Pacific Mackerel | 41 | 12 | 1 | 28 | 0 | 4 | 38.0 |
| Pacific Pomfret | 68 | 68 | 0 | 0 | 0 | 0 | 63.0 |
| Unidentified Rockfish | 1 | 0 | 1 | 0 | 0 | 0 | 0.9 |
| Jack Mackerel | 2 | 2 | 0 | 0 | 0 | 0 | 1.9 |
| Remora | 1 | 0 | 1 | 0 | 0 | 0 | 0.9 |
| Unidentified Invertebrate | 1 | 0 | 0 | 0 | 1 | 0 | 0.9 |
| Short Beak Common Dolphin | 2 | 0 | 0 | 2 | 0 | 0 | 1.9 |
| Long Beak Common Dolphin | 2 | 0 | 0 | 2 | 0 | 0 | 1.9 |
| Bottlenose Dolphin | 1 | 0 | 0 | 1 | 0 | 0 | 0.9 |
| Northern Right Whale Dolphin | 1 | 0 | 0 | 1 | 0 | 0 | 0.9 |
| Sperm Whale | 2 | 0 | 1 | 1 | 0 | 0 | 1.9 |

# 4.0 STATISTICAL SUMMARIES OF CATCH, REVENUE, AND EFFORT

This chapter presents tabular and graphical summaries of commercial HMS fisheries in Section 4.1, including landings, nominal and real revenues, and participation. Summaries of recreational HMS fisheries are provided in Section 4.2, including catch estimates by species for the private vessel recreational fleet and catch, effort and participation estimates for the commercial passenger fishing vessel (CPFV) fleet. Data sources include PacFIN for the commercial fisheries, RecFIN for the private vessel recreational fleet and the CPFV logbook database for CPFV catch and effort data summaries. Data sources and calculations are explained either in discussion or in footnotes. Commercial data summaries are either organized by catch species or by fishery (gears and fishing methods). PacFIN codes used to extract commercial fisheries data are summarized in Tables 4-56 (species codes) and 4-57 (gear codes).

## 4.1 Commercial Fisheries

**Table 4-1. West Coast commercial HMS landings, revenues, and average prices by species, 2009–2010.**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| **Species** | **Landings (round mt)** | **Ex-vessel revenue ($1000)** | **Average price ($/ round lb)** | **Landings (round mt)** | **Ex-vessel revenue ($1000)** | **Average price ($/ round lb)** |
| **Tunas** | | | | | | |
| Albacore | 12,307 | $27,584 | $1.02 | 11,855 | $29,572 | $1.13 |
| Yellowfin | 45 | $167 | $1.68 | 1 | $7 | N.A. |
| Skipjack | 5 | $5 | N.A. | 1 | $2 | N.A. |
| Bigeye | 12 | $97 | $3.67 | 31 | $242 | $3.54 |
| Bluefin | 415 | $443 | $0.48 | 1 | $5 | N.A. |
| Unspecified Tuna | | | N.A. | 1 | $6 | N.A. |
| **Tunas subtotal** | **12,784** | **$28,296** | **$1.00** | **11,890** | **$29,834** | **$1.14** |
| **Swordfish** | **407** | **$1,930** | **$2.15** | **367** | **$2,185** | **$2.70** |
| **Sharks** | | | | | | |
| Common Thresher | 106 | $198 | $0.85 | 95 | $155 | $0.74 |
| Pelagic Thresher | <0.5 | < $0.5 | N.A. | <0.5 | < $0.5 | N.A. |
| Bigeye Thresher | 7 | $5 | N.A. | 1 | $1 | N.A. |
| Shortfin Mako | 30 | $54 | $0.82 | 21 | $36 | $0.77 |
| Blue | 1 | $2 | N.A. | <0.5 | < $0.5 | N.A. |
| **Sharks subtotal** | **144** | **$259** | **$0.82** | **117** | **$192** | **$0.74** |
| **Dorado** | **1** | **$4** | **N.A.** | **4** | **$16** | **N.A.** |
| **Total HMS** | **13,336** | **$30,489** | **$1.04** | **12,378** | **$32,227** | **$1.18** |

**Interpretation**: The total West Coast commercial HMS catch was 12.4 thousand mt in 2010, down7.2percent from 13.3 thousand mt in 2009. Tunas continued to represent 96 percent of the total catch by weight in 2010. Albacore tuna catch was down 3.7 percent from the catch in the previous year,

and was by far the largest component of tuna catch, representing 99.7 percent of the total by weight. Bigeye was the next largest component of tuna catch at 31 mt.

Swordfish was the category with the next largest share of landings behind tuna at 3 percent of the total weight. Swordfish landings by weight were down by 10 percent (40 mt) from 2009 to 2010. Common thresher shark again comprised the largest component of commercial shark landings by weight in 2010. Total commercial shark landings by weight decreased by 19 percent (27mt) from 2009 to 2010.

Total current dollar West Coast commercial HMS ex-vessel revenue of $32.2 million increased from $30.5 million in the previous year, by5.7 percent ($1.7 million). Tunas comprised 93 percent of the 2010 revenue total. Albacore generated by far the most important component of revenue for any single species, at $29.6 million. Swordfish was the next highest contributor to total revenue at $2.2 million.

The average price for tuna was 13.4 percent higher in 2010 than in 2009. The overall average West Coast commercial HMS fish price increased from $1.04in 2009 to $1.18 in 2010, or roughly 14 percent. Prices are not reported for species with fewer than 10 mt of landings, due to potentially large rounding errors.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011 (landings and revenues), and represent the latest two years of current dollar revenues and landings data shown in Tables 4-4 and 4–5. Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line, then dividing by 2204.6. Revenues were computed for each species as the sum total of landed weights in pounds multiplied by the prices per pound in each fish ticket line. Aquaculture fish ticket / fish ticket line information is excluded from the data. Average prices are estimated as revenue divided by round pounds, where the latter are metric tons multiplied by 2204.6. Estimated averages are subject to rounding error for categories with small revenues or landings.

**Table 4-2. West Coast commercial Highly Migratory Species landings, revenues, and average prices by fishery, 2009-2010.**

| | 2009 | | | 2010 | | |
|---|---|---|---|---|---|---|
| Fishery | Landings (round mt) | Ex-vessel revenue ($1000) | Average price ($/ round lb) | Landings (round mt) | Ex-vessel revenue ($1000) | Average price ($/ round lb) |
| Surface Hook-and-line*** | 11,622 | $25,935 | $1.01 | 10,868 | $26,431 | $1.10 |
| Drift gillnet | 493 | $1,584 | $1.46 | 238 | $853 | $1.63 |
| Harpoon | 51 | $469 | $4.17 | 36 | $354 | $4.46 |
| Longline | ** | ** | ** | ** | ** | ** |
| Purse seine | 943 | $821 | $0.40 | * | * | * |
| **Total HMS** | **13,109** | **$28,810** | **$1.00** | **11,142** | **$27,638** | **$1.13** |

* Not reported due to data confidentiality requirements (fewer than three vessels).
** Not reported due to data confidentiality requirements based on non-PacFIN data sources (mandatory logbooks, permits, etc.)
*** Canadian vessels are excluded.

**Interpretation**: Table 4–2 shows total West Coast commercial HMS catch for the indicated fisheries. The totals shown exclude data for fisheries with fewer than three participating vessels, due to confidentiality requirements. The surface hook-and-line fishery represented 98 percent of the total catch for the fisheries whose landings are shown in the table.

Total current dollar West Coast commercial HMS ex-vessel revenue of $27.6 million in 2010 for the fisheries reported in the table decreased from $28.8 million in 2009, for a percentage decrease of 4.1 percent ($1,172 thousand). The overall average West Coast commercial HMS price per round metric ton of catch for these fisheries increased from $1.00 in 2009 to $1.13 in 2010 (13 percent increase).

**Source and Calculations**: The data were extracted from PacFIN on various dates in August 2011, and represent the latest two years of current dollar revenues and landings data in Tables 4–9 through 4–18. Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line, then dividing by 2204.6. Revenues were computed for each species as the sum total of landed weights in pounds multiplied by the prices per pound in each fish ticket line. Aquaculture fish ticket / fish ticket line information is excluded from the data. Average prices are estimated as revenue divided by round pounds, where the latter are metric tons multiplied by 2204.6. Estimated averages are subject to rounding error for categories with small revenues or landings. Data for Canadian surface hook-and-line vessels fishing in the U.S. EEZ are excluded from the table.

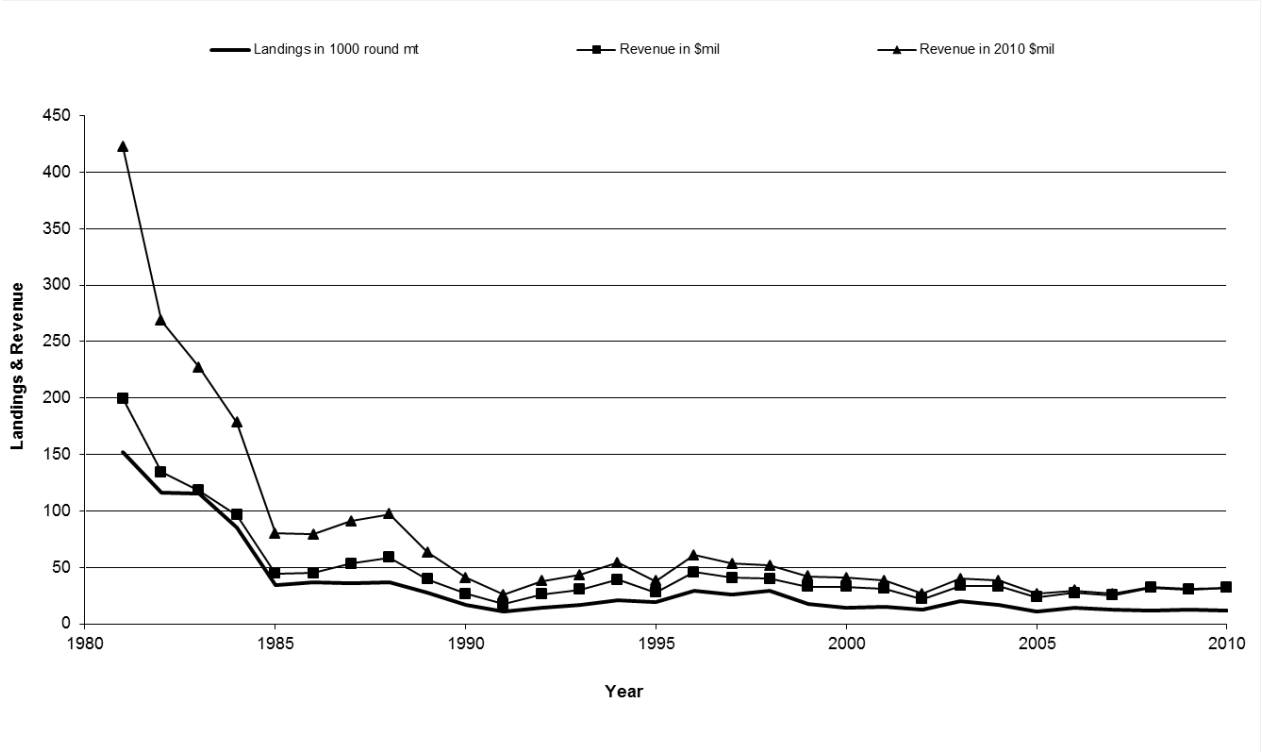


**Figure 4-1. West Coast commercial HMS landings and revenues, 1981–2010.**

**Interpretation**: Figure 4–1 shows aggregate West Coast HMS commercial landings in thousands of round metric tons and aggregate revenues in millions of both current and 2010 dollars from 1981 through 2010. The accompanying tables below (Tables 4–4 through 4–6) show commercial landings and revenues by species. Data for the graph are displayed in the far right columns of the three accompanying tables.

The most striking feature of Figure 4-1 is a precipitous drop in both commercial landings and revenues over the period from 1981 through 1985. Landings fell from a level of about 150,000 mt in 1981 to a level which has remained permanently below 50,000 mt from 1985 onwards. Revenues in real (2010) dollars fell from $423 million in 1981 to a level permanently below $200 million after 1984.Landings have recently occurred at levels between 10-20 mt, while real revenues since 2001 have ranged between $25 million and $40 million in 2010 dollars.

The drops in landings and revenues are primarily explained by the substantial decline in tuna landings during the 1980s for species other than albacore. This drop in tuna landings reflects a decline in purse seine landings and revenues, which is largely explained by structural changes in the tuna purse seine fishing industry after 1980. In 1980, there were 20 U.S. tuna processing plants in operation; this number declined to seven by 1990, while the U.S. fleet of purse seiners in the Eastern Pacific Ocean (EPO) declined from 135 vessels in 1981 to fewer than 20 vessels in years since 1998.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011(landings and revenues). Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line then dividing by 2204.6. Current dollar revenues were computed as the sum total of landed weights in pounds multiplied by the prices per pound in each fish ticket line. Aquaculture fish ticket / fish ticket line information is excluded from the data. Revenues in current dollars were adjusted to 2010 dollars using the implicit GDP deflator as calculated by the Bureau of Economic Analysis. Data for the graph were calculated by summing revenues and landings across all species in each year.

**Table 4-3. West Coast commercial HMS landings and revenues, 1981–2010.**

| Year | Landings (1000 round mt) | Revenue ($mil.) | Revenue (2010 $mil.) |
|---|---|---|---|
| 1981 | 152 | $200 | $423 |
| 1982 | 116 | $134 | $269 |
| 1983 | 115 | $118 | $227 |
| 1984 | 85 | $96 | $178 |
| 1985 | 34 | $44 | $80 |
| 1986 | 37 | $45 | $79 |
| 1987 | 36 | $53 | $91 |
| 1988 | 37 | $59 | $97 |
| 1989 | 28 | $40 | $63 |
| 1990 | 17 | $27 | $41 |
| 1991 | 11 | $17 | $26 |
| 1992 | 14 | $26 | $38 |
| 1993 | 17 | $31 | $43 |
| 1994 | 21 | $39 | $54 |
| 1995 | 19 | $28 | $38 |
| 1996 | 29 | $46 | $61 |
| 1997 | 26 | $41 | $53 |
| 1998 | 29 | $40 | $52 |
| 1999 | 18 | $33 | $42 |
| 2000 | 14 | $33 | $41 |
| 2001 | 15 | $31 | $38 |
| 2002 | 13 | $22 | $27 |
| 2003 | 20 | $34 | $40 |
| 2004 | 17 | $33 | $38 |
| 2005 | 11 | $24 | $26 |
| 2006 | 14 | $27 | $29 |
| 2007 | 13 | $26 | $27 |
| 2008 | 12 | $32 | $33 |
| 2009 | 13 | $30 | $31 |
| 2010 | 12 | $32 | $32 |

**Table 4-4. West Coast commercial landings of HMS by all HMS and non-HMS gears, 1981–2010.**

| | Landings (round mt) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tunas | | | | | | | Sharks | | | | | | |
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified | Swordfish | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Dorado | Total |
| 1981 | 13,712 | 76,091 | 57,869 | 1,168 | 868 | 40 | 749 | 1,521 | | | 182 | 92 | 4 | 152,296 |
| 1982 | 5,410 | 61,769 | 41,904 | 968 | 2,404 | 51 | 1,112 | 1,848 | | 28 | 351 | 27 | 1 | 115,873 |
| 1983 | 9,578 | 55,741 | 44,995 | 21 | 764 | 55 | 1,763 | 1,331 | 9 | 96 | 217 | 7 | 1 | 114,578 |
| 1984 | 12,654 | 35,063 | 31,251 | 126 | 635 | 1,014 | 2,890 | 1,279 | 9 | 57 | 160 | 2 | 4 | 85,144 |
| 1985 | 7,301 | 15,025 | 2,977 | 7 | 3,254 | 468 | 3,418 | 1,190 | <0.5 | 95 | 149 | 1 | <0.5 | 33,885 |
| 1986 | 5,243 | 21,517 | 1,361 | 29 | 4,731 | 143 | 2,530 | 974 | <0.5 | 48 | 312 | 2 | 2 | 36,892 |
| 1987 | 3,160 | 23,201 | 5,724 | 50 | 823 | 129 | 1,803 | 562 | 2 | 20 | 403 | 2 | <0.5 | 35,879 |
| 1988 | 4,912 | 19,520 | 8,863 | 6 | 804 | 11 | 1,636 | 500 | 1 | 9 | 322 | 3 | <0.5 | 36,587 |
| 1989 | 2,214 | 17,615 | 4,505 | 1 | 1,019 | 77 | 1,358 | 504 | <0.5 | 17 | 255 | 6 | <0.5 | 27,571 |
| 1990 | 3,028 | 8,509 | 2,256 | 2 | 925 | 46 | 1,236 | 357 | 1 | 31 | 373 | 20 | 1 | 16,785 |
| 1991 | 1,676 | 4,178 | 3,407 | 7 | 104 | 11 | 1,029 | 584 | | 32 | 219 | 1 | <0.5 | 11,248 |
| 1992 | 4,902 | 3,350 | 2,586 | 7 | 1,087 | 10 | 1,546 | 292 | <0.5 | 22 | 142 | 1 | 3 | 13,948 |
| 1993 | 6,166 | 3,795 | 4,539 | 26 | 559 | 16 | 1,767 | 275 | 1 | 44 | 122 | <0.5 | 17 | 17,327 |
| 1994 | 10,751 | 5,056 | 2,111 | 47 | 916 | 33 | 1,700 | 330 | <0.5 | 37 | 128 | 12 | 41 | 21,162 |
| 1995 | 6,530 | 3,038 | 7,037 | 49 | 714 | 1 | 1,162 | 270 | 5 | 31 | 95 | 5 | 5 | 18,942 |
| 1996 | 14,173 | 3,347 | 5,455 | 62 | 4,688 | 3 | 1,198 | 319 | 1 | 20 | 96 | 1 | 10 | 29,373 |
| 1997 | 11,292 | 4,775 | 6,070 | 82 | 2,251 | 11 | 1,459 | 320 | 35 | 32 | 132 | 1 | 5 | 26,465 |
| 1998 | 13,915 | 5,799 | 5,846 | 53 | 1,949 | 12 | 1,408 | 361 | 2 | 11 | 100 | 3 | 3 | 29,462 |
| 1999 | 9,770 | 1,353 | 3,759 | 108 | 186 | 12 | 2,033 | 320 | 10 | 5 | 63 | <0.5 | 17 | 17,636 |
| 2000 | 9,074 | 1,159 | 780 | 86 | 313 | 1 | 2,645 | 296 | 3 | 5 | 80 | 1 | 43 | 14,486 |
| 2001 | 11,191 | 655 | 58 | 53 | 196 | 1 | 2,195 | 373 | 2 | 2 | 46 | 2 | 16 | 14,790 |
| 2002 | 10,029 | 544 | 236 | 10 | 11 | 2 | 1,725 | 301 | 2 | | 82 | 41 | <0.5 | 12,983 |
| 2003 | 16,671 | 465 | 349 | 35 | 36 | <0.5 | 2,135 | 301 | 4 | 6 | 70 | 1 | 6 | 20,079 |
| 2004 | 14,540 | 488 | 307 | 22 | 10 | 9 | 1,186 | 115 | 2 | 5 | 54 | 1 | 1 | 16,740 |
| 2005 | 9,055 | 285 | 523 | 10 | 207 | <0.5 | 297 | 179 | <0.5 | 10 | 33 | 1 | <0.5 | 10,600 |
| 2006 | 12,786 | 77 | 48 | 35 | 1 | 1 | 541 | 160 | <0.5 | 4 | 46 | <0.5 | 3 | 13,702 |
| 2007 | 11,586 | 104 | 5 | 13 | 45 | <0.5 | 550 | 204 | 2 | 5 | 45 | 10 | 2 | 12,571 |
| 2008 | 11,131 | 65 | 3 | 27 | 1 | 1 | 531 | 147 | <0.5 | 6 | 35 | <0.5 | 2 | 11,949 |
| 2009 | 12,307 | 45 | 5 | 12 | 415 | | 407 | 106 | <0.5 | 7 | 30 | 1 | 1 | 13,336 |
| 2010 | 11,855 | 1 | 1 | 31 | 1 | 1 | 367 | 95 | <0.5 | 1 | 21 | <0.5 | 4 | 12,378 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 16, 2011.
Additional processing info:
Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.
Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-5. West Coast nominal commercial ex-vessel revenues from HMS landings by all HMS and non-HMS gears, 1981–2010.**

| | Revenues ($) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tunas | | | | | | | Sharks | | | | | | |
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified | Swordfish | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Dorado | Total |
| 1981 | 26,524,145 | 98,722,280 | 66,331,030 | 1,569,755 | 1,239,005 | 72,694 | 3,355,010 | 1,475,634 | | | 162,347 | 59,064 | 2,801 | 199,513,765 |
| 1982 | 8,033,073 | 74,468,306 | 40,507,405 | 1,208,147 | 2,690,102 | 98,923 | 5,115,995 | 1,980,592 | | 15,168 | 339,209 | 18,826 | 956 | 134,476,702 |
| 1983 | 12,242,167 | 59,475,802 | 36,652,119 | 45,946 | 1,062,909 | 95,490 | 6,800,233 | 1,474,213 | 8,449 | 91,455 | 229,826 | 4,645 | 695 | 118,183,949 |
| 1984 | 17,208,448 | 37,038,204 | 24,790,704 | 174,405 | 904,956 | 2,590,391 | 11,621,524 | 1,642,178 | 7,723 | 47,119 | 189,794 | 2,470 | 4,272 | 96,222,188 |
| 1985 | 8,292,769 | 14,690,108 | 2,118,170 | 17,693 | 2,819,048 | 1,028,867 | 13,415,105 | 1,817,135 | 716 | 96,433 | 192,917 | 2,132 | 377 | 44,491,470 |
| 1986 | 6,178,084 | 18,079,443 | 904,609 | 90,227 | 4,636,698 | 198,248 | 12,726,490 | 1,690,791 | 194 | 66,647 | 428,259 | 1,320 | 757 | 45,001,767 |
| 1987 | 5,127,832 | 27,878,667 | 4,426,717 | 176,504 | 2,057,402 | 448,231 | 11,115,940 | 1,184,091 | 1,840 | 22,123 | 715,138 | 1,853 | 357 | 53,156,695 |
| 1988 | 9,117,601 | 27,030,132 | 9,249,827 | 26,156 | 2,070,411 | 80,548 | 9,719,489 | 979,905 | 821 | 9,764 | 649,799 | 2,275 | 527 | 58,937,255 |
| 1989 | 3,785,613 | 20,824,242 | 3,944,894 | 2,415 | 1,271,718 | 127,320 | 8,259,204 | 944,161 | 149 | 24,711 | 552,576 | 3,465 | 485 | 39,740,953 |
| 1990 | 5,620,990 | 9,383,584 | 1,898,875 | 8,771 | 1,149,381 | 56,750 | 7,146,946 | 638,630 | 1,682 | 34,628 | 739,193 | 10,303 | 1,943 | 26,691,676 |
| 1991 | 2,823,937 | 3,996,935 | 2,692,345 | 42,810 | 116,371 | 21,161 | 6,342,361 | 968,877 | | 25,179 | 415,168 | 894 | 1,167 | 17,447,205 |
| 1992 | 11,483,392 | 3,677,441 | 1,410,546 | 44,731 | 1,129,626 | 21,228 | 7,566,616 | 464,018 | 602 | 14,629 | 231,063 | 1,816 | 6,247 | 26,051,955 |
| 1993 | 11,697,562 | 4,821,735 | 3,282,778 | 211,513 | 752,369 | 72,678 | 8,953,927 | 458,513 | 462 | 28,190 | 221,401 | 622 | 42,223 | 30,543,973 |
| 1994 | 20,188,895 | 4,522,321 | 1,751,209 | 307,147 | 1,674,099 | 55,245 | 9,596,037 | 584,318 | 42 | 33,478 | 247,088 | 16,057 | 74,889 | 39,050,825 |
| 1995 | 11,572,603 | 3,044,670 | 4,752,641 | 258,727 | 1,057,948 | 5,136 | 6,569,451 | 477,901 | 8,777 | 24,896 | 165,215 | 2,796 | 5,479 | 27,946,240 |
| 1996 | 27,222,294 | 3,230,957 | 3,986,113 | 260,306 | 4,035,455 | 28,296 | 6,063,794 | 603,006 | 1,557 | 17,745 | 167,111 | 587 | 9,815 | 45,627,036 |
| 1997 | 19,924,121 | 4,991,131 | 5,504,526 | 359,780 | 2,773,705 | 21,895 | 6,147,707 | 591,268 | 62,496 | 34,768 | 227,426 | 327 | 10,858 | 40,650,008 |
| 1998 | 18,895,247 | 5,861,959 | 5,213,131 | 271,919 | 2,965,485 | 61,688 | 5,981,719 | 625,489 | 2,584 | 9,428 | 176,313 | 5,996 | 10,492 | 40,081,450 |
| 1999 | 17,771,262 | 1,468,209 | 2,748,208 | 657,121 | 1,061,233 | 60,572 | 8,445,728 | 617,691 | 18,424 | 5,876 | 111,119 | 73 | 47,854 | 33,013,370 |
| 2000 | 17,188,570 | 1,329,357 | 483,242 | 576,919 | 580,722 | 2,298 | 11,753,472 | 589,035 | 2,738 | 4,636 | 133,621 | 720 | 63,293 | 32,708,623 |
| 2001 | 20,680,501 | 465,558 | 33,633 | 320,855 | 473,557 | 3,069 | 8,696,689 | 595,548 | 2,767 | 8,428 | 75,799 | 1,294 | 19,397 | 31,377,095 |
| 2002 | 14,256,910 | 588,677 | 128,245 | 87,304 | 43,477 | 6,325 | 6,403,254 | 503,487 | 1,946 | | 124,521 | 18,510 | 725 | 22,163,381 |
| 2003 | 24,435,697 | 451,273 | 159,961 | 262,768 | 76,106 | 21 | 7,851,693 | 487,796 | 2,814 | 3,779 | 115,728 | 390 | 10,370 | 33,858,396 |
| 2004 | 27,414,167 | 446,577 | 109,254 | 147,696 | 38,312 | 54,879 | 4,835,731 | 197,188 | 2,500 | 4,060 | 98,827 | 489 | 5,637 | 33,355,317 |
| 2005 | 20,823,045 | 315,699 | 292,193 | 60,141 | 136,847 | 913 | 1,899,245 | 271,767 | 588 | 6,234 | 57,788 | 426 | 1,290 | 23,866,176 |
| 2006 | 23,776,441 | 174,912 | 40,350 | 205,677 | 3,790 | 1,895 | 2,748,856 | 301,669 | 271 | 4,509 | 79,586 | 309 | 17,984 | 27,356,249 |
| 2007 | 21,633,438 | 149,568 | 4,361 | 94,734 | 58,106 | 46 | 3,131,178 | 337,770 | 2,903 | 4,334 | 78,569 | 1,984 | 10,092 | 25,507,083 |
| 2008 | 28,853,123 | 125,508 | 3,675 | 205,536 | 3,340 | 3,485 | 2,372,762 | 280,885 | 434 | 5,459 | 67,255 | 177 | 9,192 | 31,930,831 |
| 2009 | 27,584,153 | 166,620 | 5,332 | 97,103 | 443,095 | | 1,929,884 | 197,718 | 72 | 5,453 | 54,463 | 2,361 | 4,183 | 30,490,437 |
| 2010 | 29,572,460 | 6,861 | 1,899 | 241,834 | 4,985 | 6,356 | 2,184,610 | 155,259 | 100 | 924 | 35,565 | 177 | 15,851 | 32,226,881 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 16, 2011.

Additional processing info:

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-6. West Coast real commercial ex-vessel revenues (2010 $) from HMS landings by all HMS and non-HMS gears, 1981–2010.**

| | Revenues (2010 $) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tunas | | | | | | | Sharks | | | | | | | |
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified | Swordfish | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Dorado | Total |
| 1981 | 56,207,132 | 209,201,696 | 140,561,623 | 3,326,456 | 2,625,568 | 154,044 | 7,109,578 | 3,127,006 | | | 344,029 | 125,162 | 5,935 | 422,788,229 |
| 1982 | 16,043,686 | 148,728,393 | 80,901,548 | 2,412,915 | 5,372,683 | 197,569 | 10,217,685 | 3,955,647 | | 30,294 | 677,470 | 37,598 | 1,909 | 268,577,397 |
| 1983 | 23,520,014 | 114,266,671 | 70,417,136 | 88,272 | 2,042,092 | 183,459 | 13,064,809 | 2,832,302 | 16,233 | 175,706 | 441,548 | 8,924 | 1,335 | 227,058,501 |
| 1984 | 31,861,597 | 68,576,568 | 45,900,211 | 322,912 | 1,675,535 | 4,796,133 | 21,517,356 | 3,040,507 | 14,299 | 87,240 | 351,405 | 4,574 | 7,909 | 178,156,246 |
| 1985 | 14,904,329 | 26,402,064 | 3,806,920 | 31,799 | 5,066,586 | 1,849,151 | 24,110,542 | 3,265,879 | 1,288 | 173,315 | 346,723 | 3,831 | 677 | 79,963,104 |
| 1986 | 10,863,521 | 31,790,826 | 1,590,661 | 158,654 | 8,153,153 | 348,599 | 22,378,214 | 2,973,081 | 342 | 117,192 | 753,048 | 2,322 | 1,331 | 79,130,944 |
| 1987 | 8,762,529 | 47,639,553 | 7,564,451 | 301,614 | 3,515,724 | 765,945 | 18,995,113 | 2,023,395 | 3,144 | 37,804 | 1,222,041 | 3,167 | 610 | 90,835,090 |
| 1988 | 15,062,946 | 44,655,762 | 15,281,393 | 43,212 | 3,420,471 | 133,071 | 16,057,310 | 1,618,876 | 1,356 | 16,130 | 1,073,515 | 3,758 | 870 | 97,368,670 |
| 1989 | 6,026,127 | 33,149,065 | 6,279,679 | 3,844 | 2,024,384 | 202,675 | 13,147,412 | 1,502,963 | 237 | 39,336 | 879,618 | 5,516 | 773 | 63,261,629 |
| 1990 | 8,615,865 | 14,383,176 | 2,910,599 | 13,444 | 1,761,773 | 86,986 | 10,954,853 | 978,893 | 2,578 | 53,078 | 1,133,037 | 15,793 | 2,977 | 40,913,052 |
| 1991 | 4,179,895 | 5,916,126 | 3,985,117 | 63,367 | 172,249 | 31,322 | 9,387,746 | 1,434,099 | | 37,269 | 614,517 | 1,323 | 1,728 | 25,824,758 |
| 1992 | 16,604,094 | 5,317,295 | 2,039,540 | 64,678 | 1,633,352 | 30,693 | 10,940,741 | 670,934 | 871 | 21,152 | 334,099 | 2,626 | 9,032 | 37,669,107 |
| 1993 | 16,547,689 | 6,820,957 | 4,643,907 | 299,213 | 1,064,322 | 102,813 | 12,666,469 | 648,624 | 653 | 39,879 | 313,200 | 879 | 59,730 | 43,208,335 |
| 1994 | 27,970,207 | 6,265,338 | 2,426,169 | 425,529 | 2,319,339 | 76,537 | 13,294,592 | 809,529 | 58 | 46,381 | 342,322 | 22,246 | 103,753 | 54,102,000 |
| 1995 | 15,706,573 | 4,132,289 | 6,450,381 | 351,149 | 1,435,869 | 6,971 | 8,916,193 | 648,616 | 11,912 | 33,790 | 224,234 | 3,795 | 7,436 | 37,929,208 |
| 1996 | 36,257,717 | 4,303,353 | 5,309,154 | 346,705 | 5,374,873 | 37,687 | 8,076,444 | 803,151 | 2,074 | 23,635 | 222,578 | 782 | 13,073 | 60,771,226 |
| 1997 | 26,075,279 | 6,532,039 | 7,203,935 | 470,855 | 3,630,029 | 28,655 | 8,045,684 | 773,810 | 81,790 | 45,501 | 297,639 | 428 | 14,211 | 53,199,855 |
| 1998 | 24,453,535 | 7,586,332 | 6,746,643 | 351,908 | 3,837,822 | 79,834 | 7,741,322 | 809,485 | 3,344 | 12,202 | 228,178 | 7,760 | 13,578 | 51,871,943 |
| 1999 | 22,664,535 | 1,872,477 | 3,504,920 | 838,058 | 1,353,440 | 77,251 | 10,771,239 | 787,771 | 23,497 | 7,493 | 141,715 | 94 | 61,031 | 42,103,521 |
| 2000 | 21,456,210 | 1,659,415 | 603,223 | 720,159 | 724,906 | 2,869 | 14,671,666 | 735,282 | 3,417 | 5,787 | 166,797 | 899 | 79,007 | 40,829,637 |
| 2001 | 25,244,752 | 568,309 | 41,056 | 391,669 | 578,073 | 3,746 | 10,616,075 | 726,988 | 3,378 | 10,288 | 92,529 | 1,579 | 23,679 | 38,302,121 |
| 2002 | 17,127,474 | 707,204 | 154,067 | 104,882 | 52,231 | 7,599 | 7,692,521 | 604,862 | 2,337 | | 149,593 | 22,237 | 870 | 26,625,877 |
| 2003 | 28,737,737 | 530,723 | 188,123 | 309,030 | 89,505 | 25 | 9,234,027 | 573,675 | 3,309 | 4,445 | 136,102 | 459 | 12,196 | 39,819,356 |
| 2004 | 31,348,389 | 510,666 | 124,933 | 168,891 | 43,810 | 62,754 | 5,529,710 | 225,486 | 2,859 | 4,642 | 113,009 | 560 | 6,446 | 38,142,155 |
| 2005 | 23,041,989 | 349,341 | 323,330 | 66,550 | 151,429 | 1,010 | 2,101,632 | 300,727 | 651 | 6,898 | 63,946 | 471 | 1,427 | 26,409,401 |
| 2006 | 25,481,128 | 187,453 | 43,243 | 220,423 | 4,062 | 2,030 | 2,945,939 | 323,297 | 290 | 4,832 | 85,292 | 331 | 19,273 | 29,317,593 |
| 2007 | 22,523,101 | 155,719 | 4,540 | 98,630 | 60,496 | 47 | 3,259,945 | 351,661 | 3,022 | 4,512 | 81,800 | 2,066 | 10,507 | 26,556,046 |
| 2008 | 29,396,967 | 127,874 | 3,744 | 209,410 | 3,403 | 3,551 | 2,417,486 | 286,179 | 442 | 5,562 | 68,523 | 181 | 9,366 | 32,532,688 |
| 2009 | 27,848,716 | 168,218 | 5,383 | 98,035 | 447,345 | | 1,948,393 | 199,615 | 73 | 5,505 | 54,986 | 2,384 | 4,223 | 30,782,876 |
| 2010 | 29,572,460 | 6,861 | 1,899 | 241,834 | 4,985 | 6,356 | 2,184,610 | 155,259 | 100 | 924 | 35,565 | 177 | 15,851 | 32,226,881 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 16, 2011.
Additional processing info:
Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.
Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.
Aquaculture fish ticket/fish ticket line info is excluded.

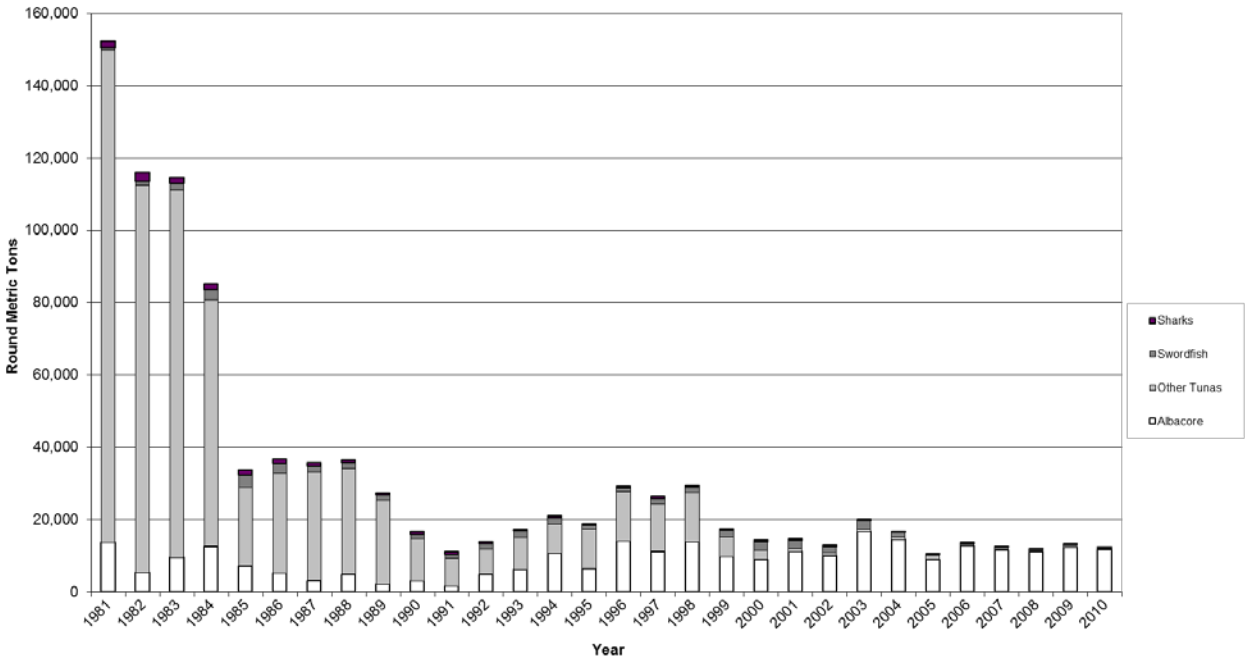


**Figure 4-2. West Coast commercial landings of albacore, other tunas, swordfish, and sharks, 1981–2010.**

**Interpretation**: Figure 4–2 shows West Coast HMS commercial landings in round metric tons grouped into categories of similar species. The accompanying table shows the numeric values for the landings in metric tons.

The principal species targeted are the tunas, with albacore gradually supplanting other tunas as a share of the catch over the period from 1981 through 2010.Swordfish, followed by sharks, comprises a far smaller share of recent total landings, with a steadily declining share in recent years.

The most striking feature of Figure 4-2 is a large drop in aggregate commercial landings from a level of about 150,000 mt in 1981 to levels near 20,000 mt by 1990. The drop is primarily explained by the substantial decline in tuna landings during the 1980s for species other than albacore.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011. They replicate a portion of Table 4–4, which displays West Coast commercial landings of HMS by species. Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6. Aquaculture fish ticket / fish ticket line information is excluded from the data.

**Table 4-7. West Coast commercial landings of albacore, other tunas, swordfish, and sharks, 1981–2010.**

| | Landings (round mt) | | | | |
|---|---|---|---|---|---|
| Year | Albacore | Other Tunas | Swordfish | Sharks | Total |
| 1981 | 13,712 | 136,036 | 749 | 1,795 | 152,292 |
| 1982 | 5,410 | 107,096 | 1,112 | 2,254 | 115,872 |
| 1983 | 9,578 | 101,576 | 1,763 | 1,660 | 114,577 |
| 1984 | 12,654 | 68,089 | 2,890 | 1,507 | 85,140 |
| 1985 | 7,301 | 21,731 | 3,418 | 1,435 | 33,885 |
| 1986 | 5,243 | 27,781 | 2,530 | 1,336 | 36,890 |
| 1987 | 3,160 | 29,927 | 1,803 | 989 | 35,879 |
| 1988 | 4,912 | 29,204 | 1,636 | 835 | 36,587 |
| 1989 | 2,214 | 23,217 | 1,358 | 782 | 27,571 |
| 1990 | 3,028 | 11,738 | 1,236 | 782 | 16,784 |
| 1991 | 1,676 | 7,707 | 1,029 | 836 | 11,248 |
| 1992 | 4,902 | 7,040 | 1,546 | 457 | 13,945 |
| 1993 | 6,166 | 8,935 | 1,767 | 442 | 17,310 |
| 1994 | 10,751 | 8,163 | 1,700 | 507 | 21,121 |
| 1995 | 6,530 | 10,839 | 1,162 | 406 | 18,937 |
| 1996 | 14,173 | 13,555 | 1,198 | 437 | 29,363 |
| 1997 | 11,292 | 13,189 | 1,459 | 520 | 26,460 |
| 1998 | 13,915 | 13,659 | 1,408 | 477 | 29,459 |
| 1999 | 9,770 | 5,418 | 2,033 | 398 | 17,619 |
| 2000 | 9,074 | 2,339 | 2,645 | 385 | 14,443 |
| 2001 | 11,191 | 963 | 2,195 | 425 | 14,774 |
| 2002 | 10,029 | 803 | 1,725 | 426 | 12,983 |
| 2003 | 16,671 | 885 | 2,135 | 382 | 20,073 |
| 2004 | 14,540 | 836 | 1,186 | 177 | 16,739 |
| 2005 | 9,055 | 1,025 | 297 | 223 | 10,600 |
| 2006 | 12,786 | 162 | 541 | 210 | 13,699 |
| 2007 | 11,586 | 167 | 550 | 266 | 12,569 |
| 2008 | 11,131 | 97 | 531 | 188 | 11,947 |
| 2009 | 12,307 | 477 | 407 | 144 | 13,335 |
| 2010 | 11,855 | 35 | 367 | 117 | 12,374 |

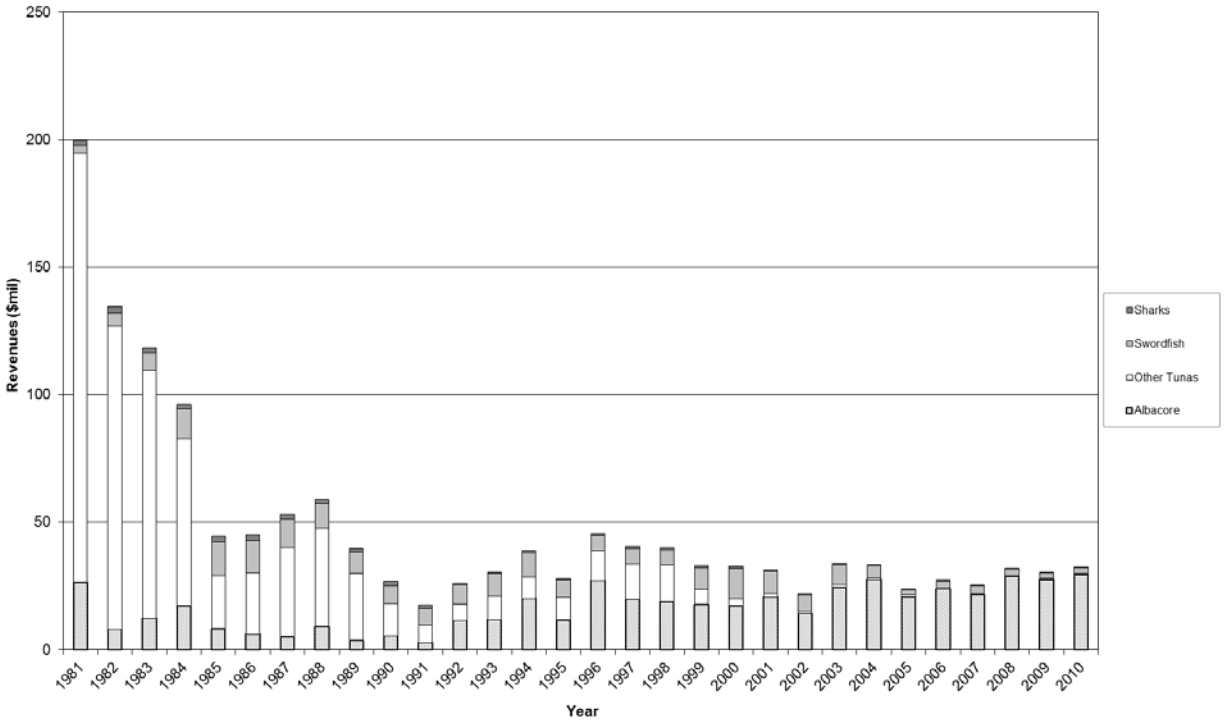


**Figure 4-3. West Coast commercial revenues for albacore, other tunas, swordfish, and sharks, 1981–2010.**

**Interpretation:** Figure 4–3 shows West Coast HMS commercial revenues in current dollars grouped into categories of similar species. Table 4–8 shows the numeric values for the revenues. Tables 4–9 through 4–23 show landings as well as nominal and real ex-vessel revenues by fishery.

The principal component of revenues is the tunas, with albacore gradually supplanting other tunas as a share of the revenues over the period from 1981 through 2010.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011. Aquaculture fish ticket / fish ticket line information is excluded from the data. Data were obtained by copying from or summing across applicable columns of Table 4–5. Current dollar revenues were computed as the sum total of landed weights in pounds multiplied by the prices per pound in each fish ticket line.

**Table 4-8. West Coast commercial revenues for albacore, other tunas, swordfish, and sharks, 1981–2010.**

| Year | Revenues ($) | | | | |
|---|---|---|---|---|---|
| | Albacore | Other Tunas | Swordfish | Sharks | Total |
| 1981 | 26,524,145 | 167,934,764 | 3,355,010 | 1,697,045 | 199,510,964 |
| 1982 | 8,033,073 | 118,972,883 | 5,115,995 | 2,353,795 | 134,475,746 |
| 1983 | 12,242,167 | 97,332,266 | 6,800,233 | 1,808,588 | 118,183,254 |
| 1984 | 17,208,448 | 65,498,660 | 11,621,524 | 1,889,284 | 96,217,916 |
| 1985 | 8,292,769 | 20,673,886 | 13,415,105 | 2,109,333 | 44,491,093 |
| 1986 | 6,178,084 | 23,909,225 | 12,726,490 | 2,187,211 | 45,001,010 |
| 1987 | 5,127,832 | 34,987,521 | 11,115,940 | 1,925,045 | 53,156,338 |
| 1988 | 9,117,601 | 38,457,074 | 9,719,489 | 1,642,564 | 58,936,728 |
| 1989 | 3,785,613 | 26,170,589 | 8,259,204 | 1,525,062 | 39,740,468 |
| 1990 | 5,620,990 | 12,497,361 | 7,146,946 | 1,424,436 | 26,689,733 |
| 1991 | 2,823,937 | 6,869,622 | 6,342,361 | 1,410,118 | 17,446,038 |
| 1992 | 11,483,392 | 6,283,572 | 7,566,616 | 712,128 | 26,045,708 |
| 1993 | 11,697,562 | 9,141,073 | 8,953,927 | 709,188 | 30,501,750 |
| 1994 | 20,188,895 | 8,310,021 | 9,596,037 | 880,983 | 38,975,936 |
| 1995 | 11,572,603 | 9,119,122 | 6,569,451 | 679,585 | 27,940,761 |
| 1996 | 27,222,294 | 11,541,127 | 6,063,794 | 790,006 | 45,617,221 |
| 1997 | 19,924,121 | 13,651,037 | 6,147,707 | 916,285 | 40,639,150 |
| 1998 | 18,895,247 | 14,374,182 | 5,981,719 | 819,810 | 40,070,958 |
| 1999 | 17,771,262 | 5,995,343 | 8,445,728 | 753,183 | 32,965,516 |
| 2000 | 17,188,570 | 2,972,538 | 11,753,472 | 730,750 | 32,645,330 |
| 2001 | 20,680,501 | 1,296,672 | 8,696,689 | 683,836 | 31,357,698 |
| 2002 | 14,256,910 | 854,028 | 6,403,254 | 648,464 | 22,162,656 |
| 2003 | 24,435,697 | 950,129 | 7,851,693 | 610,507 | 33,848,026 |
| 2004 | 27,414,167 | 796,718 | 4,835,731 | 303,064 | 33,349,680 |
| 2005 | 20,823,045 | 805,793 | 1,899,245 | 336,803 | 23,864,886 |
| 2006 | 23,776,441 | 426,624 | 2,748,856 | 386,344 | 27,338,265 |
| 2007 | 21,633,438 | 306,815 | 3,131,178 | 425,560 | 25,496,991 |
| 2008 | 28,853,123 | 341,544 | 2,372,762 | 354,210 | 31,921,639 |
| 2009 | 27,584,153 | 712,150 | 1,929,884 | 260,067 | 30,486,254 |
| 2010 | 29,572,460 | 261,935 | 2,184,610 | 192,025 | 32,211,030 |

**Table 4-9. Commercial landings (round mt) in the West Coast albacore surface hook-and-line (troll and baitboat) fishery, with Canadian vessels excluded, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 13,493 | 14 | | <0.5 | <0.5 | 4 | 2 | 37 | 1 | 13,551 |
| 1982 | 4,977 | 4 | 4 | 2 | 1 | 4 | <0.5 | 3 | <0.5 | 4,995 |
| 1983 | 9,309 | 16 | 3 | 1 | <0.5 | 23 | 34 | 14 | 1 | 9,401 |
| 1984 | 8,909 | 13 | 25 | 5 | <0.5 | 5 | 2 | 1 | 4 | 8,964 |
| 1985 | 7,010 | 2 | 11 | 4 | <0.5 | 4 | <0.5 | 2 | 2 | 7,035 |
| 1986 | 4,980 | 2 | 1 | <0.5 | | 20 | <0.5 | 2 | 1 | 5,006 |
| 1987 | 2,891 | <0.5 | 5 | 2 | | 2 | 1 | 1 | 1 | 2,903 |
| 1988 | 4,629 | <0.5 | 18 | 2 | | 1 | <0.5 | 2 | 1 | 4,653 |
| 1989 | 2,167 | 1 | 7 | 8 | <0.5 | 10 | <0.5 | 2 | 2 | 2,197 |
| 1990 | 2,926 | <0.5 | 2 | <0.5 | <0.5 | 3 | <0.5 | 1 | 1 | 2,933 |
| 1991 | 1,641 | <0.5 | 2 | 1 | | <0.5 | | 1 | <0.5 | 1,645 |
| 1992 | 4,756 | 1 | 13 | 2 | <0.5 | 7 | | 1 | <0.5 | 4,780 |
| 1993 | 5,778 | 18 | 90 | 5 | 9 | 4 | | 3 | 2 | 5,909 |
| 1994 | 10,606 | <0.5 | 1 | <0.5 | <0.5 | 1 | | <0.5 | 1 | 10,609 |
| 1995 | 6,407 | 1 | 1 | <0.5 | <0.5 | <0.5 | <0.5 | 8 | 1 | 6,418 |
| 1996 | 13,207 | 42 | <0.5 | <0.5 | | <0.5 | | 10 | 1 | 13,260 |
| 1997 | 10,825 | 8 | 1 | 1 | <0.5 | 5 | <0.5 | 12 | 2 | 10,854 |
| 1998 | 12,724 | 116 | 4 | 3 | <0.5 | 2 | <0.5 | 5 | 2 | 12,856 |
| 1999 | 8,794 | 24 | 15 | 1 | <0.5 | 1 | <0.5 | 2 | 4 | 8,841 |
| 2000 | 8,098 | 2 | 22 | <0.5 | <0.5 | 1 | <0.5 | 3 | 1 | 8,127 |
| 2001 | 10,220 | 10 | <0.5 | 1 | <0.5 | 3 | <0.5 | 9 | 6 | 10,249 |
| 2002 | 9,293 | 2 | 2 | <0.5 | <0.5 | <0.5 | <0.5 | 7 | 4 | 9,308 |
| 2003 | 13,490 | 3 | | <0.5 | <0.5 | 1 | <0.5 | 4 | 2 | 13,500 |
| 2004 | 13,393 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | 4 | 3 | 13,401 |
| 2005 | 8,217 | <0.5 | | <0.5 | | 1 | | 3 | 1 | 8,222 |
| 2006 | 12,374 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 1 | 12,376 |
| 2007 | 11,143 | <0.5 | | | <0.5 | <0.5 | <0.5 | 1 | 1 | 11,145 |
| 2008 | 9,768 | 6 | <0.5 | | <0.5 | <0.5 | <0.5 | <0.5 | 3 | 9,777 |
| 2009 | 11,612 | 7 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 1 | 2 | 11,622 |
| 2010 | 10,865 | <0.5 | | <0.5 | <0.5 | <0.5 | | 3 | <0.5 | 10,868 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 18, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-10. Commercial landings (round mt) in the West Coast albacore surface hook-and-line (troll and baitboat) fishery, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 13,493 | 14 | | <0.5 | <0.5 | 4 | 2 | 37 | 1 | 13,551 |
| 1982 | 4,988 | 4 | 4 | 2 | 1 | 4 | <0.5 | 3 | <0.5 | 5,006 |
| 1983 | 9,341 | 16 | 3 | 1 | <0.5 | 23 | 34 | 14 | 1 | 9,433 |
| 1984 | 8,912 | 13 | 25 | 5 | <0.5 | 5 | 2 | 1 | 4 | 8,967 |
| 1985 | 7,010 | 2 | 11 | 4 | <0.5 | 4 | <0.5 | 2 | 2 | 7,035 |
| 1986 | 4,980 | 2 | 1 | <0.5 | | 20 | <0.5 | 2 | 1 | 5,006 |
| 1987 | 2,891 | <0.5 | 5 | 2 | | 2 | 1 | 1 | 1 | 2,903 |
| 1988 | 4,630 | <0.5 | 18 | 2 | | 1 | <0.5 | 2 | 1 | 4,654 |
| 1989 | 2,167 | 1 | 7 | 8 | <0.5 | 10 | <0.5 | 2 | 2 | 2,197 |
| 1990 | 2,926 | <0.5 | 2 | <0.5 | <0.5 | 3 | <0.5 | 1 | 1 | 2,933 |
| 1991 | 1,641 | <0.5 | 2 | 1 | | <0.5 | | 1 | <0.5 | 1,645 |
| 1992 | 4,815 | 1 | 13 | 2 | <0.5 | 7 | | 1 | <0.5 | 4,839 |
| 1993 | 5,800 | 18 | 90 | 5 | 9 | 4 | | 3 | 1 | 5,930 |
| 1994 | 10,629 | <0.5 | 1 | <0.5 | <0.5 | 1 | | <0.5 | 1 | 10,632 |
| 1995 | 6,474 | 1 | 1 | <0.5 | <0.5 | <0.5 | <0.5 | 8 | 1 | 6,485 |
| 1996 | 14,075 | 42 | <0.5 | <0.5 | | <0.5 | | 10 | 1 | 14,128 |
| 1997 | 11,223 | 8 | 1 | 1 | <0.5 | 5 | <0.5 | 12 | 3 | 11,253 |
| 1998 | 13,685 | 116 | 4 | 3 | <0.5 | 2 | <0.5 | 5 | 2 | 13,817 |
| 1999 | 9,506 | 24 | 15 | 1 | <0.5 | 1 | <0.5 | 2 | 5 | 9,554 |
| 2000 | 8,986 | 2 | 22 | <0.5 | <0.5 | 1 | <0.5 | 3 | 2 | 9,016 |
| 2001 | 11,015 | 10 | <0.5 | 1 | <0.5 | 3 | <0.5 | 9 | 6 | 11,044 |
| 2002 | 9,995 | 2 | 2 | <0.5 | <0.5 | <0.5 | <0.5 | 7 | 4 | 10,010 |
| 2003 | 16,608 | 3 | | <0.5 | <0.5 | 1 | <0.5 | 4 | 2 | 16,618 |
| 2004 | 14,523 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | 4 | 3 | 14,531 |
| 2005 | 9,028 | <0.5 | | <0.5 | | 1 | | 3 | 1 | 9,033 |
| 2006 | 12,772 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 1 | 12,774 |
| 2007 | 11,500 | <0.5 | | | <0.5 | <0.5 | <0.5 | 1 | 1 | 11,502 |
| 2008 | 11,128 | 6 | <0.5 | | <0.5 | <0.5 | <0.5 | <0.5 | 3 | 11,137 |
| 2009 | 12,263 | 7 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 1 | 2 | 12,273 |
| 2010 | 11,823 | <0.5 | | <0.5 | <0.5 | <0.5 | | 3 | <0.5 | 11,826 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 19, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-11. Commercial landings (round mt) in the West Coast drift gillnet fishery, 1981–2010.**

| | | Sharks | | | | | Tunas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Sword-fish | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Albacore | Yellow-fin | Bigeye | Bluefin | Other | Dorado | Ground-fish | Coastal Pelagics | Other | Total |
| 1981 | 469 | 1,438 | | | 154 | 14 | 1 | 3 | 1 | <0.5 | 6 | | 6 | 10 | 127 | 2,229 |
| 1982 | 929 | 1,711 | | 23 | 325 | 4 | 6 | 5 | 2 | 1 | 16 | <0.5 | 5 | 12 | 42 | 3,081 |
| 1983 | 1,651 | 1,223 | 9 | 90 | 201 | 2 | 69 | 17 | 9 | 1 | 32 | <0.5 | <0.5 | 17 | 109 | 3,430 |
| 1984 | 2,632 | 981 | 9 | 54 | 132 | <0.5 | 140 | 11 | 2 | 4 | 8 | <0.5 | 5 | 4 | 211 | 4,193 |
| 1985 | 3,010 | 857 | <0.5 | 90 | 129 | <0.5 | 150 | 9 | 2 | 3 | 1 | <0.5 | 1 | 2 | 166 | 4,420 |
| 1986 | 2,108 | 796 | <0.5 | 34 | 250 | 1 | 138 | 8 | 3 | 3 | 4 | | <0.5 | 7 | 94 | 3,446 |
| 1987 | 1,526 | 381 | 2 | 18 | 208 | 1 | 86 | 3 | 5 | 1 | 5 | <0.5 | 2 | 9 | 47 | 2,294 |
| 1988 | 1,373 | 426 | 1 | 7 | 106 | <0.5 | 54 | 3 | 5 | 2 | 2 | <0.5 | <0.5 | 1 | 41 | 2,021 |
| 1989 | 1,239 | 427 | <0.5 | 16 | 117 | | 13 | 1 | <0.5 | 3 | 8 | <0.5 | | 1 | <0.5 | 1,880 |
| 1990 | 1,126 | 266 | 1 | 30 | 229 | <0.5 | 11 | 1 | 1 | 9 | 4 | <0.5 | | 8 | <0.5 | 1,741 |
| 1991 | 936 | 542 | | 31 | 125 | <0.5 | 15 | 1 | 3 | 4 | 6 | | | 3 | 40 | 1,706 |
| 1992 | 1,350 | 256 | <0.5 | 18 | 118 | 1 | 39 | 3 | 1 | 8 | 5 | | | 1 | 55 | 1,855 |
| 1993 | 1,409 | 243 | 1 | 41 | 87 | <0.5 | 170 | 5 | <0.5 | 28 | 10 | <0.5 | <0.5 | 3 | 65 | 2,062 |
| 1994 | 801 | 292 | <0.5 | 32 | 80 | <0.5 | 53 | <0.5 | <0.5 | 24 | 2 | <0.5 | 4 | 2 | 120 | 1,410 |
| 1995 | 772 | 229 | 5 | 30 | 79 | <0.5 | 34 | 1 | <0.5 | 18 | 13 | <0.5 | 2 | 2 | 96 | 1,281 |
| 1996 | 762 | 294 | 1 | 20 | 85 | <0.5 | 68 | 1 | <0.5 | 39 | 2 | | 1 | 6 | 140 | 1,419 |
| 1997 | 708 | 289 | 35 | 29 | 119 | <0.5 | 46 | 3 | 5 | 52 | 2 | <0.5 | 1 | 4 | 111 | 1,404 |
| 1998 | 931 | 332 | 2 | 11 | 88 | 1 | 65 | 1 | 4 | 38 | 4 | <0.5 | 1 | 2 | 163 | 1,643 |
| 1999 | 605 | 221 | 10 | 5 | 52 | <0.5 | 97 | <0.5 | 1 | 17 | 1 | | 1 | <0.5 | 114 | 1,124 |
| 2000 | 650 | 207 | 3 | 4 | 64 | <0.5 | 42 | 1 | 2 | 27 | <0.5 | <0.5 | 2 | 2 | 100 | 1,104 |
| 2001 | 371 | 320 | 1 | 1 | 31 | | 54 | 3 | <0.5 | 13 | <0.5 | <0.5 | 2 | 1 | 69 | 866 |
| 2002 | 301 | 271 | 2 | | 69 | | 15 | 1 | | 3 | <0.5 | | 3 | 1 | 84 | 750 |
| 2003 | 217 | 280 | 4 | 6 | 57 | <0.5 | 9 | <0.5 | 6 | 11 | 7 | | 1 | 1 | 65 | 664 |
| 2004 | 182 | 94 | 2 | 5 | 38 | | 11 | <0.5 | | 10 | <0.5 | | 2 | 1 | 58 | 403 |
| 2005 | 220 | 167 | <0.5 | 10 | 25 | | 8 | 1 | | 5 | <0.5 | <0.5 | 1 | <0.5 | 60 | 497 |
| 2006 | 443 | 132 | <0.5 | 4 | 38 | | 3 | <0.5 | | 1 | 3 | <0.5 | 1 | 2 | 113 | 740 |
| 2007 | 490 | 184 | 2 | 5 | 37 | 9 | 3 | <0.5 | | 2 | <0.5 | | 2 | <0.5 | 141 | 875 |
| 2008 | 405 | 128 | | 6 | 27 | | 1 | <0.5 | | 1 | <0.5 | <0.5 | 3 | 4 | 119 | 694 |
| 2009 | 251 | 81 | | 7 | 25 | 1 | 3 | <0.5 | | 3 | <0.5 | | <0.5 | <0.5 | 122 | 493 |
| 2010 | 59 | 68 | | 1 | 17 | <0.5 | 5 | | | 1 | | <0.5 | <0.5 | <0.5 | 87 | 238 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 19, 2011.
Note 1: There is no drift gillnet gear for Washington.
Note 2: Significantly higher landings prior to 1994 are reported for the swordfish and HMS shark drift gillnet fishery in this year's HMS SAFE report, for all HMS and non-HMS species except groundfish, due to PacFIN gear corrections for gears that were previously mis-assigned to California entangling net, trammel net, several trawl, encircling net, set gillnet and unknown gears, and therefore not previously reported.
Additional processing info:
Only fish tickets where at least 1 lb of swordfish or any HMS shark was landed for the drift gillnet fishery were used.
Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.
Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-12. Commercial landings (round mt) in the West Coast harpoon fishery, 1981–2010.**

| Year | Swordfish | HMS Sharks | Tunas | | Dorado | Other | Total |
|---|---|---|---|---|---|---|---|
| | | | Albacore | Other | | | |
| 1981 | 272 | 10 | 2 | <0.5 | | 4 | 288 |
| 1982 | 156 | 2 | | <0.5 | | 1 | 159 |
| 1983 | 58 | 1 | | | | 44 | 103 |
| 1984 | 105 | 7 | <0.5 | <0.5 | | 1 | 113 |
| 1985 | 275 | 1 | <0.5 | <0.5 | | 1 | 277 |
| 1986 | 296 | 1 | <0.5 | <0.5 | | 1 | 298 |
| 1987 | 237 | 3 | 1 | 1 | | 40 | 282 |
| 1988 | 199 | 3 | 1 | | | <0.5 | 203 |
| 1989 | 62 | 1 | <0.5 | <0.5 | | <0.5 | 63 |
| 1990 | 65 | 3 | | <0.5 | | <0.5 | 68 |
| 1991 | 20 | 1 | | | | <0.5 | 21 |
| 1992 | 75 | 3 | <0.5 | <0.5 | | 1 | 79 |
| 1993 | 169 | 1 | 1 | | | 1 | 172 |
| 1994 | 157 | 1 | <0.5 | | | <0.5 | 158 |
| 1995 | 97 | 2 | | | | <0.5 | 99 |
| 1996 | 81 | 1 | <0.5 | | | 1 | 83 |
| 1997 | 84 | 3 | <0.5 | | <0.5 | <0.5 | 87 |
| 1998 | 48 | 1 | | | | <0.5 | 49 |
| 1999 | 81 | <0.5 | | | | 2 | 83 |
| 2000 | 90 | <0.5 | <0.5 | | | 5 | 95 |
| 2001 | 52 | 1 | | | <0.5 | 1 | 54 |
| 2002 | 90 | 1 | | | | 1 | 92 |
| 2003 | 107 | <0.5 | | | | <0.5 | 107 |
| 2004 | 69 | 1 | | | | <0.5 | 70 |
| 2005 | 76 | 1 | | | | 1 | 78 |
| 2006 | 72 | 3 | | | | <0.5 | 75 |
| 2007 | 59 | <0.5 | | | | | 59 |
| 2008 | 48 | 1 | | | | | 49 |
| 2009 | 50 | 1 | | | | <0.5 | 51 |
| 2010 | 36 | 1 | | | | <0.5 | 36 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 20, 2011.

Note 1: Only California has harpoon landings.

Note 2: Some of the non-swordfish species may have been taken by dual-gear permit holders, who may have fished with drift gillnets but landed under harpoon.

Additional processing info:

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-13. Commercial landings (round mt) in the West Coast purse seine fishery, 1981–2010.**

| | Tunas | | | | | | Sword- | HMS | | Ground- | Coastal | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified | fish | sharks | Dorado | fish | Pelagics | Other | Total |
| 1981 | 181 | 75,063 | 54,338 | 1,156 | 854 | 28 | | | | | 203 | 2 | 131,825 |
| 1982 | 367 | 60,665 | 39,905 | 962 | 2,400 | 27 | | | | | 29 | | 104,355 |
| 1983 | 11 | 52,217 | 42,191 | | 754 | 12 | 1 | <0.5 | | | 25 | 1 | 95,212 |
| 1984 | 3,552 | 33,326 | 29,941 | 117 | 624 | 1,011 | 23 | 1 | | | 268 | 2 | 68,865 |
| 1985 | 22 | 14,609 | 2,504 | 1 | 3,240 | 467 | 1 | <0.5 | | | 308 | <0.5 | 21,152 |
| 1986 | 54 | 21,018 | 977 | 8 | 4,698 | 136 | 41 | 2 | | | 65 | 1 | 27,000 |
| 1987 | 43 | 21,527 | 5,353 | 42 | 820 | 122 | | 3 | | | 13 | 8 | 27,931 |
| 1988 | 151 | 18,470 | 7,391 | <0.5 | 795 | 7 | | | | | 63 | | 26,878 |
| 1989 | 24 | 16,118 | 3,565 | | 1,007 | 70 | 1 | <0.5 | <0.5 | | 29 | <0.5 | 20,814 |
| 1990 | 71 | 8,354 | 2,244 | | 876 | 39 | | | | | 137 | | 11,721 |
| 1991 | | 3,497 | 2,957 | | 100 | 8 | | | | | 94 | 3 | 6,659 |
| 1992 | 8 | 1,721 | 1,159 | 1 | 1,064 | 3 | 10 | 2 | 1 | <0.5 | 323 | 7 | 4,299 |
| 1993 | 1 | 951 | 1,619 | 2 | 497 | <0.5 | 17 | 1 | <0.5 | <0.5 | 91 | 11 | 3,190 |
| 1994 | | 3,566 | 1,283 | | 880 | 8 | | | | | 66 | 123 | 5,926 |
| 1995 | | 2,795 | 5,616 | | 689 | | | | | | 38 | 39 | 9,177 |
| 1996 | 11 | 2,683 | 5,049 | | 4,639 | | | | | | 244 | 53 | 12,679 |
| 1997 | 2 | 4,659 | 5,926 | | 2,189 | 7 | 1 | 1 | 1 | | 33 | 73 | 12,892 |
| 1998 | 136 | 3,753 | 5,310 | | 1,739 | | | | | | 256 | 159 | 11,353 |
| 1999 | 48 | 1,297 | 3,742 | | 99 | | | | | | 56 | 89 | 5,331 |
| 2000 | 4 | 1,152 | 775 | | 255 | | | | | | 218 | | 2,404 |
| 2001 | 51 | 631 | 55 | | 149 | | | | | | 42 | | 928 |
| 2002 | <0.5 | 541 | 236 | | | | 1 | | | | | <0.5 | 778 |
| 2003 | 44 | 463 | 337 | | 19 | | | | | | | | 862 |
| 2004 | 1 | 484 | 306 | | | | | | | | | | 791 |
| 2005 | | 283 | 522 | | 201 | | | | | | 19 | | 1,026 |
| 2006 | | * | * | | | | | | | | | | * |
| 2007 | 77 | 99 | 5 | | 42 | | | | | | 140 | | 364 |
| 2008 | * | * | * | | | | | | | | * | | * |
| 2009 | 39 | 15 | 4 | | 410 | | | | | | 474 | | 943 |
| 2010 | * | | | | | | | | | | | | * |

* Not reported due to data confidentiality requirements (fewer than three vessels).
Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 20, 2011.
Note: There is no purse seine gear for Washington.
Additional processing info:
Only fish tickets where at least 1 lb of any HMS tuna was landed for the purse seine fishery were used.
Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.
Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-14. Nominal commercial ex-vessel revenues ($) for the West Coast albacore surface hook-and-line (troll and baitboat) fishery, with Canadian vessels excluded, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 26,087,739 | 17,982 | | 173 | 72 | 2,508 | 991 | 133,177 | 1,406 | 26,244,048 |
| 1982 | 7,349,782 | 5,500 | 13,219 | 2,771 | 557 | 5,676 | 13 | 13,834 | 535 | 7,391,887 |
| 1983 | 11,879,532 | 14,586 | 7,531 | 1,597 | 33 | 20,309 | 15,495 | 36,075 | 3,880 | 11,979,038 |
| 1984 | 12,146,877 | 20,053 | 96,217 | 6,080 | 706 | 6,947 | 928 | 6,422 | 4,278 | 12,288,508 |
| 1985 | 7,994,910 | 4,278 | 30,921 | 7,017 | 6 | 6,384 | 239 | 10,802 | 2,311 | 8,056,868 |
| 1986 | 5,867,829 | 7,248 | 6,427 | 180 | | 19,050 | 160 | 9,451 | 659 | 5,911,004 |
| 1987 | 4,690,640 | 1,150 | 33,310 | 3,440 | | 2,305 | 657 | 6,838 | 436 | 4,738,776 |
| 1988 | 8,547,233 | 952 | 96,331 | 3,566 | | 766 | 614 | 11,362 | 538 | 8,661,362 |
| 1989 | 3,692,159 | 1,833 | 34,556 | 11,295 | 31 | 18,112 | 1 | 8,305 | 2,504 | 3,768,796 |
| 1990 | 5,414,995 | 79 | 13,332 | 560 | 74 | 6,163 | 85 | 2,792 | 1,529 | 5,439,609 |
| 1991 | 2,760,714 | 71 | 11,721 | 602 | | 189 | | 3,479 | 1,084 | 2,777,860 |
| 1992 | 11,078,583 | 2,195 | 55,452 | 2,361 | 281 | 6,144 | | 6,120 | 670 | 11,151,806 |
| 1993 | 10,882,080 | 154,056 | 442,687 | 7,992 | 23,216 | 4,992 | | 10,385 | 1,806 | 11,527,214 |
| 1994 | 19,936,113 | 603 | 6,797 | 302 | 180 | 590 | | 537 | 345 | 19,945,467 |
| 1995 | 11,359,888 | 914 | 3,204 | 173 | 21 | 152 | 16 | 22,290 | 3,028 | 11,389,686 |
| 1996 | 25,487,600 | 38,596 | 2,608 | 295 | | 440 | | 26,524 | 998 | 25,557,061 |
| 1997 | 19,093,866 | 14,949 | 4,390 | 1,628 | 371 | 11,951 | 89 | 37,637 | 3,725 | 19,168,606 |
| 1998 | 17,503,716 | 138,138 | 17,122 | 5,018 | 525 | 4,788 | 279 | 16,340 | 5,264 | 17,691,190 |
| 1999 | 16,139,022 | 115,448 | 77,899 | 2,623 | 1,413 | 4,347 | 455 | 9,742 | 7,708 | 16,358,657 |
| 2000 | 15,344,331 | 4,497 | 97,814 | 223 | 298 | 1,889 | 522 | 9,445 | 5,233 | 15,464,252 |
| 2001 | 18,743,953 | 27,752 | 2,037 | 2,210 | 544 | 7,801 | 178 | 33,018 | 12,398 | 18,829,891 |
| 2002 | 13,168,361 | 6,838 | 9,996 | 664 | 170 | 904 | 1,241 | 21,797 | 7,789 | 13,217,760 |
| 2003 | 19,626,793 | 11,045 | | 62 | 567 | 2,764 | 558 | 14,013 | 5,709 | 19,661,511 |
| 2004 | 24,324,409 | 2,513 | | 520 | 655 | 1,834 | 1,241 | 22,741 | 3,332 | 24,357,245 |
| 2005 | 18,507,118 | 1,437 | | 181 | | 1,587 | | 12,332 | 3,318 | 18,525,973 |
| 2006 | 22,832,059 | 1,575 | | 252 | 167 | 985 | 124 | 3,480 | 991 | 22,839,633 |
| 2007 | 20,669,326 | 1,222 | | | 223 | 1,942 | 82 | 3,958 | 1,420 | 20,678,173 |
| 2008 | 24,847,705 | 49,130 | 1,200 | | 479 | 1,308 | 3,193 | 5,091 | 6,629 | 24,914,735 |
| 2009 | 25,916,055 | 11,639 | 291 | 658 | 248 | 484 | 92 | 3,446 | 2,048 | 25,934,961 |
| 2010 | 26,395,019 | 531 | | 52 | 531 | 270 | | 34,462 | 534 | 26,431,399 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 18, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-15. Nominal commercial ex-vessel revenues ($) for the West Coast albacore surface hook-and-line (troll and baitboat) fishery, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 26,087,739 | 17,982 | | 173 | 72 | 2,508 | 991 | 133,177 | 1,406 | 26,244,048 |
| 1982 | 7,364,640 | 5,500 | 13,219 | 2,771 | 557 | 5,676 | 13 | 13,834 | 535 | 7,406,745 |
| 1983 | 11,917,582 | 14,586 | 7,531 | 1,597 | 33 | 20,309 | 15,495 | 36,075 | 3,879 | 12,017,087 |
| 1984 | 12,150,161 | 20,053 | 96,217 | 6,080 | 706 | 6,947 | 928 | 6,422 | 4,278 | 12,291,792 |
| 1985 | 7,994,910 | 4,278 | 30,921 | 7,017 | 6 | 6,384 | 239 | 10,802 | 2,311 | 8,056,868 |
| 1986 | 5,867,829 | 7,248 | 6,427 | 180 | | 19,050 | 160 | 9,451 | 659 | 5,911,004 |
| 1987 | 4,690,640 | 1,150 | 33,310 | 3,440 | | 2,305 | 657 | 6,838 | 436 | 4,738,776 |
| 1988 | 8,550,083 | 952 | 96,331 | 3,566 | | 766 | 614 | 11,362 | 538 | 8,664,212 |
| 1989 | 3,692,159 | 1,833 | 34,556 | 11,295 | 31 | 18,112 | 1 | 8,305 | 2,504 | 3,768,796 |
| 1990 | 5,414,995 | 79 | 13,332 | 560 | 74 | 6,163 | 85 | 2,792 | 1,529 | 5,439,609 |
| 1991 | 2,760,714 | 71 | 11,721 | 602 | | 189 | | 3,479 | 1,084 | 2,777,860 |
| 1992 | 11,218,614 | 2,195 | 55,452 | 2,361 | 281 | 6,144 | | 6,120 | 670 | 11,291,837 |
| 1993 | 10,923,548 | 154,056 | 442,687 | 7,992 | 23,216 | 4,992 | | 10,385 | 1,806 | 11,568,682 |
| 1994 | 19,977,732 | 603 | 6,797 | 302 | 180 | 590 | | 537 | 345 | 19,987,086 |
| 1995 | 11,481,279 | 914 | 3,204 | 173 | 21 | 152 | 16 | 22,290 | 3,029 | 11,511,078 |
| 1996 | 27,080,019 | 38,596 | 2,608 | 295 | | 440 | | 26,524 | 997 | 27,149,479 |
| 1997 | 19,811,178 | 15,026 | 4,390 | 1,628 | 484 | 11,951 | 89 | 37,637 | 3,725 | 19,886,108 |
| 1998 | 18,604,129 | 138,138 | 17,122 | 5,018 | 525 | 4,788 | 279 | 16,340 | 5,263 | 18,791,602 |
| 1999 | 17,402,696 | 115,448 | 77,899 | 2,623 | 1,413 | 4,347 | 455 | 9,742 | 7,708 | 17,622,331 |
| 2000 | 17,040,770 | 4,497 | 97,814 | 223 | 298 | 1,889 | 522 | 9,445 | 5,233 | 17,160,691 |
| 2001 | 20,406,546 | 27,752 | 2,037 | 2,210 | 544 | 7,801 | 178 | 33,018 | 12,398 | 20,492,484 |
| 2002 | 14,210,280 | 6,838 | 9,996 | 664 | 170 | 904 | 1,241 | 21,797 | 7,789 | 14,259,679 |
| 2003 | 24,385,886 | 11,045 | | 62 | 567 | 2,764 | 558 | 14,013 | 5,708 | 24,420,603 |
| 2004 | 27,375,701 | 2,513 | | 520 | 655 | 1,834 | 1,241 | 22,741 | 3,332 | 27,408,537 |
| 2005 | 20,762,541 | 1,437 | | 181 | | 1,587 | | 12,332 | 3,318 | 20,781,396 |
| 2006 | 23,731,153 | 1,575 | | 252 | 167 | 985 | 124 | 3,480 | 991 | 23,738,727 |
| 2007 | 21,494,041 | 1,222 | | | 223 | 1,942 | 82 | 3,958 | 1,421 | 21,502,889 |
| 2008 | 28,847,990 | 49,130 | 1,200 | | 479 | 1,308 | 3,193 | 5,091 | 6,630 | 28,915,021 |
| 2009 | 27,528,792 | 11,639 | 291 | 658 | 248 | 484 | 92 | 3,446 | 2,049 | 27,547,699 |
| 2010 | 29,493,379 | 531 | | 52 | 531 | 270 | | 34,462 | 535 | 29,529,760 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 19, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-16. Nominal commercial ex-vessel revenues ($) for the West Coast drift gillnet fishery, 1981–2010.**

| | | Sharks | | | | | Tunas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Sword-fish | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Albacore | Yellow-fin | Bigeye | Bluefin | Other | Dorado | Ground-fish | Coastal Pelagics | Other | Total |
| 1981 | 1,935,740 | 1,397,440 | | | 135,780 | 7,866 | 1,632 | 6,013 | 1,504 | 838 | 10,544 | | 6,569 | 6,074 | 214,718 | 3,724,718 |
| 1982 | 4,150,231 | 1,833,663 | | 12,978 | 312,560 | 2,736 | 9,730 | 8,867 | 3,450 | 1,075 | 26,990 | 15 | 5,820 | 7,690 | 53,330 | 6,429,135 |
| 1983 | 6,261,486 | 1,354,821 | 8,449 | 86,831 | 210,367 | 1,805 | 97,995 | 32,826 | 18,383 | 2,883 | 44,357 | 83 | 714 | 15,953 | 94,005 | 8,230,958 |
| 1984 | 10,410,348 | 1,321,903 | 7,579 | 44,009 | 156,302 | 162 | 175,292 | 22,891 | 5,940 | 7,222 | 5,474 | 14 | 8,410 | 4,145 | 166,613 | 12,336,304 |
| 1985 | 11,607,897 | 1,322,133 | 716 | 89,904 | 161,122 | 17 | 139,307 | 17,261 | 4,152 | 4,425 | 1,674 | 82 | 1,151 | 1,881 | 143,019 | 13,494,741 |
| 1986 | 10,319,454 | 1,308,565 | 194 | 41,409 | 339,508 | 729 | 158,392 | 17,580 | 7,537 | 6,477 | 7,306 | | 311 | 7,603 | 93,336 | 12,308,401 |
| 1987 | 9,208,592 | 737,666 | 1,840 | 21,173 | 358,961 | 624 | 142,785 | 7,451 | 13,730 | 3,357 | 15,704 | 357 | 4,792 | 6,444 | 65,053 | 10,588,529 |
| 1988 | 7,856,080 | 826,179 | 821 | 7,663 | 194,512 | 259 | 104,227 | 8,534 | 21,077 | 9,668 | 8,577 | 183 | 444 | 637 | 73,459 | 9,112,320 |
| 1989 | 7,421,923 | 803,558 | 149 | 23,918 | 231,074 | | 26,967 | 2,708 | 861 | 6,120 | 15,256 | 14 | | 1,331 | 76,633 | 8,610,512 |
| 1990 | 6,332,028 | 490,791 | 1,682 | 34,145 | 426,465 | 61 | 22,933 | 3,223 | 3,829 | 26,561 | 9,978 | 98 | | 1,901 | 102,654 | 7,456,349 |
| 1991 | 5,743,814 | 895,223 | | 24,871 | 228,320 | 55 | 30,154 | 4,540 | 12,897 | 15,768 | 11,733 | | | 1,721 | 63,828 | 7,032,924 |
| 1992 | 6,379,684 | 405,080 | 602 | 12,860 | 186,356 | 284 | 89,259 | 13,177 | 2,707 | 22,687 | 10,290 | | | 622 | 83,935 | 7,207,543 |
| 1993 | 6,847,488 | 400,698 | 462 | 26,686 | 156,082 | 51 | 273,289 | 23,373 | 510 | 102,556 | 29,420 | 174 | 1,019 | 3,554 | 93,214 | 7,958,576 |
| 1994 | 4,786,469 | 533,434 | 42 | 27,389 | 152,761 | 7 | 92,466 | 1,004 | 2,332 | 124,353 | 9,695 | 40 | 5,498 | 854 | 165,859 | 5,902,203 |
| 1995 | 4,603,642 | 398,639 | 8,681 | 23,609 | 138,274 | 105 | 54,040 | 2,781 | 2,794 | 75,886 | 10,479 | 13 | 1,655 | 1,698 | 142,475 | 5,464,771 |
| 1996 | 4,074,303 | 549,161 | 1,557 | 17,165 | 147,616 | 86 | 113,980 | 2,393 | 1,246 | 120,956 | 2,966 | | 1,084 | 2,791 | 218,407 | 5,253,711 |
| 1997 | 3,332,497 | 520,647 | 62,121 | 27,188 | 200,740 | 36 | 73,282 | 11,445 | 25,983 | 233,377 | 2,233 | 514 | 2,268 | 3,666 | 150,127 | 4,646,124 |
| 1998 | 4,078,263 | 564,305 | 2,534 | 9,270 | 150,781 | 4,842 | 80,083 | 3,913 | 19,454 | 188,727 | 7,335 | 2,457 | 1,481 | 1,835 | 231,252 | 5,346,532 |
| 1999 | 2,829,832 | 407,576 | 18,001 | 5,320 | 91,295 | 23 | 106,181 | 909 | 9,899 | 79,197 | 1,674 | | 1,304 | 278 | 206,320 | 3,757,809 |
| 2000 | 2,814,819 | 405,074 | 2,209 | 3,943 | 106,299 | 169 | 68,945 | 943 | 17,921 | 107,264 | 732 | 545 | 1,298 | 2,348 | 170,616 | 3,703,125 |
| 2001 | 1,645,877 | 519,998 | 465 | 998 | 49,066 | | 88,962 | 4,040 | 673 | 33,657 | 516 | 336 | 1,273 | 399 | 127,723 | 2,473,983 |
| 2002 | 1,515,987 | 451,543 | 1,946 | | 101,276 | | 20,343 | 1,517 | | 10,451 | 88 | | 2,429 | 1,005 | 233,486 | 2,340,071 |
| 2003 | 1,120,260 | 445,617 | 2,814 | 3,577 | 93,556 | 11 | 15,945 | 517 | 36,417 | 35,691 | 3,862 | | 825 | 604 | 169,074 | 1,928,770 |
| 2004 | 944,192 | 157,739 | 2,500 | 3,795 | 67,289 | | 25,354 | 697 | | 37,186 | 146 | | 2,024 | 386 | 169,284 | 1,410,592 |
| 2005 | 1,184,545 | 248,291 | 539 | 6,234 | 41,695 | | 17,819 | 4,188 | | 16,488 | 105 | 90 | 1,182 | 9 | 236,993 | 1,758,178 |
| 2006 | 1,996,530 | 248,444 | 218 | 4,455 | 62,904 | | 4,079 | 1,755 | | 2,959 | 2,970 | 87 | 1,346 | 2,221 | 320,805 | 2,648,773 |
| 2007 | 2,528,886 | 294,164 | 2,870 | 4,044 | 60,640 | 1,174 | 7,465 | 102 | | 11,636 | 79 | | 2,349 | 349 | 438,990 | 3,352,748 |
| 2008 | 1,708,969 | 237,491 | | 5,419 | 49,255 | | 1,705 | 813 | | 2,515 | 102 | 52 | 3,129 | 3,108 | 415,817 | 2,428,375 |
| 2009 | 1,076,535 | 141,598 | | 5,453 | 41,964 | 2,309 | 8,434 | 137 | | 8,740 | 29 | | 241 | 316 | 298,585 | 1,584,341 |
| 2010 | 392,878 | 100,756 | | 924 | 26,744 | 72 | 14,001 | | | 3,870 | | 200 | 115 | 116 | 312,973 | 852,649 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 19, 2011.

Note 1: There is no drift gillnet gear for Washington.

Note 2: Significantly higher ex-vessel revenues prior to 1994 are reported for the swordfish and HMS shark drift gillnet fishery in this year's HMS SAFE report, for all HMS and non-HMS species except groundfish, due to PacFIN gear corrections for gears that were previously mis-assigned to California entangling net, trammel net, several trawl, encircling net, set gillnet and unknown gears, and therefore not previously reported.

Additional processing info:

Only fish tickets where at least 1 lb of swordfish or any HMS shark was landed for the drift gillnet fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-17. Nominal commercial ex-vessel revenues ($) for the West Coast harpoon fishery, 1981–2010.**

| Year | Swordfish | HMS Sharks | Tunas | | Dorado | Other | Total |
|---|---|---|---|---|---|---|---|
| | | | Albacore | Other | | | |
| 1981 | 1,371,646 | 10,204 | 3,952 | 385 | | 12,029 | 1,398,216 |
| 1982 | 839,886 | 1,988 | | 146 | | 1,233 | 843,253 |
| 1983 | 318,044 | 1,962 | | | | 9,752 | 329,758 |
| 1984 | 583,079 | 8,473 | 330 | 150 | | 2,026 | 594,058 |
| 1985 | 1,280,993 | 1,721 | 225 | 247 | | 1,751 | 1,284,937 |
| 1986 | 1,796,277 | 2,433 | 53 | 337 | | 1,203 | 1,800,303 |
| 1987 | 1,647,710 | 5,053 | 4,150 | 2,076 | | 84,568 | 1,743,557 |
| 1988 | 1,477,860 | 6,429 | 8,552 | | | 882 | 1,493,723 |
| 1989 | 500,435 | 1,527 | 2,106 | 65 | | 1,256 | 505,389 |
| 1990 | 539,322 | 5,869 | | 108 | | 811 | 546,110 |
| 1991 | 179,949 | 2,025 | | | | 70 | 182,044 |
| 1992 | 586,740 | 6,126 | 1,236 | 133 | | 1,336 | 595,571 |
| 1993 | 1,132,762 | 1,890 | 7,730 | | | 1,000 | 1,143,382 |
| 1994 | 1,273,087 | 1,613 | 2,490 | | | 2,888 | 1,280,078 |
| 1995 | 760,108 | 4,078 | | | | 1,752 | 765,938 |
| 1996 | 633,027 | 3,217 | 216 | | | 652 | 637,112 |
| 1997 | 683,211 | 5,567 | 200 | | 90 | 675 | 689,743 |
| 1998 | 402,914 | 1,603 | | | | 766 | 405,283 |
| 1999 | 608,982 | 811 | | | | 5,851 | 615,644 |
| 2000 | 750,533 | 798 | 302 | | | 8,381 | 760,014 |
| 2001 | 468,289 | 1,152 | | | 50 | 2,748 | 472,239 |
| 2002 | 678,934 | 1,259 | | | | 1,141 | 681,334 |
| 2003 | 839,197 | 562 | | | | 1,768 | 841,527 |
| 2004 | 670,001 | 2,457 | | | | 1,643 | 674,101 |
| 2005 | 709,760 | 1,229 | | | | 1,921 | 712,910 |
| 2006 | 680,036 | 5,013 | | | | 709 | 685,758 |
| 2007 | 597,707 | 1,305 | | | | | 599,012 |
| 2008 | 458,482 | 1,436 | | | | | 459,918 |
| 2009 | 466,645 | 1,846 | | | | 589 | 469,080 |
| 2010 | 352,525 | 1,419 | | | | 349 | 354,293 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 20, 2011.
Note 1: Only California has revenues from harpoon landings.
Note 2: Some of the non-swordfish species may have been taken by dual-gear permit holders, who may have fished with drift gillnets but landed under harpoon.
Additional processing info:
Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.
Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-18. Nominal commercial ex-vessel revenues ($) for the West Coast purse seine fishery, 1981–2010.**

| | Tunas | | | | | | Sword- | HMS | | Ground- | Coastal | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified | fish | Sharks | Dorado | fish | Pelagics | Other | Total |
| 1981 | 362,636 | 97,391,144 | 62,318,736 | 1,552,545 | 1,219,984 | 54,643 | | | | | 119,029 | 1,456 | 163,020,173 |
| 1982 | 575,736 | 73,205,578 | 38,822,258 | 1,196,824 | 2,680,401 | 54,040 | | | | | 5,155 | | 116,539,991 |
| 1983 | 15,349 | 55,980,011 | 34,377,044 | | 1,042,089 | 24,989 | 1,796 | 261 | | | 6,638 | 587 | 91,448,764 |
| 1984 | 4,822,262 | 35,503,573 | 23,741,980 | 143,266 | 878,031 | 2,580,939 | 87,097 | 651 | | | 60,118 | 6,054 | 67,823,971 |
| 1985 | 28,953 | 14,191,940 | 1,713,118 | 810 | 2,797,571 | 1,026,024 | 7,080 | 460 | | | 50,191 | 956 | 19,817,103 |
| 1986 | 64,622 | 17,655,730 | 643,905 | 13,335 | 4,575,913 | 182,575 | 182,606 | 2,595 | | | 8,204 | 2,452 | 23,331,937 |
| 1987 | 69,499 | 26,028,704 | 4,116,606 | 150,602 | 2,049,722 | 427,505 | | 900 | | | 2,005 | 8,980 | 32,854,523 |
| 1988 | 266,685 | 25,754,782 | 7,772,435 | 680 | 2,037,504 | 67,724 | | | | | 25,342 | | 35,925,150 |
| 1989 | 45,978 | 19,139,726 | 3,113,729 | | 1,231,363 | 112,194 | 6,955 | 270 | 128 | | 6,300 | 138 | 23,656,781 |
| 1990 | 139,859 | 9,225,983 | 1,889,065 | | 1,069,829 | 32,343 | | | | | 43,459 | | 12,400,537 |
| 1991 | | 3,399,732 | 2,298,693 | | 98,226 | 7,985 | | | | | 36,458 | 3,315 | 5,844,409 |
| 1992 | 19,291 | 1,686,917 | 551,315 | 2,927 | 1,087,353 | 2,936 | 51,873 | 3,524 | 2,597 | 220 | 62,091 | 11,397 | 3,482,441 |
| 1993 | 1,202 | 1,051,265 | 1,047,039 | 4,229 | 569,367 | 880 | 98,722 | 1,599 | 175 | 14 | 16,833 | 10,658 | 2,801,983 |
| 1994 | | 3,135,039 | 1,078,217 | | 1,463,167 | 3,393 | | | | | 36,342 | 125,354 | 5,841,512 |
| 1995 | | 2,811,700 | 3,801,888 | | 943,602 | | | | | | 15,670 | 20,463 | 7,593,323 |
| 1996 | 875 | 2,669,391 | 3,643,203 | | 3,865,969 | | | | | | 69,959 | 25,249 | 10,274,646 |
| 1997 | 3,654 | 4,795,089 | 5,326,959 | | 2,504,396 | 4,195 | 6,666 | 1,909 | 1,425 | | 17,321 | 51,754 | 12,713,368 |
| 1998 | 162,925 | 3,808,379 | 4,717,085 | | 2,294,031 | | | | | | 165,275 | 109,262 | 11,256,957 |
| 1999 | 33,416 | 1,397,578 | 2,732,409 | | 360,132 | | | | | | 5,340 | 59,908 | 4,588,783 |
| 2000 | 6,615 | 1,306,040 | 475,592 | | 296,687 | | | | | | 24,484 | | 2,109,419 |
| 2001 | 62,841 | 411,133 | 28,595 | | 336,831 | | | | | | 5,092 | | 844,492 |
| 2002 | 358 | 577,814 | 128,094 | | | | 2,623 | | | | | 45 | 708,934 |
| 2003 | 16,153 | 442,370 | 152,188 | | 14,874 | | | | | | | | 625,584 |
| 2004 | 1,537 | 435,085 | 108,853 | | | | | | | | | | 545,475 |
| 2005 | | 304,037 | 291,183 | | 119,162 | | | | | | 1,708 | | 716,090 |
| 2006 | | * | * | | | | | | | | | | * |
| 2007 | 119,394 | 119,395 | 3,958 | | 45,267 | | | | | | 55,587 | | 343,600 |
| 2008 | * | * | * | | | | | | | | * | | * |
| 2009 | 41,701 | 14,185 | 3,655 | | 426,987 | | | | | | 334,695 | | 821,222 |
| 2010 | * | | | | | | | | | | | | * |

* Not reported due to data confidentiality requirements (fewer than three vessels).

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 20, 2011.

Note: There is no purse seine gear for Washington.

Additional processing info:

Only fish tickets where at least 1 lb of any HMS tuna was landed for the purse seine fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-19. Real commercial ex-vessel revenues (2010 $) for the West Coast albacore surface hook-and-line (troll and baitboat) fishery, with Canadian vessels excluded, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 55,282,345 | 38,106 | | 366 | 152 | 5,314 | 2,101 | 282,214 | 2,982 | 55,613,580 |
| 1982 | 14,679,013 | 10,984 | 26,401 | 5,533 | 1,112 | 11,337 | 25 | 27,629 | 1,071 | 14,763,105 |
| 1983 | 22,823,309 | 28,022 | 14,468 | 3,069 | 63 | 39,018 | 29,769 | 69,308 | 7,456 | 23,014,482 |
| 1984 | 22,490,052 | 37,129 | 178,147 | 11,256 | 1,308 | 12,862 | 1,718 | 11,891 | 7,921 | 22,752,284 |
| 1985 | 14,368,997 | 7,688 | 55,574 | 12,612 | 11 | 11,474 | 430 | 19,415 | 4,151 | 14,480,352 |
| 1986 | 10,317,969 | 12,744 | 11,301 | 317 | | 33,498 | 282 | 16,619 | 1,158 | 10,393,888 |
| 1987 | 8,015,447 | 1,964 | 56,920 | 5,878 | | 3,938 | 1,122 | 11,684 | 751 | 8,097,704 |
| 1988 | 14,120,656 | 1,572 | 159,146 | 5,891 | | 1,266 | 1,014 | 18,772 | 888 | 14,309,205 |
| 1989 | 5,877,363 | 2,919 | 55,009 | 17,980 | 49 | 28,831 | 2 | 13,220 | 3,984 | 5,999,357 |
| 1990 | 8,300,114 | 121 | 20,435 | 858 | 113 | 9,447 | 131 | 4,279 | 2,345 | 8,337,843 |
| 1991 | 4,086,314 | 105 | 17,350 | 891 | | 280 | | 5,150 | 1,603 | 4,111,693 |
| 1992 | 16,018,772 | 3,174 | 80,179 | 3,414 | 407 | 8,884 | | 8,850 | 967 | 16,124,647 |
| 1993 | 15,394,087 | 217,932 | 626,237 | 11,305 | 32,842 | 7,062 | | 14,691 | 2,555 | 16,306,711 |
| 1994 | 27,619,996 | 835 | 9,417 | 418 | 249 | 818 | | 744 | 478 | 27,632,955 |
| 1995 | 15,417,871 | 1,241 | 4,349 | 234 | 28 | 206 | 22 | 30,253 | 4,111 | 15,458,315 |
| 1996 | 33,947,257 | 51,407 | 3,473 | 393 | | 586 | | 35,328 | 1,328 | 34,039,772 |
| 1997 | 24,988,700 | 19,565 | 5,746 | 2,130 | 486 | 15,640 | 117 | 49,257 | 4,874 | 25,086,515 |
| 1998 | 22,652,668 | 178,773 | 22,158 | 6,495 | 679 | 6,196 | 361 | 21,146 | 6,813 | 22,895,289 |
| 1999 | 20,582,862 | 147,237 | 99,348 | 3,345 | 1,802 | 5,544 | 580 | 12,425 | 9,830 | 20,862,973 |
| 2000 | 19,154,077 | 5,613 | 122,100 | 278 | 372 | 2,358 | 652 | 11,790 | 6,532 | 19,303,772 |
| 2001 | 22,880,801 | 33,877 | 2,486 | 2,698 | 663 | 9,523 | 217 | 40,306 | 15,136 | 22,985,707 |
| 2002 | 15,819,751 | 8,215 | 12,009 | 797 | 204 | 1,086 | 1,491 | 26,186 | 9,357 | 15,879,096 |
| 2003 | 23,082,198 | 12,989 | | 73 | 667 | 3,251 | 656 | 16,481 | 6,713 | 23,123,028 |
| 2004 | 27,815,219 | 2,874 | | 594 | 749 | 2,097 | 1,419 | 26,004 | 3,811 | 27,852,767 |
| 2005 | 20,479,272 | 1,590 | | 200 | | 1,756 | | 13,646 | 3,672 | 20,500,136 |
| 2006 | 24,469,038 | 1,688 | | 270 | 178 | 1,055 | 133 | 3,730 | 1,063 | 24,477,155 |
| 2007 | 21,519,340 | 1,272 | | | 232 | 2,022 | 85 | 4,121 | 1,479 | 21,528,551 |
| 2008 | 25,316,052 | 50,056 | 1,223 | | 488 | 1,332 | 3,254 | 5,187 | 6,754 | 25,384,346 |
| 2009 | 26,164,619 | 11,750 | 293 | 665 | 251 | 489 | 93 | 3,479 | 2,068 | 26,183,707 |
| 2010 | 26,395,019 | 531 | | 52 | 531 | 270 | | 34,462 | 534 | 26,431,399 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 18, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and cheking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-20. Real commercial ex-vessel revenues (2010 $) for the West Coast albacore surface hook-and-line (troll and baitboat) fishery, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 55,282,345 | 38,106 | | 366 | 152 | 5,314 | 2,101 | 282,214 | 2,982 | 55,613,580 |
| 1982 | 14,708,687 | 10,984 | 26,401 | 5,533 | 1,112 | 11,337 | 25 | 27,629 | 1,072 | 14,792,780 |
| 1983 | 22,896,411 | 28,022 | 14,468 | 3,069 | 63 | 39,018 | 29,769 | 69,308 | 7,456 | 23,087,584 |
| 1984 | 22,496,132 | 37,129 | 178,147 | 11,256 | 1,308 | 12,862 | 1,718 | 11,891 | 7,921 | 22,758,364 |
| 1985 | 14,368,997 | 7,688 | 55,574 | 12,612 | 11 | 11,474 | 430 | 19,415 | 4,151 | 14,480,352 |
| 1986 | 10,317,969 | 12,744 | 11,301 | 317 | | 33,498 | 282 | 16,619 | 1,158 | 10,393,888 |
| 1987 | 8,015,447 | 1,964 | 56,920 | 5,878 | | 3,938 | 1,122 | 11,684 | 751 | 8,097,704 |
| 1988 | 14,125,364 | 1,572 | 159,146 | 5,891 | | 1,266 | 1,014 | 18,772 | 888 | 14,313,913 |
| 1989 | 5,877,363 | 2,919 | 55,009 | 17,980 | 49 | 28,831 | 2 | 13,220 | 3,984 | 5,999,357 |
| 1990 | 8,300,114 | 121 | 20,435 | 858 | 113 | 9,447 | 131 | 4,279 | 2,345 | 8,337,843 |
| 1991 | 4,086,314 | 105 | 17,350 | 891 | | 280 | | 5,150 | 1,603 | 4,111,693 |
| 1992 | 16,221,246 | 3,174 | 80,179 | 3,414 | 407 | 8,884 | | 8,850 | 967 | 16,327,121 |
| 1993 | 15,452,749 | 217,932 | 626,237 | 11,305 | 32,842 | 7,062 | | 14,691 | 2,555 | 16,365,373 |
| 1994 | 27,677,656 | 835 | 9,417 | 418 | 249 | 818 | | 744 | 478 | 27,690,615 |
| 1995 | 15,582,626 | 1,241 | 4,349 | 234 | 28 | 206 | 22 | 30,253 | 4,111 | 15,623,070 |
| 1996 | 36,068,219 | 51,407 | 3,473 | 393 | | 586 | | 35,328 | 1,328 | 36,160,734 |
| 1997 | 25,927,468 | 19,665 | 5,746 | 2,130 | 633 | 15,640 | 117 | 49,257 | 4,875 | 26,025,531 |
| 1998 | 24,076,781 | 178,773 | 22,158 | 6,495 | 679 | 6,196 | 361 | 21,146 | 6,813 | 24,319,402 |
| 1999 | 22,194,486 | 147,237 | 99,348 | 3,345 | 1,802 | 5,544 | 580 | 12,425 | 9,830 | 22,474,597 |
| 2000 | 21,271,714 | 5,613 | 122,100 | 278 | 372 | 2,358 | 652 | 11,790 | 6,533 | 21,421,410 |
| 2001 | 24,910,334 | 33,877 | 2,486 | 2,698 | 663 | 9,523 | 217 | 40,306 | 15,135 | 25,015,239 |
| 2002 | 17,071,456 | 8,215 | 12,009 | 797 | 204 | 1,086 | 1,491 | 26,186 | 9,357 | 17,130,801 |
| 2003 | 28,679,155 | 12,989 | | 73 | 667 | 3,251 | 656 | 16,481 | 6,713 | 28,719,985 |
| 2004 | 31,304,404 | 2,874 | | 594 | 749 | 2,097 | 1,419 | 26,004 | 3,811 | 31,341,952 |
| 2005 | 22,975,037 | 1,590 | | 200 | | 1,756 | | 13,646 | 3,672 | 22,995,901 |
| 2006 | 25,432,593 | 1,688 | | 270 | 178 | 1,055 | 133 | 3,730 | 1,064 | 25,440,711 |
| 2007 | 22,377,971 | 1,272 | | | 232 | 2,022 | 85 | 4,121 | 1,480 | 22,387,183 |
| 2008 | 29,391,737 | 50,056 | 1,223 | | 488 | 1,332 | 3,254 | 5,187 | 6,754 | 29,460,031 |
| 2009 | 27,792,824 | 11,750 | 293 | 665 | 251 | 489 | 93 | 3,479 | 2,068 | 27,811,912 |
| 2010 | 29,493,379 | 531 | | 52 | 531 | 270 | | 34,462 | 535 | 29,529,760 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 19, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-21. Real commercial ex-vessel revenues (2010 $) for the West Coast drift gillnet fishery, 1981–2010.**

| | | Sharks | | | | | Tunas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Sword-fish | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Albacore | Yellow-fin | Bigeye | Bluefin | Other | Dorado | Ground-fish | Coastal Pelagics | Other | Total |
| 1981 | 4,102,014 | 2,961,305 | | | 287,731 | 16,670 | 3,459 | 12,742 | 3,188 | 1,775 | 22,344 | | 13,921 | 12,871 | 455,005 | 7,893,025 |
| 1982 | 8,288,858 | 3,662,200 | | 25,920 | 624,247 | 5,464 | 19,433 | 17,710 | 6,890 | 2,147 | 53,904 | 29 | 11,624 | 15,359 | 106,509 | 12,840,294 |
| 1983 | 12,029,752 | 2,602,922 | 16,233 | 166,823 | 404,164 | 3,468 | 188,272 | 63,067 | 35,318 | 5,539 | 85,219 | 159 | 1,371 | 30,650 | 180,603 | 15,813,560 |
| 1984 | 19,274,853 | 2,447,515 | 14,032 | 81,483 | 289,395 | 299 | 324,555 | 42,382 | 10,999 | 13,372 | 10,135 | 25 | 15,572 | 7,674 | 308,487 | 22,840,778 |
| 1985 | 20,862,504 | 2,376,228 | 1,288 | 161,582 | 289,579 | 30 | 250,373 | 31,023 | 7,463 | 7,953 | 3,008 | 147 | 2,069 | 3,381 | 257,041 | 24,253,669 |
| 1986 | 18,145,691 | 2,300,976 | 342 | 72,813 | 596,990 | 1,282 | 278,516 | 30,912 | 13,253 | 11,388 | 12,846 | | 547 | 13,369 | 164,122 | 21,643,047 |
| 1987 | 15,735,804 | 1,260,536 | 3,144 | 36,182 | 613,399 | 1,066 | 243,994 | 12,733 | 23,463 | 5,736 | 26,836 | 610 | 8,189 | 11,011 | 111,160 | 18,093,863 |
| 1988 | 12,978,821 | 1,364,908 | 1,356 | 12,660 | 321,348 | 428 | 172,190 | 14,099 | 34,820 | 15,972 | 14,169 | 302 | 734 | 1,053 | 121,361 | 15,054,221 |
| 1989 | 11,814,587 | 1,279,144 | 237 | 38,073 | 367,834 | | 42,928 | 4,310 | 1,371 | 9,743 | 24,286 | 22 | | 2,120 | 121,986 | 13,706,641 |
| 1990 | 9,705,745 | 752,286 | 2,578 | 52,337 | 653,687 | 94 | 35,152 | 4,941 | 5,869 | 40,712 | 15,294 | 150 | | 2,914 | 157,347 | 11,429,106 |
| 1991 | 8,501,796 | 1,325,079 | | 36,813 | 337,952 | 81 | 44,633 | 6,721 | 19,089 | 23,339 | 17,366 | | | 2,547 | 94,478 | 10,409,894 |
| 1992 | 9,224,529 | 585,715 | 871 | 18,594 | 269,457 | 411 | 129,062 | 19,053 | 3,914 | 32,803 | 14,878 | | | 899 | 121,362 | 10,421,548 |
| 1993 | 9,686,643 | 566,839 | 653 | 37,751 | 220,798 | 71 | 386,602 | 33,063 | 721 | 145,079 | 41,619 | 246 | 1,441 | 5,028 | 131,865 | 11,258,419 |
| 1994 | 6,631,296 | 739,032 | 58 | 37,946 | 211,638 | 9 | 128,105 | 1,391 | 3,231 | 172,281 | 13,432 | 55 | 7,617 | 1,183 | 229,787 | 8,177,061 |
| 1995 | 6,248,157 | 541,041 | 11,782 | 32,042 | 187,668 | 142 | 73,345 | 3,775 | 3,792 | 102,995 | 14,223 | 18 | 2,246 | 2,305 | 193,367 | 7,416,898 |
| 1996 | 5,426,615 | 731,434 | 2,074 | 22,863 | 196,611 | 114 | 151,811 | 3,187 | 1,659 | 161,102 | 3,950 | | 1,444 | 3,718 | 290,903 | 6,997,485 |
| 1997 | 4,361,337 | 681,386 | 81,300 | 35,582 | 262,715 | 47 | 95,906 | 14,979 | 34,005 | 305,427 | 2,923 | 673 | 2,968 | 4,798 | 196,472 | 6,080,518 |
| 1998 | 5,277,939 | 730,303 | 3,280 | 11,998 | 195,136 | 6,266 | 103,640 | 5,064 | 25,177 | 244,244 | 9,493 | 3,179 | 1,916 | 2,375 | 299,276 | 6,919,286 |
| 1999 | 3,609,019 | 519,802 | 22,958 | 6,785 | 116,433 | 29 | 135,417 | 1,159 | 12,625 | 101,004 | 2,135 | | 1,663 | 354 | 263,130 | 4,792,513 |
| 2000 | 3,513,693 | 505,647 | 2,757 | 4,922 | 132,691 | 211 | 86,063 | 1,177 | 22,371 | 133,896 | 913 | 680 | 1,620 | 2,931 | 212,979 | 4,622,551 |
| 2001 | 2,009,128 | 634,763 | 568 | 1,218 | 59,895 | | 108,596 | 4,931 | 822 | 41,086 | 629 | 410 | 1,554 | 487 | 155,912 | 3,019,999 |
| 2002 | 1,821,225 | 542,459 | 2,337 | | 121,667 | | 24,439 | 1,822 | | 12,555 | 106 | | 2,918 | 1,207 | 280,499 | 2,811,234 |
| 2003 | 1,317,487 | 524,070 | 3,309 | 4,207 | 110,027 | 13 | 18,752 | 608 | 42,829 | 41,975 | 4,542 | | 970 | 710 | 198,841 | 2,268,340 |
| 2004 | 1,079,693 | 180,376 | 2,859 | 4,340 | 76,945 | | 28,993 | 797 | | 42,522 | 167 | | 2,314 | 441 | 193,580 | 1,613,027 |
| 2005 | 1,310,773 | 274,750 | 596 | 6,898 | 46,139 | | 19,718 | 4,634 | | 18,245 | 116 | 100 | 1,308 | 10 | 262,246 | 1,945,533 |
| 2006 | 2,139,674 | 266,256 | 233 | 4,775 | 67,414 | | 4,371 | 1,881 | | 3,171 | 3,183 | 93 | 1,443 | 2,380 | 343,806 | 2,838,680 |
| 2007 | 2,632,885 | 306,262 | 2,988 | 4,210 | 63,134 | 1,222 | 7,772 | 106 | | 12,114 | 82 | | 2,445 | 363 | 457,044 | 3,490,627 |
| 2008 | 1,741,181 | 241,967 | | 5,522 | 50,183 | | 1,737 | 828 | | 2,562 | 104 | 53 | 3,188 | 3,166 | 423,656 | 2,474,147 |
| 2009 | 1,086,861 | 142,957 | | 5,505 | 42,367 | 2,331 | 8,515 | 138 | | 8,824 | 29 | | 244 | 319 | 301,446 | 1,599,536 |
| 2010 | 392,878 | 100,756 | | 924 | 26,744 | 72 | 14,001 | | | 3,870 | | 200 | 115 | 116 | 312,973 | 852,649 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 19, 2011.
Note 1: There is no drift gillnet gear for Washington.
Note 2: Significantly higher real ex-vessel revenues prior to 1994 are reported for the swordfish and HMS shark drift gillnet fishery in this year's HMS SAFE report, for all HMS and non-HMS species except groundfish, due to PacFIN gear corrections for gears that were previously mis-assigned to California entangling net, trammel net, several trawl, encircling net, set gillnet and unknown gears, and therefore not previously reported.
Additional processing info:
Only fish tickets where at least 1 lb of swordfish or any HMS shark was landed for the drift gillnet fishery were used.
Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.
Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.
Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-22. Real commercial ex-vessel revenues (2010 $) for the West Coast harpoon fishery, 1981–2010.**

| Year | Swordfish | HMS Sharks | Tunas | | Dorado | Other | Total |
|---|---|---|---|---|---|---|---|
| | | | Albacore | Other | | | |
| 1981 | 2,906,645 | 21,624 | 8,375 | 816 | | 25,489 | 2,962,949 |
| 1982 | 1,677,423 | 3,970 | | 292 | | 2,464 | 1,684,149 |
| 1983 | 611,035 | 3,769 | | | | 18,737 | 633,541 |
| 1984 | 1,079,576 | 15,688 | 611 | 278 | | 3,750 | 1,099,903 |
| 1985 | 2,302,287 | 3,094 | 405 | 444 | | 3,146 | 2,309,376 |
| 1986 | 3,158,567 | 4,278 | 93 | 593 | | 2,115 | 3,165,646 |
| 1987 | 2,815,636 | 8,634 | 7,092 | 3,547 | | 144,512 | 2,979,421 |
| 1988 | 2,441,533 | 10,622 | 14,128 | | | 1,456 | 2,467,739 |
| 1989 | 796,618 | 2,431 | 3,353 | 103 | | 1,998 | 804,503 |
| 1990 | 826,674 | 8,996 | | 165 | | 1,243 | 837,078 |
| 1991 | 266,355 | 2,997 | | | | 103 | 269,455 |
| 1992 | 848,381 | 8,858 | 1,788 | 192 | | 1,930 | 861,149 |
| 1993 | 1,602,435 | 2,674 | 10,934 | | | 1,417 | 1,617,460 |
| 1994 | 1,763,766 | 2,234 | 3,450 | | | 4,002 | 1,773,452 |
| 1995 | 1,031,634 | 5,535 | | | | 2,378 | 1,039,547 |
| 1996 | 843,137 | 4,284 | 288 | | | 869 | 848,578 |
| 1997 | 894,138 | 7,286 | 261 | | 118 | 884 | 902,687 |
| 1998 | 521,437 | 2,074 | | | | 991 | 524,502 |
| 1999 | 776,664 | 1,034 | | | | 7,461 | 785,159 |
| 2000 | 936,879 | 996 | 377 | | | 10,461 | 948,713 |
| 2001 | 571,641 | 1,406 | | | 61 | 3,355 | 576,463 |
| 2002 | 815,634 | 1,513 | | | | 1,370 | 818,517 |
| 2003 | 986,943 | 661 | | | | 2,079 | 989,683 |
| 2004 | 766,153 | 2,809 | | | | 1,880 | 770,842 |
| 2005 | 785,394 | 1,360 | | | | 2,125 | 788,879 |
| 2006 | 728,792 | 5,372 | | | | 761 | 734,925 |
| 2007 | 622,288 | 1,359 | | | | | 623,647 |
| 2008 | 467,124 | 1,463 | | | | | 468,587 |
| 2009 | 471,121 | 1,863 | | | | 595 | 473,579 |
| 2010 | 352,525 | 1,419 | | | | 349 | 354,293 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 20, 2011.

Note 1: Only California has revenues from harpoon landings.

Note 2: Some of the non-swordfish species may have been taken by dual-gear permit holders, who may have fished with drift gillnets but landed under harpoon.

Additional processing info:

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-23. Real commercial ex-vessel revenues (2010 $) for the West Coast purse seine fishery, 1981–2010.**

| | Tunas | | | | | | Sword- | HMS | | Ground- | Coastal | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified | fish | Sharks | Dorado | fish | Pelagics | Other | Total |
| 1981 | 768,460 | 206,380,895 | 132,059,198 | 3,289,988 | 2,585,260 | 115,794 | | | | | 252,234 | 3,082 | 345,454,911 |
| 1982 | 1,149,863 | 146,206,467 | 77,535,965 | 2,390,302 | 5,353,307 | 107,928 | | | | | 10,295 | | 232,754,127 |
| 1983 | 29,489 | 107,550,453 | 66,046,194 | | 2,002,092 | 48,009 | 3,450 | 501 | | | 12,754 | 1,129 | 175,694,071 |
| 1984 | 8,928,462 | 65,735,185 | 43,958,490 | 265,259 | 1,625,682 | 4,778,632 | 161,260 | 1,204 | | | 111,309 | 11,209 | 125,576,692 |
| 1985 | 52,036 | 25,506,722 | 3,078,932 | 1,455 | 5,027,986 | 1,844,041 | 12,725 | 826 | | | 90,206 | 1,719 | 35,616,648 |
| 1986 | 113,630 | 31,045,772 | 1,132,241 | 23,448 | 8,046,269 | 321,039 | 321,094 | 4,562 | | | 14,425 | 4,313 | 41,026,793 |
| 1987 | 118,760 | 44,478,305 | 7,034,528 | 257,351 | 3,502,601 | 730,529 | | 1,538 | | | 3,426 | 15,347 | 56,142,385 |
| 1988 | 440,583 | 42,548,789 | 12,840,632 | 1,123 | 3,366,105 | 111,885 | | | | | 41,866 | | 59,350,984 |
| 1989 | 73,189 | 30,467,568 | 4,956,589 | | 1,960,145 | 178,596 | 11,071 | 429 | 204 | | 10,029 | 220 | 37,658,040 |
| 1990 | 214,376 | 14,141,605 | 2,895,562 | | 1,639,836 | 49,575 | | | | | 66,615 | | 19,007,568 |
| 1991 | | 5,032,166 | 3,402,447 | | 145,391 | 11,819 | | | | | 53,964 | 4,907 | 8,650,694 |
| 1992 | 27,893 | 2,439,152 | 797,159 | 4,232 | 1,572,228 | 4,246 | 75,004 | 5,095 | 3,755 | 318 | 89,778 | 16,479 | 5,035,339 |
| 1993 | 1,700 | 1,487,148 | 1,481,170 | 5,982 | 805,441 | 1,245 | 139,655 | 2,262 | 248 | 19 | 23,813 | 15,079 | 3,963,762 |
| 1994 | | 4,343,362 | 1,493,788 | | 2,027,109 | 4,701 | | | | | 50,349 | 173,670 | 8,092,979 |
| 1995 | | 3,816,097 | 5,160,000 | | 1,280,676 | | | | | | 21,268 | 27,773 | 10,305,814 |
| 1996 | 1,165 | 3,555,395 | 4,852,428 | | 5,149,133 | | | | | | 93,180 | 33,630 | 13,684,931 |
| 1997 | 4,782 | 6,275,473 | 6,971,548 | | 3,277,577 | 5,490 | 8,724 | 2,499 | 1,864 | | 22,668 | 67,731 | 16,638,356 |
| 1998 | 210,851 | 4,928,664 | 6,104,679 | | 2,968,850 | | | | | | 213,893 | 141,404 | 14,568,341 |
| 1999 | 42,617 | 1,782,398 | 3,484,771 | | 459,293 | | | | | | 6,810 | 76,404 | 5,852,293 |
| 2000 | 8,258 | 1,630,308 | 593,674 | | 370,350 | | | | | | 30,563 | | 2,633,153 |
| 2001 | 76,711 | 501,871 | 34,906 | | 411,171 | | | | | | 6,216 | | 1,030,875 |
| 2002 | 429 | 694,155 | 153,885 | | | | 3,151 | | | | | 54 | 851,674 |
| 2003 | 18,997 | 520,252 | 178,981 | | 17,492 | | | | | | | | 735,722 |
| 2004 | 1,758 | 497,524 | 124,474 | | | | | | | | | | 623,756 |
| 2005 | | 336,436 | 322,212 | | 131,860 | | | | | | 1,890 | | 792,398 |
| 2006 | | * | * | | | | | | | | | | * |
| 2007 | 124,304 | 124,305 | 4,120 | | 47,128 | | | | | | 57,872 | | 357,731 |
| 2008 | * | * | * | | | | | | | | * | | * |
| 2009 | 42,101 | 14,321 | 3,690 | | 431,082 | | | | | | 337,905 | | 829,099 |
| 2010 | * | | | | | | | | | | | | * |

* Not reported due to data confidentiality requirements (fewer than three vessels).

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 20, 2011.

Note: There is no purse seine gear for Washington.

Additional processing info:

Only fish tickets where at least 1 lb of any HMS tuna was landed for the purse seine fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Aquaculture fish ticket/fish ticket line info is excluded.

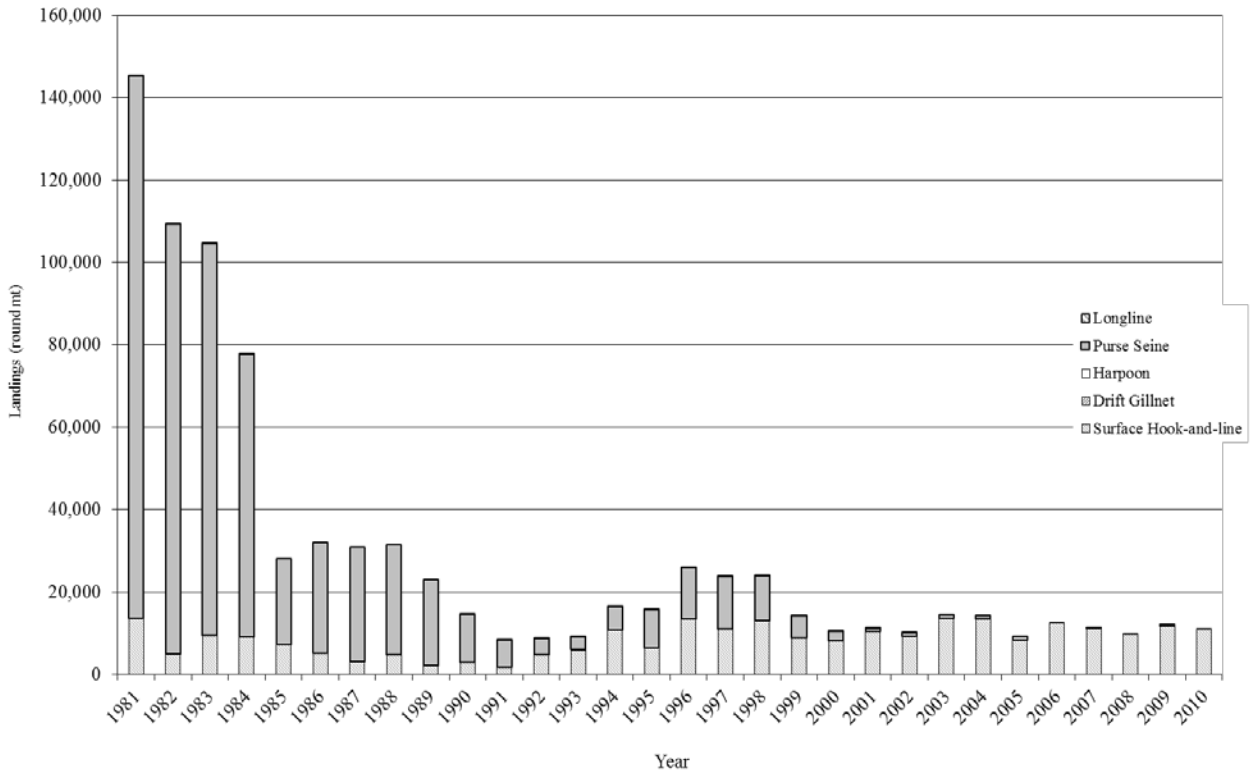


**Figure 4-4. West Coast commercial tuna landings by fishery, 1981–2010.**

**Interpretation:** Figure 4–4 and Table 4–24 display West Coast commercial tuna landings by fishery over the years 1981–2010 for the surface hook-and-line, drift gillnet, harpoon, longline, and purse seine fisheries, respectively.

**Source and Calculations**: The data were extracted from PacFIN on various dates in August 2011. Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6. Aquaculture fish ticket / fish ticket line information is excluded from the data. Canadian surface hook-and-line fishery data are also excluded.

**Table 4-24. West Coast commercial tuna landings by fishery, 1981–2010.**

| Year | Landings (round mt) | | | | | |
|---|---|---|---|---|---|---|
| | Surface Hook-and-line | Drift Gillnet | Harpoon | Longline | Purse Seine | Total |
| 1981 | 13,507 | 11 | 2 | 26 | 131,620 | 145,166 |
| 1982 | 4,981 | 30 | | 43 | 104,326 | 109,380 |
| 1983 | 9,325 | 128 | | 9 | 95,185 | 104,647 |
| 1984 | 8,922 | 165 | <0.5 | 3 | 68,571 | 77,661 |
| 1985 | 7,012 | 165 | <0.5 | | 20,843 | 28,020 |
| 1986 | 4,982 | 156 | <0.5 | | 26,891 | 32,029 |
| 1987 | 2,891 | 100 | 1 | | 27,907 | 30,899 |
| 1988 | 4,629 | 66 | 1 | | 26,814 | 31,510 |
| 1989 | 2,168 | 25 | <0.5 | | 20,784 | 22,977 |
| 1990 | 2,926 | 26 | | 1 | 11,584 | 14,537 |
| 1991 | 1,641 | 29 | | 2 | 6,562 | 8,234 |
| 1992 | 4,757 | 56 | <0.5 | 1 | 3,956 | 8,770 |
| 1993 | 5,796 | 213 | 1 | 5 | 3,070 | 9,085 |
| 1994 | 10,606 | 79 | <0.5 | 104 | 5,737 | 16,526 |
| 1995 | 6,408 | 66 | | 61 | 9,100 | 15,635 |
| 1996 | 13,249 | 110 | <0.5 | 71 | 12,382 | 25,812 |
| 1997 | 10,833 | 108 | <0.5 | 89 | 12,783 | 23,813 |
| 1998 | 12,840 | 112 | | 106 | 10,938 | 23,996 |
| 1999 | 8,818 | 116 | | 228 | 5,186 | 14,348 |
| 2000 | 8,100 | 72 | <0.5 | 122 | 2,186 | 10,480 |
| 2001 | 10,230 | 70 | | 95 | 886 | 11,281 |
| 2002 | 9,295 | 19 | | 14 | 777 | 10,105 |
| 2003 | 13,493 | 33 | | 31 | 863 | 14,420 |
| 2004 | 13,394 | 21 | | 33 | 791 | 14,239 |
| 2005 | 8,217 | 14 | | ** | 1,006 | 9,237 |
| 2006 | 12,375 | 7 | | ** | * | 12,382 |
| 2007 | 11,143 | 5 | | ** | 223 | 11,371 |
| 2008 | 9,774 | 2 | | ** | * | 9,776 |
| 2009 | 11,619 | 6 | | ** | 468 | 12,093 |
| 2010 | 10,865 | 6 | | ** | * | 10,871 |

* Not reported due to data confidentiality requirements (fewer than three vessels).

** Not reported due to data confidentiality requirements based on non-PacFIN data sources (mandatory logbooks, permits, etc.)

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted on various dates in August, 2011, except longline was last updated in August 2009.

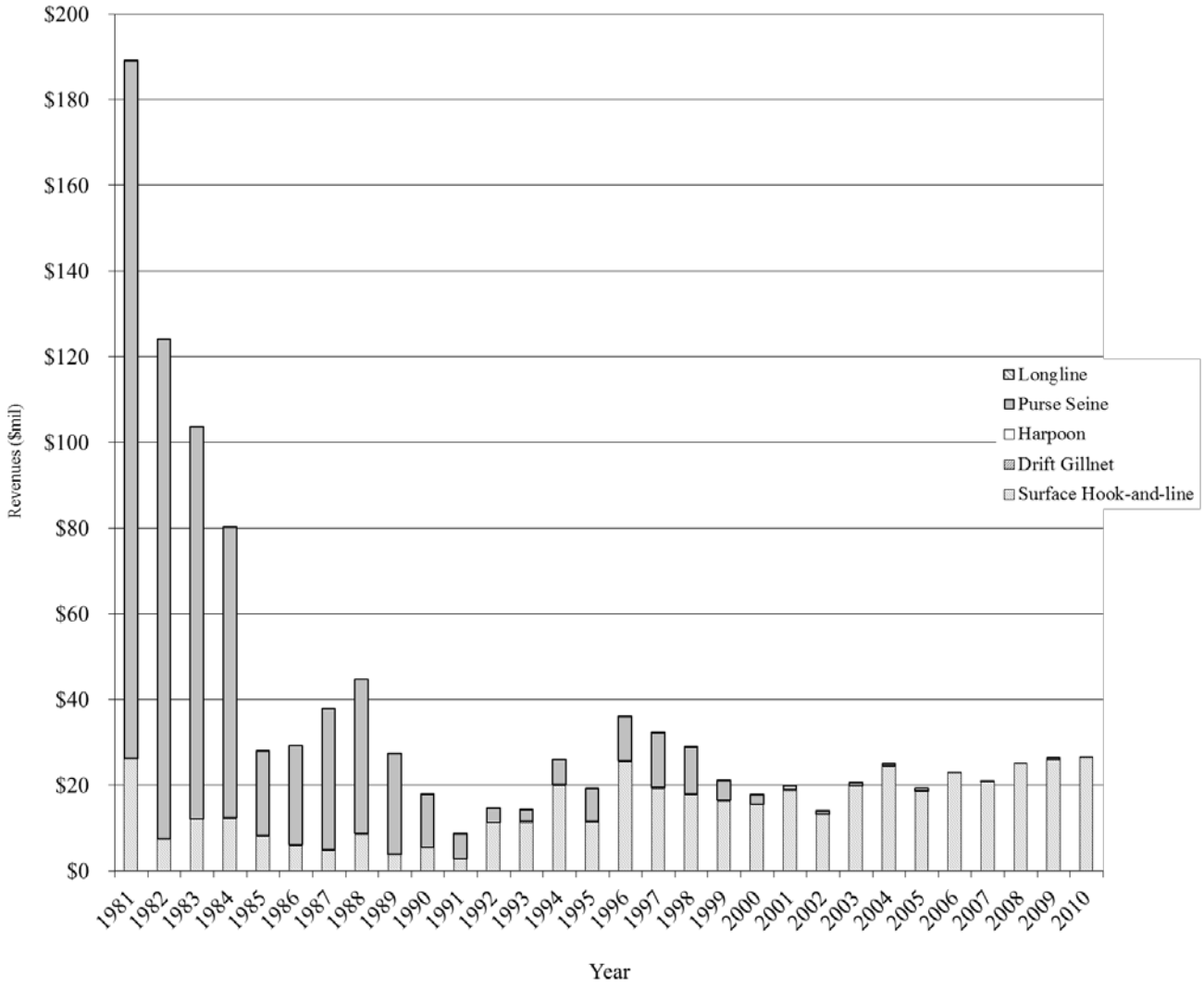


**Figure 4-5. West Coast commercial tuna revenues by fishery, 1981–2010.**

**Interpretation:** Figure 4–5 and Table 4–25 display West Coast commercial tuna revenues by fishery over the years 1981–2010 for the surface hook-and-line, drift gillnet, harpoon, longline, and purse seine fisheries, respectively.

**Source and Calculations**: The data were extracted from PacFIN on various dates in August 2011. Aquaculture fish ticket / fish ticket line information is excluded from the data. Canadian surface hook-and-line fishery data are also excluded.

**Table 4-25. West Coast commercial tuna revenues by fishery, 1981–2010.**

| | Revenues ($) | | | | | |
|---|---|---|---|---|---|---|
| Year | Surface Hook-and-line | Drift Gillnet | Harpoon | Longline | Purse Seine | Total |
| 1981 | 26,105,721 | 20,531 | 4,337 | 49,477 | 162,899,688 | 189,079,754 |
| 1982 | 7,355,282 | 50,112 | 146 | 73,415 | 116,534,837 | 124,013,792 |
| 1983 | 11,894,118 | 196,444 | | 16,549 | 91,439,482 | 103,546,593 |
| 1984 | 12,166,930 | 216,819 | 480 | 4,364 | 67,670,051 | 80,058,644 |
| 1985 | 7,999,188 | 166,819 | 472 | 740 | 19,758,416 | 27,925,635 |
| 1986 | 5,875,077 | 197,292 | 390 | | 23,136,080 | 29,208,839 |
| 1987 | 4,691,790 | 183,027 | 6,226 | 164 | 32,842,638 | 37,723,845 |
| 1988 | 8,548,185 | 152,083 | 8,552 | | 35,899,810 | 44,608,630 |
| 1989 | 3,693,992 | 51,912 | 2,171 | | 23,642,990 | 27,391,065 |
| 1990 | 5,415,074 | 66,524 | 108 | 45 | 12,357,079 | 17,838,830 |
| 1991 | 2,760,785 | 75,092 | | 873 | 5,804,636 | 8,641,386 |
| 1992 | 11,080,778 | 138,120 | 1,369 | 1,790 | 3,350,739 | 14,572,796 |
| 1993 | 11,036,136 | 429,148 | 7,730 | 10,592 | 2,673,982 | 14,157,588 |
| 1994 | 19,936,716 | 229,850 | 2,490 | 104,222 | 5,679,816 | 25,953,094 |
| 1995 | 11,360,802 | 145,980 | | 31,071 | 7,557,190 | 19,095,043 |
| 1996 | 25,526,196 | 241,541 | 216 | 16,116 | 10,179,438 | 35,963,507 |
| 1997 | 19,108,815 | 346,320 | 200 | 20,355 | 12,634,293 | 32,109,983 |
| 1998 | 17,641,854 | 299,512 | | 27,185 | 10,982,420 | 28,950,971 |
| 1999 | 16,254,470 | 197,860 | | 150,985 | 4,523,535 | 21,126,850 |
| 2000 | 15,348,828 | 195,805 | 302 | 38,632 | 2,084,934 | 17,668,501 |
| 2001 | 18,771,705 | 127,848 | | 79,286 | 839,400 | 19,818,239 |
| 2002 | 13,175,199 | 32,399 | | 11,051 | 706,266 | 13,924,915 |
| 2003 | 19,637,838 | 92,432 | | 3,975 | 625,585 | 20,359,830 |
| 2004 | 24,326,922 | 63,383 | | 5,589 | 545,475 | 24,941,369 |
| 2005 | 18,508,555 | 38,600 | | ** | 714,382 | 19,261,537 |
| 2006 | 22,833,634 | 11,763 | | ** | * | 22,845,397 |
| 2007 | 20,670,548 | 19,282 | | ** | 288,014 | 20,977,844 |
| 2008 | 24,896,835 | 5,135 | | ** | * | 24,901,970 |
| 2009 | 25,927,694 | 17,340 | | ** | 486,528 | 26,431,562 |
| 2010 | 26,395,550 | 17,871 | | ** | * | 26,413,421 |

* Not reported due to data confidentiality requirements (fewer than three vessels).

** Not reported due to data confidentiality requirements based on non-PacFIN data sources (mandatory logbooks, permits, etc.)

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted on various dates in August, 2011, except longline was last updated in August 2009.

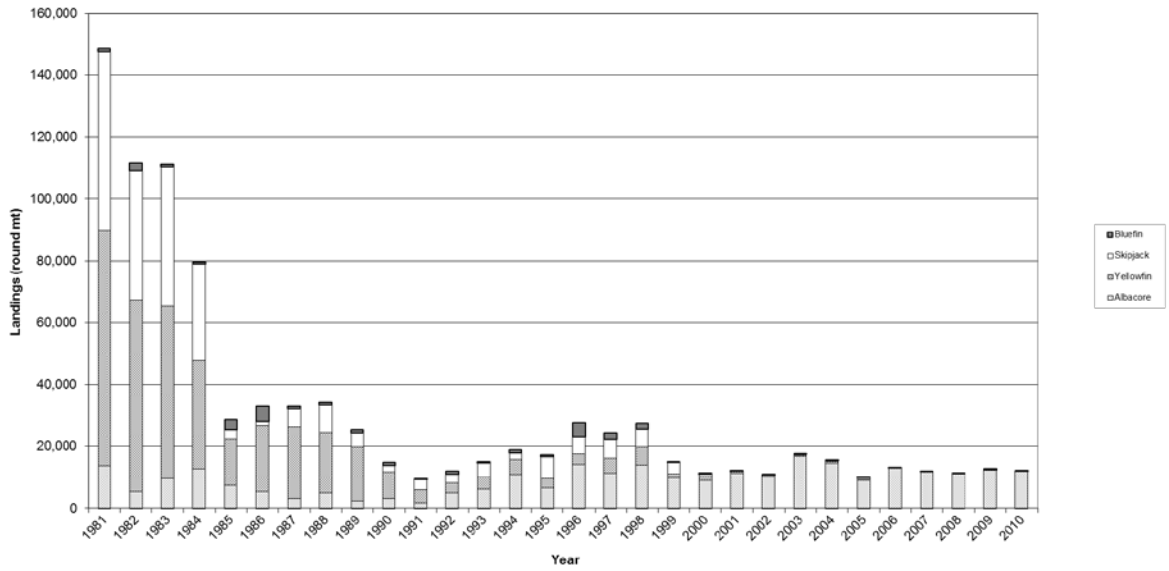


**Figure 4-6. Coastwide commercial tuna landings by species, 1981–2010.**

**Interpretation**: Figure 4–6 shows West Coast HMS commercial tuna landings in round metric tons for all gear types from 1981 through 2010 for the four principal species. The landings of these species, and other tuna species which comprise a smaller part of the catch, are shown in accompanying table 4-26.

The principal species of tuna targeted by commercial fishers are albacore, yellowfin, skipjack, and bluefin. The levels of yellowfin and skipjack landings declined precipitously during the 1980s and by 1996 albacore had supplanted yellowfin and skipjack as the most important tuna in the commercial landings. By 2000, yellowfin, skipjack, and bluefin landings had all declined to far below their levels in the early 1980s; only albacore landings remained near their long-term average.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011. They represent a portion of West Coast commercial landings by species, displayed in Table 4–4. Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6. Aquaculture fish ticket / fish ticket line information is excluded from the data.

**Table 4-26. Coastwide commercial tuna landings by species, 1981–2010.**

| | Landings (round mt) | | | | | | |
|---|---|---|---|---|---|---|---|
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified Tuna | Total |
| 1981 | 13,712 | 76,091 | 57,869 | 1,168 | 868 | 40 | 149,748 |
| 1982 | 5,410 | 61,769 | 41,904 | 968 | 2,404 | 51 | 112,506 |
| 1983 | 9,578 | 55,741 | 44,995 | 21 | 764 | 55 | 111,154 |
| 1984 | 12,654 | 35,063 | 31,251 | 126 | 635 | 1,014 | 80,743 |
| 1985 | 7,301 | 15,025 | 2,977 | 7 | 3,254 | 468 | 29,032 |
| 1986 | 5,243 | 21,517 | 1,361 | 29 | 4,731 | 143 | 33,024 |
| 1987 | 3,160 | 23,201 | 5,724 | 50 | 823 | 129 | 33,087 |
| 1988 | 4,912 | 19,520 | 8,863 | 6 | 804 | 11 | 34,116 |
| 1989 | 2,214 | 17,615 | 4,505 | 1 | 1,019 | 77 | 25,431 |
| 1990 | 3,028 | 8,509 | 2,256 | 2 | 925 | 46 | 14,766 |
| 1991 | 1,676 | 4,178 | 3,407 | 7 | 104 | 11 | 9,383 |
| 1992 | 4,902 | 3,350 | 2,586 | 7 | 1,087 | 10 | 11,942 |
| 1993 | 6,166 | 3,795 | 4,539 | 26 | 559 | 16 | 15,101 |
| 1994 | 10,751 | 5,056 | 2,111 | 47 | 916 | 33 | 18,914 |
| 1995 | 6,530 | 3,038 | 7,037 | 49 | 714 | 1 | 17,369 |
| 1996 | 14,173 | 3,347 | 5,455 | 62 | 4,688 | 3 | 27,728 |
| 1997 | 11,292 | 4,775 | 6,070 | 82 | 2,251 | 11 | 24,481 |
| 1998 | 13,915 | 5,799 | 5,846 | 53 | 1,949 | 12 | 27,574 |
| 1999 | 9,770 | 1,353 | 3,759 | 108 | 186 | 12 | 15,188 |
| 2000 | 9,074 | 1,159 | 780 | 86 | 313 | 1 | 11,413 |
| 2001 | 11,191 | 655 | 58 | 53 | 196 | 1 | 12,154 |
| 2002 | 10,029 | 544 | 236 | 10 | 11 | 2 | 10,832 |
| 2003 | 16,671 | 465 | 349 | 35 | 36 | <0.5 | 17,556 |
| 2004 | 14,540 | 488 | 307 | 22 | 10 | 9 | 15,376 |
| 2005 | 9,055 | 285 | 523 | 10 | 207 | <0.5 | 10,080 |
| 2006 | 12,786 | 77 | 48 | 35 | 1 | 1 | 12,948 |
| 2007 | 11,586 | 104 | 5 | 13 | 45 | <0.5 | 11,753 |
| 2008 | 11,131 | 65 | 3 | 27 | 1 | 1 | 11,228 |
| 2009 | 12,307 | 45 | 5 | 12 | 415 | | 12,784 |
| 2010 | 11,855 | 1 | 1 | 31 | 1 | 1 | 11,890 |

Source: PacFIN, extracted August 16, 2011.

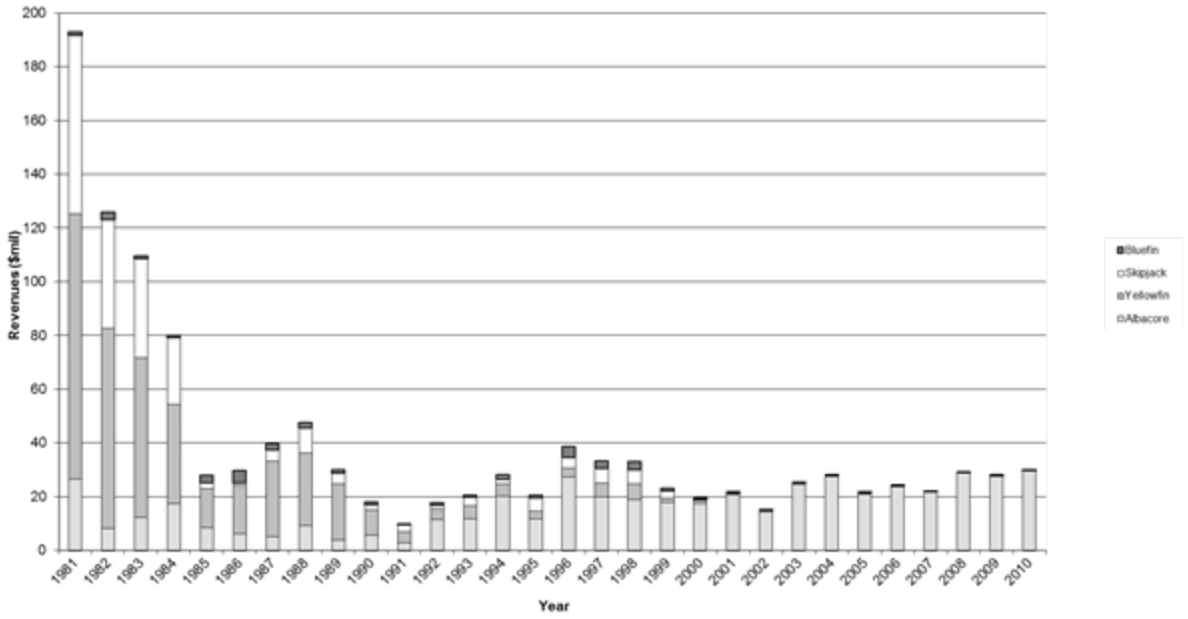


**Figure 4-7. Coastwide commercial tuna revenues by species, 1981–2010.**

**Interpretation**: Figure 4–7 shows West Coast HMS commercial tuna revenues in current dollars from 1981 through 2010 for the four principal species across all gear types. The revenues of these species and other tuna species, which comprise a smaller part of the catch, are shown in accompanying table 4-27.

The principal species of tuna targeted by commercial fishers are albacore, yellowfin, skipjack, and bluefin. The levels of yellowfin and skipjack revenues declined precipitously during the 1980s, and by 1992 albacore had supplanted yellowfin and skipjack as the most important component of commercial revenues.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011. They represent a portion of Table 4-5, which tabulates West Coast commercial current dollar revenues by species. Current dollar revenues were computed as the sum total of landed weights in pounds multiplied by the prices per pound in each fish ticket line. Aquaculture fish ticket / fish ticket line information is excluded from the data.

**Table 4-27. Coastwide commercial tuna revenues by species, 1981–2010.**

| | Revenues ($) | | | | | | |
|---|---|---|---|---|---|---|---|
| Year | Albacore | Yellowfin | Skipjack | Bigeye | Bluefin | Unspecified Tuna | Total |
| 1981 | 26,524,145 | 98,722,280 | 66,331,030 | 1,569,755 | 1,239,005 | 72,694 | 194,458,909 |
| 1982 | 8,033,073 | 74,468,306 | 40,507,405 | 1,208,147 | 2,690,102 | 98,923 | 127,005,956 |
| 1983 | 12,242,167 | 59,475,802 | 36,652,119 | 45,946 | 1,062,909 | 95,490 | 109,574,433 |
| 1984 | 17,208,448 | 37,038,204 | 24,790,704 | 174,405 | 904,956 | 2,590,391 | 82,707,108 |
| 1985 | 8,292,769 | 14,690,108 | 2,118,170 | 17,693 | 2,819,048 | 1,028,867 | 28,966,655 |
| 1986 | 6,178,084 | 18,079,443 | 904,609 | 90,227 | 4,636,698 | 198,248 | 30,087,309 |
| 1987 | 5,127,832 | 27,878,667 | 4,426,717 | 176,504 | 2,057,402 | 448,231 | 40,115,353 |
| 1988 | 9,117,601 | 27,030,132 | 9,249,827 | 26,156 | 2,070,411 | 80,548 | 47,574,675 |
| 1989 | 3,785,613 | 20,824,242 | 3,944,894 | 2,415 | 1,271,718 | 127,320 | 29,956,202 |
| 1990 | 5,620,990 | 9,383,584 | 1,898,875 | 8,771 | 1,149,381 | 56,750 | 18,118,351 |
| 1991 | 2,823,937 | 3,996,935 | 2,692,345 | 42,810 | 116,371 | 21,161 | 9,693,559 |
| 1992 | 11,483,392 | 3,677,441 | 1,410,546 | 44,731 | 1,129,626 | 21,228 | 17,766,964 |
| 1993 | 11,697,562 | 4,821,735 | 3,282,778 | 211,513 | 752,369 | 72,678 | 20,838,635 |
| 1994 | 20,188,895 | 4,522,321 | 1,751,209 | 307,147 | 1,674,099 | 55,245 | 28,498,916 |
| 1995 | 11,572,603 | 3,044,670 | 4,752,641 | 258,727 | 1,057,948 | 5,136 | 20,691,725 |
| 1996 | 27,222,294 | 3,230,957 | 3,986,113 | 260,306 | 4,035,455 | 28,296 | 38,763,421 |
| 1997 | 19,924,121 | 4,991,131 | 5,504,526 | 359,780 | 2,773,705 | 21,895 | 33,575,158 |
| 1998 | 18,895,247 | 5,861,959 | 5,213,131 | 271,919 | 2,965,485 | 61,688 | 33,269,429 |
| 1999 | 17,771,262 | 1,468,209 | 2,748,208 | 657,121 | 1,061,233 | 60,572 | 23,766,605 |
| 2000 | 17,188,570 | 1,329,357 | 483,242 | 576,919 | 580,722 | 2,298 | 20,161,108 |
| 2001 | 20,680,501 | 465,558 | 33,633 | 320,855 | 473,557 | 3,069 | 21,977,173 |
| 2002 | 14,256,910 | 588,677 | 128,245 | 87,304 | 43,477 | 6,325 | 15,110,938 |
| 2003 | 24,435,697 | 451,273 | 159,961 | 262,768 | 76,106 | 21 | 25,385,826 |
| 2004 | 27,414,167 | 446,577 | 109,254 | 147,696 | 38,312 | 54,879 | 28,210,885 |
| 2005 | 20,823,045 | 315,699 | 292,193 | 60,141 | 136,847 | 913 | 21,628,838 |
| 2006 | 23,776,441 | 174,912 | 40,350 | 205,677 | 3,790 | 1,895 | 24,203,065 |
| 2007 | 21,633,438 | 149,568 | 4,361 | 94,734 | 58,106 | 46 | 21,940,253 |
| 2008 | 28,853,123 | 125,508 | 3,675 | 205,536 | 3,340 | 3,485 | 29,194,667 |
| 2009 | 27,584,153 | 166,620 | 5,332 | 97,103 | 443,095 | | 28,296,303 |
| 2010 | 29,572,460 | 6,861 | 1,899 | 241,834 | 4,985 | 6,356 | 29,834,395 |

Source: PacFIN, extracted August 16, 2011.

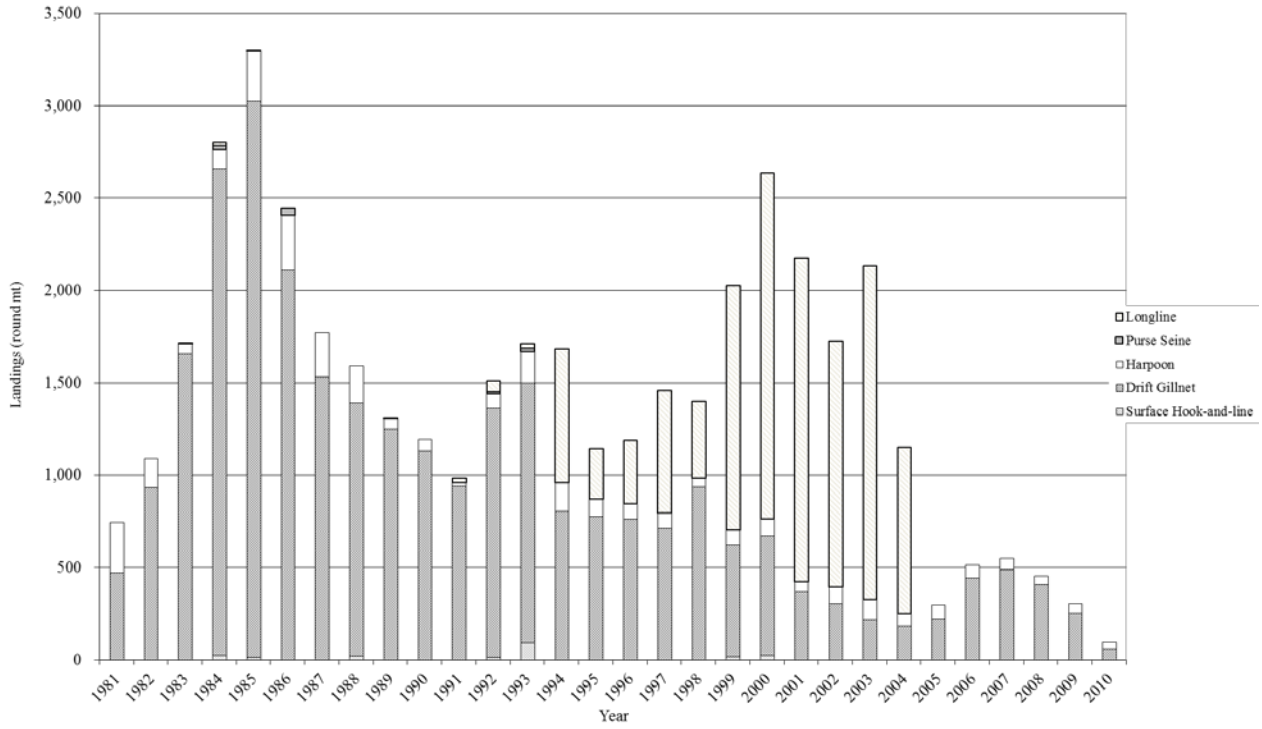


**Figure 4-8. West Coast commercial swordfish landings by fishery, 1981–2010.**

**Interpretation:** Figure 4–8 and Table 4–28 display West Coast commercial swordfish landings by fishery over the years 1981–2010 for the surface hook-and-line, drift gillnet, harpoon, longline, and purse seine fisheries, respectively. Reported drift gillnet landings for years before 1994 increased substantially from amounts shown in previous years' HMS SAFE reports due to PacFIN drift gillnet gear code corrections.

**Source and Calculations**: The data were extracted from PacFIN on various dates in August 2011. Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6. Aquaculture fish ticket / fish ticket line information is excluded from the data. Canadian surface hook-and-line fishery data are also excluded.

**Table 4-28. West Coast commercial swordfish landings by fishery, 1981–2010.**

| | Landings (round mt) | | | | | |
|---|---|---|---|---|---|---|
| Year | Surface Hook-and-line | Drift Gillnet | Harpoon | Longline | Purse Seine | Total |
| 1981 | | 469 | 272 | <0.5 | | 741 |
| 1982 | 4 | 929 | 156 | <0.5 | | 1,089 |
| 1983 | 3 | 1,651 | 58 | <0.5 | 1 | 1,713 |
| 1984 | 25 | 2,632 | 105 | 12 | 23 | 2,797 |
| 1985 | 11 | 3,010 | 275 | <0.5 | 1 | 3,297 |
| 1986 | 1 | 2,108 | 296 | | 41 | 2,446 |
| 1987 | 5 | 1,526 | 237 | | | 1,768 |
| 1988 | 18 | 1,373 | 199 | <0.5 | | 1,590 |
| 1989 | 7 | 1,239 | 62 | | 1 | 1,309 |
| 1990 | 2 | 1,126 | 65 | | | 1,193 |
| 1991 | 2 | 936 | 20 | 27 | | 985 |
| 1992 | 13 | 1,350 | 75 | 63 | 10 | 1,511 |
| 1993 | 90 | 1,409 | 169 | 27 | 17 | 1,712 |
| 1994 | 1 | 801 | 157 | 722 | | 1,681 |
| 1995 | 1 | 772 | 97 | 271 | | 1,141 |
| 1996 | <0.5 | 762 | 81 | 346 | | 1,189 |
| 1997 | 1 | 708 | 84 | 663 | 1 | 1,457 |
| 1998 | 4 | 931 | 48 | 418 | | 1,401 |
| 1999 | 15 | 605 | 81 | 1,325 | | 2,026 |
| 2000 | 22 | 650 | 90 | 1,873 | | 2,635 |
| 2001 | <0.5 | 371 | 52 | 1,749 | | 2,172 |
| 2002 | 2 | 301 | 90 | 1,331 | 1 | 1,725 |
| 2003 | | 217 | 107 | 1,810 | | 2,134 |
| 2004 | | 182 | 69 | 898 | | 1,149 |
| 2005 | | 220 | 76 | ** | | 296 |
| 2006 | | 443 | 72 | ** | | 515 |
| 2007 | | 490 | 59 | ** | | 549 |
| 2008 | <0.5 | 405 | 48 | ** | | 453 |
| 2009 | <0.5 | 251 | 50 | ** | | 301 |
| 2010 | | 59 | 36 | ** | | 95 |

** Not reported due to data confidentiality requirements based on non-PacFIN data sources (mandatory logbooks, permits, etc.)

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted on various dates in August, 2011, except longline was last updated in August 2009.

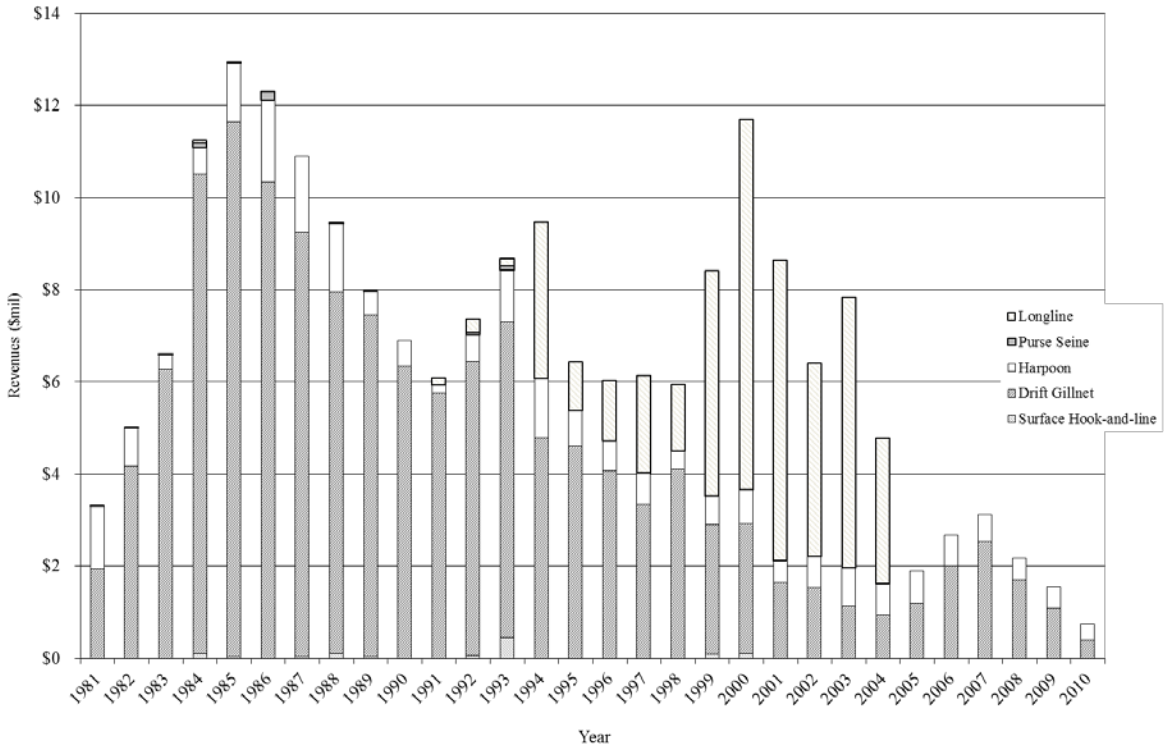


**Figure 4-9. West Coast commercial swordfish revenues by fishery, 1981–2010.**

**Interpretation:** Figure 4–9 and Table 4–29 display West Coast commercial swordfish revenues by fishery in current dollars over the years 1981–2010 for the surface hook-and-line, drift gillnet, harpoon, longline, and purse seine fisheries, respectively. Reported drift gillnet revenues for years before 1994 increased substantially from amounts shown in previous years' HMS SAFE reports due to PacFIN drift gillnet gear code corrections.

**Source and Calculations**: The data were extracted from PacFIN on various dates in August 2011. Aquaculture fish ticket / fish ticket line information is excluded from the data. Canadian surface hook-and-line fishery data are also excluded.

**Table 4-29. West Coast commercial swordfish revenues by fishery, 1981–2010.**

| | Revenues ($) | | | | | |
|---|---|---|---|---|---|---|
| Year | Surface Hook-and-line | Drift Gillnet | Harpoon | Longline | Purse Seine | Total |
| 1981 | | 1,935,740 | 1,371,646 | 1,544 | | 3,308,930 |
| 1982 | 13,219 | 4,150,231 | 839,886 | 306 | | 5,003,642 |
| 1983 | 7,531 | 6,261,486 | 318,044 | 506 | 1,796 | 6,589,363 |
| 1984 | 96,217 | 10,410,348 | 583,079 | 62,804 | 87,097 | 11,239,545 |
| 1985 | 30,921 | 11,607,897 | 1,280,993 | 752 | 7,080 | 12,927,643 |
| 1986 | 6,427 | 10,319,454 | 1,796,277 | | 182,606 | 12,304,764 |
| 1987 | 33,310 | 9,208,592 | 1,647,710 | | | 10,889,612 |
| 1988 | 96,331 | 7,856,080 | 1,477,860 | 1,601 | | 9,431,872 |
| 1989 | 34,556 | 7,421,923 | 500,435 | | 6,955 | 7,963,869 |
| 1990 | 13,332 | 6,332,028 | 539,322 | | | 6,884,682 |
| 1991 | 11,721 | 5,743,814 | 179,949 | 146,305 | | 6,081,789 |
| 1992 | 55,452 | 6,379,684 | 586,740 | 298,852 | 51,873 | 7,372,601 |
| 1993 | 442,687 | 6,847,488 | 1,132,762 | 153,383 | 98,722 | 8,675,042 |
| 1994 | 6,797 | 4,786,469 | 1,273,087 | 3,401,896 | | 9,468,249 |
| 1995 | 3,204 | 4,603,642 | 760,108 | 1,064,427 | | 6,431,381 |
| 1996 | 2,608 | 4,074,303 | 633,027 | 1,319,868 | | 6,029,806 |
| 1997 | 4,390 | 3,332,497 | 683,211 | 2,115,438 | 6,666 | 6,142,202 |
| 1998 | 17,122 | 4,078,263 | 402,914 | 1,454,529 | | 5,952,828 |
| 1999 | 77,899 | 2,829,832 | 608,982 | 4,893,372 | | 8,410,085 |
| 2000 | 97,814 | 2,814,819 | 750,533 | 8,028,596 | | 11,691,762 |
| 2001 | 2,037 | 1,645,877 | 468,289 | 6,527,196 | | 8,643,399 |
| 2002 | 9,996 | 1,515,987 | 678,934 | 4,190,669 | 2,623 | 6,398,209 |
| 2003 | | 1,120,260 | 839,197 | 5,879,612 | | 7,839,069 |
| 2004 | | 944,192 | 670,001 | 3,160,052 | | 4,774,245 |
| 2005 | | 1,184,545 | 709,760 | ** | | 1,894,305 |
| 2006 | | 1,996,530 | 680,036 | ** | | 2,676,566 |
| 2007 | | 2,528,886 | 597,707 | ** | | 3,126,593 |
| 2008 | 1,200 | 1,708,969 | 458,482 | ** | | 2,168,651 |
| 2009 | 291 | 1,076,535 | 466,645 | ** | | 1,543,471 |
| 2010 | | 392,878 | 352,525 | ** | | 745,403 |

** Not reported due to data confidentiality requirements based on non-PacFIN data sources (mandatory logbooks, permits, etc.)

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted on various dates in August, 2011, except longline was last updated in August 2009.

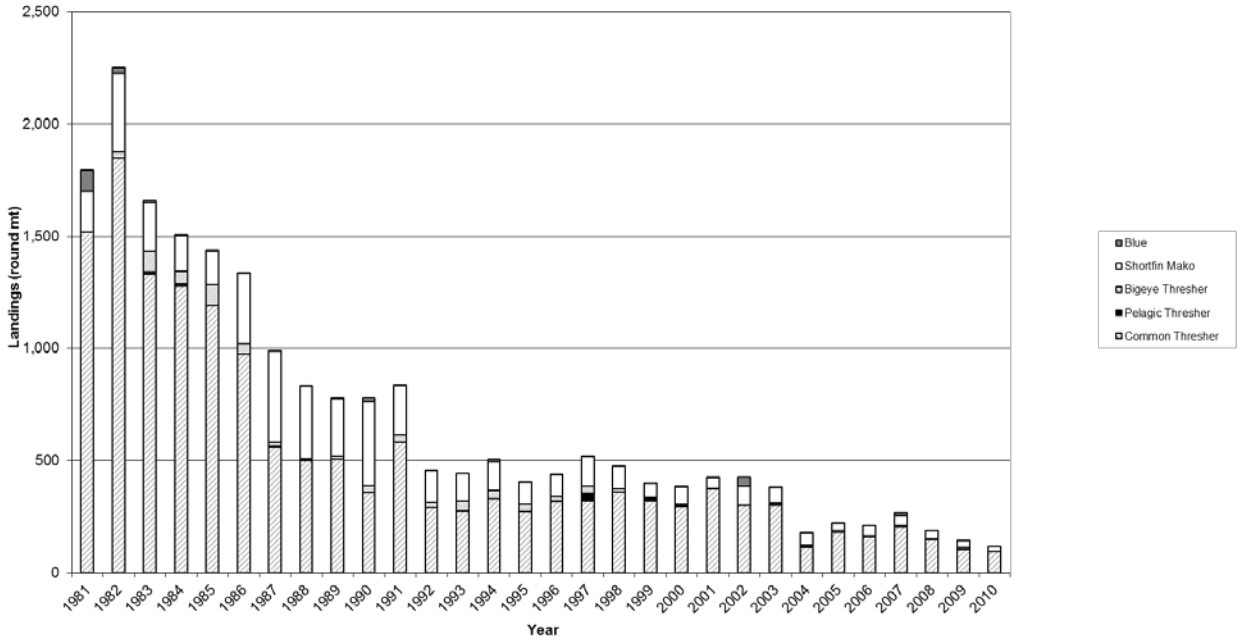


**Figure 4-10. Coastwide commercial shark landings by species, 1981–2010.**

**Interpretation:** Figure 4–10and Table 4-30 show West Coast commercial shark landings in round metric tons for all gear types from 1981 through 2010. The graph shows a general pattern of decline in landings from near 2,000 mt in the early 1980s down to a level near or below 500 mt from 1992 onwards. The decline was primarily driven by a downward trend in common thresher landings, and to a lesser extent by a similar decline in shortfin mako landings. Since 2004, total West Coast commercial shark landings have remained near or below 250. The decline in landings reflects a decrease in drift gillnet effort.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011. They represent a portion of Table 4–4, which displays West Coast commercial landings by species. Landings in pounds were converted to round weight in metric tons by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6. Aquaculture fish ticket / fish ticket line information is excluded from the data.

**Table 4-30. Coastwide commercial shark landings by species, 1981–2010.**

| Year | Landings (round mt) | | | | | |
|---|---|---|---|---|---|---|
| | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Total |
| 1981 | 1,521 | | | 182 | 92 | 1,795 |
| 1982 | 1,848 | | 28 | 351 | 27 | 2,254 |
| 1983 | 1,331 | 9 | 96 | 217 | 7 | 1,660 |
| 1984 | 1,279 | 9 | 57 | 160 | 2 | 1,507 |
| 1985 | 1,190 | <0.5 | 95 | 149 | 1 | 1,435 |
| 1986 | 974 | <0.5 | 48 | 312 | 2 | 1,336 |
| 1987 | 562 | 2 | 20 | 403 | 2 | 989 |
| 1988 | 500 | 1 | 9 | 322 | 3 | 835 |
| 1989 | 504 | <0.5 | 17 | 255 | 6 | 782 |
| 1990 | 357 | 1 | 31 | 373 | 20 | 782 |
| 1991 | 584 | | 32 | 219 | 1 | 836 |
| 1992 | 292 | <0.5 | 22 | 142 | 1 | 457 |
| 1993 | 275 | 1 | 44 | 122 | <0.5 | 442 |
| 1994 | 330 | <0.5 | 37 | 128 | 12 | 507 |
| 1995 | 270 | 5 | 31 | 95 | 5 | 406 |
| 1996 | 319 | 1 | 20 | 96 | 1 | 437 |
| 1997 | 320 | 35 | 32 | 132 | 1 | 520 |
| 1998 | 361 | 2 | 11 | 100 | 3 | 477 |
| 1999 | 320 | 10 | 5 | 63 | <0.5 | 398 |
| 2000 | 296 | 3 | 5 | 80 | 1 | 385 |
| 2001 | 373 | 2 | 2 | 46 | 2 | 425 |
| 2002 | 301 | 2 | | 82 | 41 | 426 |
| 2003 | 301 | 4 | 6 | 70 | 1 | 382 |
| 2004 | 115 | 2 | 5 | 54 | 1 | 177 |
| 2005 | 179 | <0.5 | 10 | 33 | 1 | 223 |
| 2006 | 160 | <0.5 | 4 | 46 | <0.5 | 210 |
| 2007 | 204 | 2 | 5 | 45 | 10 | 266 |
| 2008 | 147 | <0.5 | 6 | 35 | <0.5 | 188 |
| 2009 | 106 | <0.5 | 7 | 30 | 1 | 144 |
| 2010 | 95 | <0.5 | 1 | 21 | <0.5 | 117 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted August 16, 2011.

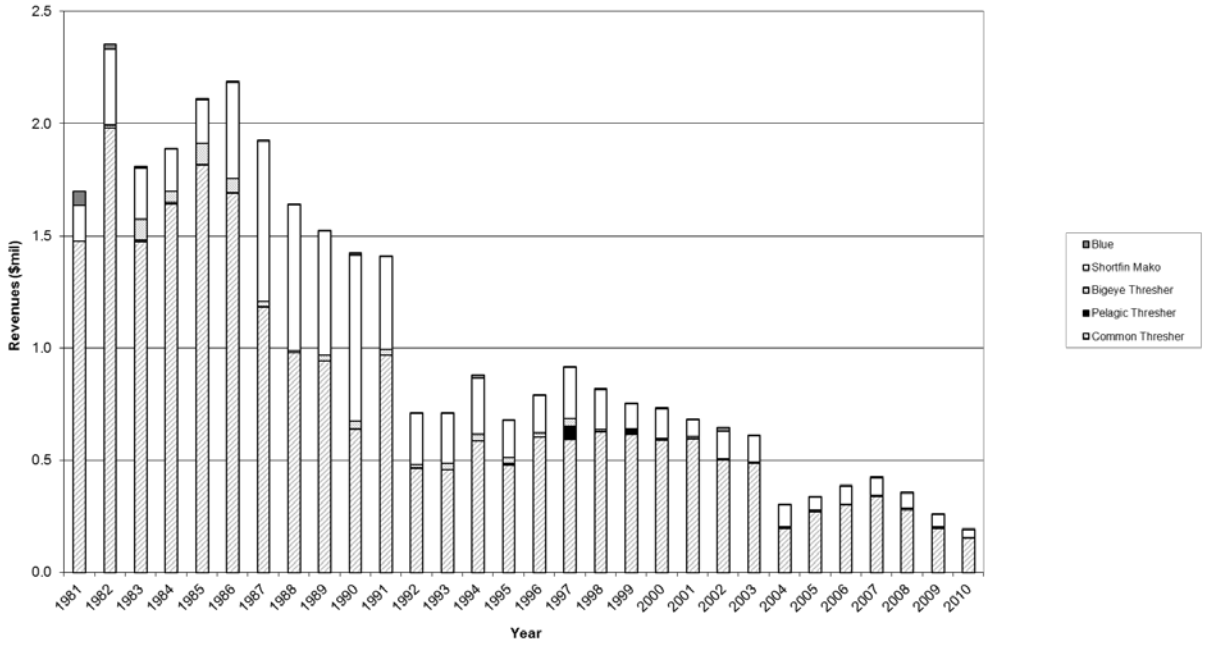


**Figure 4-11. Coastwide commercial shark revenues by species, 1981–2010.**

**Interpretation**: Figure 4–11 and Table 4-31 show West Coast commercial shark revenues in current dollars by species for all gear types from 1981 through 2010.

The graph shows a long-term downward trend in commercial shark revenues from levels approaching $2.5 million in the early 1980s to a level below $0.5 million since 2004. The decline was primarily driven by a downward trend in common thresher revenue, and to a lesser extent by a similar decline in shortfin mako revenue. A key factor underlying the decline in revenues is a drop in drift gillnet fishery effort.

**Source and Calculations**: The data were extracted from PacFIN on August 16, 2011. They represent a portion of the Table 4–5, which displays West Coast commercial current dollar revenues by species. Current dollar revenues were computed as the sum total of landed weights in pounds multiplied by the prices per pound in each fish ticket line. Aquaculture fish ticket / fish ticket line information is excluded from the data.

**Table 4-31. Coastwide commercial shark revenues by species, 1981–2010.**

| Year | Revenues ($) | | | | | |
|---|---|---|---|---|---|---|
| | Common Thresher | Pelagic Thresher | Bigeye Thresher | Shortfin Mako | Blue | Total |
| 1981 | 1,475,634 | | | 162,347 | 59,064 | 1,697,045 |
| 1982 | 1,980,592 | | 15,168 | 339,209 | 18,826 | 2,353,795 |
| 1983 | 1,474,213 | 8,449 | 91,455 | 229,826 | 4,645 | 1,808,588 |
| 1984 | 1,642,178 | 7,723 | 47,119 | 189,794 | 2,470 | 1,889,284 |
| 1985 | 1,817,135 | 716 | 96,433 | 192,917 | 2,132 | 2,109,333 |
| 1986 | 1,690,791 | 194 | 66,647 | 428,259 | 1,320 | 2,187,211 |
| 1987 | 1,184,091 | 1,840 | 22,123 | 715,138 | 1,853 | 1,925,045 |
| 1988 | 979,905 | 821 | 9,764 | 649,799 | 2,275 | 1,642,564 |
| 1989 | 944,161 | 149 | 24,711 | 552,576 | 3,465 | 1,525,062 |
| 1990 | 638,630 | 1,682 | 34,628 | 739,193 | 10,303 | 1,424,436 |
| 1991 | 968,877 | | 25,179 | 415,168 | 894 | 1,410,118 |
| 1992 | 464,018 | 602 | 14,629 | 231,063 | 1,816 | 712,128 |
| 1993 | 458,513 | 462 | 28,190 | 221,401 | 622 | 709,188 |
| 1994 | 584,318 | 42 | 33,478 | 247,088 | 16,057 | 880,983 |
| 1995 | 477,901 | 8,777 | 24,896 | 165,215 | 2,796 | 679,585 |
| 1996 | 603,006 | 1,557 | 17,745 | 167,111 | 587 | 790,006 |
| 1997 | 591,268 | 62,496 | 34,768 | 227,426 | 327 | 916,285 |
| 1998 | 625,489 | 2,584 | 9,428 | 176,313 | 5,996 | 819,810 |
| 1999 | 617,691 | 18,424 | 5,876 | 111,119 | 73 | 753,183 |
| 2000 | 589,035 | 2,738 | 4,636 | 133,621 | 720 | 730,750 |
| 2001 | 595,548 | 2,767 | 8,428 | 75,799 | 1,294 | 683,836 |
| 2002 | 503,487 | 1,946 | | 124,521 | 18,510 | 648,464 |
| 2003 | 487,796 | 2,814 | 3,779 | 115,728 | 390 | 610,507 |
| 2004 | 197,188 | 2,500 | 4,060 | 98,827 | 489 | 303,064 |
| 2005 | 271,767 | 588 | 6,234 | 57,788 | 426 | 336,803 |
| 2006 | 301,669 | 271 | 4,509 | 79,586 | 309 | 386,344 |
| 2007 | 337,770 | 2,903 | 4,334 | 78,569 | 1,984 | 425,560 |
| 2008 | 280,885 | 434 | 5,459 | 67,255 | 177 | 354,210 |
| 2009 | 197,718 | 72 | 5,453 | 54,463 | 2,361 | 260,067 |
| 2010 | 155,259 | 100 | 924 | 35,565 | 177 | 192,025 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted August 16, 2011.

**Table 4-32. Commercial landings (round mt) of the albacore surface hook-and-line (troll and baitboat) fishery in California, with Canadian vessels excluded, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 9,113 | 14 | | <0.5 | <0.5 | 1 | 2 | 3 | 2 | 9,135 |
| 1982 | 3,859 | 3 | 4 | 2 | 1 | 4 | <0.5 | 2 | <0.5 | 3,875 |
| 1983 | 7,270 | 16 | 3 | 1 | <0.5 | 20 | 34 | 4 | 1 | 7,349 |
| 1984 | 8,109 | 13 | 25 | 5 | <0.5 | 5 | 2 | <0.5 | 4 | 8,163 |
| 1985 | 6,147 | 2 | 11 | 4 | <0.5 | 4 | <0.5 | 2 | 1 | 6,171 |
| 1986 | 3,019 | 2 | 1 | <0.5 | | 20 | <0.5 | 2 | <0.5 | 3,044 |
| 1987 | 1,324 | <0.5 | 5 | 2 | | 2 | 1 | 1 | <0.5 | 1,335 |
| 1988 | 931 | <0.5 | 17 | 2 | | <0.5 | | <0.5 | 1 | 951 |
| 1989 | 823 | 1 | 7 | 8 | <0.5 | 10 | <0.5 | 2 | 1 | 852 |
| 1990 | 758 | <0.5 | 2 | <0.5 | <0.5 | 3 | <0.5 | <0.5 | 2 | 765 |
| 1991 | 642 | <0.5 | 2 | 1 | | <0.5 | | | 1 | 646 |
| 1992 | 1,184 | <0.5 | 13 | 2 | <0.5 | 6 | | <0.5 | 2 | 1,207 |
| 1993 | 1,461 | 18 | 89 | 5 | 9 | 3 | | | 1 | 1,586 |
| 1994 | 3,055 | <0.5 | 1 | <0.5 | <0.5 | 1 | | <0.5 | <0.5 | 3,057 |
| 1995 | 777 | <0.5 | <0.5 | <0.5 | | <0.5 | <0.5 | <0.5 | 3 | 780 |
| 1996 | 5,038 | 42 | <0.5 | <0.5 | | <0.5 | | <0.5 | 2 | 5,082 |
| 1997 | 3,288 | 7 | 1 | 1 | <0.5 | 5 | <0.5 | 3 | 2 | 3,307 |
| 1998 | 2,232 | 116 | 4 | 3 | <0.5 | 1 | <0.5 | 1 | 2 | 2,359 |
| 1999 | 5,339 | 6 | 15 | 1 | <0.5 | 1 | <0.5 | <0.5 | 5 | 5,367 |
| 2000 | 1,798 | 2 | 22 | <0.5 | <0.5 | 1 | <0.5 | 1 | 2 | 1,826 |
| 2001 | 2,796 | 8 | <0.5 | 1 | <0.5 | 2 | <0.5 | 3 | 6 | 2,816 |
| 2002 | 2,659 | 2 | 2 | <0.5 | <0.5 | <0.5 | <0.5 | 3 | 3 | 2,669 |
| 2003 | 1,696 | 3 | | <0.5 | <0.5 | 1 | <0.5 | 2 | 3 | 1,705 |
| 2004 | 1,336 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | 2 | 2 | 1,341 |
| 2005 | 455 | <0.5 | | | | 1 | | <0.5 | 1 | 457 |
| 2006 | 201 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 202 |
| 2007 | 772 | <0.5 | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 772 |
| 2008 | 376 | 1 | | | <0.5 | <0.5 | <0.5 | | 1 | 378 |
| 2009 | 349 | 7 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 2 | 358 |
| 2010 | 711 | <0.5 | | <0.5 | <0.5 | <0.5 | | | <0.5 | 711 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-33. Commercial landings (round mt) of the albacore surface hook-and-line (troll and baitboat) fishery in California, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 9,113 | 14 | | <0.5 | <0.5 | 1 | 2 | 3 | 2 | 9,135 |
| 1982 | 3,859 | 3 | 4 | 2 | 1 | 4 | <0.5 | 2 | <0.5 | 3,875 |
| 1983 | 7,270 | 16 | 3 | 1 | <0.5 | 20 | 34 | 4 | 1 | 7,349 |
| 1984 | 8,109 | 13 | 25 | 5 | <0.5 | 5 | 2 | <0.5 | 4 | 8,163 |
| 1985 | 6,147 | 2 | 11 | 4 | <0.5 | 4 | <0.5 | 2 | 1 | 6,171 |
| 1986 | 3,019 | 2 | 1 | <0.5 | | 20 | <0.5 | 2 | <0.5 | 3,044 |
| 1987 | 1,324 | <0.5 | 5 | 2 | | 2 | 1 | 1 | <0.5 | 1,335 |
| 1988 | 931 | <0.5 | 17 | 2 | | <0.5 | | <0.5 | 1 | 951 |
| 1989 | 823 | 1 | 7 | 8 | <0.5 | 10 | <0.5 | 2 | 1 | 852 |
| 1990 | 758 | <0.5 | 2 | <0.5 | <0.5 | 3 | <0.5 | <0.5 | 2 | 765 |
| 1991 | 642 | <0.5 | 2 | 1 | | <0.5 | | | 1 | 646 |
| 1992 | 1,184 | <0.5 | 13 | 2 | <0.5 | 6 | | <0.5 | 2 | 1,207 |
| 1993 | 1,461 | 18 | 89 | 5 | 9 | 3 | | | 1 | 1,586 |
| 1994 | 3,055 | <0.5 | 1 | <0.5 | <0.5 | 1 | | <0.5 | <0.5 | 3,057 |
| 1995 | 777 | <0.5 | <0.5 | <0.5 | | <0.5 | <0.5 | <0.5 | 3 | 780 |
| 1996 | 5,047 | 42 | <0.5 | <0.5 | | <0.5 | | <0.5 | 2 | 5,091 |
| 1997 | 3,290 | 7 | 1 | 1 | <0.5 | 5 | <0.5 | 3 | 1 | 3,308 |
| 1998 | 2,232 | 116 | 4 | 3 | <0.5 | 1 | <0.5 | 1 | 2 | 2,359 |
| 1999 | 5,360 | 6 | 15 | 1 | <0.5 | 1 | <0.5 | <0.5 | 5 | 5,388 |
| 2000 | 1,798 | 2 | 22 | <0.5 | <0.5 | 1 | <0.5 | 1 | 2 | 1,826 |
| 2001 | 2,796 | 8 | <0.5 | 1 | <0.5 | 2 | <0.5 | 3 | 6 | 2,816 |
| 2002 | 2,659 | 2 | 2 | <0.5 | <0.5 | <0.5 | <0.5 | 3 | 3 | 2,669 |
| 2003 | 1,696 | 3 | | <0.5 | <0.5 | 1 | <0.5 | 2 | 3 | 1,705 |
| 2004 | 1,336 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | 2 | 2 | 1,341 |
| 2005 | 455 | <0.5 | | | | 1 | | <0.5 | 1 | 457 |
| 2006 | 201 | 1 | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 202 |
| 2007 | 772 | <0.5 | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 772 |
| 2008 | 376 | 1 | | | <0.5 | <0.5 | <0.5 | | 1 | 378 |
| 2009 | 349 | 7 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 2 | 358 |
| 2010 | 711 | <0.5 | | <0.5 | <0.5 | <0.5 | | | <0.5 | 711 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-34. Commercial landings (round mt) of the albacore surface hook-and-line (troll and baitboat) fishery in Oregon, with Canadian vessels excluded, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 3,505 | | | | | 1 | | 25 | <0.5 | 3,531 |
| 1982 | 853 | <0.5 | | | | <0.5 | | 1 | <0.5 | 854 |
| 1983 | 1,509 | <0.5 | | | | 3 | <0.5 | 5 | <0.5 | 1,517 |
| 1984 | 733 | <0.5 | | | | <0.5 | | 1 | <0.5 | 734 |
| 1985 | 692 | | | | | <0.5 | | <0.5 | <0.5 | 692 |
| 1986 | 1,116 | <0.5 | | | | <0.5 | | 1 | | 1,117 |
| 1987 | 1,038 | | | | | | | 1 | | 1,038 |
| 1988 | 1,794 | | | | | <0.5 | | 2 | <0.5 | 1,796 |
| 1989 | 490 | | | | | <0.5 | | <0.5 | | 490 |
| 1990 | 943 | | | | | <0.5 | <0.5 | 1 | | 944 |
| 1991 | 571 | | | | | | | 1 | <0.5 | 572 |
| 1992 | 1,719 | | | <0.5 | | <0.5 | | 1 | | 1,720 |
| 1993 | 2,147 | | | | | 1 | | 3 | | 2,151 |
| 1994 | 2,131 | | | <0.5 | | | | <0.5 | <0.5 | 2,131 |
| 1995 | 2,283 | 1 | | | <0.5 | <0.5 | | 6 | | 2,290 |
| 1996 | 3,595 | <0.5 | | | | <0.5 | | 10 | | 3,606 |
| 1997 | 3,867 | <0.5 | | | <0.5 | 1 | | 9 | | 3,877 |
| 1998 | 4,292 | | | <0.5 | | 1 | | 4 | <0.5 | 4,296 |
| 1999 | 1,632 | 6 | | <0.5 | | <0.5 | | 2 | | 1,640 |
| 2000 | 3,282 | <0.5 | | <0.5 | | <0.5 | | 2 | | 3,284 |
| 2001 | 3,572 | <0.5 | | <0.5 | | <0.5 | | 6 | | 3,579 |
| 2002 | 1,924 | | | | | | | 3 | | 1,927 |
| 2003 | 3,807 | <0.5 | | | | | | 1 | | 3,809 |
| 2004 | 4,632 | <0.5 | | <0.5 | | <0.5 | <0.5 | 2 | | 4,635 |
| 2005 | 3,258 | | | <0.5 | | <0.5 | | 1 | | 3,260 |
| 2006 | 3,680 | <0.5 | | <0.5 | | <0.5 | <0.5 | | 1 | 3,681 |
| 2007 | 4,469 | | | | <0.5 | <0.5 | <0.5 | <0.5 | 1 | 4,470 |
| 2008 | 3,196 | 5 | <0.5 | | <0.5 | <0.5 | | | 1 | 3,202 |
| 2009 | 4,416 | <0.5 | | <0.5 | | <0.5 | | <0.5 | 1 | 4,417 |
| 2010 | 4,306 | | | | | <0.5 | | 2 | 1 | 4,309 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-35. Commercial landings (round mt) of the albacore surface hook-and-line (troll and baitboat) fishery in Oregon, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 3,505 | | | | | 1 | | 25 | <0.5 | 3,531 |
| 1982 | 863 | <0.5 | | | | <0.5 | | 1 | 1 | 865 |
| 1983 | 1,540 | <0.5 | | | | 3 | <0.5 | 5 | 1 | 1,549 |
| 1984 | 736 | <0.5 | | | | <0.5 | | 1 | <0.5 | 737 |
| 1985 | 692 | | | | | <0.5 | | <0.5 | <0.5 | 692 |
| 1986 | 1,116 | <0.5 | | | | <0.5 | | 1 | | 1,117 |
| 1987 | 1,038 | | | | | | | 1 | | 1,038 |
| 1988 | 1,795 | | | | | <0.5 | | 2 | <0.5 | 1,797 |
| 1989 | 490 | | | | | <0.5 | | <0.5 | | 490 |
| 1990 | 943 | | | | | <0.5 | <0.5 | 1 | | 944 |
| 1991 | 571 | | | | | | | 1 | <0.5 | 572 |
| 1992 | 1,767 | | | <0.5 | | <0.5 | | 1 | | 1,768 |
| 1993 | 2,157 | | | | | 1 | | 3 | | 2,160 |
| 1994 | 2,131 | | | <0.5 | | | | <0.5 | <0.5 | 2,131 |
| 1995 | 2,283 | 1 | | | <0.5 | <0.5 | | 6 | | 2,290 |
| 1996 | 4,059 | <0.5 | | | | <0.5 | | 10 | | 4,069 |
| 1997 | 4,158 | <0.5 | | | <0.5 | 1 | | 9 | | 4,169 |
| 1998 | 4,810 | | | <0.5 | | 1 | | 4 | <0.5 | 4,814 |
| 1999 | 2,065 | 6 | | <0.5 | | <0.5 | | 2 | | 2,073 |
| 2000 | 3,972 | <0.5 | | <0.5 | | <0.5 | | 2 | | 3,974 |
| 2001 | 4,064 | <0.5 | | <0.5 | | <0.5 | | 6 | | 4,070 |
| 2002 | 1,978 | | | | | | | 3 | | 1,982 |
| 2003 | 4,118 | <0.5 | | | | | | 1 | | 4,120 |
| 2004 | 4,878 | <0.5 | | <0.5 | | <0.5 | <0.5 | 2 | | 4,880 |
| 2005 | 3,668 | | | <0.5 | | <0.5 | | 1 | | 3,670 |
| 2006 | 3,864 | <0.5 | | <0.5 | | <0.5 | <0.5 | | <0.5 | 3,864 |
| 2007 | 4,748 | | | | <0.5 | <0.5 | <0.5 | <0.5 | 1 | 4,749 |
| 2008 | 4,026 | 5 | <0.5 | | <0.5 | <0.5 | | | 2 | 4,033 |
| 2009 | 4,574 | <0.5 | | <0.5 | | <0.5 | | <0.5 | 1 | 4,575 |
| 2010 | 4,854 | | | | | <0.5 | | 2 | <0.5 | 4,856 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-36. Commercial landings (round mt) of the albacore surface hook-and-line (troll and baitboat) fishery in Washington, with Canadian vessels excluded, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado[1] | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 875 | | | | N.A. | 1 | | 9 | <0.5 | 885 |
| 1982 | 266 | | | | N.A. | | | | | 266 |
| 1983 | 530 | | | | N.A. | 1 | | 4 | | 535 |
| 1984 | 67 | | | | N.A. | | | | | 67 |
| 1985 | 172 | | | | N.A. | | | | | 172 |
| 1986 | 845 | | | | N.A. | | | | | 845 |
| 1987 | 529 | | | | N.A. | | | | <0.5 | 529 |
| 1988 | 1,904 | | 1 | | N.A. | <0.5 | <0.5 | <0.5 | 1 | 1,906 |
| 1989 | 855 | | | | N.A. | <0.5 | | | | 855 |
| 1990 | 1,225 | | | | N.A. | | | | | 1,225 |
| 1991 | 428 | <0.5 | | | N.A. | <0.5 | | <0.5 | | 428 |
| 1992 | 1,852 | <0.5 | | | N.A. | <0.5 | | | 1 | 1,853 |
| 1993 | 2,171 | | 1 | <0.5 | N.A. | <0.5 | | <0.5 | <0.5 | 2,172 |
| 1994 | 5,420 | | | | N.A. | | | | | 5,420 |
| 1995 | 3,347 | | <0.5 | | N.A. | | | 1 | <0.5 | 3,348 |
| 1996 | 4,573 | | | | N.A. | | | | | 4,573 |
| 1997 | 3,670 | | | | N.A. | <0.5 | | | | 3,670 |
| 1998 | 6,201 | | | | N.A. | | | | | 6,201 |
| 1999 | 1,822 | 12 | | | N.A. | | | | <0.5 | 1,834 |
| 2000 | 3,017 | | | | N.A. | | | | | 3,017 |
| 2001 | 3,852 | 1 | | | N.A. | 1 | | <0.5 | | 3,853 |
| 2002 | 4,710 | | | | N.A. | <0.5 | | 1 | 1 | 4,712 |
| 2003 | 7,986 | | | | N.A. | | | | | 7,986 |
| 2004 | 7,425 | | | | N.A. | | | | <0.5 | 7,425 |
| 2005 | 4,504 | | | | N.A. | | | 1 | <0.5 | 4,505 |
| 2006 | 8,493 | | | | N.A. | | | | | 8,493 |
| 2007 | 5,902 | | | | N.A. | | | <0.5 | 1 | 5,903 |
| 2008 | 6,197 | | | | N.A. | <0.5 | | <0.5 | | 6,197 |
| 2009 | 6,847 | | | | N.A. | | | 1 | | 6,848 |
| 2010 | 5,847 | | | | N.A. | | | 1 | | 5,848 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

[1]There is no species code for dorado in Washington.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-37. Commercial landings (round mt) of the albacore surface hook-and-line (troll and baitboat) fishery in Washington, 1981–2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado[1] | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 875 | | | | N.A. | 1 | | 9 | <0.5 | 885 |
| 1982 | 266 | | | | N.A. | | | | | 266 |
| 1983 | 530 | | | | N.A. | 1 | | 4 | | 535 |
| 1984 | 67 | | | | N.A. | | | | | 67 |
| 1985 | 172 | | | | N.A. | | | | | 172 |
| 1986 | 845 | | | | N.A. | | | | | 845 |
| 1987 | 529 | | | | N.A. | | | | <0.5 | 529 |
| 1988 | 1,904 | | 1 | | N.A. | <0.5 | <0.5 | <0.5 | 1 | 1,906 |
| 1989 | 855 | | | | N.A. | <0.5 | | | | 855 |
| 1990 | 1,225 | | | | N.A. | | | | | 1,225 |
| 1991 | 428 | <0.5 | | | N.A. | <0.5 | | <0.5 | | 428 |
| 1992 | 1,864 | <0.5 | | | N.A. | <0.5 | | | <0.5 | 1,864 |
| 1993 | 2,183 | | 1 | <0.5 | N.A. | <0.5 | | <0.5 | <0.5 | 2,184 |
| 1994 | 5,443 | | | | N.A. | | | | | 5,443 |
| 1995 | 3,414 | | <0.5 | | N.A. | | | 1 | <0.5 | 3,415 |
| 1996 | 4,969 | | | | N.A. | | | | | 4,969 |
| 1997 | 3,775 | | | | N.A. | <0.5 | | | | 3,775 |
| 1998 | 6,644 | | | | N.A. | | | | | 6,644 |
| 1999 | 2,081 | 12 | | | N.A. | | | | <0.5 | 2,093 |
| 2000 | 3,216 | | | | N.A. | | | | | 3,216 |
| 2001 | 4,156 | 1 | | | N.A. | 1 | | <0.5 | | 4,157 |
| 2002 | 5,358 | | | | N.A. | <0.5 | | 1 | <0.5 | 5,359 |
| 2003 | 10,793 | | | | N.A. | | | <0.5 | | 10,793 |
| 2004 | 8,310 | | | | N.A. | | | | <0.5 | 8,310 |
| 2005 | 4,904 | | | | N.A. | | | 1 | <0.5 | 4,905 |
| 2006 | 8,707 | | | | N.A. | | | | | 8,707 |
| 2007 | 5,980 | | | | N.A. | | | <0.5 | 1 | 5,981 |
| 2008 | 6,725 | | | | N.A. | <0.5 | | <0.5 | | 6,726 |
| 2009 | 7,340 | | | | N.A. | | | 1 | | 7,340 |
| 2010 | 6,258 | | | | N.A. | | | 1 | | 6,259 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

[1]There is no species code for dorado in Washington.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landings in lbs are converted to round weight in mt by multiplying the landed weights by the conversion factors in each fish ticket line and then dividing by 2204.6.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-38. Nominal commercial ex-vessel revenues ($) of the albacore surface hook-and-line (troll and baitboat) fishery in California, with Canadian vessels excluded, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 17,731,395 | 17,982 | | 173 | 72 | 1,444 | 991 | 16,689 | 1,091 | 17,769,837 |
| 1982 | 5,735,370 | 5,258 | 13,219 | 2,771 | 557 | 5,671 | 13 | 10,001 | 332 | 5,773,192 |
| 1983 | 9,394,970 | 14,511 | 7,531 | 1,597 | 33 | 18,504 | 15,429 | 14,994 | 3,713 | 9,471,282 |
| 1984 | 11,157,988 | 19,870 | 96,217 | 6,080 | 706 | 6,854 | 928 | 2,154 | 3,559 | 11,294,356 |
| 1985 | 6,973,498 | 4,278 | 30,921 | 7,017 | 6 | 6,375 | 239 | 10,104 | 1,976 | 7,034,414 |
| 1986 | 3,598,008 | 7,124 | 6,427 | 180 | | 18,967 | 160 | 6,309 | 660 | 3,637,835 |
| 1987 | 2,173,044 | 1,150 | 33,310 | 3,440 | | 2,305 | 657 | 3,089 | 402 | 2,217,397 |
| 1988 | 1,728,315 | 952 | 89,636 | 3,566 | | 664 | | 1,860 | 421 | 1,825,414 |
| 1989 | 1,455,484 | 1,833 | 34,556 | 11,295 | 31 | 18,058 | 1 | 7,412 | 2,504 | 1,531,174 |
| 1990 | 1,457,546 | 79 | 13,332 | 560 | 74 | 6,059 | 83 | 39 | 1,529 | 1,479,301 |
| 1991 | 1,089,097 | 56 | 11,721 | 602 | | 185 | | | 774 | 1,102,435 |
| 1992 | 2,889,632 | 2,124 | 55,452 | 2,321 | 281 | 6,004 | | 1,259 | 614 | 2,957,687 |
| 1993 | 2,902,857 | 154,056 | 437,415 | 7,144 | 23,216 | 3,917 | | | 1,741 | 3,530,346 |
| 1994 | 6,415,286 | 603 | 6,797 | 275 | 180 | 590 | | 529 | 326 | 6,424,586 |
| 1995 | 1,418,582 | 592 | 2,953 | 173 | | 47 | 16 | 710 | 2,992 | 1,426,065 |
| 1996 | 10,571,220 | 38,548 | 2,608 | 295 | | 60 | | 1,567 | 996 | 10,615,294 |
| 1997 | 5,675,955 | 14,095 | 4,390 | 1,628 | 266 | 11,221 | 89 | 8,581 | 3,726 | 5,719,951 |
| 1998 | 3,097,075 | 138,138 | 17,122 | 5,018 | 525 | 3,979 | 279 | 4,144 | 5,215 | 3,271,495 |
| 1999 | 9,931,533 | 53,721 | 77,899 | 2,556 | 1,413 | 4,033 | 455 | 1,603 | 7,556 | 10,080,769 |
| 2000 | 3,682,725 | 3,841 | 97,814 | 223 | 298 | 1,887 | 522 | 2,501 | 5,233 | 3,795,044 |
| 2001 | 4,917,834 | 25,961 | 2,037 | 2,002 | 544 | 6,140 | 178 | 10,462 | 12,397 | 4,977,555 |
| 2002 | 3,861,585 | 6,838 | 9,996 | 664 | 170 | 827 | 1,241 | 9,544 | 6,168 | 3,897,033 |
| 2003 | 2,570,926 | 10,929 | | 62 | 567 | 2,764 | 558 | 9,127 | 5,707 | 2,600,640 |
| 2004 | 2,407,735 | 2,383 | | 319 | 655 | 1,783 | 1,059 | 12,366 | 3,101 | 2,429,401 |
| 2005 | 1,059,355 | 1,437 | | | | 1,557 | | 1,337 | 2,614 | 1,066,300 |
| 2006 | 504,401 | 1,569 | | 42 | 167 | 221 | 124 | 3,480 | 927 | 510,931 |
| 2007 | 1,575,242 | 1,222 | | | 208 | 6 | 60 | 1,178 | 702 | 1,578,618 |
| 2008 | 956,535 | 2,834 | | | 371 | 53 | 3,193 | | 1,290 | 964,276 |
| 2009 | 912,138 | 11,570 | 291 | 568 | 248 | 232 | 92 | | 1,652 | 926,791 |
| 2010 | 1,715,001 | 531 | | 52 | 531 | 176 | | | 307 | 1,716,598 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-39. Nominal commercial ex-vessel revenues ($) of the albacore surface hook-and-line (troll and baitboat) fishery in California, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 17,731,395 | 17,982 | | 173 | 72 | 1,444 | 991 | 16,689 | 1,091 | 17,769,837 |
| 1982 | 5,735,370 | 5,258 | 13,219 | 2,771 | 557 | 5,671 | 13 | 10,001 | 332 | 5,773,192 |
| 1983 | 9,394,970 | 14,511 | 7,531 | 1,597 | 33 | 18,504 | 15,429 | 14,994 | 3,713 | 9,471,282 |
| 1984 | 11,157,988 | 19,870 | 96,217 | 6,080 | 706 | 6,854 | 928 | 2,154 | 3,559 | 11,294,356 |
| 1985 | 6,973,498 | 4,278 | 30,921 | 7,017 | 6 | 6,375 | 239 | 10,104 | 1,976 | 7,034,414 |
| 1986 | 3,598,008 | 7,124 | 6,427 | 180 | | 18,967 | 160 | 6,309 | 660 | 3,637,835 |
| 1987 | 2,173,044 | 1,150 | 33,310 | 3,440 | | 2,305 | 657 | 3,089 | 402 | 2,217,397 |
| 1988 | 1,728,315 | 952 | 89,636 | 3,566 | | 664 | | 1,860 | 421 | 1,825,414 |
| 1989 | 1,455,484 | 1,833 | 34,556 | 11,295 | 31 | 18,058 | 1 | 7,412 | 2,504 | 1,531,174 |
| 1990 | 1,457,546 | 79 | 13,332 | 560 | 74 | 6,059 | 83 | 39 | 1,529 | 1,479,301 |
| 1991 | 1,089,097 | 56 | 11,721 | 602 | | 185 | | | 774 | 1,102,435 |
| 1992 | 2,889,632 | 2,124 | 55,452 | 2,321 | 281 | 6,004 | | 1,259 | 614 | 2,957,687 |
| 1993 | 2,902,857 | 154,056 | 437,415 | 7,144 | 23,216 | 3,917 | | | 1,741 | 3,530,346 |
| 1994 | 6,415,286 | 603 | 6,797 | 275 | 180 | 590 | | 529 | 326 | 6,424,586 |
| 1995 | 1,418,582 | 592 | 2,953 | 173 | | 47 | 16 | 710 | 2,992 | 1,426,065 |
| 1996 | 10,587,510 | 38,548 | 2,608 | 295 | | 60 | | 1,567 | 997 | 10,631,585 |
| 1997 | 5,678,124 | 14,095 | 4,390 | 1,628 | 266 | 11,221 | 89 | 8,581 | 3,726 | 5,722,120 |
| 1998 | 3,097,075 | 138,138 | 17,122 | 5,018 | 525 | 3,979 | 279 | 4,144 | 5,215 | 3,271,495 |
| 1999 | 9,968,024 | 53,721 | 77,899 | 2,556 | 1,413 | 4,033 | 455 | 1,603 | 7,555 | 10,117,259 |
| 2000 | 3,682,725 | 3,841 | 97,814 | 223 | 298 | 1,887 | 522 | 2,501 | 5,233 | 3,795,044 |
| 2001 | 4,917,834 | 25,961 | 2,037 | 2,002 | 544 | 6,140 | 178 | 10,462 | 12,397 | 4,977,555 |
| 2002 | 3,861,585 | 6,838 | 9,996 | 664 | 170 | 827 | 1,241 | 9,544 | 6,168 | 3,897,033 |
| 2003 | 2,570,926 | 10,929 | | 62 | 567 | 2,764 | 558 | 9,127 | 5,707 | 2,600,640 |
| 2004 | 2,407,735 | 2,383 | | 319 | 655 | 1,783 | 1,059 | 12,366 | 3,101 | 2,429,401 |
| 2005 | 1,059,355 | 1,437 | | | | 1,557 | | 1,337 | 2,614 | 1,066,300 |
| 2006 | 504,401 | 1,569 | | 42 | 167 | 221 | 124 | 3,480 | 927 | 510,931 |
| 2007 | 1,575,242 | 1,222 | | | 208 | 6 | 60 | 1,178 | 702 | 1,578,618 |
| 2008 | 956,535 | 2,834 | | | 371 | 53 | 3,193 | | 1,290 | 964,276 |
| 2009 | 912,138 | 11,570 | 291 | 568 | 248 | 232 | 92 | | 1,652 | 926,791 |
| 2010 | 1,715,001 | 531 | | 52 | 531 | 176 | | | 307 | 1,716,598 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-40. Nominal commercial ex-vessel revenues ($) of the albacore surface hook-and-line (troll and baitboat) fishery in Oregon, with Canadian vessels excluded, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 6,686,230 | | | | | 748 | | 87,410 | 298 | 6,774,686 |
| 1982 | 1,250,455 | 242 | | | | 5 | | 3,833 | 202 | 1,254,737 |
| 1983 | 1,845,205 | 75 | | | | 1,426 | 65 | 16,699 | 167 | 1,863,637 |
| 1984 | 898,066 | 183 | | | | 92 | | 4,269 | 720 | 903,330 |
| 1985 | 822,379 | | | | | 8 | | 698 | 336 | 823,421 |
| 1986 | 1,324,977 | 124 | | | | 83 | | 3,142 | | 1,328,326 |
| 1987 | 1,679,449 | | | | | | | 3,749 | | 1,683,198 |
| 1988 | 3,318,399 | | | | | 73 | | 9,451 | 66 | 3,327,989 |
| 1989 | 886,505 | | | | | 39 | | 893 | | 887,437 |
| 1990 | 1,763,611 | | | | | 104 | 2 | 2,753 | | 1,766,471 |
| 1991 | 979,262 | | | | | | | 2,604 | 311 | 982,177 |
| 1992 | 3,856,956 | | | 40 | | 133 | | 4,862 | | 3,861,991 |
| 1993 | 3,864,366 | | | | | 908 | | 10,358 | | 3,875,632 |
| 1994 | 3,749,780 | | | 27 | | | | 8 | 19 | 3,749,834 |
| 1995 | 4,049,908 | 323 | | | 21 | 105 | | 19,802 | | 4,070,158 |
| 1996 | 6,572,323 | 49 | | | | 380 | | 24,958 | | 6,597,709 |
| 1997 | 6,815,587 | 854 | | | 105 | 717 | | 29,056 | | 6,846,319 |
| 1998 | 5,936,402 | | | <0.5 | | 809 | | 12,196 | 48 | 5,949,455 |
| 1999 | 3,008,900 | 35,377 | | 67 | | 314 | | 8,140 | | 3,052,796 |
| 2000 | 6,171,331 | 656 | | <0.5 | | 3 | | 6,943 | | 6,178,933 |
| 2001 | 6,509,649 | 1,036 | | 208 | | 528 | | 22,477 | | 6,533,898 |
| 2002 | 2,871,875 | | | | | | | 10,002 | | 2,881,877 |
| 2003 | 5,694,424 | 116 | | | | | | 4,887 | | 5,699,427 |
| 2004 | 8,484,606 | 130 | | 200 | | 51 | 182 | 10,375 | | 8,495,544 |
| 2005 | 7,674,185 | | | 181 | | 30 | | 6,939 | | 7,681,335 |
| 2006 | 7,602,928 | 6 | | 210 | | 764 | <0.5 | | 64 | 7,603,972 |
| 2007 | 8,818,890 | | | | 15 | 1,936 | 22 | 204 | 408 | 8,821,475 |
| 2008 | 8,250,123 | 46,296 | 1,200 | | 108 | 1,211 | | | 5,340 | 8,304,278 |
| 2009 | 9,782,752 | 69 | | 90 | | 252 | | 842 | 397 | 9,784,402 |
| 2010 | 10,644,242 | | | | | 95 | | 27,952 | 226 | 10,672,515 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-41. Nominal commercial ex-vessel revenues ($) of the albacore surface hook-and-line (troll and baitboat) fishery in Oregon, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 6,686,230 | | | | | 748 | | 87,410 | 298 | 6,774,686 |
| 1982 | 1,265,313 | 242 | | | | 5 | | 3,833 | 202 | 1,269,595 |
| 1983 | 1,883,255 | 75 | | | | 1,426 | 65 | 16,699 | 166 | 1,901,686 |
| 1984 | 901,350 | 183 | | | | 92 | | 4,269 | 720 | 906,614 |
| 1985 | 822,379 | | | | | 8 | | 698 | 336 | 823,421 |
| 1986 | 1,324,977 | 124 | | | | 83 | | 3,142 | | 1,328,326 |
| 1987 | 1,679,449 | | | | | | | 3,749 | | 1,683,198 |
| 1988 | 3,321,249 | | | | | 73 | | 9,451 | 66 | 3,330,839 |
| 1989 | 886,505 | | | | | 39 | | 893 | | 887,437 |
| 1990 | 1,763,611 | | | | | 104 | 2 | 2,753 | | 1,766,471 |
| 1991 | 979,262 | | | | | | | 2,604 | 311 | 982,177 |
| 1992 | 3,968,734 | | | 40 | | 133 | | 4,862 | | 3,973,769 |
| 1993 | 3,882,548 | | | | | 908 | | 10,358 | | 3,893,814 |
| 1994 | 3,749,780 | | | 27 | | | | 8 | 19 | 3,749,834 |
| 1995 | 4,049,908 | 323 | | | 21 | 105 | | 19,802 | | 4,070,158 |
| 1996 | 7,429,668 | 49 | | | | 380 | | 24,958 | | 7,455,054 |
| 1997 | 7,341,599 | 931 | | | 218 | 717 | | 29,056 | | 7,372,520 |
| 1998 | 6,540,414 | | | <0.5 | | 809 | | 12,196 | 48 | 6,553,467 |
| 1999 | 3,783,515 | 35,377 | | 67 | | 314 | | 8,140 | | 3,827,411 |
| 2000 | 7,488,665 | 656 | | <0.5 | | 3 | | 6,943 | | 7,496,267 |
| 2001 | 7,558,629 | 1,036 | | 208 | | 528 | | 22,477 | | 7,582,878 |
| 2002 | 2,951,707 | | | | | | | 10,002 | | 2,961,709 |
| 2003 | 6,158,462 | 116 | | | | | | 4,887 | | 6,163,464 |
| 2004 | 9,144,548 | 130 | | 200 | | 51 | 182 | 10,375 | | 9,155,486 |
| 2005 | 8,815,478 | | | 181 | | 30 | | 6,939 | | 8,822,628 |
| 2006 | 8,048,157 | 6 | | 210 | | 764 | <0.5 | | 64 | 8,049,201 |
| 2007 | 9,467,854 | | | | 15 | 1,936 | 22 | 204 | 408 | 9,470,439 |
| 2008 | 10,666,183 | 46,296 | 1,200 | | 108 | 1,211 | | | 5,340 | 10,720,338 |
| 2009 | 10,190,661 | 69 | | 90 | | 252 | | 842 | 398 | 10,192,312 |
| 2010 | 12,422,409 | | | | | 95 | | 27,952 | 226 | 12,450,682 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-42. Nominal commercial ex-vessel revenues ($) of the albacore surface hook-and-line (troll and baitboat) fishery in Washington, with Canadian vessels excluded, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado[1] | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 1,670,113 | | | | N.A. | 315 | | 29,078 | 20 | 1,699,526 |
| 1982 | 363,957 | | | | N.A. | | | | | 363,957 |
| 1983 | 639,357 | | | | N.A. | 379 | | 4,382 | | 644,119 |
| 1984 | 90,823 | | | | N.A. | | | | | 90,823 |
| 1985 | 199,032 | | | | N.A. | | | | | 199,032 |
| 1986 | 944,843 | | | | N.A. | | | | | 944,843 |
| 1987 | 838,147 | | | | N.A. | | | | 35 | 838,182 |
| 1988 | 3,500,519 | | 6,695 | | N.A. | 29 | 614 | 51 | 51 | 3,507,959 |
| 1989 | 1,350,170 | | | | N.A. | 15 | | | | 1,350,185 |
| 1990 | 2,193,837 | | | | N.A. | | | | | 2,193,837 |
| 1991 | 692,354 | 15 | | | N.A. | 4 | | 875 | | 693,248 |
| 1992 | 4,331,995 | 72 | | | N.A. | 6 | | | 55 | 4,332,128 |
| 1993 | 4,114,857 | | 5,272 | 848 | N.A. | 167 | | 28 | 64 | 4,121,236 |
| 1994 | 9,771,047 | | | | N.A. | | | | | 9,771,047 |
| 1995 | 5,891,398 | | 251 | | N.A. | | | 1,779 | 35 | 5,893,463 |
| 1996 | 8,344,058 | | | | N.A. | | | | | 8,344,058 |
| 1997 | 6,602,324 | | | | N.A. | 13 | | | | 6,602,336 |
| 1998 | 8,470,240 | | | | N.A. | | | | | 8,470,240 |
| 1999 | 3,198,589 | 26,351 | | | N.A. | | | | 152 | 3,225,092 |
| 2000 | 5,490,275 | | | | N.A. | | | | | 5,490,275 |
| 2001 | 7,316,469 | 755 | | | N.A. | 1,133 | | 80 | | 7,318,437 |
| 2002 | 6,434,901 | | | | N.A. | 77 | | 2,251 | 1,621 | 6,438,850 |
| 2003 | 11,361,444 | | | | N.A. | | | | | 11,361,444 |
| 2004 | 13,432,068 | | | | N.A. | | | | 232 | 13,432,300 |
| 2005 | 9,773,578 | | | | N.A. | | | 4,057 | 704 | 9,778,339 |
| 2006 | 14,724,730 | | | | N.A. | | | | | 14,724,730 |
| 2007 | 10,275,193 | | | | N.A. | | | 2,576 | 311 | 10,278,080 |
| 2008 | 15,641,047 | | | | N.A. | 44 | | 5,091 | | 15,646,182 |
| 2009 | 15,221,165 | | | | N.A. | | | 2,603 | | 15,223,768 |
| 2010 | 14,035,776 | | | | N.A. | | | 6,510 | | 14,042,286 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

[1]There is no species code for dorado in Washington.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-43. Nominal commercial ex-vessel revenues ($) of the albacore surface hook-and-line (troll and baitboat) fishery in Washington, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado[1] | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 1,670,113 | | | | N.A. | 315 | | 29,078 | 20 | 1,699,526 |
| 1982 | 363,957 | | | | N.A. | | | | | 363,957 |
| 1983 | 639,357 | | | | N.A. | 379 | | 4,382 | | 644,119 |
| 1984 | 90,823 | | | | N.A. | | | | | 90,823 |
| 1985 | 199,032 | | | | N.A. | | | | | 199,032 |
| 1986 | 944,843 | | | | N.A. | | | | | 944,843 |
| 1987 | 838,147 | | | | N.A. | | | | 35 | 838,182 |
| 1988 | 3,500,519 | | 6,695 | | N.A. | 29 | 614 | 51 | 51 | 3,507,959 |
| 1989 | 1,350,170 | | | | N.A. | 15 | | | | 1,350,185 |
| 1990 | 2,193,837 | | | | N.A. | | | | | 2,193,837 |
| 1991 | 692,354 | 15 | | | N.A. | 4 | | 875 | | 693,248 |
| 1992 | 4,360,248 | 72 | | | N.A. | 6 | | | 55 | 4,360,381 |
| 1993 | 4,138,143 | | 5,272 | 848 | N.A. | 167 | | 28 | 64 | 4,144,522 |
| 1994 | 9,812,666 | | | | N.A. | | | | | 9,812,666 |
| 1995 | 6,012,790 | | 251 | | N.A. | | | 1,779 | 34 | 6,014,854 |
| 1996 | 9,062,840 | | | | N.A. | | | | | 9,062,840 |
| 1997 | 6,791,456 | | | | N.A. | 13 | | | | 6,791,468 |
| 1998 | 8,966,640 | | | | N.A. | | | | | 8,966,640 |
| 1999 | 3,651,158 | 26,351 | | | N.A. | | | | 152 | 3,677,661 |
| 2000 | 5,869,381 | | | | N.A. | | | | | 5,869,381 |
| 2001 | 7,930,083 | 755 | | | N.A. | 1,133 | | 80 | | 7,932,051 |
| 2002 | 7,396,988 | | | | N.A. | 77 | | 2,251 | 1,621 | 7,400,937 |
| 2003 | 15,656,498 | | | | N.A. | | | <0.5 | | 15,656,498 |
| 2004 | 15,823,418 | | | | N.A. | | | | 232 | 15,823,650 |
| 2005 | 10,887,708 | | | | N.A. | | | 4,057 | 703 | 10,892,468 |
| 2006 | 15,178,595 | | | | N.A. | | | | | 15,178,595 |
| 2007 | 10,450,945 | | | | N.A. | | | 2,576 | 310 | 10,453,831 |
| 2008 | 17,225,272 | | | | N.A. | 44 | | 5,091 | | 17,230,407 |
| 2009 | 16,425,993 | | | | N.A. | | | 2,603 | | 16,428,596 |
| 2010 | 15,355,970 | | | | N.A. | | | 6,510 | | 15,362,480 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

[1]There is no species code for dorado in Washington.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-44. Real commercial ex-vessel revenues (2010 $) of the albacore surface hook-and-line (troll and baitboat) fishery in California, with Canadian vessels excluded, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 37,574,476 | 38,106 | | 366 | 152 | 3,061 | 2,101 | 35,365 | 2,310 | 37,655,937 |
| 1982 | 11,454,704 | 10,501 | 26,401 | 5,533 | 1,112 | 11,327 | 25 | 19,975 | 665 | 11,530,243 |
| 1983 | 18,049,894 | 27,878 | 14,468 | 3,069 | 63 | 35,551 | 29,643 | 28,807 | 7,135 | 18,196,508 |
| 1984 | 20,659,116 | 36,790 | 178,147 | 11,256 | 1,308 | 12,691 | 1,718 | 3,987 | 6,588 | 20,911,601 |
| 1985 | 12,533,247 | 7,688 | 55,574 | 12,612 | 11 | 11,458 | 430 | 18,160 | 3,548 | 12,642,728 |
| 1986 | 6,326,725 | 12,526 | 11,301 | 317 | | 33,352 | 282 | 11,094 | 1,159 | 6,396,756 |
| 1987 | 3,713,335 | 1,964 | 56,920 | 5,878 | | 3,938 | 1,122 | 5,279 | 691 | 3,789,127 |
| 1988 | 2,855,303 | 1,572 | 148,085 | 5,891 | | 1,098 | | 3,073 | 695 | 3,015,717 |
| 1989 | 2,316,912 | 2,919 | 55,009 | 17,980 | 49 | 28,745 | 2 | 11,799 | 3,984 | 2,437,399 |
| 1990 | 2,234,129 | 121 | 20,435 | 858 | 113 | 9,287 | 128 | 59 | 2,345 | 2,267,475 |
| 1991 | 1,612,045 | 83 | 17,350 | 891 | | 274 | | | 1,144 | 1,631,787 |
| 1992 | 4,178,183 | 3,071 | 80,179 | 3,356 | 407 | 8,682 | | 1,820 | 888 | 4,276,586 |
| 1993 | 4,106,461 | 217,932 | 618,779 | 10,107 | 32,842 | 5,541 | | | 2,461 | 4,994,123 |
| 1994 | 8,887,899 | 835 | 9,417 | 381 | 249 | 818 | | 733 | 452 | 8,900,784 |
| 1995 | 1,925,328 | 803 | 4,008 | 234 | | 63 | 22 | 963 | 4,064 | 1,935,485 |
| 1996 | 14,079,941 | 51,342 | 3,473 | 393 | | 80 | | 2,087 | 1,328 | 14,138,644 |
| 1997 | 7,428,288 | 18,447 | 5,746 | 2,130 | 348 | 14,685 | 117 | 11,230 | 4,876 | 7,485,867 |
| 1998 | 4,008,120 | 178,773 | 22,158 | 6,494 | 679 | 5,150 | 361 | 5,362 | 6,752 | 4,233,849 |
| 1999 | 12,666,157 | 68,513 | 99,348 | 3,260 | 1,802 | 5,143 | 580 | 2,044 | 9,636 | 12,856,483 |
| 2000 | 4,597,085 | 4,794 | 122,100 | 278 | 372 | 2,355 | 652 | 3,122 | 6,533 | 4,737,291 |
| 2001 | 6,003,215 | 31,691 | 2,486 | 2,444 | 663 | 7,495 | 217 | 12,770 | 15,137 | 6,076,118 |
| 2002 | 4,639,098 | 8,215 | 12,009 | 797 | 204 | 993 | 1,491 | 11,466 | 7,410 | 4,681,683 |
| 2003 | 3,023,552 | 12,853 | | 73 | 667 | 3,251 | 656 | 10,734 | 6,711 | 3,058,497 |
| 2004 | 2,753,271 | 2,725 | | 365 | 749 | 2,039 | 1,211 | 14,140 | 3,546 | 2,778,046 |
| 2005 | 1,172,242 | 1,590 | | | | 1,722 | | 1,480 | 2,893 | 1,179,927 |
| 2006 | 540,565 | 1,681 | | 45 | 178 | 236 | 133 | 3,730 | 995 | 547,563 |
| 2007 | 1,640,023 | 1,272 | | | 217 | 6 | 62 | 1,226 | 732 | 1,643,538 |
| 2008 | 974,565 | 2,887 | | | 377 | 53 | 3,254 | | 1,315 | 982,451 |
| 2009 | 920,886 | 11,681 | 293 | 574 | 251 | 234 | 93 | | 1,668 | 935,680 |
| 2010 | 1,715,001 | 531 | | 52 | 531 | 176 | | | 307 | 1,716,598 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-45. Real commercial ex-vessel revenues (2010 $) of the albacore surface hook-and-line (troll and baitboat) fishery in California, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 37,574,476 | 38,106 | | 366 | 152 | 3,061 | 2,101 | 35,365 | 2,310 | 37,655,937 |
| 1982 | 11,454,704 | 10,501 | 26,401 | 5,533 | 1,112 | 11,327 | 25 | 19,975 | 665 | 11,530,243 |
| 1983 | 18,049,894 | 27,878 | 14,468 | 3,069 | 63 | 35,551 | 29,643 | 28,807 | 7,135 | 18,196,508 |
| 1984 | 20,659,116 | 36,790 | 178,147 | 11,256 | 1,308 | 12,691 | 1,718 | 3,987 | 6,588 | 20,911,601 |
| 1985 | 12,533,247 | 7,688 | 55,574 | 12,612 | 11 | 11,458 | 430 | 18,160 | 3,548 | 12,642,728 |
| 1986 | 6,326,725 | 12,526 | 11,301 | 317 | | 33,352 | 282 | 11,094 | 1,159 | 6,396,756 |
| 1987 | 3,713,335 | 1,964 | 56,920 | 5,878 | | 3,938 | 1,122 | 5,279 | 691 | 3,789,127 |
| 1988 | 2,855,303 | 1,572 | 148,085 | 5,891 | | 1,098 | | 3,073 | 695 | 3,015,717 |
| 1989 | 2,316,912 | 2,919 | 55,009 | 17,980 | 49 | 28,745 | 2 | 11,799 | 3,984 | 2,437,399 |
| 1990 | 2,234,129 | 121 | 20,435 | 858 | 113 | 9,287 | 128 | 59 | 2,345 | 2,267,475 |
| 1991 | 1,612,045 | 83 | 17,350 | 891 | | 274 | | | 1,144 | 1,631,787 |
| 1992 | 4,178,183 | 3,071 | 80,179 | 3,356 | 407 | 8,682 | | 1,820 | 888 | 4,276,586 |
| 1993 | 4,106,461 | 217,932 | 618,779 | 10,107 | 32,842 | 5,541 | | | 2,461 | 4,994,123 |
| 1994 | 8,887,899 | 835 | 9,417 | 381 | 249 | 818 | | 733 | 452 | 8,900,784 |
| 1995 | 1,925,328 | 803 | 4,008 | 234 | | 63 | 22 | 963 | 4,064 | 1,935,485 |
| 1996 | 14,101,639 | 51,342 | 3,473 | 393 | | 80 | | 2,087 | 1,328 | 14,160,342 |
| 1997 | 7,431,127 | 18,447 | 5,746 | 2,130 | 348 | 14,685 | 117 | 11,230 | 4,875 | 7,488,705 |
| 1998 | 4,008,120 | 178,773 | 22,158 | 6,494 | 679 | 5,150 | 361 | 5,362 | 6,752 | 4,233,849 |
| 1999 | 12,712,694 | 68,513 | 99,348 | 3,260 | 1,802 | 5,143 | 580 | 2,044 | 9,637 | 12,903,021 |
| 2000 | 4,597,085 | 4,794 | 122,100 | 278 | 372 | 2,355 | 652 | 3,122 | 6,533 | 4,737,291 |
| 2001 | 6,003,215 | 31,691 | 2,486 | 2,444 | 663 | 7,495 | 217 | 12,770 | 15,137 | 6,076,118 |
| 2002 | 4,639,098 | 8,215 | 12,009 | 797 | 204 | 993 | 1,491 | 11,466 | 7,410 | 4,681,683 |
| 2003 | 3,023,552 | 12,853 | | 73 | 667 | 3,251 | 656 | 10,734 | 6,711 | 3,058,497 |
| 2004 | 2,753,271 | 2,725 | | 365 | 749 | 2,039 | 1,211 | 14,140 | 3,546 | 2,778,046 |
| 2005 | 1,172,242 | 1,590 | | | | 1,722 | | 1,480 | 2,893 | 1,179,927 |
| 2006 | 540,565 | 1,681 | | 45 | 178 | 236 | 133 | 3,730 | 995 | 547,563 |
| 2007 | 1,640,023 | 1,272 | | | 217 | 6 | 62 | 1,226 | 732 | 1,643,538 |
| 2008 | 974,565 | 2,887 | | | 377 | 53 | 3,254 | | 1,315 | 982,451 |
| 2009 | 920,886 | 11,681 | 293 | 574 | 251 | 234 | 93 | | 1,668 | 935,680 |
| 2010 | 1,715,001 | 531 | | 52 | 531 | 176 | | | 307 | 1,716,598 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-46. Real commercial ex-vessel revenues (2010 $) of the albacore surface hook-and-line (troll and baitboat) fishery in Oregon, with Canadian vessels excluded, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 14,168,743 | | | | | 1,586 | | 185,230 | 630 | 14,356,189 |
| 1982 | 2,497,413 | 484 | | | | 10 | | 7,655 | 405 | 2,505,967 |
| 1983 | 3,545,062 | 144 | | | | 2,739 | 126 | 32,082 | 321 | 3,580,474 |
| 1984 | 1,662,777 | 339 | | | | 171 | | 7,904 | 1,333 | 1,672,524 |
| 1985 | 1,478,036 | | | | | 15 | | 1,254 | 604 | 1,479,909 |
| 1986 | 2,329,835 | 218 | | | | 146 | | 5,525 | | 2,335,723 |
| 1987 | 2,869,872 | | | | | | | 6,406 | | 2,876,278 |
| 1988 | 5,482,238 | | | | | 121 | | 15,614 | 109 | 5,498,082 |
| 1989 | 1,411,183 | | | | | 62 | | 1,421 | | 1,412,666 |
| 1990 | 2,703,267 | | | | | 160 | 3 | 4,220 | | 2,707,650 |
| 1991 | 1,449,471 | | | | | | | 3,855 | 459 | 1,453,785 |
| 1992 | 5,576,860 | | | 58 | | 193 | | 7,029 | | 5,584,140 |
| 1993 | 5,466,638 | | | | | 1,285 | | 14,652 | | 5,482,575 |
| 1994 | 5,195,040 | | | 37 | | | | 11 | 27 | 5,195,115 |
| 1995 | 5,496,618 | 438 | | | 28 | 143 | | 26,876 | | 5,524,102 |
| 1996 | 8,753,760 | 65 | | | | 506 | | 33,241 | | 8,787,572 |
| 1997 | 8,919,758 | 1,118 | | | 137 | 939 | | 38,026 | | 8,959,978 |
| 1998 | 7,682,673 | | | <0.5 | | 1,047 | | 15,784 | 62 | 7,699,566 |
| 1999 | 3,837,393 | 45,117 | | 85 | | 400 | | 10,381 | | 3,893,376 |
| 2000 | 7,703,572 | 819 | | <0.5 | | 3 | | 8,667 | | 7,713,061 |
| 2001 | 7,946,349 | 1,265 | | 254 | | 645 | | 27,437 | | 7,975,950 |
| 2002 | 3,450,114 | | | | | | | 12,016 | | 3,462,130 |
| 2003 | 6,696,959 | 136 | | | | | | 5,747 | | 6,702,842 |
| 2004 | 9,702,236 | 149 | | 229 | | 58 | 209 | 11,864 | | 9,714,744 |
| 2005 | 8,491,961 | | | 200 | | 33 | | 7,678 | | 8,499,873 |
| 2006 | 8,148,031 | 6 | | 225 | | 819 | <0.5 | | 69 | 8,149,150 |
| 2007 | 9,181,562 | | | | 16 | 2,015 | 23 | 212 | 425 | 9,184,253 |
| 2008 | 8,405,627 | 47,169 | 1,223 | | 110 | 1,234 | | | 5,439 | 8,460,802 |
| 2009 | 9,876,580 | 70 | | 91 | | 254 | | 850 | 401 | 9,878,246 |
| 2010 | 10,644,242 | | | | | 95 | | 27,952 | 226 | 10,672,515 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-47. Real commercial ex-vessel revenues (2010 $) of the albacore surface hook-and-line (troll and baitboat) fishery in Oregon, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 14,168,743 | | | | | 1,586 | | 185,230 | 630 | 14,356,189 |
| 1982 | 2,527,087 | 484 | | | | 10 | | 7,655 | 405 | 2,535,641 |
| 1983 | 3,618,165 | 144 | | | | 2,739 | 126 | 32,082 | 320 | 3,653,576 |
| 1984 | 1,668,858 | 339 | | | | 171 | | 7,904 | 1,332 | 1,678,604 |
| 1985 | 1,478,036 | | | | | 15 | | 1,254 | 604 | 1,479,909 |
| 1986 | 2,329,835 | 218 | | | | 146 | | 5,525 | | 2,335,723 |
| 1987 | 2,869,872 | | | | | | | 6,406 | | 2,876,278 |
| 1988 | 5,486,947 | | | | | 121 | | 15,614 | 108 | 5,502,790 |
| 1989 | 1,411,183 | | | | | 62 | | 1,421 | | 1,412,666 |
| 1990 | 2,703,267 | | | | | 160 | 3 | 4,220 | | 2,707,650 |
| 1991 | 1,449,471 | | | | | | | 3,855 | 459 | 1,453,785 |
| 1992 | 5,738,482 | | | 58 | | 193 | | 7,029 | | 5,745,762 |
| 1993 | 5,492,358 | | | | | 1,285 | | 14,652 | | 5,508,295 |
| 1994 | 5,195,040 | | | 37 | | | | 11 | 27 | 5,195,115 |
| 1995 | 5,496,618 | 438 | | | 28 | 143 | | 26,876 | | 5,524,102 |
| 1996 | 9,895,669 | 65 | | | | 506 | | 33,241 | | 9,929,481 |
| 1997 | 9,608,165 | 1,218 | | | 285 | 939 | | 38,026 | | 9,648,632 |
| 1998 | 8,464,363 | | | <0.5 | | 1,047 | | 15,784 | 62 | 8,481,256 |
| 1999 | 4,825,296 | 45,117 | | 85 | | 400 | | 10,381 | | 4,881,280 |
| 2000 | 9,347,977 | 819 | | <0.5 | | 3 | | 8,667 | | 9,357,467 |
| 2001 | 9,226,842 | 1,265 | | 254 | | 645 | | 27,437 | | 9,256,443 |
| 2002 | 3,546,020 | | | | | | | 12,016 | | 3,558,035 |
| 2003 | 7,242,693 | 136 | | | | | | 5,747 | | 7,248,576 |
| 2004 | 10,456,888 | 149 | | 229 | | 58 | 209 | 11,864 | | 10,469,396 |
| 2005 | 9,754,872 | | | 200 | | 33 | | 7,678 | | 9,762,784 |
| 2006 | 8,625,181 | 6 | | 225 | | 819 | <0.5 | | 69 | 8,626,300 |
| 2007 | 9,857,214 | | | | 16 | 2,015 | 23 | 212 | 426 | 9,859,906 |
| 2008 | 10,867,226 | 47,169 | 1,223 | | 110 | 1,234 | | | 5,440 | 10,922,402 |
| 2009 | 10,288,401 | 70 | | 91 | | 254 | | 850 | 401 | 10,290,067 |
| 2010 | 12,422,409 | | | | | 95 | | 27,952 | 226 | 12,450,682 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-48. Real commercial ex-vessel revenues (2010 $) of the albacore surface hook-and-line (troll and baitboat) fishery in Washington, with Canadian vessels excluded, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado[1] | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 3,539,126 | | | | N.A. | 668 | | 61,618 | 42 | 3,601,454 |
| 1982 | 726,896 | | | | N.A. | | | | | 726,896 |
| 1983 | 1,228,352 | | | | N.A. | 729 | | 8,419 | | 1,237,500 |
| 1984 | 168,159 | | | | N.A. | | | | | 168,159 |
| 1985 | 357,715 | | | | N.A. | | | | | 357,715 |
| 1986 | 1,661,409 | | | | N.A. | | | | | 1,661,409 |
| 1987 | 1,432,240 | | | | N.A. | | | | 59 | 1,432,299 |
| 1988 | 5,783,114 | | 11,061 | | N.A. | 47 | 1,014 | 84 | 85 | 5,795,405 |
| 1989 | 2,149,268 | | | | N.A. | 24 | | | | 2,149,292 |
| 1990 | 3,362,718 | | | | N.A. | | | | | 3,362,718 |
| 1991 | 1,024,799 | 22 | | | N.A. | 6 | | 1,295 | | 1,026,122 |
| 1992 | 6,263,729 | 104 | | | N.A. | 9 | | | 79 | 6,263,921 |
| 1993 | 5,820,988 | | 7,458 | 1,199 | N.A. | 236 | | 39 | 93 | 5,830,013 |
| 1994 | 13,537,056 | | | | N.A. | | | | | 13,537,056 |
| 1995 | 7,995,926 | | 340 | | N.A. | | | 2,414 | 48 | 7,998,728 |
| 1996 | 11,113,556 | | | | N.A. | | | | | 11,113,556 |
| 1997 | 8,640,654 | | | | N.A. | 16 | | | | 8,640,670 |
| 1998 | 10,961,874 | | | | N.A. | | | | | 10,961,874 |
| 1999 | 4,079,313 | 33,607 | | | N.A. | | | | 194 | 4,113,114 |
| 2000 | 6,853,420 | | | | N.A. | | | | | 6,853,420 |
| 2001 | 8,931,237 | 921 | | | N.A. | 1,383 | | 98 | | 8,933,639 |
| 2002 | 7,730,539 | | | | N.A. | 93 | | 2,704 | 1,947 | 7,735,283 |
| 2003 | 13,361,688 | | | | N.A. | | | | | 13,361,688 |
| 2004 | 15,359,712 | | | | N.A. | | | | 265 | 15,359,977 |
| 2005 | 10,815,069 | | | | N.A. | | | 4,489 | 779 | 10,820,337 |
| 2006 | 15,780,442 | | | | N.A. | | | | | 15,780,442 |
| 2007 | 10,697,754 | | | | N.A. | | | 2,682 | 324 | 10,700,760 |
| 2008 | 15,935,860 | | | | N.A. | 45 | | 5,187 | | 15,941,092 |
| 2009 | 15,367,153 | | | | N.A. | | | 2,628 | | 15,369,781 |
| 2010 | 14,035,776 | | | | N.A. | | | 6,510 | | 14,042,286 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 29, 2011.

[1]There is no species code for dorado in Washington.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Canadian vessels were excluded by outer joining the fish ticket tables with the state vessel table and checking the "idtype."

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-49. Real commercial ex-vessel revenues (2010 $) of the albacore surface hook-and-line (troll and baitboat) fishery in Washington, 1981-2010.**

| Year | Albacore | Other Tunas | Swordfish | HMS Sharks | Dorado[1] | Groundfish | Coastal Pelagics | Salmon | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 3,539,126 | | | | N.A. | 668 | | 61,618 | 42 | 3,601,454 |
| 1982 | 726,896 | | | | N.A. | | | | | 726,896 |
| 1983 | 1,228,352 | | | | N.A. | 729 | | 8,419 | | 1,237,500 |
| 1984 | 168,159 | | | | N.A. | | | | | 168,159 |
| 1985 | 357,715 | | | | N.A. | | | | | 357,715 |
| 1986 | 1,661,409 | | | | N.A. | | | | | 1,661,409 |
| 1987 | 1,432,240 | | | | N.A. | | | | 59 | 1,432,299 |
| 1988 | 5,783,114 | | 11,061 | | N.A. | 47 | 1,014 | 84 | 85 | 5,795,405 |
| 1989 | 2,149,268 | | | | N.A. | 24 | | | | 2,149,292 |
| 1990 | 3,362,718 | | | | N.A. | | | | | 3,362,718 |
| 1991 | 1,024,799 | 22 | | | N.A. | 6 | | 1,295 | | 1,026,122 |
| 1992 | 6,304,581 | 104 | | | N.A. | 9 | | | 79 | 6,304,773 |
| 1993 | 5,853,930 | | 7,458 | 1,199 | N.A. | 236 | | 39 | 92 | 5,862,954 |
| 1994 | 13,594,717 | | | | N.A. | | | | | 13,594,717 |
| 1995 | 8,160,681 | | 340 | | N.A. | | | 2,414 | 48 | 8,163,483 |
| 1996 | 12,070,911 | | | | N.A. | | | | | 12,070,911 |
| 1997 | 8,888,176 | | | | N.A. | 16 | | | | 8,888,193 |
| 1998 | 11,604,297 | | | | N.A. | | | | | 11,604,297 |
| 1999 | 4,656,495 | 33,607 | | | N.A. | | | | 194 | 4,690,296 |
| 2000 | 7,326,652 | | | | N.A. | | | | | 7,326,652 |
| 2001 | 9,680,277 | 921 | | | N.A. | 1,383 | | 98 | | 9,682,679 |
| 2002 | 8,886,338 | | | | N.A. | 93 | | 2,704 | 1,947 | 8,891,082 |
| 2003 | 18,412,911 | | | | N.A. | | | <0.5 | | 18,412,911 |
| 2004 | 18,094,245 | | | | N.A. | | | | 266 | 18,094,511 |
| 2005 | 12,047,923 | | | | N.A. | | | 4,489 | 779 | 12,053,191 |
| 2006 | 16,266,847 | | | | N.A. | | | | | 16,266,847 |
| 2007 | 10,880,734 | | | | N.A. | | | 2,682 | 323 | 10,883,739 |
| 2008 | 17,549,946 | | | | N.A. | 45 | | 5,187 | | 17,555,178 |
| 2009 | 16,583,537 | | | | N.A. | | | 2,628 | | 16,586,165 |
| 2010 | 15,355,970 | | | | N.A. | | | 6,510 | | 15,362,480 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 30, 2011.

[1]There is no species code for dorado in Washington.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Real values are calculated to eliminate the effects of inflation by dividing current nominal values by the current year GDP implicit price deflator, with a base year of 2010.

Landed weights in lbs are multiplied by the prices per pound in each fish ticket line and then divided by the corresponding deflator.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-50. Commercial catch and effort fishery statistics for the U.S. South Pacific albacore troll fishery, 1986-2010.**

| Fishing Season | No. Trips | Catch (mt) | No. Days | No. Vessels |
|---|---|---|---|---|
| 1986-1987 | 16 | 751 | 565 | 7 |
| 1987-1988 | 91 | 3,558 | 3,163 | 43 |
| 1988-1989 | 80 | 3,239 | 3,749 | 43 |
| 1989-1990 | 76 | 3,995 | 3,537 | 39 |
| 1990-1991 | 78 | 5,221 | 6,997 | 56 |
| 1991-1992 | 65 | 3,097 | 6,867 | 55 |
| 1992-1993 | 45 | 1,036 | 4,687 | 44 |
| 1993-1994 | 17 | 2,236 | 3,848 | 14 |
| 1994-1995 | 29 | 1,953 | 1,894 | 21 |
| 1995-1996 | 55 | 1,964 | 4,152 | 53 |
| 1996-1997 | 26 | 1,617 | 3,189 | 26 |
| 1997-1998 | 38 | 1,701 | 5,384 | 36 |
| 1998-1999 | 24 | 1,241 | 2,505 | 21 |
| 1999-2000 | 39 | 2,562 | 4,958 | 36 |
| 2000-2001 | 39 | 2,128 | 6,377 | 33 |
| 2001-2002 | 12 | 1,218 | 3,602 | 12 |
| 2002-2003 | 14 | 1,678 | 2,289 | 14 |
| 2003-2004 | 12 | 995 | 1,488 | 11 |
| 2004-2005 | 8 | 725 | 1,491 | 8 |
| 2005-2006 | 10 | 601 | 1,310 | 8 |
| 2006-2007 | 6 | 271 | 813 | 6 |
| 2007-2008 | 4 | 150 | 255 | 3 |
| 2008-2009 | 4 | 237 | 197 | 4 |
| 2009-2010 | 6 | 307 | 404 | 6 |

Source: Childers, SWFSC, August 15, 2011.

Note 1: Total catches for the U.S. South Pacific albacore troll fishery may include catch from November and December of the previous year.

Note 2: Total catches for seasons before 1996-97 may contain catch from non-U.S. vessels.

**Table 4-51. Percentages of commercial catch and effort by fishing areas for U.S. albacore surface hook-and-line (troll and baitboat) vessels, 1995–2010.**

| | Catch | | | Effort | | |
|---|---|---|---|---|---|---|
| Year | U.S. EEZ | Canada EEZ | High-Seas | U.S. EEZ | Canada EEZ | High-Seas |
| 1995 | 5 | 6 | 89 | 16 | 10 | 73 |
| 1996 | 14 | 0 | 86 | 27 | 0 | 73 |
| 1997 | 17 | 4 | 80 | 30 | 4 | 66 |
| 1998 | 15 | 0 | 85 | 26 | 0 | 74 |
| 1999 | 65 | 1 | 34 | 62 | 1 | 37 |
| 2000 | 70 | 0 | 30 | 69 | 1 | 31 |
| 2001 | 57 | 0 | 43 | 67 | 1 | 33 |
| 2002 | 64 | 2 | 34 | 73 | 2 | 25 |
| 2003 | 86 | 1 | 13 | 87 | 1 | 12 |
| 2004 | 93 | 1 | 6 | 89 | 2 | 9 |
| 2005 | 92 | 2 | 6 | 89 | 3 | 8 |
| 2006 | 83 | 1 | 16 | 90 | 1 | 9 |
| 2007 | 99 | 1 | 0 | 97 | 1 | 2 |
| 2008 | 79 | 6 | 15 | 86 | 3 | 11 |
| 2009 | 93 | 3 | 4 | 93 | 2 | 5 |
| 2010 | 71 | 2 | 26 | 82 | 3 | 15 |

Zeros mean no catch or effort.

Source: Childers, SWFSC, August 15, 2011.

Note 1: Data for 2009 and 2010 are preliminary.

Note 2: Data prior to 2005 are from voluntary logbooks.

**Table 4-52. Number of vessels with West Coast commercial HMS landings by fishery (HMS gear & species), 1981-2010.**

| Year | Albacore Surface Hook-and-Line | Swordfish & HMS Shark Drift Gillnet[1] | Any Species Harpoon[2] | HMS Species Longline | HMS Tuna Purse Seine[3] | Any HMS Fishery |
|---|---|---|---|---|---|---|
| 1981 | 1,837 | 181 | 190 | 27 | 135 | 2,206 |
| 1982 | 761 | 212 | 162 | 28 | 124 | 1,168 |
| 1983 | 1,629 | 238 | 93 | 19 | 111 | 1,972 |
| 1984 | 1,126 | 284 | 114 | 14 | 78 | 1,405 |
| 1985 | 792 | 297 | 101 | 12 | 53 | 1,120 |
| 1986 | 419 | 268 | 114 | 6 | 51 | 763 |
| 1987 | 486 | 258 | 101 | 8 | 47 | 818 |
| 1988 | 533 | 220 | 84 | 14 | 43 | 825 |
| 1989 | 338 | 195 | 45 | 4 | 38 | 570 |
| 1990 | 368 | 196 | 52 | 5 | 33 | 607 |
| 1991 | 172 | 172 | 33 | 13 | 18 | 377 |
| 1992 | 610 | 154 | 48 | 20 | 29 | 800 |
| 1993 | 610 | 150 | 42 | 12 | 26 | 782 |
| 1994 | 718 | 163 | 51 | 44 | 25 | 916 |
| 1995 | 477 | 138 | 43 | 36 | 22 | 660 |
| 1996 | 726 | 141 | 31 | 29 | 23 | 877 |
| 1997 | 1,200 | 136 | 32 | 52 | 34 | 1,359 |
| 1998 | 866 | 127 | 30 | 70 | 33 | 1,031 |
| 1999 | 827 | 120 | 33 | 53 | 14 | 944 |
| 2000 | 763 | 104 | 36 | 70 | 16 | 905 |
| 2001 | 981 | 96 | 25 | 56 | 15 | 1,085 |
| 2002 | 736 | 80 | 32 | 36 | 4 | 842 |
| 2003 | 888 | 72 | 35 | 40 | 3 | 990 |
| 2004 | 780 | 63 | 29 | 40 | 11 | 894 |
| 2005 | 599 | 56 | 25 | ** | 8 | 674 |
| 2006 | 635 | 61 | 24 | ** | * | 722 |
| 2007 | 679 | 61 | 28 | ** | 4 | 758 |
| 2008 | 523 | 62 | 32 | ** | * | 610 |
| 2009 | 680 | 61 | 28 | ** | 8 | 772 |
| 2010 | 651 | 53 | 25 | ** | * | 729 |

* Not reported due to data confidentiality requirements (fewer than three vessels).

** Not reported due to data confidentiality requirements based on non-PacFIN data sources (mandatory logbooks, permits, etc.)

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 21, 2011.

[1]There is no drift gillnet gear for Washington. Significantly higher vessel counts prior to 1994 are reported for the swordfish & HMS shark drift gillnet fishery in this year's HMS SAFE report due to PacFIN gear corrections for gears that were previously mis-assigned to California entangling net, trammel net, several trawl, encircling net, set gillnet and unknown gears, and therefore not previously reported.

[2]Only California has harpoon landings. Some of the non-swordfish species may have been taken by dual-gear permit holders, who may have fished with drift gillnets but landed under harpoon.

[3]There is no purse seine gear for Washington.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Only fish tickets where at least 1 lb of swordfish or any HMS shark was landed for the drift gillnet fishery were used.

Only fish tickets where at least 1 lb of any highly migratory species (except striped marlin) was landed for the longline fishery were used.

Only fish tickets where at least 1 lb of any HMS tuna was landed for the purse seine fishery were used.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-53. Number of vessels with commercial HMS landings in California by fishery (HMS gear & species), 1981-2010.**

| Year | Albacore Surface Hook-and-Line | Swordfish & HMS Shark Drift Gillnet[1] | Any Species Harpoon[2] | HMS Species Longline | HMS Tuna Purse Seine | Any HMS Fishery |
|---|---|---|---|---|---|---|
| 1981 | 1,310 | 181 | 190 | 27 | 135 | 1,682 |
| 1982 | 602 | 212 | 162 | 28 | 124 | 1,009 |
| 1983 | 1,243 | 238 | 93 | 19 | 111 | 1,586 |
| 1984 | 993 | 284 | 114 | 14 | 78 | 1,273 |
| 1985 | 724 | * | 101 | 6 | 53 | 1,046 |
| 1986 | 344 | 267 | 114 | * | 51 | 687 |
| 1987 | 289 | 257 | 101 | * | 47 | 622 |
| 1988 | 149 | 220 | 84 | * | 43 | 453 |
| 1989 | 180 | 195 | 45 | 4 | 38 | 416 |
| 1990 | 103 | 196 | 52 | 5 | 33 | 348 |
| 1991 | 76 | 172 | 33 | * | 18 | 280 |
| 1992 | 139 | 154 | 48 | * | 29 | 337 |
| 1993 | 202 | 150 | 42 | 12 | 26 | 378 |
| 1994 | 271 | 163 | 51 | 44 | 25 | 476 |
| 1995 | 137 | 138 | 43 | 36 | 22 | 334 |
| 1996 | 290 | 141 | 31 | * | 23 | 446 |
| 1997 | 612 | 136 | 32 | 52 | 34 | 780 |
| 1998 | 382 | 126 | 30 | * | 33 | 561 |
| 1999 | 446 | 118 | 33 | 53 | 14 | 565 |
| 2000 | 349 | * | 36 | * | 16 | 493 |
| 2001 | 474 | 96 | 25 | * | 15 | 581 |
| 2002 | 321 | 80 | 32 | * | 4 | 429 |
| 2003 | 325 | * | 35 | 40 | * | 432 |
| 2004 | 191 | * | 29 | * | 11 | 308 |
| 2005 | 97 | 56 | 25 | ** | 8 | 179 |
| 2006 | 80 | 61 | 24 | ** | * | 174 |
| 2007 | 155 | 61 | 28 | ** | 4 | 240 |
| 2008 | 67 | 62 | 32 | ** | * | 160 |
| 2009 | 129 | 61 | 28 | ** | 8 | 226 |
| 2010 | 135 | 53 | 25 | ** | * | 215 |

* Not reported due to data confidentiality requirements (fewer than three vessels or information for two or fewer vessels could otherwise be deduced).

** Not reported due to data confidentiality requirements based on non-PacFIN data sources (mandatory logbooks, permits, etc.)

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.

Source: PacFIN, extracted Aug. 25, 2011.

[1]Significantly higher vessel counts prior to 1994 are reported for the swordfish & HMS shark drift gillnet fishery in this year's HMS SAFE report due to PacFIN gear corrections for gears that were previously mis-assigned to California entangling net, trammel net, several trawl, encircling net, set gillnet and unknown gears, and therefore not previously reported.

[2]Some of the non-swordfish species may have been taken by dual-gear permit holders, who may have fished with drift gillnets but landed under harpoon.

Additional processing info:

Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.

Only fish tickets where at least 1 lb of swordfish or any HMS shark was landed for the drift gillnet fishery were used.

Only fish tickets where at least 1 lb of any highly migratory species (except striped marlin) was landed for the longline fishery were used.

Only fish tickets where at least 1 lb of any HMS tuna was landed for the purse seine fishery were used.

Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-54. Number of vessels with commercial HMS landings in Oregon by fishery (HMS gear & species), 1981-2010.**

| Year | Albacore Surface Hook-and-Line | Swordfish & HMS Shark Drift Gillnet | HMS Species Pelagic Longline | HMS Tuna Purse Seine | Any HMS Fishery |
|---|---|---|---|---|---|
| 1981 | 681 | | | | 681 |
| 1982 | 192 | | | | 192 |
| 1983 | 407 | | | | 407 |
| 1984 | 177 | | | | 177 |
| 1985 | 89 | * | | | * |
| 1986 | 90 | 33 | | | 122 |
| 1987 | 170 | 20 | * | | 187 |
| 1988 | 262 | 5 | | | 266 |
| 1989 | 134 | | | | 134 |
| 1990 | 211 | | | | 211 |
| 1991 | 71 | | | | 71 |
| 1992 | 352 | | | | 352 |
| 1993 | 367 | | | | 367 |
| 1994 | 328 | | | | 328 |
| 1995 | 230 | 3 | | | 231 |
| 1996 | 385 | 3 | | | 385 |
| 1997 | 498 | 4 | | | 499 |
| 1998 | 373 | 6 | | | 374 |
| 1999 | 309 | 4 | | | 309 |
| 2000 | 375 | * | | | * |
| 2001 | 473 | | * | | * |
| 2002 | 269 | | | | 269 |
| 2003 | 385 | * | | * | * |
| 2004 | 450 | * | | | * |
| 2005 | 383 | | | | 383 |
| 2006 | 368 | | | | 368 |
| 2007 | 413 | | | | 413 |
| 2008 | 337 | | | | 337 |
| 2009 | 417 | | | | 417 |
| 2010 | 423 | | | | 423 |

* Not reported due to data confidentiality requirements (fewer than three vessels or information for two or fewer vessels could otherwise be deduced).
Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 25, 2011.
Additional processing info:
Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.
Only fish tickets where at least 1 lb of swordfish or any HMS shark was landed for the drift gillnet fishery were used.
Only fish tickets where at least 1 lb of any highly migratory species (except striped marlin) was landed for the pelagic longline fishery were used.
Only fish tickets where at least 1 lb of any HMS tuna was landed for the purse seine fishery were used.
Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-55. Number of vessels with commercial HMS landings in Washington by fishery (HMS gear & species), 1981-2010.**

| Year | Albacore Surface Hook-and-Line | HMS Species Longline | Any HMS Fishery |
|---|---|---|---|
| 1981 | 251 | | 251 |
| 1982 | 61 | | 61 |
| 1983 | 157 | | 157 |
| 1984 | 45 | | 45 |
| 1985 | 32 | 6 | 38 |
| 1986 | 47 | * | * |
| 1987 | 89 | * | * |
| 1988 | 223 | * | * |
| 1989 | 77 | | 77 |
| 1990 | 103 | | 103 |
| 1991 | 42 | * | * |
| 1992 | 229 | * | * |
| 1993 | 208 | | 208 |
| 1994 | 265 | | 265 |
| 1995 | 207 | | 207 |
| 1996 | 215 | * | * |
| 1997 | 247 | | 247 |
| 1998 | 220 | * | * |
| 1999 | 187 | | 187 |
| 2000 | 179 | * | * |
| 2001 | 205 | * | * |
| 2002 | 241 | * | * |
| 2003 | 325 | | 325 |
| 2004 | 301 | * | * |
| 2005 | 225 | | 225 |
| 2006 | 313 | | 313 |
| 2007 | 221 | | 221 |
| 2008 | 225 | | 225 |
| 2009 | 272 | | 272 |
| 2010 | 241 | | 241 |

* Not reported due to data confidentiality requirements (fewer than three vessels or information for two or fewer vessels could otherwise be deduced).
Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: PacFIN, extracted Aug. 25, 2011.
Additional processing info:
Only fish tickets where at least 1 lb of albacore was landed for the albacore surface hook-and-line (troll and baitboat) fishery were used.
Only fish tickets where at least 1 lb of any highly migratory species (except striped marlin) was landed for the longline fishery were used.
Aquaculture fish ticket/fish ticket line info is excluded.

**Table 4-56. West Coast landings (round mt) by Hawaii-based longline vessels in 2008 and 2010.**

| Species | 2008 | 2010 |
|---|---|---|
| Swordfish | 75 | 270 |
| Albacore | 1 | 2 |
| Bigeye Tuna | 5 | 1 |
| Yellowfin Tuna | 0 | <0.5 |
| Unspecified Tuna | 0 | 1 |
| Shortfin Mako Shark | 2 | <0.5 |
| Unspecified Shark | 0 | <0.5 |
| Dorado/Dolphinfish | <0.5 | 3 |
| Pacific Halibut | <0.5 | 0 |
| Yellowtail | <0.5 | 0 |
| Other Unspecified Fish | 2 | 3 |
| Miscellaneous | 0 | <0.5 |

Note: 2005-2007 and 2009 data excluded due to confidentiality rules.
Data Sources: PacFIN, Hawaii longline permits data.

**Table 4-57. PacFIN species codes used to extract commercial fisheries data for this HMS SAFE report.**

| AGID | CATEGORY | SPID | MGRP[1] | DESCRIPTION |
|---|---|---|---|---|
| C | 5 | ALBC | HMSP | TUNA, ALBACORE |
| O | 375 | ALBC | HMSP | TUNA, ALBACORE |
| W | 101 | ALBC | HMSP | ALBACORE TUNA THUNNUS ALALUNGA |
| C | 1 | YTNA | HMSP | TUNA, YELLOWFIN |
| O | 376 | YTNA | HMSP | TUNA, YELLOWFIN |
| C | 2 | STNA | HMSP | TUNA, SKIPJACK |
| O | 372 | STNA | HMSP | TUNA, SKIPJACK |
| W | 104 | STNA | HMSP | SKIPJACK TUNA |
| C | 8 | ETNA | HMSP | TUNA, BIGEYE |
| O | 377 | ETNA | HMSP | TUNA, BIGEYE |
| C | 4 | BTNA | HMSP | TUNA, BLUEFIN |
| O | 378 | BTNA | HMSP | TUNA, BLUEFIN |
| W | 102 | BTNA | HMSP | BLUEFIN TUNA (THUNNUS THYNNUS) |
| C | 6 | UTNA | HMSP | TUNA, UNSPECIFIED |
| C | 91 | SWRD | HMSP | SWORDFISH |
| O | 385 | SWRD | HMSP | SWORDFISH |
| W | 106 | SWRD | HMSP | SWORDFISH XIPHIAS GLADIUS |
| C | 155 | TSRK | HMSP | SHARK, COMMON THRESHER |
| O | 023 | TSRK | HMSP | SHARK, THRESHER |
| W | 287 | TSRK | HMSP | THRESHER SHARK ALOPIUS VULPINUS |
| W | 387 | TSRK | HMSP | THRESHER SHARK (REDUCTION) ALOPIUS VULPINUS |
| W | 487 | TSRK | HMSP | THRESHER SHARK (ANIMAL FOOD) ALOPIUS VULPINUS |
| C | 98 | PSRK | HMSP | SHARK, PELAGIC THRESHER |
| C | 97 | ISRK | HMSP | SHARK, BIGEYE THRESHER |
| C | 151 | MAKO | HMSP | SHARK, BONITO (MAKO) |
| O | 026 | MAKO | HMSP | SHARK, SHORTFIN MAKO |
| C | 167 | BSRK | HMSP | SHARK, BLUE |
| O | 031 | BSRK | HMSP | SHARK, BLUE |
| W | 282 | BSRK | HMSP | BLUE SHARK PRIONACE GLAUCA |
| W | 382 | BSRK | HMSP | BLUE SHARK (REDUCTION) PRIONACE GLAUCA |
| W | 482 | BSRK | HMSP | BLUE SHARK (ANIMAL FOOD) PRIONACE GLAUCA |
| C | 481 | DRDO | HMSP | DOLPHINFISH |
| O | 292 | DRDO | HMSP | DOLPHINFISH |

AGID = agency id (C=CDFG, O=ODFW, W=WDFW)
CATEGORY = state species character code
SPID = PacFIN species ID
MGRP = PacFIN species management group
DESCRIPTION = state species description

[1]PacFIN species codes in the HMSP management group that are not used include:

| | | | | |
|---|---|---|---|---|
| C | 92 | MRLN | HMSP | MARLIN, STRIPED |
| O | 388 | MRLN | HMSP | MARLIN, STRIPED |

**Table 4-58. PacFIN gear codes used to extract commercial fisheries data for this HMS SAFE report.**

| AGID | GEAR | GRID | GRGROUP | DESCRIPTION |
|---|---|---|---|---|
| **SURFACE HOOK AND LINE (ALBACORE)** | | | | |
| C | 001 | POL | HKL | HOOK AND LINE |
| C | 002 | POL | HKL | LIVE BAIT |
| C | 006 | POL | HKL | JIG (ALBACORE) |
| C | 007 | TRL | TLS | TROLL (ALBACORE) |
| C | 009 | TRL | TLS | TROLL, (SALMON) |
| O | 120 | TRL | TLS | OCEAN TROLL |
| O | 170 | POL | HKL | TUNA BAITBOAT |
| W | 41 | TRL | TLS | TROLL (SALMON) |
| **DRIFT GILLNET (SWORDFISH & SHARK)** | | | | |
| C | 065 | DGN | NET | GILL NET, DRIFT |
| O | 140 | GLN | NET | OCEAN GILLNET |
| **HARPOON** | | | | |
| C | 012 | OTH | MSC | HARPOON/SPEAR |
| **LONGLINE (HMS)** | | | | |
| C | 005 | LGL | HKL | LONG LINE, SET |
| O | 150 | LGL | HKL | PELAGIC LONGLINE |
| W | 43 | LGL | HKL | SET LINE/LONG LINE |
| **PURSE SEINE (TUNA)** | | | | |
| C | 070 | SEN | NET | ENCIRCLING NETS |
| C | 071 | SEN | NET | PURSE SEINE |
| C | 073 | SEN | NET | DRUM PURSE SEINE |
| C | 075 | SEN | NET | LAMPARA NET |
| O | 160 | SEN | NET | TUNA SEINE |

AGID = agency id (C=CDFG, O=ODFW, W=WDFW)
GEAR = state gear character code
GRID = PacFIN gear ID
GRGROUP = PacFIN gear group
DESCRIPTION = state gear description

## 4.2 Recreational Fisheries

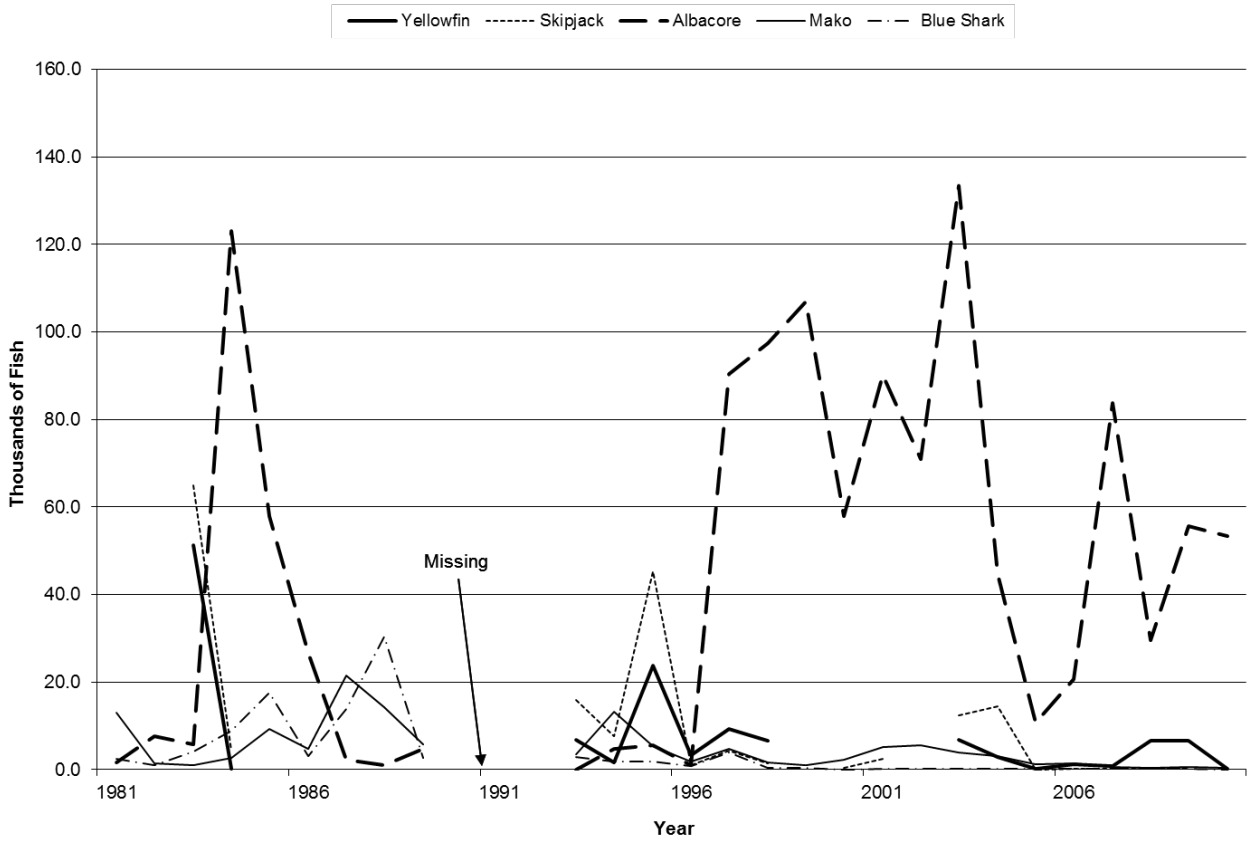


**Figure 4-12. Catches by species (thousands of fish) for the West Coast recreational private sport fishing fleet, 1981–2010.**

**Interpretation**: Figure 4–12 shows West Coast recreational private sport fishing fleet HMS catches by species, in thousands of fish. Table 4-58shows the numeric values, with added columns for species representing negligible shares of the overall catch (bluefin tuna, bigeye tuna, swordfish, marlin, common thresher shark, and dorado).

The principal catch species are the tunas, with albacore and yellowfin comprising the most important components of the catch. Albacore represented the largest share of overall private sport fishing boat catch in 2010. Common thresher shark was the most frequently caught shark species included in the HMS private boat catch in 2010.

**Source and Calculations**: The data were extracted from RecFIN on August 8, 2011. The data represent thousands of fish caught for each species. Tables were created for each species by requesting "examined" and "dead" catch types (RecFIN codes A + B1) summed across the range of waves within each year from 1981 through 2010. The primary source for the data was the Marine Recreational Fisheries Statistics Survey (MRFSS) survey for 1981-2003 and the California Recreational Fisheries Survey (CRFS) for 2004–2010. MRFSS and CRFS data are generally not comparable due to different sampling methodologies. Blank table entries represent missing values (including the years 1990–1992 for which no data are available). Data for 2010 are preliminary and may be incomplete.

**Table 4-59. Catches by species (thousands of fish) for the West Coast recreational private sport fishing fleet, 1981–2010.**

| Year | Yellowfin | Skipjack | Bluefin | Albacore | Bigeye | Swordfish | Striped Marlin | Mako Shark | Thresher Shark | Blue Shark | Dorado |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | | | | 1.7 | | | | 13.0 | | 2.4 | |
| 1982 | | | | 7.6 | 2.5 | | 0.8 | 1.5 | 2.2 | 1.1 | |
| 1983 | 51.3 | 65.0 | 0.6 | 5.7 | 0.6 | | 0.4 | 1.1 | 2.4 | 4.2 | 4.7 |
| 1984 | 0.3 | 4.4 | 0.6 | 123.0 | 0.6 | | 1.2 | 2.6 | 0.8 | 8.8 | 4.5 |
| 1985 | | | | 57.9 | | | 0.7 | 9.3 | 0.4 | 17.6 | |
| 1986 | | | | 26.7 | | | | 4.8 | 1.4 | 3.0 | |
| 1987 | | 0.5 | | 2.3 | | | 0.9 | 21.6 | 4.8 | 13.9 | |
| 1988 | | | | 1.0 | | | 0.8 | 14.3 | 0.9 | 30.3 | |
| 1989 | 7.0 | 5.0 | | 4.7 | | | | 5.8 | 0.8 | 2.6 | |
| 1990 | | | | | | | | | | | |
| 1991 | | | | | | | | | | | |
| 1992 | | | | | | | | | | | |
| 1993 | 6.9 | 16.0 | | 0.0 | | | 0.3 | 3.6 | 2.6 | 2.9 | 6.2 |
| 1994 | 1.7 | 7.7 | | 4.8 | | | 0.4 | 13.3 | 3.6 | 1.8 | 1.0 |
| 1995 | 23.7 | 45.2 | | 5.5 | | | 0.3 | 5.3 | 2.7 | 1.9 | |
| 1996 | 3.2 | 1.0 | | 1.0 | | | | 1.9 | 0.7 | 0.8 | 2.7 |
| 1997 | 9.2 | 4.3 | | 90.5 | | | 0.4 | 4.8 | 0.5 | 3.9 | 19.8 |
| 1998 | 6.7 | 1.5 | 1.6 | 97.5 | | | | 1.7 | 0.6 | 0.4 | 11.1 |
| 1999 | | | | 106.9 | | | | 1.1 | 1.3 | 0.5 | 1.1 |
| 2000 | 36.8 | 0.4 | | 57.9 | 0.4 | | | 2.3 | 1.7 | 0.0 | 61.0 |
| 2001 | | 2.5 | 1.0 | 90.1 | | | | 5.1 | 2.2 | 0.1 | |
| 2002 | | | 0.9 | 70.9 | | | | 5.6 | 1.6 | 0.1 | 0.2 |
| 2003 | 6.8 | 12.4 | | 133.5 | 0.2 | | | 3.9 | 2.0 | 0.2 | 0.2 |
| 2004 | 2.9 | 14.5 | 0.1 | 44.6 | 0.0 | | 0.0 | 3.0 | 4.5 | 0.3 | 3.2 |
| 2005 | 0.1 | 0.0 | 0.1 | 10.8 | | | 0.0 | 1.3 | 0.3 | 0.1 | 0.2 |
| 2006 | 1.3 | 0.3 | 0.2 | 20.6 | | | 0.0 | 1.5 | 0.5 | 0.1 | 12.9 |
| 2007 | 0.8 | 0.1 | 0.0 | 83.8 | | 0.0 | | 0.7 | 0.7 | 0.3 | 0.3 |
| 2008 | 6.7 | 0.3 | 0.4 | 29.6 | | | | 0.4 | 0.8 | 0.1 | 16.9 |
| 2009 | 6.6 | 0.5 | 0.2 | 55.7 | | | 0.0 | 0.6 | 1.1 | 0.1 | 2.4 |
| 2010 | 0.2 | | 0.0 | 53.4 | | | 0.0 | 0.4 | 0.7 | 0.0 | 0.0 |

Data were extracted from RecFINby going to the link entitled "Tabulate Historical Estimates (1980-2003)." Blank cells indicate no data exist.
Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown. Extracted August 8, 2011.

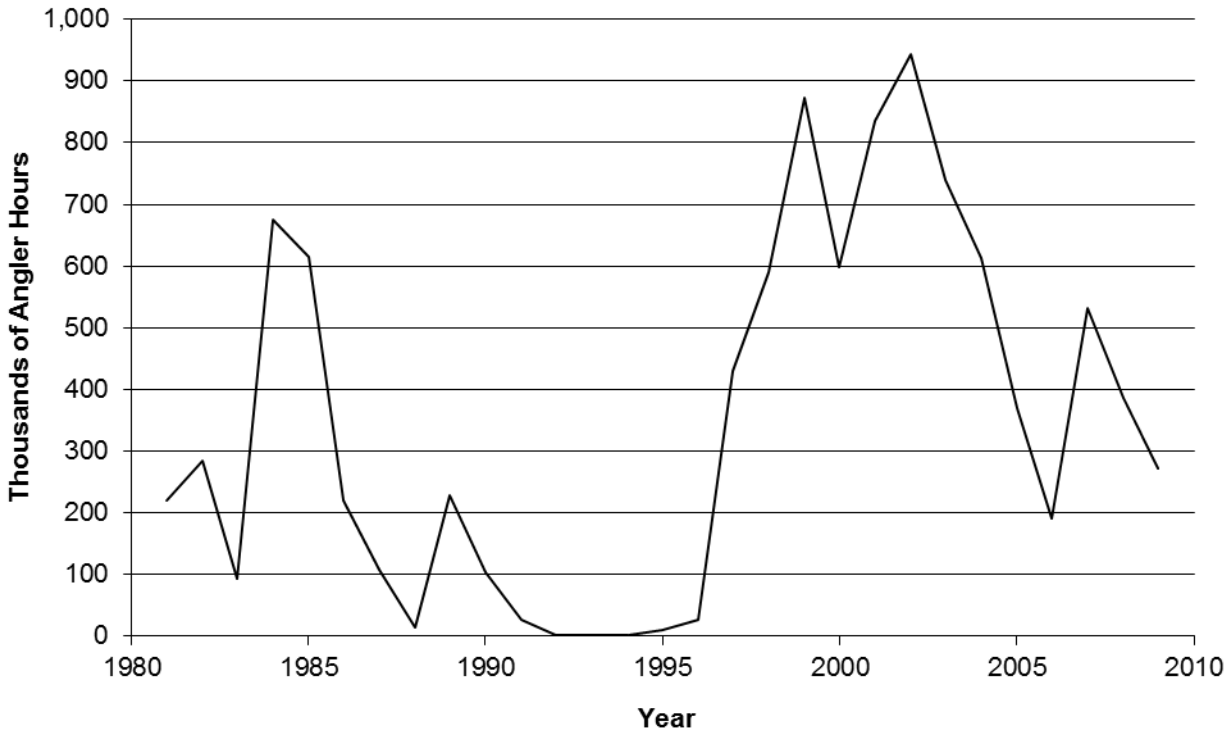


**Figure 4-13. Albacore fishing hours (in thousands) for the California CPFV fleet annually, 1981–2010.**

**Interpretation**: Figure 4–13 and Table 4-59present the total number of recorded hours of albacore fishing time for passengers on boats in the CPFV fleet for each year from 1981–2010. The fishing time shows a wide range of variation over the period, from a minimum of 891 hours in 1994 to a maximum of 943,755 hours in 2002, with a steady decline from 2002 through 2006. Albacore hours for 2010 decreased to 174,875 hours, continuing to trend down from 2007 through 2009.

**Source and Calculations**: The data were extracted from the CPFV logbook database, by selecting trip logs with the market code indicating albacore was caught. For the selected records, albacore hours were computed as the number of fishing hours multiplied by the number of passengers

**Table 4-60. Albacore fishing hours for the California CPFV fleet, 1981–2010.**

| Year | Albacore Hours |
|---|---|
| 1981 | 219,274 |
| 1982 | 284,584 |
| 1983 | 94,051 |
| 1984 | 675,921 |
| 1985 | 614,060 |
| 1986 | 219,414 |
| 1987 | 108,287 |
| 1988 | 14,775 |
| 1989 | 227,960 |
| 1990 | 102,966 |
| 1991 | 26,487 |
| 1992 | 2,248 |
| 1993 | 1,458 |
| 1994 | 891 |
| 1995 | 10,464 |
| 1996 | 27,148 |
| 1997 | 429,092 |
| 1998 | 590,152 |
| 1999 | 872,207 |
| 2000 | 596,074 |
| 2001 | 835,143 |
| 2002 | 943,755 |
| 2003 | 740,230 |
| 2004 | 612,312 |
| 2005 | 370,636 |
| 2006 | 192,692 |
| 2007 | 531,004 |
| 2008 | 387,556 |
| 2009 | 296,021 |
| 2010 | 174,875 |

Source: CPFV Logbook Database.
Extracted August 3, 2011.

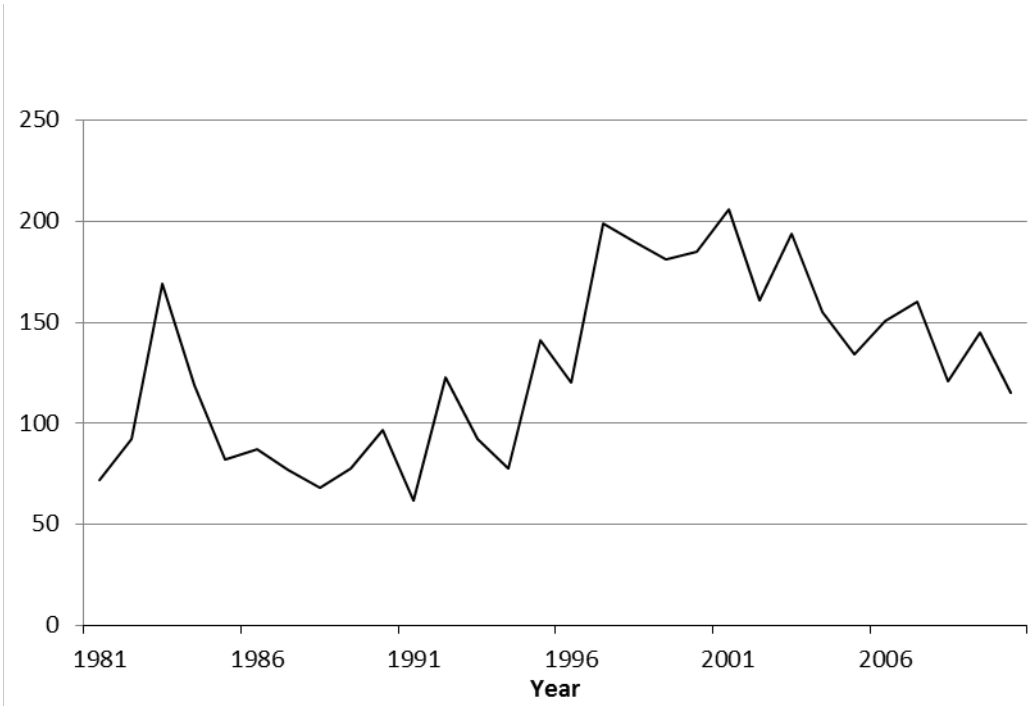


**Figure 4-14. Annual numbers of CPFV vessels targeting HMS in California waters, 1981–2010.**

**Interpretation:** Figure 4–14 and Table 4-60 present the number of vessels in the California CPFV fleet which targeted HMS in California waters annually from 1981 through 2010.

The number of vessels targeting HMS in California waters peaked at 206 in 2001 before declining to 121 vessels in 2008. A slight rebound to a level of 145 vessels was seen in 2009 before declining again to 115 vessels in 2010.

**Source and Calculations**: The data were extracted from the CPFV logbook database.

**Table 4-61. Annual numbers of CPFV vessels targeting HMS in California waters, 1981–2010.**

| Year | Vessels |
|---|---|
| 1981 | 72 |
| 1982 | 92 |
| 1983 | 169 |
| 1984 | 119 |
| 1985 | 82 |
| 1986 | 87 |
| 1987 | 77 |
| 1988 | 68 |
| 1989 | 78 |
| 1990 | 97 |
| 1991 | 62 |
| 1992 | 123 |
| 1993 | 92 |
| 1994 | 78 |
| 1995 | 141 |
| 1996 | 120 |
| 1997 | 199 |
| 1998 | 190 |
| 1999 | 181 |
| 2000 | 185 |
| 2001 | 206 |
| 2002 | 161 |
| 2003 | 194 |
| 2004 | 155 |
| 2005 | 134 |
| 2006 | 151 |
| 2007 | 160 |
| 2008 | 121 |
| 2009 | 145 |
| 2010 | 115 |

Source: CPFV Logbook Database.
Extracted August 3, 2011.

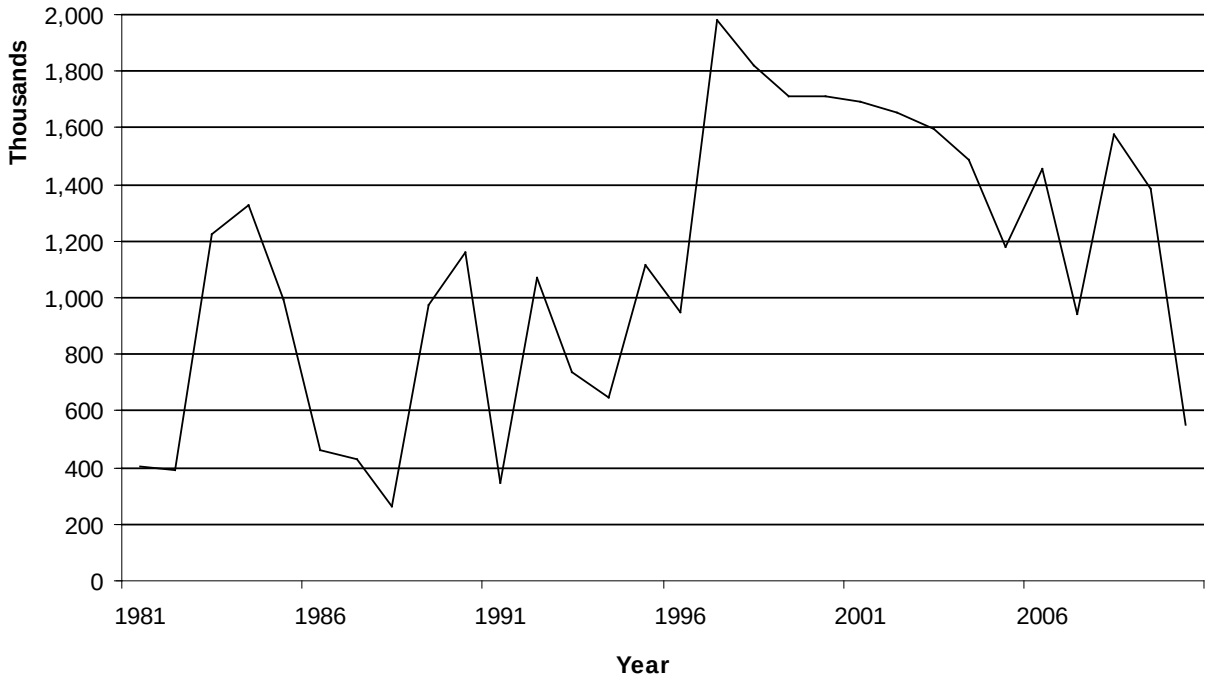


**Figure 4-15. Annual numbers of angler hours (in thousands) for the California CPFV fleet, 1981–2010.**

**Interpretation:** Figure 4–15 and Table 4-61show the number of angler hours for the California CPFV fleet which targeted HMS in each year from 1981 to 2010.

The number of angler hours shows a sizable variation over time, from a minimum of 263,433 in 1988 to a maximum of1, 982,207 in 1997. Since 1997, the number of angler hours gradually declined to about 900,000 hours in 2007, but subsequently rebounded to more than 1,000,000 hours in 2008 and 2009. Angler hours dropped sharply in 2010 to 552,900, the lowest level since 1991.

**Source and Calculations**: The data were extracted from the CPFV logbook database.

**Table 4-62. Table 4–61. Annual numbers of angler hours for the California CPFV fleet, 1981–2010.**

| Year | Angler Hours |
|---|---|
| 1981 | 406,100 |
| 1982 | 393,620 |
| 1983 | 1,224,248 |
| 1984 | 1,324,407 |
| 1985 | 993,614 |
| 1986 | 458,523 |
| 1987 | 430,448 |
| 1988 | 263,433 |
| 1989 | 975,549 |
| 1990 | 1,162,217 |
| 1991 | 343,925 |
| 1992 | 1,068,365 |
| 1993 | 740,005 |
| 1994 | 647,049 |
| 1995 | 1,116,193 |
| 1996 | 948,204 |
| 1997 | 1,982,207 |
| 1998 | 1,821,848 |
| 1999 | 1,708,633 |
| 2000 | 1,712,145 |
| 2001 | 1,690,471 |
| 2002 | 1,654,025 |
| 2003 | 1,593,126 |
| 2004 | 1,490,142 |
| 2005 | 1,180,789 |
| 2006 | 1,457,769 |
| 2007 | 943,911 |
| 2008 | 1,579,081 |
| 2009 | 1,384,082 |
| 2010 | 552,900 |

Source: CPFV Logbook Database.
Extracted August 3, 2011.

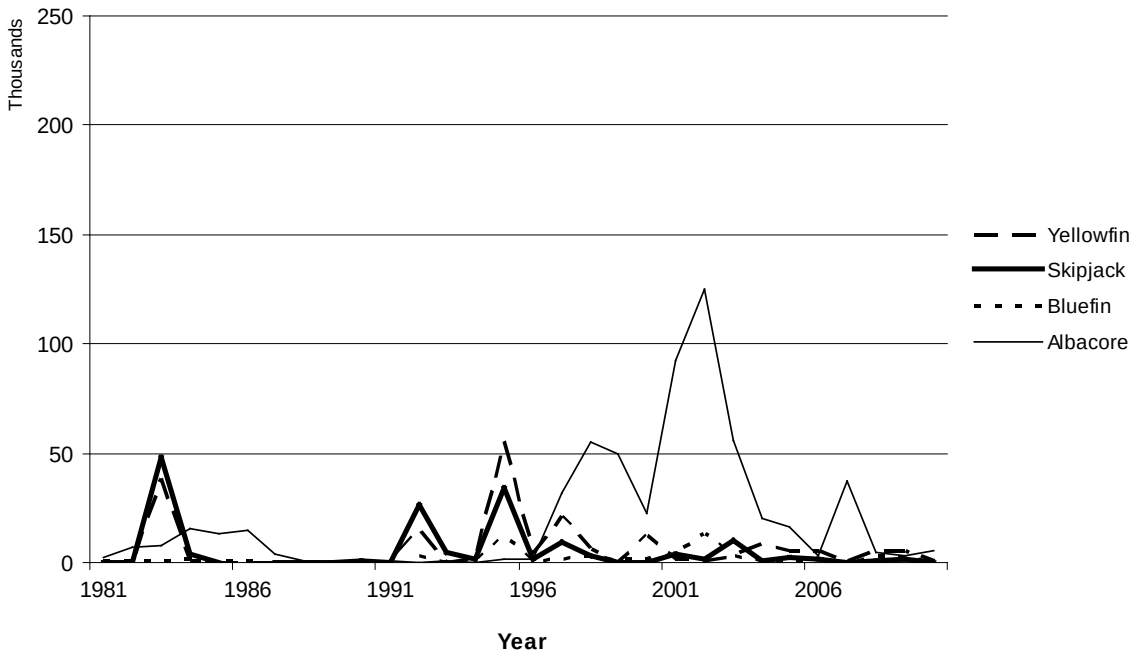


**Figure 4-16. Annual catch in number of fish by species for the California CPFV fleet in California waters, 1981–2010.**

**Interpretation**: Figure 4–16 and Table 4-62 show California CPFV fleet HMS catches by species which were caught in California waters. Figure 4-16 only displays the four most frequently caught constituents of the catch, all of which are tuna species. Table 4-60a displays the numeric values for additional species representing minor shares of the overall catch (bluefin tuna, bigeye tuna, swordfish, marlin, mako shark, thresher shark, blue shark, and dorado). The table displays catch data for California CPFVs fishing in California waters.

The principal species targeted are the tunas, with albacore of increasing importance relative to other species of tuna in recent years; however, in 2008-2009 the number of albacore caught in California waters was less than the number of yellowfin tuna that were caught. However, in 2010 albacore catch was more than yellowfin tuna catch. Blue shark was the most frequently caught shark species from the late 1980s through the early 1990s, but blue shark catch has been less than shortfin mako and thresher shark catch through 2009. In 2010, blue shark catch returned to a level not seen since 2001.

**Source and Calculations**: The data were extracted from the CPFV logbook database. Blank table entries indicate no catch was recorded.

**Table 4-63. Annual catch in number of fish by species for the California Commercial Passenger Fishing Vessel fleet in California waters, 1981–2010.**

| Year | Yellowfin | Skipjack | Bluefin | Albacore | Bigeye | Swordfish | Striped Marlin | Mako Shark | Thresher Shark | Blue Shark | Dorado |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 81 | 17 | 419 | 2,127 | 25 | | 37 | 34 | 7 | 100 | 35 |
| 1982 | 129 | 8 | 392 | 7,352 | 9 | | 13 | 18 | 36 | 83 | |
| 1983 | 37,816 | 48,254 | 443 | 7,833 | 176 | | 28 | 28 | 136 | 22 | 1,258 |
| 1984 | 421 | 3,993 | 1,765 | 15,527 | 26 | 2 | 9 | 49 | 16 | 35 | 527 |
| 1985 | 43 | 40 | 850 | 13,309 | 10 | | 7 | 18 | 29 | 19 | 5 |
| 1986 | 0 | | 443 | 14,706 | 37 | | 13 | 58 | 13 | 217 | 11 |
| 1987 | 1 | 167 | 5 | 3,580 | 7 | | 8 | 296 | 15 | 645 | |
| 1988 | 9 | 2 | 147 | 547 | 2 | 2 | 2 | 115 | 15 | 882 | 1 |
| 1989 | 17 | 165 | 88 | 367 | 2 | | 7 | 302 | 45 | 4,469 | 1 |
| 1990 | 216 | 1,008 | 198 | 275 | 5 | | 7 | 231 | 51 | 2,675 | 7,147 |
| 1991 | 60 | 18 | | 741 | | | 1 | 129 | 50 | 5,802 | |
| 1992 | 15,457 | 26,326 | 3,325 | 379 | 7 | | 12 | 130 | 29 | 1,109 | 1,912 |
| 1993 | 73 | 4,743 | 316 | 393 | | 3 | 1 | 297 | 163 | 694 | 707 |
| 1994 | 2,285 | 1,797 | 10 | 171 | | | 5 | 269 | 30 | 497 | 64 |
| 1995 | 55,205 | 34,368 | 12,062 | 1,554 | 11 | 1 | 21 | 161 | 59 | 521 | 1,354 |
| 1996 | 4,203 | 1,199 | 439 | 1,826 | | | 5 | 237 | 31 | 439 | 646 |
| 1997 | 20,838 | 9,694 | 1,354 | 31,685 | 33 | | 12 | 356 | 47 | 500 | 5,715 |
| 1998 | 6,339 | 3,162 | 2,828 | 55,065 | 27 | | 6 | 150 | 28 | 94 | 378 |
| 1999 | 230 | 171 | 1,623 | 49,954 | 14 | | 1 | 70 | 47 | 150 | 392 |
| 2000 | 12,786 | 190 | 1,562 | 22,150 | 60 | | 2 | 83 | 40 | 149 | 4,343 |
| 2001 | 1,385 | 4,080 | 3,829 | 92,519 | 2 | 1 | | 193 | 14 | 140 | 755 |
| 2002 | 509 | 1,817 | 13,245 | 125,138 | 2 | 2 | 2 | 189 | 11 | 15 | 298 |
| 2003 | 2,788 | 10,363 | 2,858 | 56,004 | | | | 79 | 26 | 47 | 74 |
| 2004 | 8,330 | 735 | 485 | 20,197 | 63 | 2 | 1 | 250 | 18 | 6 | 671 |
| 2005 | 5,634 | 2,224 | 723 | 16,426 | 2 | | 4 | 121 | 23 | 26 | 668 |
| 2006 | 5,407 | 1,765 | 1,349 | 3,402 | 4 | 3 | 2 | 178 | 27 | 18 | 11,329 |
| 2007 | 1,083 | 67 | 176 | 36,974 | | | 93 | 108 | 40 | 19 | 72 |
| 2008 | 5,597 | 821 | 3,158 | 4,530 | | 2 | 1 | 77 | 45 | 17 | 5,621 |
| 2009 | 5,300 | 1,611 | 1,944 | 3,141 | | | 4 | 43 | 39 | 11 | 1,289 |
| 2010 | 1,020 | 7 | 306 | 5,710 | | | | 32 | 68 | 140 | 3 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown.
Source: CPFV Logbook Database, extracted August 3, 2011.

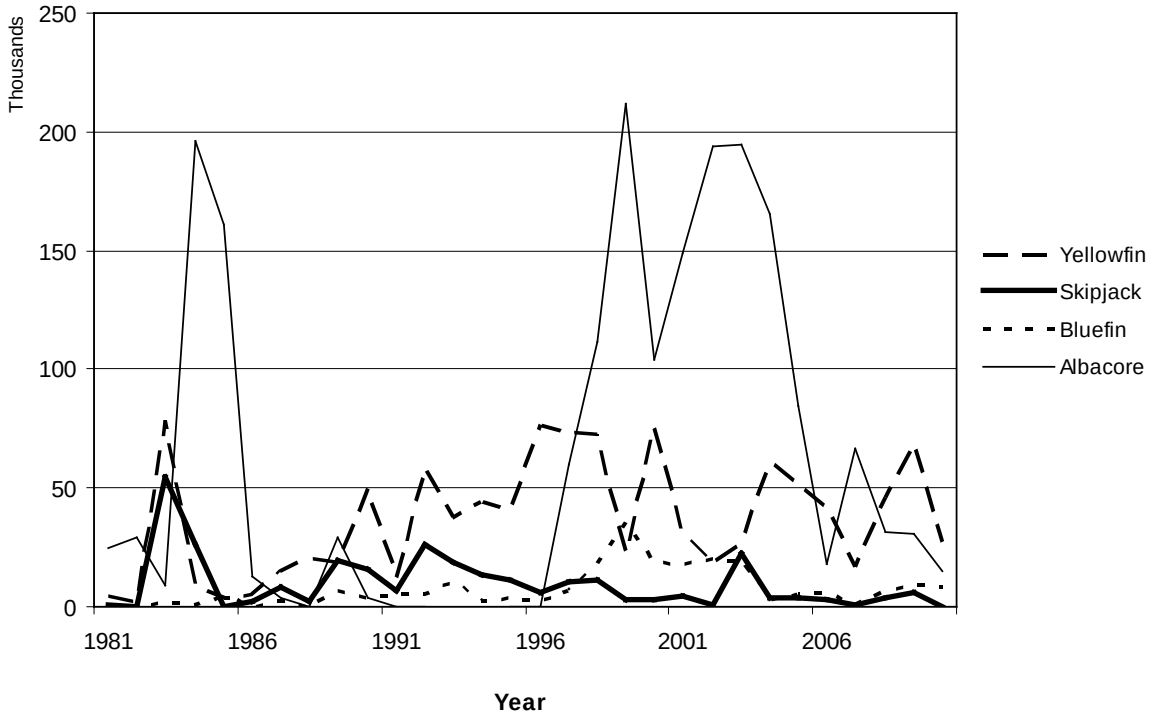


**Figure 4-17. Catch in number of fish by species for the California CPFV fleet in Mexico waters annually, 1981–2010.**

**Interpretation**: Figure 4–17 and Table 4-63show California CPFV fleet HMS catches by species which were caught in Mexico waters. The graph only displays the four most frequently caught constituents of the catch, all of which are tuna species. Table 4-60b displays the numeric values for additional species representing minor shares of the overall catch (bluefin tuna, bigeye tuna, marlin, mako shark, thresher shark, blue shark, and dorado). The table displays catch data for California CPFVs fishing in Mexico waters. For several species (e.g., dorado and the tunas), recent catch in Mexico waters substantially exceeds catch in California waters for the CPFV fleet.

The principal species targeted are the tunas, with albacore of higher catch frequency relative to other species of tuna in recent years; however, in 2008- 2010 the number of albacore caught was less than the number of yellowfin tuna caught.

**Source and Calculations**: The data were extracted from the CPFV logbook database. Blank table entries indicate no catch was recorded.

**Table 4-64. Annual catch in number of fish by species for the California Commercial Passenger Fishing Vessel fleet in Mexico waters, 1981–2010.**

| Year | Yellowfin | Skipjack | Bluefin | Albacore | Bigeye | Swordfish | Striped Marlin | Mako Shark | Thresher Shark | Blue Shark | Dorado |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 4,478 | 418 | 123 | 24,521 | 217 | 1 | 30 | 3 | | 1 | 1,246 |
| 1982 | 1,906 | 24 | 273 | 29,338 | 129 | | 20 | 8 | | 2 | 1,099 |
| 1983 | 78,482 | 54,786 | 1,469 | 9,328 | 2,077 | | 37 | 1 | | 6 | 3,734 |
| 1984 | 8,227 | 26,364 | 1,069 | 195,758 | 511 | | 278 | 13 | | | 6,005 |
| 1985 | 3,882 | 317 | 4,298 | 161,194 | 659 | | 64 | 8 | | 1 | 1,357 |
| 1986 | 5,505 | 2,249 | 250 | 12,616 | 1,478 | | 30 | 8 | | 2 | 1,855 |
| 1987 | 14,796 | 8,038 | 1,946 | 3,466 | 628 | | 160 | 8 | | 6 | 3,518 |
| 1988 | 20,056 | 1,896 | 183 | 12 | 426 | | 132 | 17 | | 62 | 3,348 |
| 1989 | 19,059 | 19,571 | 6,431 | 29,361 | 42 | | 33 | 8 | 1 | 6 | 2,340 |
| 1990 | 49,524 | 15,523 | 3,558 | 3,568 | 2,191 | | 101 | 12 | | 2 | 24,574 |
| 1991 | 11,702 | 6,788 | 5,330 | 272 | 256 | | 11 | 10 | | | 1,301 |
| 1992 | 58,282 | 25,976 | 5,261 | 1 | 42 | | 13 | 6 | 1 | 1 | 20,815 |
| 1993 | 37,069 | 19,080 | 10,219 | | 46 | | 29 | 11 | | 1 | 8,245 |
| 1994 | 43,999 | 13,513 | 2,233 | | 15 | | 37 | 17 | | 4 | 5,151 |
| 1995 | 41,271 | 10,904 | 3,963 | 1 | 27 | | 18 | 17 | | 10 | 3,971 |
| 1996 | 76,511 | 5,791 | 2,300 | 364 | 132 | | 16 | 53 | 1 | 55 | 24,284 |
| 1997 | 73,326 | 10,804 | 6,984 | 59,529 | 253 | | 12 | 19 | 2 | 32 | 24,162 |
| 1998 | 72,952 | 11,298 | 17,639 | 111,233 | 1,939 | 3 | 11 | 34 | | 88 | 6,372 |
| 1999 | 22,418 | 2,632 | 35,174 | 211,947 | 1,092 | 1 | 2 | 27 | | 72 | 3,745 |
| 2000 | 75,660 | 2,834 | 19,030 | 104,394 | 503 | | 1 | 36 | | 9 | 12,101 |
| 2001 | 30,925 | 4,649 | 18,078 | 148,994 | 9 | | | 49 | | 72 | 3,448 |
| 2002 | 18,085 | 1,113 | 20,153 | 193,999 | 6 | | 1 | 24 | | | 2,409 |
| 2003 | 27,267 | 22,189 | 19,433 | 194,549 | 66 | 2 | 4 | 37 | | | 3,143 |
| 2004 | 60,338 | 3,934 | 2,906 | 165,570 | 400 | | 3 | 54 | | | 7,668 |
| 2005 | 51,314 | 3,682 | 5,034 | 84,657 | 37 | | 14 | 41 | | | 6,033 |
| 2006 | 41,920 | 2,968 | 6,047 | 17,691 | 7 | | 13 | 65 | | 7 | 35,042 |
| 2007 | 16,713 | 375 | 839 | 66,459 | | | 1 | 27 | | | 6,374 |
| 2008 | 45,511 | 3,471 | 6,908 | 31,323 | 1 | | 4 | 52 | | | 23,523 |
| 2009 | 68,273 | 6,328 | 8,810 | 30,463 | 4 | | 3 | 8 | | | 15,727 |
| 2010 | 26,751 | 311 | 7,867 | 15,049 | | | | 10 | 2 | | 1,571 |

Blank cells indicate no data exists. Any calculated or derived zeros are due to rounding of summarized data to less than half of the unit shown. Source: CPFV Logbook Database, extracted August 3, 2011.

# 5.0 UPDATED STATUS OF THE HIGHLY MIGRATORY SPECIES MANAGEMENT UNIT SPECIES

This chapter contains a brief review of the stock status for each species with respect to the Council-adopted Control Rules. Section 5.1 summarizes the adopted Control Rules and the Status Determination Criteria. In Section 5.2, a table of the recent and upcoming assessment efforts of various international scientific bodies responsible for assessing several of the stocks is presented. Section 5.3 summarizes the results of stock assessments conducted in 2010. Stock structure is not fully understood for many of the species that range throughout the Pacific, thus some assessments for WCPO populations are also included, although those populations and their fisheries are not specifically managed under the HMS FMP. The summaries are derived from the assessments or reports of working group meetings associated with the assessments and do not necessarily represent the conclusions of the Council's HMSMT or NMFS. In many cases there has been minimal outside review of the assessment. Nevertheless, they represent the best available information for those species in 2010 to compare to past and future work.

Assessments of stock status always involve assumptions, uncertainty, and particular interpretations of fishery statistics. There are no universally-accepted standards by which to determine confidence for particular assessments, and "ground-truthing" (i.e., comparing assessment estimates to actual population counts) will never be possible over the broad range occupied by highly migratory species. Furthermore, for many of these species, the RFMOs have not agreed upon appropriate biological reference points for use in the context of managing fisheries. Therefore, explicit definitions for both overfished and sustainable exploitation levels are not currently available. Table 5-1 summarizes the current stock status of the management unit species with respect to overfishing and overfished criteria. The conclusions presented in the table should be reasonably accurate, but should also be treated with caution.

Finally, Section 5.4 provides links to assessments that have already been produced in 2011 by the respective RFMOs so that readers can access the most recent publicly available assessments of the management unit species. These assessments will be summarized in the 2011 HMS SAFE.

## 5.1 Control Rules for Management

The Control Rules and Status Determination Criteria implemented in the HMS FMP are based on the Technical Guidance for National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act (Restrepo, et al. 1998). The following is a summary of the Control Rules for Management adopted for the HMS FMP.

In general, a default maximum sustainable yield (MSY) control rule was adopted for most MUS, with an optimum yield[1] (OY) target control rule for the vulnerable species (Figure 5–1).

For the less vulnerable species managed under the MSY Control Rule, the minimum stock size threshold (MSST), the minimum biomass at which recovery measures are to begin, is the ratio $B_{MSST}/B_{MSY}$. It specifies a lower biomass level that allows remedial action not to be triggered each time B drops below $B_{MSY}$, simply from natural variation. In terms of $B_{MSY}$ the recommended level of $B_{MSST}$ is:

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

[1] Optimum yield (OY) is defined as MSY reduced by relevant socioeconomic factors, ecological considerations, and fishery-biological constraints so as to provide the greatest average long-term benefits to the Nation.

(i.e., whichever is greater). $B_{MSST}$ must not be less than $B_{MIN} = 0.5B_{MSY}$ and should allow recovery back to $B_{MSY}$ within 10 years when F (fishing mortality) is reduced to zero (to the extent possible).

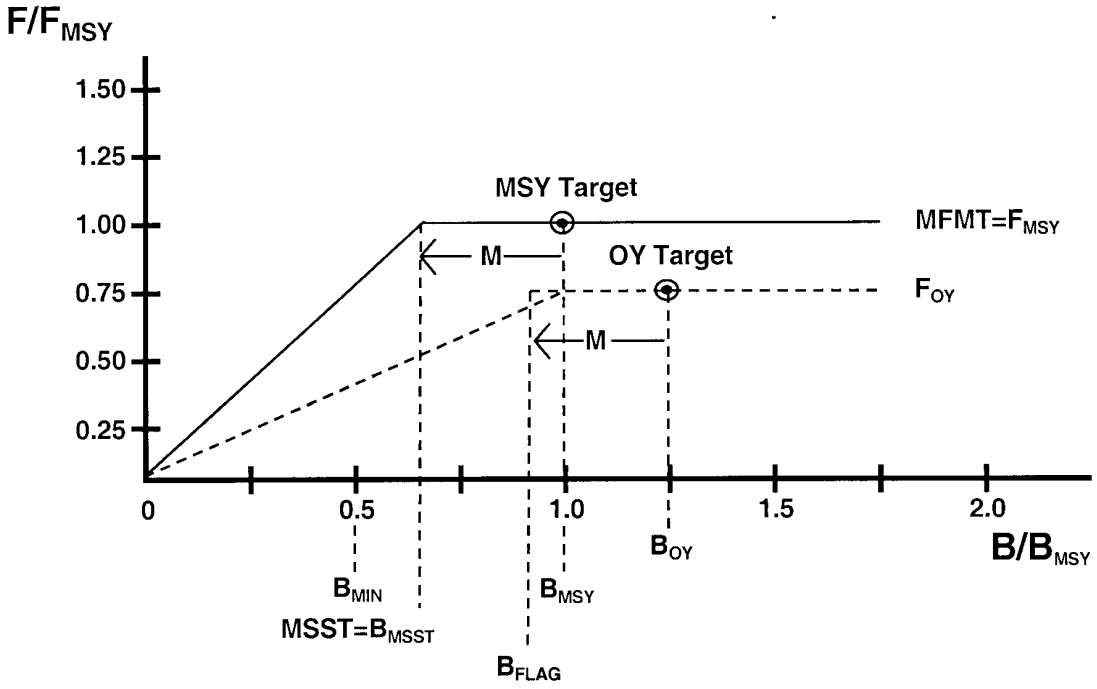


**Figure 5-1. General model of MSY and OY Control Rules, from Restrepo, et al. 1998.**

For the vulnerable species, which in this FMP includes the pelagic sharks, bluefin tuna, and striped marlin, there is a Minimum Biomass Flag ($B_{FLAG}$) for the OY Control Rule equal to $(1\text{-}M)B_{OY}$ or $0.5B_{OY}$ (whichever is greater). $B_{FLAG}$, which would then be equivalent to $1.25(B_{MSST}/B_{MSY})$, serves as a warning call to halt biomass reduction that would jeopardize obtaining OY. In this FMP, the OY for vulnerable species is set at 0.75MSY (or MSY proxy), and any harvest guideline is set equal to OY.

Rebuilding of overfished stocks is a unilateral requirement by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), but internationally-fished stocks require cooperative catch reductions among the fishing nations for this rebuilding to be effective. U.S. responsibility in the rebuilding, however, will be greater the more localized the stock and the greater the domestic take of the stock's production.

Under the Magnuson-Stevens Reauthorization Act of 2006, the National Standard 1 guidelines have been revised regarding establishing annual catch limits (ACLs) and control rules. In 2009, the Council began considering a framework process under the HMS FMP to meet the revised NS1 Guidelines. The new framework was fully implemented in September 2011 and thus will be reported on in the 2011 HMS SAFE document.

## 5.2 Recent and Projected Assessment Schedule

**Table 5-1. Schedule of recent and next anticipated assessments for FMP MUS and the organizations responsible for the assessments as of December 31, 2010.**

| Species (Stock) | Date (Next Anticipated) | Organization Responsible for the Assessment |
|---|---|---|
| TUNAS | | |
| Albacore (NPO) | 2006 (2011) | ISC (ISC) |
| Bluefin (NPO) | 2010 (2012) | ISC (ISC) |
| Bigeye (EPO) | 2010 (2011) | IATTC (IATTC) |
| Bigeye (WCPO) | 2010 (2011) | WCPFC (WCPFC) |
| Skipjack (EPO) | 2010 (2011) | IATTC (IATTC) |
| Skipjack (WCPO) | 2010 (2011) | WCPFC (WCPFC) |
| Yellowfin (EPO) | 2010 (2011) | IATTC (IATTC) |
| Yellowfin (WCPO) | 2009 (2011) | WCPFC (WCPFC) |
| BILLFISHES | | |
| Striped Marlin (EPO) | | |
| Striped Marlin (NPO) | 2007 (2012) | ISC (ISC) |
| Swordfish (SEPO) | 2006 (2011) | IATTC (IATTC) |
| Swordfish (NEPO) | 2010 | ISC |
| Swordfish (NPO) | 2009 (2013) | ISC (ISC) |
| SHARKS | | |
| Common Thresher (WA/OR/CA EEZ) | 2001 (2011) | NMFS (NMFS) |
| Pelagic Thresher | | |
| Bigeye Thresher | | |
| Shortfin Mako | (2013) | (ISC) |
| Blue (NPO) | 2009 (2012) | NMFS and NRIFSF Japan (ISC) |
| OTHER | | |
| Dorado (EPO) | | |

Note: Text in parentheses indicates the year the next assessment is anticipated and the organization expected to conduct the assessment. The acronyms listed in this table are defined near the front of this document.

## 5.3 Conclusions from 2010 Pacific HMS stock assessments

### *5.3.1 Bluefin Tuna*

#### 5.3.1.1 Bluefin Tuna (NPO) - Update

The last full stock assessment of north Pacific bluefin tuna was conducted by the ISC Pacific Bluefin Working Group (PBFWG) in 2008 using fishery data through 2005 and the Stock Synthesis 2 modeling framework (ISC 2008). The assessment was accepted by the ISC Plenary, but the Plenary tasked the PBFWG to examine the cause of some uncertainties in the modeling. Since then an update to the assessment was conducted in 2009 using the same data, a different natural mortality schedule and Stock Synthesis 3 (ISC 2009b). In 2010, another update to the assessment was conducted using Stock Synthesis 3 with fishery data through 2007 and all other modeling assumptions as in the 2009 update (ISC 2010a). A suite of sensitivity runs were also conducted. The analyses provided updates in relative trends in fishing mortality and biomass rather than estimates of absolute levels. Key results of the 2010 update as summarized in the ISC's Tenth Plenary Report (ISC 2010b) are listed below.

"The estimate of spawning biomass in 2008 (at the end of the 2007 fishing year) declined from 2006 and

is estimated to be in the range of the 40-60 percentile of the historically observed spawning biomasses.

Average fishing mortality 2004-2006 ($F_{2004\text{-}2006}$) had increased from $F_{2002\text{-}2004}$ by 6 percent for age-0, approximately 30 percent for ages 1-4, and 6 percent for ages 5+.

30-year projections predict that at $F_{2004\text{-}2006}$, median spawning biomass is likely to decline to levels around the 25th percentile of historical spawning biomass, with approximately 5 percent of the projections declining to or below the lowest previously observed spawning biomass. At $F_{2002\text{-}2004}$, median spawning biomass is likely to decline in subsequent years but recover to levels near the median of the historically observed levels. In contrast to $F_{2004\text{-}2006}$, $F_{2002\text{-}2004}$ had no projections (0 percent) declining to the lowest observed spawning biomass. In both projections, long-term average yield is expected to be lower than recent levels."

Based on the 2009 update when absolute estimates of F, biomass and spawning biomass were calculated, fishing mortality for 2002-04 ($F_{2002\text{-}04}$) was greater than most commonly used biological reference points that may serve, in principle, as potential target reference points. $F_{MSY}$ is roughly equivalent to $F_{MAX}$, given the model assumptions. The recent estimation of $F$, $F_{2002\text{-}2004}$ exceeded $F_{MAX}$ by 46 percent (ISC 2009). Thus, based on the 2009 assessment update and considering $F_{MAX}$ as a proxy to $F_{MSY}$, NMFS determined that overfishing of bluefin tuna was occurring.

Catch of bluefin tuna by U.S. West Coast fisheries constitutes less than one percent of the North Pacific-wide catch.

### *5.3.2 Bigeye Tuna*

#### 5.3.2.1 Bigeye Tuna (EPO)

Stock status of bigeye tuna in the Eastern Pacific is assessed every 1–2 years by the IATTC. A new assessment was conducted using Stock Synthesis 3 in September 2010 (Aires-da-Silva and Maunder 2011) and is based on the assumption that there is a single stock of bigeye tuna in the EPO. Improvements to the assessment including changes to some of the modeling assumptions were made based on a comprehensive external review of the previous assessment. Below is a summary of results from the assessment report which can be downloaded from http://www.iattc.org/PDFFiles2/StockAssessmentReports/SAR-11-BET-ENG.pdf. These results are based on the base case assessment for which steepness of the stock-recruitment relationship was fixed at 1 (i.e. recruitment is independent of stock size).

> "The MSY-based estimates were computed with the parameter estimates from the base case assessment and estimated fishing mortality patterns averaged over 2007 and 2009. Therefore, while these MSY-based results are currently presented as point estimates, there are uncertainties in the results.
>
> At the beginning of January 2010, the spawning biomass of bigeye tuna in the EPO appears to have been about 33 percent higher than $S_{MSY}$, and the recent catches are estimated to have been about 17 percent greater than the MSY.
>
> If fishing mortality is proportional to fishing effort, and the current patterns of age-specific selectivity are maintained, $F_{MSY}$is about 13 percent higher than the current level of effort."
>
> "The results are more pessimistic if a stock-recruitment relationship is assumed, if a higher value is assumed for the average size of the older fish, if lower rates of natural mortality are assumed for adult bigeye, and if only the late period of the fishery (1995-2009) is included in the

assessment; the results are more optimistic if a lower value is assumed for the average size of the older fish, and if higher levels of natural mortality are assumed for adult bigeye."

Catch of bigeye tuna by U.S. West Coast fisheries constitutes less than one percent of the Eastern Pacific-wide catch.

#### 5.3.2.2 Bigeye Tuna (WCPO)

An assessment of bigeye tuna in the WCPO was conducted by the WCPFC's Scientific Committee in August 2010 (Harley et al. 2010). The assessment was conducted using MULTIFAN-CL. The base case model selected to determine stock status was model 3d for which steepness of the stock recruitment relationship was estimated. In general, the results are slightly more optimistic in comparison to the 2009 assessment. Below is a summary of the results excerpted from the Report of the Sixth Scientific Committee meeting (WCPFC 2011). The assessment document can be downloaded from http://www.wcpfc.int/system/files/documents/meetings/scientific-committee/6th-regular-session/stock-status-theme/working-papers/WCPFC-SC6-2010-SA-WP-04_BET_Assessment.pdf.

"For the base model, $F_{current}/F_{MSY}$ is estimated at 1.41, indicating that overfishing is occurring for the WCPO bigeye tuna stock and that in order to reduce fishing mortality to $F_{MSY,}$ a 29 percent reduction in fishing mortality is required from the 2005-2008 level. Considering historical levels of fishing mortality, a 31 percent reduction in fishing mortality from 2004 levels is required (consistent with the aim of CMM2008-01), and a 20 percent reduction from average 2001-2004 levels.

Current stock status in the base model indicates that the current total (B) and spawning biomass (SB) are higher than the associated MSY levels ($B_{current}/B_{MSY}$ = 1.39 and $SB_{current}/SB_{MSY}$ = 1.34). This indicates that the WCPO bigeye stock is not in an overfished state if the spawning biomass reference period is 2005-2008. However, if the spawning biomass period is considered to be 2009, then the spawning biomass is further reduced ($SB_{latest}/SB_{MSY}$ =1.17).

Stock status results with regard to MSY reference points (RPs) are far worse when a lower (0.75) value of steepness is assumed; a 49 percent reduction in fishing mortality is required from the 2005-2008 level to reduce fishing mortality to $F_{MSY}$. The stock is in a slightly overfished state ($SB_{latest}/SB_{MSY}$ = 0.97) when the lower value of steepness (0.75) is assumed."

### *5.3.3 Skipjack Tuna*

#### 5.3.3.1 Skipjack Tuna (EPO)

Skipjack tuna is a difficult species to assess due to uncertainties about stock structure, the vulnerabilities of all age classes, and how well fishery CPUE data tracks abundance. Thus, in 2007 the IATTC developed methods to evaluate indicators of skipjack biomass, recruitment, and exploitation rate and used simple indicators of stock status based on relative values of fishery data, such as, CPUE, average weight of fish caught, and effort (Maunder and Deriso 2007). In 2010, the IATTC updated the indicators of stock status for EPO skipjack with data through 2009 (Maunder 2011). The recent report can be downloaded from http://iattc.org/PDFFiles2/StockAssessmentReports/SAR-11-SKJ-ENG.pdf. A brief excerpt from the report is provided below.

"The purse-seine catch has been increasing since 1985, and has fluctuated around the upper reference level since 2003. Except for a large peak in 1999, the floating-object CPUE has generally fluctuated around an average level since 1990. The unassociated CPUE has been higher than average since about 2003 and was at its highest level in 2008. The standardized effort

indicator of exploitation rate has been increasing since about 1991 and has been above the upper reference level in recent years, but dropped below it in 2009. The average weight of skipjack has been declining since 2000, and in 2009 was below the lower reference level. Ignoring the peak in 2000, average length has been declining since 1985. The biomass, recruitment, and exploitation rate have been increasing over the past 20 years, and have fluctuated at high levels since 2003.

The main concern with the skipjack stock is the constantly increasing exploitation rate. However, the data- and model-based indicators have yet to detect any adverse consequence of this increase. The average weight is below its lower reference level, which can be a consequence of overexploitation, but it can also be caused by recent recruitments being greater than past recruitments. The continued decline in average length is a concern and, combined with leveling off of catch and CPUE, may indicate that the exploitation rate is approaching or above the level associated with MSY."

Catch of skipjack tuna by U.S. West Coast fisheries constitutes less than 1 percent of the Eastern Pacific-wide catch.

#### 5.3.3.2 Skipjack Tuna (WCPO)

An assessment of skipjack tuna in the WCPO was conducted by the WCPFC's Scientific Committee in August 2010 (Hoyle et al. 2010). The assessment was conducted using MULTIFAN-CL. The model is age and spatially structured with catch, effort, size composition, and tagging data grouped into 17 fisheries and quarterly time periods from 1952 through 2009. Results from the base case run and associated sensitivities indicate that the exploitation is well below that which would produce maximum sustainable yield and the stock size is roughly 60 percent of its unfished level. Below is a summary of the results excerpted from the Report of the Sixth Scientific Committee meeting (WCPFC 2011).

"Fishing mortality rates tended to be higher during the last decade than for the preceding period and fishing mortality and biomass indicators relative to MSY started to move to 1.0, although they remained substantially below the $F_{MSY}$ level ($F_{current}/\tilde{F}_{MSY}$ = 0.34). The stock is not in an overfished state because biomass is above the $B_{MSY}$($B_{current}/\tilde{B}_{MSY}$ = 2.42).

The assessment document can be downloaded from http://www.wcpfc.int/system/files/documents/meetings/scientific-committee/6th-regular-session/stock-status-theme/working-papers/WCPFC-SC6-2010-SA-WP-11_SKJ_Assessment_Rev.1.pdf.

### *5.3.4 Yellowfin Tuna*

#### 5.3.4.1 Yellowfin Tuna (EPO) - update

Stock status of yellowfin tuna in the Eastern Pacific is assessed every 1-2 years by the IATTC. An updated assessment was conducted in September 2010 using the same Stock Synthesis model and assumptions as in 2009, but with some updated fishery data and new data for 2009 (Maunder and Aires-da-Silva 2011). The assessment is based on the assumption that there is a single stock of yellowfin tuna in the EPO, although it is likely that there is a continuous stock throughout the Pacific Ocean with exchange of individuals at a local level. Fishing is concentrated in the east and west, making separate consideration of the EPO stock relevant for management purposes. Below are the key results of the assessment excerpted from the assessment report which can be downloaded from http://iattc.org/PDFFiles2/StockAssessmentReports/SAR-11-YFT-ENG.pdf.

"1. There is uncertainty about recent and future recruitment and biomass levels, and there are retrospective patterns of overestimating recent recruitment.

2. The recent fishing mortality rates are lower than those corresponding to the MSY.

3. Increasing the average weight of the yellowfin caught could increase the MSY.

4. There have been two, and possibly three, different productivity regimes, and the levels of MSY and the biomasses corresponding to the MSY may differ among the regimes. The population may have recently switched from the high to an intermediate productivity regime.

5. The results are more pessimistic if a stock-recruitment relationship is assumed.

6. The results are sensitive to the natural mortality assumed for adult yellowfin and the length assumed for the oldest fish."

Catch of yellowfin tuna by U.S. West Coast fisheries constitutes less than 1 percent of the Eastern Pacific-wide catch.

### *5.3.5 Striped Marlin*

#### 5.3.5.1 Striped Marlin (NEPO)

In 2010, the IATTC conducted analyses of stock status for striped marlin in the EPO using fisheries data from 1975 through 2009 (Hinton and Maunder 2010). The assessment was conducted with Stock Synthesis 3 and assumed limited mixing of the northeast Pacific stock with other areas of the Pacific, although there is potential for a seasonal presence of juveniles from a north-central Pacific stock. Input data included catch, discards, sizes and standardized CPUE indices for 3 Japanese longline fisheries. Steepness of the stock recruitment relationship was set at 1.0 in the base case. Below is a summary excerpted from the report which can be downloaded from http://iattc.org/PDFFiles2/StockAssessmentReports/SAR-11-MLS-ENG.pdf.

"The results of the assessment indicated that overfishing of the stock of striped marlin in the northeast Pacific Ocean was not occurring and that the stock was not overfished. Total removals from the population, the retained catch and dead discards, decreased steadily from about 3,300 t in 1997 to about 930 t in 2004, and since then the annual average removal has been about 1,350 t. The following estimates from the assessment indicated that overfishing was not occurring: $C_{(2009)}/MSY = 0.52$, and $F_{mult} = 13.3$. The stock biomass has steadily increased from a low of about 2,600 t in 2003 to about 5,100 in 2009, and over the same period, the SBR [ratio of observed spawning biomass to the spawning biomass in the unexploited stock] has increased steadily from about 0.78 to 1.52."

"It is expected that if removals continue at levels recently observed, then the biomass of the stock of striped marlin in the northeast Pacific Ocean will continue to increase over the near term."

Catch of striped marlin by U.S. West Coast fisheries constitutes about one percent of the Eastern Pacific-wide catch.

### *5.3.6 Swordfish*

#### 5.3.6.1 Swordfish (NEPO) - Update

The status and stock structure of NPO swordfish was assessed by the ISC Billfish Working Group in 2009 (ISC 2009). Modeling was based on a two stock hypothesis comprised of a northwest and central North

Pacific stock and a southeastern North Pacific stock separated by an irregular boundary extending from Baja California, Mexico to the southwest[2]. Fishery data used in 2009 for the eastern region (IATTC area) were deemed incomplete. Thus, in 2010, the ISC Billfish Working Group conducted an update to the 2009 assessment for the EPO region only that included new EPO fishery data (Brodziak 2010). Below is a summary of the results of the EPO assessment update from the ISC Tenth Plenary Report (ISC 2010b). The full assessment report can be downloaded from http://isc.ac.affrc.go.jp/pdf/BILL/BILL_Apr10_FINAL_WP02.pdf.

> "Based on the 2009 stock assessment results, the exploitable biomass of the WCPO SWO stock [in the North Pacific] was estimated to be about 75,000 t in 2006 ($B_{2006}$), roughly 30 percent above $B_{MSY}$. The exploitation rate on the WCPO stock in 2006 was estimated to be 14 percent with a total catch of roughly 9,900 t or roughly 69 percent of MSY (MSY=14,400 t). There was very high probability that $B_{2006}$ was above $B_{MSY}$, a 93 out of 100 chance, and there was a 0 out of 100 chance that the exploitation rate in 2006 exceeded the rate to produce MSY.
>
> Based on the 2010 stock assessment update results for the EPO stock only, the exploitable biomass of the EPO SWO stock was estimated to be about 69,000 t in 2006, over 200 percent above $B_{MSY}$. Exploitation rate on the EPO stock in 2006 was estimated to be 6 percent with a total catch of roughly 3,900 t or roughly 78 percent of MSY (MSY=5,000 t). There was very high probability that $B_{2006}$ was above $B_{MSY}$, a 99 out of 100 chance, and there was a two out of 100 chance that the exploitation rate in 2006 exceeded the rate to produce MSY.
>
> The exploitable biomass of the WCPO SWO stock was 31 percent above $B_{MSY}$ and the exploitation rate was 46 percent below $F_{MSY}$ in 2006. Similarly, exploitable biomass of the EPO SWO stock was over two-fold greater than $B_{MSY}$ and the exploitation rate was 62 percent below $F_{MSY}$ in 2006.

Catch of swordfish by U.S. West Coast fisheries constitutes about 5.8 percent of the Eastern Pacific-wide catch.

[2] A figure in the assessment report linked below shows the stock separation boundary.

## 5.4 Most Recent Pacific HMS Stock Assessments through August 2011

The following table includes links to information on the most recent Pacific HMS stock assessments through August 2011, including those which were conducted after December 31, 2010.

**Table 5-2. Links to Information on Most Recent Pacific HMS Stock Assessments through August 2011**

| Species (Stock) | Organization Responsible for Assessment | Link to Assessment Report |
|---|---|---|
| Albacore (NPO) | ISC | http://isc.ac.affrc.go.jp/pdf/ISC11pdf/Annex_9_ISC11_ALBWG_Stock%20Assessment%20Workshop%20Report_FINAL_complete.pdf.\ |
| Bigeye (EPO) | IATTC | http://iattc.org/Meetings2011/May-SAC-Shark/PDFfiles/SAC-02-07-BET-assessment-2010.pdf |
| Bigeye (WCPO) | WCPFC | http://www.wcpfc.int/system/files/documents/meetings/scientific-committee/7th-regular-session/stock-status-theme/working-papers/SC7-SA-WP-02%20%5BBET%20Assessment%5D.pdf |
| Skipjack (EPO) | IATTC | http://iattc.org/Meetings2011/May-SAC-Shark/PDFfiles/SAC-02-08-SKJ-assessment-2010.pdf |
| Skipjack (WCPO) | WCPFC | http://www.wcpfc.int/system/files/documents/meetings/scientific-committee/7th-regular-session/stock-status-theme/working-papers/SC-7-SA-WP-04%20%5BSKJ%20Assessment-rev1%5D.pdf |
| Yellowfin (EPO) | IATTC | http://iattc.org/Meetings2011/May-SAC-Shark/PDFfiles/SAC-02-06-YFT-assessment-2010.pdf |
| Yellowfin (WCPO) | WCPFC | http://www.wcpfc.int/system/files/documents/meetings/scientific-committee/7th-regular-session/stock-status-theme/working-papers/SC7-SA-WP-03%20%5BYellowfin%20tuna%20stock%20assessment-rev.1%20-%2003Aug2011%5D.pdf |
| Swordfish (SEPO) | IATTC | http://iattc.org/Meetings2011/May-SAC-Shark/PDFfiles/SAC-02-09-SWO-assessment-2010-DRAFT.pdf (Draft document) |

**Table 5-3. Recent stock status with respect to management criteria.**
Note that for most of these species, the scientific bodies developing the assessments do not have a consensus biological reference point for use in the context of managing the fisheries. Levels of *F* and *B* are provided based on the most recent analyses, but in many cases the analyses have not been updated for several years. Thus, those findings should be viewed cautiously for management purposes.

| Species (stock) | $F_{Recent}/F_{MSY}$[1] | Overfishing? ($F/F_{MSY}>1.0$) | $B_{Recent}/B_{MSY}$[1] | $B_{MSST}/B_{MSY}$ | Overfished? ($B_{Recent}<B_{MSST}$) | $B_{FLAG}$[2] ($1.25B_{MSST}/B_{MSY}$) | Assessment |
|---|---|---|---|---|---|---|---|
| TUNAS | | | | | | | |
| Albacore (NPO) | 1.67–2.31[3] | Unknown[3] | Unknown[3] | 0.7 | Unknown[3] | | ISC 2007a |
| Bluefin (NPO) | 1.46[4] | Y[4] | 0.88 | 0.75 | N | 0.94 | ISC 2009b |
| Bigeye (EPO) | 0.88[5] | N | 1.33[5] | 0.6 | N | | IATTC, Aires-da-Silva and Maunder 2011 |
| Bigeye (WCPO) | 1.41[6] | Y | 1.39[6] | 0.6 | N | | WCPFC, Harley et al. 2010 |
| Skipjack (EPO) | Unknown[7] | Unlikely[7] | Unknown[7] | 0.5 | Unlikely[7] | | IATTC, Maunder 2010 |
| Skipjack (WCPO) | 0.34[8] | N | 2.42[8] | 0.5 | N | | WCPFC, Hoyle et al. 2010 |
| Yellowfin (EPO) | 0.75[5] | N | 1.1[5] | 0.5 | N | | IATTC, Maunder and Aires-da-Silva 2011 |
| Yellowfin (WCPO) | 0.58[9] | Y | 1.57[9] | 0.5 | N | | WCPFC, Langley et al. 2009 |
| BILLFISHES | | | | | | | |
| Striped Marlin (NPO) | Unknown[10] | Unknown[10] | Unknown | 0.5 | Unknown | | ISC 2007b |
| Striped Marlin (NEPO) | 0.16[11] | N | ≥1.0[11] | 0.5 | N | 0.63 | IATTC, Hinton and Maunder 2011 |
| Swordfish (NEPO) | 0.59[12] | N | 2.10[12] | 0.61-0.8 | N | | ISC, Brodziak 2010 |
| Swordfish (NWPO) | 0.54[12] | N | 1.31[12] | 0.61-0.8 | N | | ISC 2009a |
| SHARKS | | | | | | | |
| C. Thresher (CA,OR,WA) | <1.0[13] | N | ~1.10 | 0.77 | N | 0.96 | NMFS, PFMC HMS plan development team 2002 |
| Pelagic Thresher | Unknown[14] | Unknown | Unknown | 0.85 | Unknown | 1.06 | |
| Bigeye Thresher | Unknown[15] | Unknown | Unknown | 0.78 | Unknown | 0.97 | |
| Shortfin Mako | <1.0[16] | N | >1.0 | 0.71 | N | 0.89 | NMFS, PFMC HMS plan development team 2002 |
| Blue | 0.86[17] | N | 1.11[17] | 0.78 | N | 0.97 | NMFS and NRIFSF Japan, Kleiber et al. 2009 |
| OTHER | | | | | | | |
| Dorado | Unknown[18] | Unknown | Unknown | 0.5 | Unknown | | |

Notes:
1 Measures of $F_{MSY}$ and $B_{MSY}$ are not available for all species. Various proxies for these values have been used in preparing this table. However, PFMC has not adopted the use of a particular proxy; hence the designation of Overfishing and Overfished should be considered preliminary.
2 For vulnerable species managed under the OY control rule only: bluefin tuna, striped marlin, and pelagic sharks.
3 Albacore results are based on a suite of $F_{MSY}$ proxies ($F_{40\%}$, $F_{35\%}$, $F_{30\%}$ and $F_{0.1}$), the estimated level of recent (2002-2004) fishing pressure (F=0.75), and constant productivity (R = 27.375 million recruits).However, "Unknown" is indicated because of the lack of accepted reference points for management.
4 ISC considers $F_{MSY}$ as roughly equivalent to $F_{MAX}$, given the model assumptions, and used an instantaneous annual F averaged across years (2002-2004) by age.
5 EPO bigeye and EPO yellowfin results are based on base-case assessments assuming no stock-recruitment relationships and estimated recent (2007-2009) fishing effort.

[6] WCPO bigeye results are based on model3d for which steepness of the stock recruitment relationship was estimated.

[7] Because of uncertainties in the estimates of growth and natural mortality, MSY-proxy reference points could not be calculated for EPO skipjack; however, based on methods examining non-MSY based stock condition indicators, the IATTC does not consider there to be a need for management due to recent high CPUE indices and high biomass estimates relative to historical levels.

[8] WCPO skipjack results are from the base-case assessment with steepness equal to 0.75.

[9] WCPO yellowfin results are based on the 2009 base-case assessment: "CPUE low, LL sample high, LL Q incr".

[10.] MSY-proxy reference points were not be calculated for NP striped marlin; however, the declining biomass trend and the level of recent fishing effort relative to many commonly used MSY proxy reference points indicates overfishing may be occurring. The ISC recommended that a plan be developed to reduce F and until that plan is adopted that F not be increased.

[11] The area covered by the assessment was the EPO north of 5° N latitude and east of 145° W longitude. The base case Stock Synthesis model demonstrates that the NEPO striped marlin population is in good condition with the estimated ratio of spawning biomass in 2009 to that at MSY equal to 1.19, but a $B_{recent}/B_{MSY}$ estimate was not provided.

[12] Results from Bayesian Surplus Production analysis of two substocks of swordfish: one in the northwestern Pacific Ocean and the second in the northeast Pacific Ocean provided status updates relative to MSY for each region separately.

[13] U.S. West Coast EEZ regional catch and CPUE demonstrated the population increasing from estimated low levels in the early 1990s. Recent (2005-2009) West Coast total landings average 194 mt, which is less than 0.75 × MSY proxy (MSY proxy = LMSY from the Population Growth Rate method)

[14] Status unknown, but catches are incidental and occur on the edge of the species' range, predominately during warm water years.

[15] Status unknown, but catches are incidental and occur on the edge of the species' range.

[16] Tentative results based on commercial landings and CPUE calculations. Recent (2005–2009) West Coast total landings average 53 mt, which is less than 0.75 × MSY proxy (MSY proxy = average landings 1981–1999).

[17] Results for North Pacific blue shark are based on the base-case integrated model conducted with MULTIFAN-CL; $F_{current}$ is the average F for the period 1998-2001.

[18] Status unknown, but dorado are highly productive and widely distributed throughout tropical/subtropical Pacific. Recent (2005-2009) West Coast total landings average 120 mt.

**Table 5-4. Stockwide and regional catches for HMS management unit species (x1,000 mt round weight), 2005–2009.**

| Species (stock) | Stockwide Catch | U.S. West Coast Catch | | Average Annual Fractional Catch |
|---|---|---|---|---|
| | | Commercial | Recreational | |
| TUNAS | | | | |
| Albacore (NPO) | 63-93[1] | 9–13 | 0.2–0.9 | 0.16 |
| Bluefin (NPO) | 20-29[1] | <0.42 | 0.01–0.1 | <0.01 |
| Bigeye (EPO) | 93–118[2] | <0.04 | <0.01 | <0.01 |
| Skipjack (EPO) | 210–299[2] | <0.53 | ≤0.02 | <0.01 |
| Yellowfin (EPO) | 178–283[2] | <0.29 | 0.1–0.36 | <0.01 |
| BILLFISHES | | | | |
| Striped Marlin (EPO) | 0.7–2.4[2] | <0.01[3] | <0.03[4] | 0.01 |
| Swordfish (EPO) | 4.5-13.2[2] | 0.3–0.6 | <0.01 | 0.06 |
| SHARKS | | | | |
| Common Thresher | Unknown | 0.1–0.2 | 0.01–0.06 | |
| Pelagic Thresher | Unknown | <0.01 | | |
| Bigeye Thresher | Unknown | ≤0.01 | | |
| Shortfin Mako | Unknown | 0.03–0.05 | <0.03 | |
| Blue (NPO) | Unknown | <0.04[3] | <0.01 | |
| OTHER | | | | |
| Dorado | 6.5-53[2] | <0.01 | 0.04–0.26 | 0.01 |

Notes:
Data for U.S. West Coast catch are from updated commercial, CPFV and private recreational catches 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 Eleventh Plenary Report Catch Tables, August 2011.

2 IATTC catch tables extracted 8/18/11.

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.

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# 6.0 RESEARCH AND DATA NEEDS

## 6.1 Research and Data Needs

This section is intended to explicitly link HMS research and data needs to the Council's current management priorities. These priorities should be considered in light of two central characteristics of HMS research and data needs. First, the two regional fishery management organizations (RFMOs) involved with management of HMS FMP stocks—the Inter-American Tropical Tuna Commission (IATTC) and Western and Central Pacific Fisheries Commission (WCPFC)—coordinate and conduct their own stock assessments. In addition, a third scientific organization—the International Scientific Committee (ISC) on Tuna and Tuna-like Species in the North Pacific Ocean—provides scientific advice on the status of North Pacific HMS stocks that straddle the 150$^{o}$ W longitude boundary between the RFMOs. Although research and stock assessment of the tunas, billfishes, and pelagic sharks in HMS FMP would ideally consider stocks throughout their entire range, the reality is that not all species in the HMS FMP benefit from international scientific coordination.

Second, there is substantial uncertainty on the status of stocks and/or estimates of MSY for many HMS species. Basic biological and life history data are unknown for some species, and understanding of distribution, abundance, and reproductive behaviors of most HMS species is poor. There is insufficient understanding of stock structures relative to the extent of fisheries, on the interchange between stocks, and on survival and fecundity schedules for investigating exploitation effects and species' resiliency to exploitation. There is also a lack of fishery independent indexes of abundance. These data gaps will likely need to be considered closely during implementation of the MSA revised National Standard 1 guidelines.

### *6.1.1 Highest Priority Issues*

#### 6.1.1.1 North Pacific Albacore

Fisheries Statistics: Timely submission of national fishery data to the ISC Albacore WG data manager is critical for producing timely and up-to-date stock assessments. Additional resources are needed to monitor the submission of these data, to provide adequate database management, and to adequately document the entire database system, including metadata catalogs. Electronic reporting systems increase data entry convenience for industry participants, reduce processing time and costs for data managers, and significantly improve the quality of data being collected through validation checks. Following examples set in Alaska and on the east coast, the implementation of an electronic fish ticket system on the West Coast would greatly improve the availability, timeliness and accuracy of fishery landings data. The development of a coastwide, multi-fisheries electronic logbook system would provide similar results for logbook data.

Biological Studies: Biological information is a critical building block for stock assessments and should be reviewed and updated regularly to capture changes in population parameters as they occur. Unfortunately, these updates have not been accomplished for North Pacific albacore because of limited resources for biological studies. Consequently, the stock assessment models used by the ISC Albacore WG still rely on some biological information that was developed largely in the 1950s and 1960s,although updated length-weight schedules have been applied and a recent age and growth study has provided new information.

There is a critical need to reassess the biological information and to conduct contemporary research studies to update this information. More specifically, there is a critical need to conduct and/or continue

studies on:

- age and growth with the goal of updating growth rates and identifying regional differences in growth rates;
- reproductive biology with the goal of updating the maturity schedule and identifying regional differences;
- migration and habitat utilization, with the goal of determining migration and habitat use patterns, improving fishery catch-effort standardization and fishery selectivity/catchability estimates;
- stock structure with the goal of identifying possible sub-stocks in the EPO;
- natural mortality with the goal of estimating natural mortality rates using well-designed tagging experiments;
- influence of environmental conditions on albacore biological parameters, including recruitment, growth, migration, habitat use, and catchability of albacore; and
- albacore age and length data through port and biological sampling.

Stock Assessment and Management Studies: Demand for more frequent and more precise information on the status of the stock and the sustainability of albacore fisheries is likely to increase. With this in mind, the albacore stock assessment needs improvement in several areas:

- evaluate effects of changes to assessment model structure and assumptions, by challenging the assessment model with data generated by a simulation model tuned to albacore biology;
- develop simulations to assist fishery managers in selecting appropriate biological reference points for albacore;
- development and improvement of abundance indices from commercial and recreational fisheries;
- stock-recruitment relationship, with the goal of improving current assumptions of the stock-recruitment relationship;
- development of models that include tagging data from a variety of tags, e.g., conventional, electronic, and biological tags; and
- development of environmental indices that strongly influence albacore population dynamics and evaluate effects of including these environmental indices in assessment models.

#### 6.1.1.2 Swordfish

Fisheries Statistics: The timeliness of data reporting, as outlined above for albacore, is equally important for swordfish.

Biological Studies: All biological studies listed above for albacore are needed for swordfish as well. In addition, age and growth data from locally caught fish should be examined, and the distribution of swordfish by season and age within the outer portions of the EEZ and high seas should be evaluated.

Stock Assessment and Management Studies: All stock assessment and management studies listed above for albacore are also needed for swordfish. In particular, there is a need for additional work on effort standardization. In addition, complementary studies using tools ranging from otolith microchemistry to electronic tagging are needed to characterize the stock dynamics of swordfish in the California Current region.

Economic Studies: Explore economic viability of harpoon and longline gear as an alternative to DGN gear for swordfish. Research the best options to promote developing and testing novel gear (e.g., deep-set

buoy gear or deep-set daytime longlining) to reduce protected species interactions and increase swordfish catch. Gauge the impact on global swordfish production and trade of unilateral measures to limit West Coast fishing effort.

#### 6.1.1.3 Sharks

Most of the tunas covered in the HMS FMP are being assessed on a regular basis, with varying degrees of completeness and sophistication. Some of the billfishes—particularly striped marlin and swordfish—are either being assessed or have assessments planned in the near future. On the other hand, stock assessments for sharks have been preliminary at best, and few and far between. This situation should not be taken to imply that sharks are unimportant. Nor should it be inferred that sharks are less vulnerable to the effects of fishing than are the tunas and billfishes. In fact, because of the key vital rates of most sharks (especially reproductive rates that are lower than those for tunas and billfishes), many HMS shark species are likely to be more vulnerable to overfishing than other HMS. The Pacific RFMOs have begun to prioritize shark stock assessments. The WCPFC, IATTC and ISC have each developed plans to assess some shark stocks over the next several years, but given the fact that many species are not targeted and fishery data are scant, there will be many challenges.

As with the other trans boundary species covered by the HMS FMP, most shark species cannot be assessed or managed unilaterally by the Council. Some species are highly oceanic with ranges similar to that of tunas (e.g., blue shark and shortfin mako shark). Others are more coastal—with a substantial portion of their habitat shoreward of the U.S. EEZ—but exhibit north-south migrations with significant catches in Mexican waters (e.g., common thresher shark). The net effect is that accounting for the total catch of sharks over their entire period (several decades) and areas of exploitation is not possible. Furthermore, there is a paucity of the biological samples needed to characterize the size of animals taken from the fisheries that account for most of the catch. Active biological studies (age, growth, maturity, food habits, etc.) are ongoing (NMFS, State, non-profit, and academic researchers) and understanding of the biological characteristics for at least some shark species is probably sufficient for stock assessment purposes. However, without an accurate history of total catch, effort, and the corresponding size samples, stock assessment efforts and concomitant management by the Council will be problematic.

The following specific research priorities have been identified for the two sharks species of greatest priority to the Council with respect to their importance in U.S. West Coast commercial and recreational fisheries:

**Common thresher shark:**

- stock structure and boundaries of the species and relationships to other populations;
- the pattern of seasonal migrations for feeding and reproduction, and where and when life stages may be vulnerable;
- improved recreational catch estimates which adaptively sample the pulse nature of fishing effort;
- improved commercial fishery monitoring in Mexican waters;
- age and growth rates, including comparisons of growth rates in other areas; and
- maturity and reproductive schedules.

**Shortfin mako shark:**

- distribution, abundance, and size in areas to the south and west of the West Coast EEZ;
- stock structure and boundaries of the species and relationships to other populations; and
- age and growth rates (current growth estimates differ widely).

#### 6.1.1.4 Interactions with Protected Species and Prohibited Species

More complete catch information and data on interactions with protected and prohibited species are needed for most HMS fisheries. There is inadequate understanding of the fisheries on some HMS stocks that are shared with Mexico (e.g., species composition of shark catches in Mexican fisheries), and inadequate data exchange with Mexico. These fisheries are likely affecting both protected species and prohibited species of fish.

More work is needed to better understand possible impacts of the HMS fisheries on protected species of sea turtles, birds, and marine mammals. For example, there is a need to investigate the post-release survivorship of protected species, such as turtles and seabirds that are caught as bycatch in the HMS fisheries. In addition, fisheries-independent research is required to better understand distribution and habitat use by turtles and to determine the linkages to ecosystem parameters (oceanographic and biological). This includes data on turtle migration seasonality and routes, genetic stock composition of populations by species, and habitat use in order to better understand turtle life histories and likely periods of interaction with fisheries. Predictive models that integrate oceanography, ecosystem parameters (e.g., prey distribution), and habitat use of turtles are needed. More work on the sizes and structures of turtle populations by species would also enable improved application of the ESA and other laws and regulations to HMS fisheries. Continued research on the abundance and distribution of marine mammals is also critical, particularly for HMS fisheries operating within the West Coast EEZ.

Some specific research priorities include:

- Research habitat use of leatherback turtles and other species of concern, including target species, to better understand the potential for reducing bycatch;
- Explore whether hotspots or temperature bands can be identified in near-real-time in order to provide information to fishermen regarding places with potentially high interaction risks;
- Explore how regulating the U.S. West Coast Pacific swordfish fishery affects international trade in swordfish and the potential unintended consequences for protected species interactions in foreign fisheries;
- Compare bycatch rates of DGN vs. shallow set longline gear for swordfish, both by mining observer data and conducting gear comparison studies in the fishery areas; and
- Develop probability-based estimates of unobserved bycatch for observer programs with less than 100 percent observer coverage.

### *6.1.2 High Priority Issues*

#### 6.1.2.1 Blue shark

As noted above, relatively little assessment and research activity is focused on shark species compared to the existing work being done on other HMS such as tunas. Blue shark catch was relatively high in the California CPFV fishery of the late 1980s, but has steeply declined. Blue sharks are encountered in relatively small numbers coastwide in commercial and recreational fisheries. Three specific research needs identified for blue sharks are to: 1) monitor sex and size composition of catches; 2) determine the

migratory movements of juvenile and maturing fish from the EEZ to high seas; and 3) examine the Pacific-wide stock structure and interactions among populations using genetics and other techniques.

#### 6.1.2.2 Striped Marlin

Fisheries Statistics: The timeliness of data reporting, as outlined for albacore, is equally important for striped marlin. Additionally, the official striped marlin catch statistics are considerably less well developed than those for albacore, and significant effort is needed to ensure that the total catch from all nations is well estimated.

Biological Studies: All biological studies listed above for albacore are also needed for striped marlin. In addition,

- Stock structure for striped marlin in the Pacific Ocean is more uncertain than for other HMS species and several stock structure hypotheses are credible. A synoptic, critical review of all available information (fisheries data, icthyoplankton data, and genetic studies) is needed to either resolve the issue or at least to reduce the number of credible hypotheses; and
- Age and growth data from locally caught fish should be examined.

Stock Assessment and Management Studies: All stock assessment and management studies listed above for albacore are also needed for striped marlin. Specific to striped marlin, there is a need for additional work on effort standardization.

#### 6.1.2.3 Pacific Bluefin Tuna

Fisheries Statistics: The timeliness of data reporting, as outlined for albacore above, is equally important for bluefin tuna. Additionally increased port sampling of commercial bluefin length frequencies is needed in the EPO, particularly of the fish destined for the pens in farming operations.
Biological Studies: All biological studies listed above for albacore are also needed for bluefin tuna.
Additionally, there is a need to:

- develop seasonal and perhaps area-based weight-length relationships as the bluefin condition factor appears to vary both seasonally and regionally;
- estimate natural mortality rates since previous assessment results were highly sensitive to the assumed mortality rates; and
- estimate age-specific migration rates of bluefin tuna from the WCPO to the EPO and understand the factors that influences those rates, since this in turn strongly influences the availability of bluefin in the EPO.

Stock Assessment and Management Studies: All of stock assessment and management studies listed above for albacore are also needed for bluefin tuna. In
addition:

- there is a need for improvements to standardization of abundance indices;
- development of an abundance index from spotter plane data from the EPO; and
- incorporating tagging data and environmental indices into the assessment model.

### *6.1.3 Other Priority Stocks and Issues*

#### 6.1.3.1 Management Unit Species Catch Data

Total catch data are likely inaccurate for most HMS stocks due to an inadequate at-sea data collection programs, logbook programs, and shoreside sampling programs for commercial West Coast fisheries and unreported catch by international fisheries. Commercial catch data needs include:

- Total catch information (including incidental and bycatch) and protected species interactions for surface hook-and-line, purse seine, and additional at-sea sampling of drift gillnet fisheries;
- Catch composition data for harpoon gear;
- Size composition of bycatch in drift gillnet fisheries; and
- Condition (e.g., live, dead, good, poor) of discarded catch in all HMS fisheries.

Additional work needs to be done to develop ways to adequately sample recreational fisheries, particularly shore-based anglers and private vessels. There is a need to develop methods for sampling private marinas and boat ramps to determine catch, and the level of bycatch and protected species interactions, as well as sample the catch for length and weight of fish caught to convert catches reported in numbers to catches by weight. Better catch and effort estimates are also needed for HMS recreational fishing tournaments, in particular those tournaments focusing on common thresher and shortfin mako sharks.

#### 6.1.3.2 Archival PacFIN Data Cleanup

Some progress has been made to address coding issues with the gear codes for drift gillnet records in the PacFIN data base. The results of the recoding are reflected in drift gillnet landings and revenues summaries provided in Chapters 2 and 4 of this HMS SAFE Report; however, issues remain for PacFIN archived longline records.

Review and subsequent revision of archival PacFIN data is needed to improve the accuracy of historical commercial landings and revenues for longline landings.

#### 6.1.3.3 Survivability of Released Fish

Little is known of the long-term survivorship of hooked fishes after release, the effectiveness of recreational catch-and-release methods on big game fishes (pelagic sharks, tunas, and billfishes) and of methods to reduce bycatch mortality in commercial fisheries. Controlled studies of the survivability of caught and released pelagic sharks and billfishes are needed to determine the physiological responses to different fishing gears, and the effects of time on the line, handling, methods of release, and other factors. Appropriate discard mortality rates, by species, need to be identified in order to quantify total catch (including released catch).Alternative gears and methods to increase survivability of recreationally and commercially caught fish and to minimize unwanted bycatch in fisheries should be identified.

#### 6.1.3.4 Essential Fish Habitat (EFH)

There is very little specific information on the migratory corridors and habitat dependencies of these large mobile fish, how they are distributed by season and age throughout the Pacific and within the West Coast EEZ, and how oceanographic changes within the pelagic environment affect production, recruitment, and migration. Research is needed to better define EFH and to identify specific habitat areas of particular concern (HAPCs), such as pupping grounds, key migratory routes, feeding areas, and where adults aggregate for reproduction. A particularly important need is to identify the pupping areas of thresher and mako sharks, which are presumed to be within the southern portion of the West Coast EEZ, judging from the occurrence of post-partum and young pups in the areas (e.g., NMFS driftnet observer data). Areas where pregnant females congregate may be sensitive to perturbation, and the aggregated females and pups

there may be more vulnerable to fishing pressure.

#### 6.1.3.5 Stock Assessment Review

Pacific HMS stock assessments are carried out by the RFMOs and by the ISC. The processes used to conduct the assessments and to have them critically reviewed varies considerably across the organizations and the species being assessed. In none of these cases, however, does the level of critical peer review approach that of the Council's STAR process. This may become an issue for the Council if international management regulations begin to affect U.S. coastal fisheries to a greater extent than they do at present. The Council may want to consider having some member(s) of its SSC participate in these international processes. This will provide the Council with a better perspective on the stock assessments and the ensuing international management advice.

#### 6.1.3.6 Tropical Tuna Species and Dorado

The commercially important tropical tuna species, namely yellowfin, bigeye, and skipjack tuna, are principally harvested in the EPO by vessels from the Central and Latin American fishing fleets. Although a small West Coast based U.S. flag purse seine fishery opportunistically harvests these tunas, the U.S. does not have a fleet active in the main EPO fishery at present. The tropical yellowfin, bigeye and skipjack tunas are no longer taken in large numbers by West Coast based commercial fisheries.

The California commercial passenger fishing vessel (CPFV) fleet is the principal U.S. West Coast fishery for dorado which are often taken in the Mexican EEZ. Dorado can be a significant portion of the total CPFV annual catch and was the leading species in 2006, followed by yellowfin tuna and albacore tuna. Specific recommendations on dorado research include:

- Determine the stock structure of dorado in the eastern Pacific, and
- Investigate the significance of floating objects and other-species associations relative to life history.

#### 6.1.3.7 Pelagic and Bigeye Thresher Sharks

These species occur in far lower frequency than common thresher sharks in U.S. West Coast fisheries. Nevertheless, they are taken in Council-managed fisheries and studies of their life history and ecology, and temporal and spatial catch monitoring will help inform management along the West Coast and in other areas.

## 6.2 Research Updates

The following sections summarize some, but not all, of the research projects conducted during 2010 at the NMFS Southwest Fisheries Science Center (SWFSC) and Southwest Regional Office (SWR) to study HMS MUS, fisheries, and fishery-related species. Research on other MUS not reported here is ongoing at a number of U.S. West Coast research institutions. See chapter 7for a list of links to websites of research institutions conducting research on HMS.

### *6.2.1 Albacore*

The commercial surface-albacore fishery is the most important fishery for HMS on the U.S. West Coast. NMFS scientists participate in the ISC Albacore Working Group which makes an effort to conduct a full stock assessment every three years.. The most recent assessment was conducted in 2011 and will be reported on in the 2011 SAFE Report. In addition to ISC assessment work, a number of research projects

are ongoing.

SWFSC scientists are working with the American Fishermen's Research Foundation (AFRF) and commercial and recreational albacore fisheries constituents on monitoring programs and other research efforts to improve knowledge of the biology and migration of North Pacific albacore in the waters off the U.S. Pacific coast. The cooperative research includes:

***Port and onboard sampling:*** Since 1961, a biological data collection program, or port sampling program, has been in place for collecting size data from albacore landings made by the U.S. and Canadian troll fleets at ports along the U.S. Pacific coast. State fishery personnel collect the biological data by following sampling protocol provided by the SWFSC, where the data are maintained. In recent years, with industry support, fishermen have collected biological data during selected fishing trips. These data are collected to augment data collected through the port sampling program. Following procedures established by SWFSC scientists, fishermen on five vessels measured 752 albacore during the 2009 season. During 2010, five vessels measured 1,010albacore. The sample information provided by the fishermen helped to fill in gaps missed by the port sampling program. Overall, the sizes were found to be generally similar to those collected through the port sampling program.

***Logbook Program:*** The logbook sampling program has been in place since the late 1950's. Fishermen have been voluntarily submitting their fishing records to the SWFSC for decades prior to implementation of the HMS FMP. These data are primarily used to develop relative indices of abundance, which subsequently provide valuable information for fine-tuning stock assessment models. Logbook data are also maintained at the SWFSC. An electronic logbook application is available to facilitate logbook submission and data entry for albacore troll fishermen. Logbook data collection is discussed further in section 3.1.7 of this HMS SAFE report.

***Archival Tagging:*** The SWFSC and AFRF initiated an archival tagging program in 2001 to study the migration patterns and stock structure of juvenile albacore in the North Pacific. Since 2001, a total of 630 archival tags and 43 dummy tags have been deployed. Two tagging charters were conducted during 2010, one off the Columbia River aboard the charter sport fishing boat *Playboy Too* during which 15 tags were deployed, and the second off Cape Mendocino aboard F/V *Royal Dawn* during which 22 tags were deployed. To date, 22 archival and 6 dummy tags have been recovered. Recovery rates have been low. In 2010, no tags were returned. The study will continue in 2011.

### *6.2.2 Common Thresher Shark*

***Nursery Survey and Pup Abundance Index:*** A common thresher shark pre-recruit index and nursery ground annual survey, which was initiated in 2003, provides a fisheries-independent index of pre-recruit abundance In 2010, a SWFSC research team worked aboard the F/V *Outer Banks*. Forty-eight longline sets were made in relatively shallow, nearshore waters and a total of 4,800 hooks were fished during the 18-day cruise. Shark catch included 295 common thresher, 5 smoothhound (*Mustelus*), 2 spiny dogfish (*Squalus acanthias*), and 1 leopard (*Triakis semifasciata*) shark. Two hundred and sixty-eight sharks were tagged with conventional tags and 280 DNA samples were collected.

The preliminary survey data indicate that the average nominal catch rate by set was 3.75 per 100 hook-hours for common thresher sharks. This is the highest catch rate since the inception of the sampling program. The distribution of common threshers is very patchy and areas of high abundance are not consistent across years. In all years, a large percentage of the catch has been neonates, which were found in all areas surveyed. In addition to providing important information on abundance and distributions, the thresher shark pre-recruit survey enhances other ongoing research on age and growth, feeding, and habitat

utilization studies.

***Post-release Survival in the Recreational Fishery:*** The SWFSC, SWR, and Pfleger Institute of Environmental Research are conducting a study to assess the post-release survival of thresher sharks caught by recreational anglers. During the first phase of the study, sharks were released after tail hooking and results demonstrated that survivorship is low for sharks greater than 185 cm fork length (FL) or enduring fight times exceeding 85 minutes. Those results were published in the journal *Fisheries Research* in 2010. During the second phase of the study, the hypothesis that tail-hooked common thresher sharks survive the acute effects of trailing fishing gear is being tested in the southern California recreational fishery. Survivorship is being determined using PSATs deployed on subadult and adult common thresher sharks. To date, PSATs have been deployed on 5 common thresher sharks (132 to 175 cm FL) captured using fishery standard techniques and released with trailing gear. Of the 5 sharks, 3 displayed immediate mortality (within 31 hours of release), 1 shark survived the effects of trailing gear, and one of the PSATs did not report any information. The results of this study in combination with results of a published study on the survivorship of tail-hooked thresher sharks released without trailing gear will be used to estimate the survival rates of thresher sharks released from the recreational fishery. These data will be important for determining total removals by the recreational shark fishery and can be used in stock assessments for this species. Concurrent investigations on the effectiveness of degradable links and alternative fishing techniques are also being performed to reduce overall post-release mortality in the recreational fishery. A DVD documenting the research project, thresher shark life history and ecology, and best fishing practices for effective catch-and-release is being produced and will be available for outreach purposes in 2012.

### *6.2.3 Shortfin Mako and Blue Sharks*

***Shortfin Mako Shark Genetics Studies:*** The shortfin mako is a wide-ranging pelagic shark caught globally in temperate and tropical waters. The stock structure within their broad range is poorly understood, especially in the Pacific. In the North Atlantic, thousands of conventional tags have been deployed, and although 608 have been returned, not a single shark was recaptured south of 10°N. This suggests, at a minimum, the existence of separate northern and southern stocks. Although the more limited conventional tag returns in the Pacific reveal movement across the North Pacific from California to as far as Japan, the potential for separation between the North and South Pacific is not known. A study is being conducted using mitochondrial DNA analyses from samples gathered around the Pacific to test the hypothesis that shortfin makos from the North and South Pacific are genetically distinct. In addition, this study will examine corridors of gene flow for shortfin mako sharks in the Pacific Ocean.

To date, 410 samples from seven sites in the Pacific (southern California, Hawaii, Japan, New Zealand, Australia, NW South America, and Chile) and one site in the North Atlantic have been analyzed. The North Atlantic site is significantly different from all Pacific sites. Within the Pacific, analyses reveal that sharks in locations in closest proximity—California/Hawaii, NW South America/Chile, and Australia/New Zealand—show no population subdivision. Divergence was apparent between the Northern and Southern Hemispheres as well as across the North Pacific between California/Hawaii and Japan. After performing isolation by distance analyses, it appears that the corridors of gene flow are following a stepping stone model. This master's thesis, completed in collaboration with the University of San Diego and the SWFSC, provided evidence of regional stock structure within the Pacific; the results are being prepared for publication.

Another study is underway representing joint research between the University of California Davis and San Diego State University in collaboration with the SWFSC.A PhD student has been developing a suite of nuclear microsatellite markers to further refine the spatial and temporal resolution of shortfin mako stocks within the Pacific. In addition to studies of stock structure, these markers will be used to develop

estimates of effective population size within the California Current region. Application of these markers will commence during 2011.

***Juvenile Mako and Blue Shark Abundance Survey*:** The Southern California Bight is a known nursery area for shortfin mako and blue sharks. In 2010, the SWFSC conducted its seventeenth juvenile shark survey for mako and blue sharks since 1994. The annual abundance survey was completed between 14 July and 12 August 2010. Working aboard F/V *Ventura II*, a team of scientists and volunteers fished a total of 5,956 hooks during 29 daytime sets inside 7 focal areas within the Southern California Bight. Survey catch totaled 13 shortfin makos, 25 blue sharks, 18 pelagic rays (*Pteroplatytrygon violacea*), 10 opah (*Lampris guttatus*), and 1 mola (ocean sunfish, *Mola mola*). The preliminary data indicate that the nominal survey catch rate was 0.057 per 100 hook-hours for shortfin mako and 0.105 per 100 hook-hours for blue sharks. The nominal CPUE for both blue and shortfin mako sharks was the lowest in survey history. There is a declining trend in nominal CPUE for both species over the time series of the survey.

***Survival of Blue Sharks Released From the Drift Gillnet Fishery***:
The CDGN fishery targets swordfish in the California Current. With the exception of ocean sunfish, blue sharks are caught in greater numbers than any other finfish species taken in this fishery. Nearly all blue shark are discarded at sea due to lack of market value. A 2009 analysis of the 1990-2008 observer data reveals that 63 percent of blue sharks caught were discarded dead.

In 2007, the NOAA Fisheries began deploying PSATs on sharks released alive from the drift gillnet fishery to assess survivorship. To date, 11 blue sharks (100 to 200 cm FL) have been tagged by fishery observers. Nine of these animals were male, and the sex of two animals was unknown. Based on established release condition criteria, three of the 11 sharks were released in "good" condition while the remaining 8 were released in "fair" condition. The satellite tag data suggest that all animals survived the acute effects of capture in the CDGN fishery. Temperature, depth, and movement data demonstrated behavior of blue sharks that was similar to that reported in other studies. One tag appeared to have been ingested after 17 days and regurgitated 3 days later.

No confirmed female sharks or sharks in poor condition have yet been tagged. Thus tagging efforts during the 2010-11 season were focused on smaller sharks, females, and animals released in poor condition. Tags were distributed among observers as widely as possible in an attempt to ensure deployment. However, due to the decreased effort in the fishery during the season with fewer trips observed, and the small numbers of blue sharks caught overall, particularly of the desired size and condition ranges, no blue sharks were tagged for this study during the 2010-11 drift gillnet season. The objectives for the 2011-12 season will be the same. Results to date suggest a 100 percent survival rate for male blue sharks released in fair or better condition.

***Tagging:*** Since 1999, NOAA has been using satellite technology to study the movements and behaviors primarily of blue, shortfin mako, and common thresher sharks, while other species are tagged opportunistically. In recent years, tag deployments have been carried out in collaboration with the Tagging of Pacific Pelagics (TOPP) program (www.topp.org), Mexican colleagues at CICESE (Centro de Investigación Cientifica y de Educatión Superior de Ensenada), and colleagues at the DFO (Department of Fisheries and Oceans) Pacific Biological Station in Nanaimo, British Columbia. The goals of the projects are to document and compare the movements and behaviors of these species in the California Current and to link these data to physical and biological oceanography. This approach will allow us to characterize the essential habitats of sharks and subsequently better understand how populations might shift in response to changes in environmental conditions on short or long time scales. In 2010, 4 shortfin mako sharks, 9 blue sharks, 1 thresher shark, and 1 basking shark were tagged with either SPOT tags or towed GPS tags. Since 1999, a total of 95 makos, 85 blue sharks, 28 common threshers, 2 hammerheads,

5 ocean sunfish, and 1 basking shark have been satellite-tagged through collaborative projects.

### 6.2.4 Swordfish

***Deep-Set Buoy Project***: The future viability of the west coast swordfish fishery has been raised by stakeholders and fisheries managers as an issue of concern because the fishery has declined substantially in response to, among other factors, the increased regulation of the West Coast DGN Swordfish fishery. A major driver of the increased regulation centered on bycatch issues in the fishery including interactions with protected species such as sea turtles and marine mammals. The current suite of swordfish fisheries and their underlying regulatory regime is likely contributing to the underutilization of a healthy swordfish stock. Thus, development of an economically feasible/low bycatch gear for swordfish fishing along the U.S west coast may provide relief to swordfish fishermen and the communities they support. The Pfleger Institute of Environmental Research (PIER) has been awarded an Saltonstall-Kennedy Grant to capture and tag swordfish off the coast of southern California using experimental deep-set buoy gear. Buoy gear has been successfully fished off the east coast of the U.S. to capture commercial quantities of swordfish without any significant bycatch issues. The PIER research will take place over a two-year span within the southern California Bight with 300 sets of deep-set buoy gear to be deployed in year one utilizing the PIER research vessel and 600 sets of buoy gear in year two using cooperative commercial fishing vessels as the research platform. The research would take place from June-November with the gear set during daylight hours at depths below the thermocline (250-400 meters). The field research is anticipated to commence in June 2011.

***Commercial Swordfish Fishery Cost-and-earnings Survey***: A cost-and-earnings survey of the DGN and harpoon fisheries was initiated in 2010 and completed in April 2011. Follow-up analysis is planned to measure the relative economic viability of harpoon compared to DGN used to target swordfish, providing important data to address one of the issues identified at the Swordfish and Leatherback Use of Temperate Habitat (SLUTH) Workshop held May 28-29, 2008, at UC San Diego's Scripps Institution of Oceanography.

### 6.2.5 Sea Turtles

NMFS, in cooperation with researchers around the world, continues to conduct sea turtle research in the Pacific. Due in part to this work, the understanding of Pacific sea turtles has increased substantially over the past several years. Proceedings of the aforementioned SLUTH workshop were summarized and published in NOAA Administrative Report LJ-09-06 (August 2009).

A number of research projects have been planned based on priorities identified at the SLUTH workshop, including measuring the economic viability of harpoon as a substitute for other gears used to target swordfish based on the cost and earnings study mentioned above, characterizing the environmental conditions associated with fishing, swordfish and leatherback catch, assessing the rates of blue shark and other non-target catch in drift gillnet and longline fisheries, and deploying additional electronic tags to quantify the movements and habitat of swordfish.

### 6.2.6 Marine Recreational Information Program (MRIP) Projects

In the fall of 2008, the HMSMT developed proposals for MRIP funding to support research on the recreational fisheries for albacore and HMS sharks. The purpose of the albacore project is to evaluate the potential use of for-hire sector (CPFV) catch per unit effort (CPUE) estimates to develop an index of abundance for North Pacific albacore. The HMS shark project addresses areas of uncertainty in the current sampling program for HMS shark catch, including the potential use of adaptive sampling methods to more efficiently sample the pulse fishery for thresher sharks, and better sampling of night fishing and

tournament effort on HMS sharks. Both projects received funding for one year, and workshops were conducted to receive input from state data managers, biologists and industry representatives. Sampling programs were subsequently developed to meet the need for improved data collection in the recreational fisheries for albacore and for thresher sharks.

Proposals submitted by HMSMT members to MRIP in February 2011 to conduct pilot sampling programs for the albacore and HMS shark sampling methodologies were not approved for funding.

# 7.0 COMMONLY-USED WEB LINKS IN HIGHLY MIGRATORY SPECIES MANAGEMENT AND RESEARCH

## International Regional Fishery Management Organizations and Scientific Bodies

| | |
|---|---|
| Inter-American Tropical Tuna Commission | http://iattc.org/ |
| Western and Central Pacific Fisheries Commission | http://www.wcpfc.int/ |
| International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean | http://isc.ac.affrc.go.jp/ |

## U.S. West Coast Regional Fishery Management Councils

| | |
|---|---|
| Pacific Fishery Management Council | http://www.pcouncil.org/ |
| Western Pacific Regional Fishery Management Council | http://www.wpcouncil.org/ |

## State and Interstate Fisheries Commissions

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|---|---|
| California Department of Fish and Game | http://www.dfg.ca.gov/ |
| Oregon Department of Fish and Wildlife | http://www.dfw.state.or.us/ |
| Pacific States Marine Fisheries Commission | http://www.psmfc.org |
| Washington Department of Fish and Wildlife | http://wdfw.wa.gov/ |

## Institutions Conducting HMS Research

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|---|---|
| American Fishermen's Research Foundation | http://www.afrf.org/ |
| California State University, Long Beach | http://www.csulb.edu |
| Centro de Investigación Científica y Educación Superior de Ensenada | http://www.cicese.mx/ |
| Inter-American Tropical Tuna Commission | http://www.iattc.org |
| Monterey Bay Aquarium | http://www.mbayaq.org/ |
| Monterey Bay Aquarium Tuna Research and Conservation Center | http://www.tunaresearch.org |
| Moss Landing Marine Lab | http://www.mlml.calstate.edu/ |
| NOAA Pacific Islands Fisheries Science Center | http://www.pifsc.noaa.gov |
| NOAA Southwest Fisheries Science Center | http://swfsc.noaa.gov |
| NOAA Southwest Regional Office | http://swr.nmfs.noaa.gov |
| Pfleger Institute of Environmental Research | http://www.pier.org |
| Scripps Institute of Oceanography | http://www-sio.ucsd.edu |
| Tagging of Pacific Pelagics | http://www.toppcensus.org |

**Sport and Commercial Fishing Industry Related Associations**

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| American Albacore Fishing Association | http://www.americanalbacore.com |
| Oregon Albacore Commission | http://www.oregonalbacore.org/ |
| Sportfishing Association of California | http://californiasportfishing.org/ |
| United Anglers of Southern California | http://www.unitedanglers.com |
| Western Fishboat Owner's Association | http://www.wfoa-tuna.org |